

The Early Upper Palaeolithic puzzle in Mediterranean Iberia

Das Frühe Jungpaläolithikum im mediterranen Spanien

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ABSTRACT - In this paper we present a new technological tradition associated with what has been called the Gravettian in Mediterranean Iberia. Two important sequences: El Palomar Rock Shelter and Mallaetes Cave support an interpretation that this technological unit might have played a key role in the consolidation of the Upper Palaeolithic in the region. A review of the main Early Upper Palaeolithic sites documented in this area is also presented, in order to discuss this controversial period. The main ideas from this new industry and the critical revision of the current evidence of the Early Upper Palaeolithic both show that there is no compelling evidence for an Aurignacian in Mediterranean Iberia and that the Gravettian is the strongest manifestation of the beginning of the Upper Palaeolithic in the region. Finally, we highlight three of the major problems about the discussion of the Early Upper Palaeolithic in this area: 1) the reliance on fossiles directeurs in typological studies has caused some confusion in the labelling of industries, 2) the expectation that Iberia should follow the western European lithic tradition has resulted in labelling those assemblages that do not 'fit' as 'indeterminate' Early Upper Palaeolithic industries, adding more difficulty to the debate and 3) the disregard of stratigraphical evidence in the debate.

ZUSAMMENFASSUNG - Der Beitrag stellt eine neue technologische Tradition vor, die mit dem Gravettien der mediterranen Zone der Iberischen Halbinsel verbunden ist. Die stratigraphischen Abfolgen aus dem Abri El Palomar und der Höhle Mallaetes werden beschrieben und bilden die Grundlage für diese neu definierte technologische Tradition, die entscheidend war für die Entwicklung des Jungpaläolithikums in der Region. Eine Zusammenfassung des Forschungsstandes zum frühen Jungpaläolithikum der Region erläutert die verschiedenen Forschungsansätze und dient als Grundlage für eine Bewertung der sich teilweise widersprechenden Meinungen. Das zentrale Ergebnis des Beitrages besagt, dass keine überzeugenden Hinweise für den Nachweis eines Aurignaciens in der mediterranen Zone der Iberischen Halbinsel vorliegen und dass erst mit dem Gravettien ein eindeutig fassbares Jungpaläolithikum nachweisbar ist. Abschließend werden die wichtigsten Probleme bei der Diskussion des frühen Jungpaläolithikums in der Region erläutert. Dazu zählen: 1) Die Überbewertung der Aussagekraft typologischer Leitformen bei der Klassifizierung der Technokomplexe. 2) Die strikte Erwartung, dass die technologische Entwicklung der lithischen Inventare auf der Iberischen Halbinsel dem westeuropäischen Muster folgt, hat dazu geführt, dass Inventare, die nicht dem typischen Schema entsprechen, als „unbestimmtes frühes Jungpaläolithikum“ angesprochen wurden. Damit wird die ohnehin unübersichtliche Situation noch verwirrender. 3) Die Aussagekraft der stratigraphischen Abfolgen wurde vernachlässigt zugunsten einer Einordnung der Inventare in das gängige Klassifikationsschema.

KEYWORDS - Early Upper Palaeolithic, Gravettian, technology, Iberian Peninsula, Mediterranean, chronostratigraphy
Frühes Jungpaläolithikum, Gravettien, Technologie, Iberische Halbinsel, Mittelmeer, Chronostratigraphie

Introduction

This paper calls attention to one of the principal areas of study in the Iberian Peninsula, the Southeast, where very few previous studies have been made about the Early Upper Palaeolithic, even though this area was one of the first for pioneering prehistoric archaeology

in Europe (Siret 1891). Moreover, this area (included in the Mediterranean region) is highly controversial because a very particular beginning for the Upper Palaeolithic has been proposed here (Cacho 1981, 1982; Vega Toscano 1993, 2005; Zilhão 2006). Our aim is to define a new technological unit within what previously has been generally termed Gravettian in the Mediterranean area. There are several indications to support a suggestion that this technological unit might have played an important role in the consolidation of the Upper Palaeolithic in the region. In

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addition to the presentation of a new technological unit, we will review the main Early Upper Palaeolithic sites documented in this area and discuss its characteristics in order to formulate an appropriate argument.

The south-eastern part of the Iberian Peninsula seems a particularly interesting area to discuss the Gravettian for two main reasons: first, since the 1980s there have been few studies of it. This situation is paradoxical because, on typological grounds, the Gravettian has been considered the most important technocomplex of the Early Upper Palaeolithic in the region (Cacho 1981, 1982; Fortea et al. 1983; Fullola et al. 2007). Secondly, previous and preliminary studies have highlighted its particular characterization and importance; see for example the technical publications of El Palomar Rock Shelter (Vega Toscano & Martín 2006; de la Peña Alonso 2011a, de la Peña Alonso & Vega Toscano 2013) or from Cendres Cave (Villaverde & Román 2004, Villaverde et al. 2007-2008).

In fact, defining the Early Upper Palaeolithic along the Mediterranean and the southern region of the Iberian Peninsula is still a complex subject, as there are some gaps and unresolved questions throughout its supposed development. On the one hand, it has been proposed that Mousterian technology continued until the end of Marine Isotope Stage (MIS) 3 and the beginning of MIS 2 (Zeuner 1953; Vega Toscano 1988; Vega Toscano et al. 1988, 1990, 1993; Finlayson et al. 2006; Fernández et al. 2007). Moreover, no transitional industries have been found so far (Cacho 1981, 1982; Vega Toscano 1993; de la Peña 2011a), contrasting with other western European areas such as the Cantabrian region, south-western France, or even Italy. On the other hand, the most ancient as well as the most recent varieties within the Aurignacian technocomplex have been mentioned along the Mediterranean coast. We are referring for example to L'Arbreda in Catalunya, associated to the Protoaurignacian (Soler & Maroto 1987a, 1987b, 1990), or Beneito, associated with a late Aurignacian (Iturbe et al. 1993). In fact, the Evolved Aurignacian has been proposed as the first Early Upper Palaeolithic technocomplex in all southern Iberia (Cortés 2007a, 2007b). It is recognised mainly from Mallaetes Cave (Fortea & Jordá 1976) and, recently from the Pego do Diabo sequence in Portugal (Zilhão et al. 2010). Finally, other technological varieties associated with the Early Upper Palaeolithic have also been quoted, but they have been defined as "indeterminate Early Upper Palaeolithic", as at Cova Gran (Catalunya) (Martínez-Moreno et al. 2009) or Cova Foradada (Casabó 1997a, 1997b, 2000, 2001).

Although some sites are cited as Aurignacian, the Gravettian looks like the most robust Early Upper Palaeolithic culture of the Mediterranean area of the Iberian Peninsula on typological and technological grounds (Siret 1891; Jordá 1954; Cacho 1981, 1982; Miralles 1982a, 1982b; Fortea et al. 1983; Zilhão 1997;

Almeida 2000; Fullola et al. 2007; Bicho 2000, 2005; de la Peña Alonso 2009; Bicho et al. 2010; de la Peña Alonso 2011a).

This paper attempts to prove that the so called Gravettian industries are a clue to a better understanding of the beginning of the Early Upper Palaeolithic in the Mediterranean region, emphasizing their particular character. Moreover, it looks like the wish to recognize a "proper" Aurignacian has overshadowed other explanations for the beginning of the Upper Palaeolithic.

The Gravettian is putatively one of the key "cultures" of the Upper Palaeolithic in a great part of Eurasia. It was first recognized as Upper Aurignacian (Breuil 1912), then Upper Perigordian (Peyrony 1933, 1936, 1946) and, finally, Gravettian (Garrod 1936). This last term has been recently generally accepted (Djindjian et al. 1999; Zilhão 1997; Nespoulet 1995; Klaric 2003; Conard & Bolus 2003; Simonet 2009a, 2009b; Moreau 2010, among others), however, it must be said that during much of the second half of the 20th century the term, "Gravettian", was firmly rejected by some of the most influential researchers of the French *hyper-positiviste* tradition, for example Bordes and Sonnevile-Bordes (Sonneville-Bordes 1960; Bordes 1968). Moreover, it is not well defined and it is sometimes classified as a cultural tradition and, recently, as a technocomplex (de la Peña Alonso 2012).

The Gravettian is important not only because is one of the principal technological traditions of the Early Upper Palaeolithic. It is furthermore the first technological tradition that can be firmly assigned to *Homo sapiens* in Western and Central Europe, usually with well-developed burials (Henry-Gambier 2005). Even the *Homo sapiens* human remains of Cro-Magnon cave have been recently attributed to the Gravettian (Henry-Gambier et al. 2006). Other discoveries might point to the relationship between *Homo sapiens* and older technological traditions, but the archaeological contexts of these discoveries are uncertain, and they are assigned to the Aurignacian only in chronological terms, see for example the case of Peștera cu Oase (Trinkaus et al. 2003).

There are three principal archaeological features which are recognized as the hallmark of the Gravettian Culture throughout Europe: the rock art, such as hand-stencils, "Venus" figurines, the complex burials and the lithic industries. Indeed, the lithic industries, and particularly the backed tools (such as *gravettes*, *micro-gravettes* and backed blades / bladelets), were one of the main characteristics of this "archaeological culture" (Garrod 1936). However, since its definition it looks as though a great variety of different industries or *facies* have been described within it, e.g. the Noaillian (David 1985), the Rayssian (Klaric 2003) or the Protomagdalenian (Bordes 1958) in France, the Kostenkian in Russia (Sinitsyn 2007), and the Pavlovian in the Czech Republic (Svoboda 2007), to quote a few examples.

This situation has led some authors to rename the phenomenon as “the Big Mosaic” (Mussi & Roebroeks 1996). Nevertheless, a number of researchers still consider the Gravettian as a unitarian cultural event (Otte 1985; Djindjian et al. 1999; Simonet 2009a, 2009b).

Another important idea is that the Gravettian was originally from Eastern or Central Europe. In other words, most researchers believe that it later moved to Western and Mediterranean Europe (Otte & Keeley 1990; Djindjian et al. 1999; Conard & Bolus 2003). This is the main idea expressed in the Danube Corridor or the *Kulturpumpe* models (Kozłowski & Otte 2000; Conard & Bolus 2003) which have been used in reference to both for Aurignacian and Gravettian beginnings. Accordingly, the Gravettian dates of Willendorf and other central European sites such as Hohle Fels or Geißenklösterle are accepted as the oldest ones in Eurasia (vid. Conard & Bolus 2003; Moreau 2010). However, even in other areas of the continent new data clearly challenge this view, such as the new radiocarbon dates from Gravettian sites in the Basque Country, see for example the new data from Aitzbitarte III or Antoliña (Aguirre 1998-2000; Altuna et al. 2012). From this point of view is suggested, tacitly, that what happens in these eastern ‘nuclear’ areas will occur sooner or later in other outlying areas. This presumption, as will be seen, has important implications for the interpretation of “peripheral” areas not as well studied as the centre of Europe; because a pre-defined model is anticipated.

The Gravettian in the Iberian Peninsula has been traditionally recognized in lithic typological terms (Siret 1891; Obermaier 1925; Jordá 1954; McCollough 1971; Fullola 1979; Cacho 1981; Bernaldo de Quirós 1982; Miralles 1982a, 1982b; Fortea et al. 1983; Arrizabalaga, 1995; Fullola et al. 2007); only very recently has technological analysis been proposed and this mainly in the Atlantic area (Zilhão 1997; Almeida 2000; Aubry et al. 2007; Marreiros et al. 2010, 2012; de la Peña Alonso 2011a; de la Peña Alonso & Vega Toscano 2012).

In recent years the Gravettian has been clearly overshadowed in Upper Palaeolithic debates by other issues such as the so-called transitional industries (namely the Chatelperronian) and the transition between the final Middle Palaeolithic and the beginning of the Aurignacian (Cabrera & Bischoff 1989; Bischoff et al. 1989; Bischoff et al. 1994; Maíllo 2003; Ríos Garaizar 2003; Cabrera et al. 2004; Vega Toscano 2005; Zilhão 2006; Vaquero 2006). This situation is striking because authentic peninsular milestones for the Early Upper Palaeolithic can be attributed to the Gravettian. For example, the Iberian Peninsula is one of the few areas in Europe (with the Balkan Peninsula) without the well-known “Venus” figurines (Mussi & Roebroeks 1996); the Gravettian is the first tradition or culture that is associated with *Homo sapiens* remains (e.g. the occipital from Mallaetes

cave, Arsuaga et al. 2002) and complex burials (such as the Lagar Velho discovery, Zilhão & Trinkaus 2002), as well as the first evidence of well-developed rock and mobile art (Gárate 2008; González Sainz 2007; Villaverde 1994, 2005; among others), which has recently seen a notable increase of discoveries. Moreover, the Gravettian industry is very well represented along all the Iberian Peninsula on typological grounds.

One of the main shortcomings in the studies of the Gravettian of the Iberian Peninsula is that until very recently (de la Peña Alonso 2009, 2011a) a synthesis or reflection beyond the regional level has never been made. Generally, the Gravettian has been included in broader chronological studies (Early Upper Palaeolithic) of very limited regions. Moreover, consideration of the Gravettian has always been influenced by the classification, parameters and results of other Western European areas. This has generated forced frameworks, such as the application of the French Peri-gordian model in the Cantabrian region (see Almagro 1956 or Bernaldo de Quirós 1982) or contradictory peninsular overviews, such as the one of McCollough (1971). In that interpretation almost three quarters of the Peninsula Gravettian sites were classified as “anomalous” because they did not fit with the Perigordian model (de la Peña Alonso 2011a). For all these reasons it has not contributed (or very marginally) to the current Early Upper Palaeolithic debate.

In fact, the inherited perspective of the Gravettian from the 1980s was highly contradictory. On the one hand, F. Bernaldo de Quirós (1982) called attention to the strong development of the Aurignacian in the Cantabrian region and the late development of the Upper Perigordian. Bernaldo de Quirós also argued for an acculturation of the Aurignacian by the Perigordian Vc (one of the Peyrony’s subdivision of the Upper Perigordian, also called Noaillian). On the other hand, Cacho (1981) argued that the Upper Perigordian was the most important culture of the Mediterranean Upper Palaeolithic and that the Aurignacian presence so scarce that an evolution from the Mousterian to the Upper Perigordian could be even argued.

From a technological point of view the thesis of Zilhão (1997) and Almeida (2000), brought new ideas for the Iberian Peninsula. They defined four new techno-typological facies (Ancien Gravettian, Fontesantense, Final Gravettian and Terminal Gravettian) in Estremadura Portuguesa, never documented in the rest of the Peninsula. Moreover, several papers by Bicho (2000, 2005), and recent publications by his team (Bicho et al. 2010; Marreiros et al. 2010; Marreiros et al. 2012) have highlighted that the Gravettian is the strongest early Upper Palaeolithic manifestation in southern Iberia. Also, recent discoveries and studies in the Basque Country and Pyrenees, such as at Gargas, Zatoya, Alkerdi or

Aitzbitarte III (Barandiarán & Cava 2001; Foucher 2005; Cava et al. 2009; Altuna et al. 2012), and open-air sites like Mugarduia (Barandiarán et al. 2007), are promising for the study of this industry in the Iberian Peninsula.

Characterization of the lithic evidence of the South-eastern area: the case of El Palomar and Mallaetes

El Palomar Rock Shelter

We present a long sequence in the South-eastern part of the Iberian Peninsula: El Palomar rock shelter. This site is one of the few sequences which include both Middle and Early Upper Palaeolithic industries. Moreover, as we have already mentioned, it has a variety of industry never documented before (Vega Toscano & Martín 2006; de la Peña Alonso 2011a) in the rest of the territory. This site contains three stratigraphic layers (V, IV and III) associated by chronology and typology (presence of gravettes, microgravettes and backed bladelets) with the Gravettian (de la Peña Alonso 2011a; de la Peña Alonso & Vega Toscano 2013).

El Palomar rock shelter is located near the village of Yeste (Fig. 1), which lies in the Sierra de Segura, in the South of the province of Albacete. It is part of the vast Betic Mountain Chain (Vera 2004). Geographically speaking, the Sierra de Segura is a complex of medium-high mountain ranges, with

altitudes from 700 to 2000 m .a.s.l, which extends through the provinces of Jaén and Albacete. The terrain is rugged, with deep valleys and narrow passes. Due to the predominance of limestone in this area, the landscape has numerous karstic formations with huge massif-like mounds, known in this region as *Calares*.

El Palomar is located next to Fuensanta reservoir (UTM X565930 Y4250147 Z610 m). The site was discovered in 1984 by Córdoba and Vega Toscano (Córdoba & Vega Toscano 1988) and its stratigraphy was described in 1996 by Vega Toscano (Vega Toscano & Martín 2006). The excavation was resumed in 2004, and since 2008 it has been under the co-direction of Gerardo Vega Toscano, Fernando Colino Polo and Paloma de la Peña Alonso.

The rock shelter forms part of a fluvio-karstic canyon carved out by the Tus River, 3 km upstream from where it joins the Segura River. It is made of limestone, and is around three metres wide by forty metres long. From the front of the rock shelter a gentle slope leads down to the edge of the reservoir.

El Palomar has two big sedimentary areas: one is alluvial, with evidence of lithic industries corresponding to the Middle Palaeolithic, and the other is a colluvial deposit partially covered by the rock shelter. In the area inside the rock shelter 13 lithostratigraphic layers have been documented so far, comprising Middle Palaeolithic (Layers XIII to VI), Early Upper Palaeolithic (Layers V, IV, and III) and later Upper Palaeolithic and Holocene (Layers II and I) (Vega Toscano & Martín 2006) (Fig. 2).

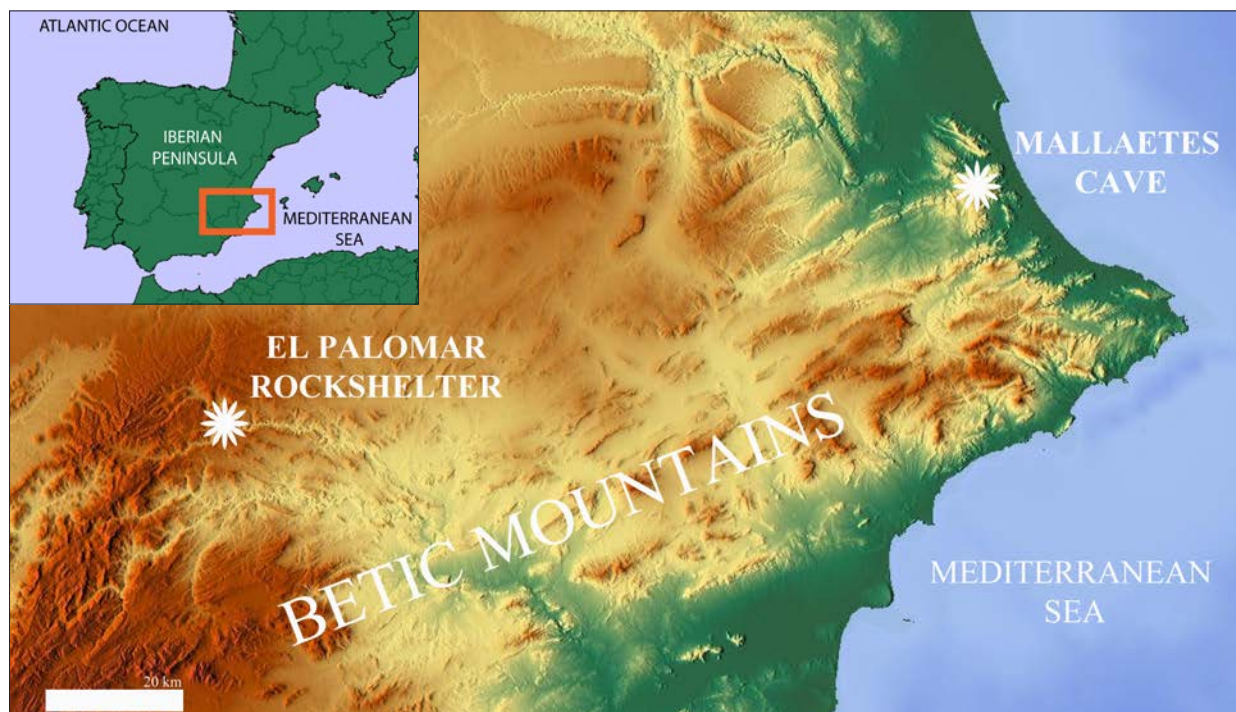


Fig. 1. Location of El Palomar Rock Shelter and Mallaetes Cave at the edge of the Betic Mountain chain.

Abb. 1. Die Lage des Abris El Palomar und der Mallaetes Höhle am Rand der Betischen Kordillere.

The radiocarbon dating of bone from Layers V, IV and III shows a chronology between 31-30 kyr cal BP for Layers V and IV (in a probabilistic overlapping) and 26-25 kyr cal BP for Layer III (Fig. 3). However, it must be highlighted that Layer IV has four radiocarbon dates from sediments which are not stratigraphically consistent with the rest of the dates on bone. This seems to be a methodological problem specific to sand. Moreover, the sand that was dated is from

independent stratigraphic units which look like hearths in layer III. This might explain their young chronology. Nevertheless, all the (bone) radiocarbon dates link Layers V, IV and III chronologically to the Gravettian in this geographical area (Fortea & Jordá 1976). Layer VI is not discussed in the present paper because the assemblage excavated so far is a very small sample.

The Layers V, IV and III of El Palomar rock shelter

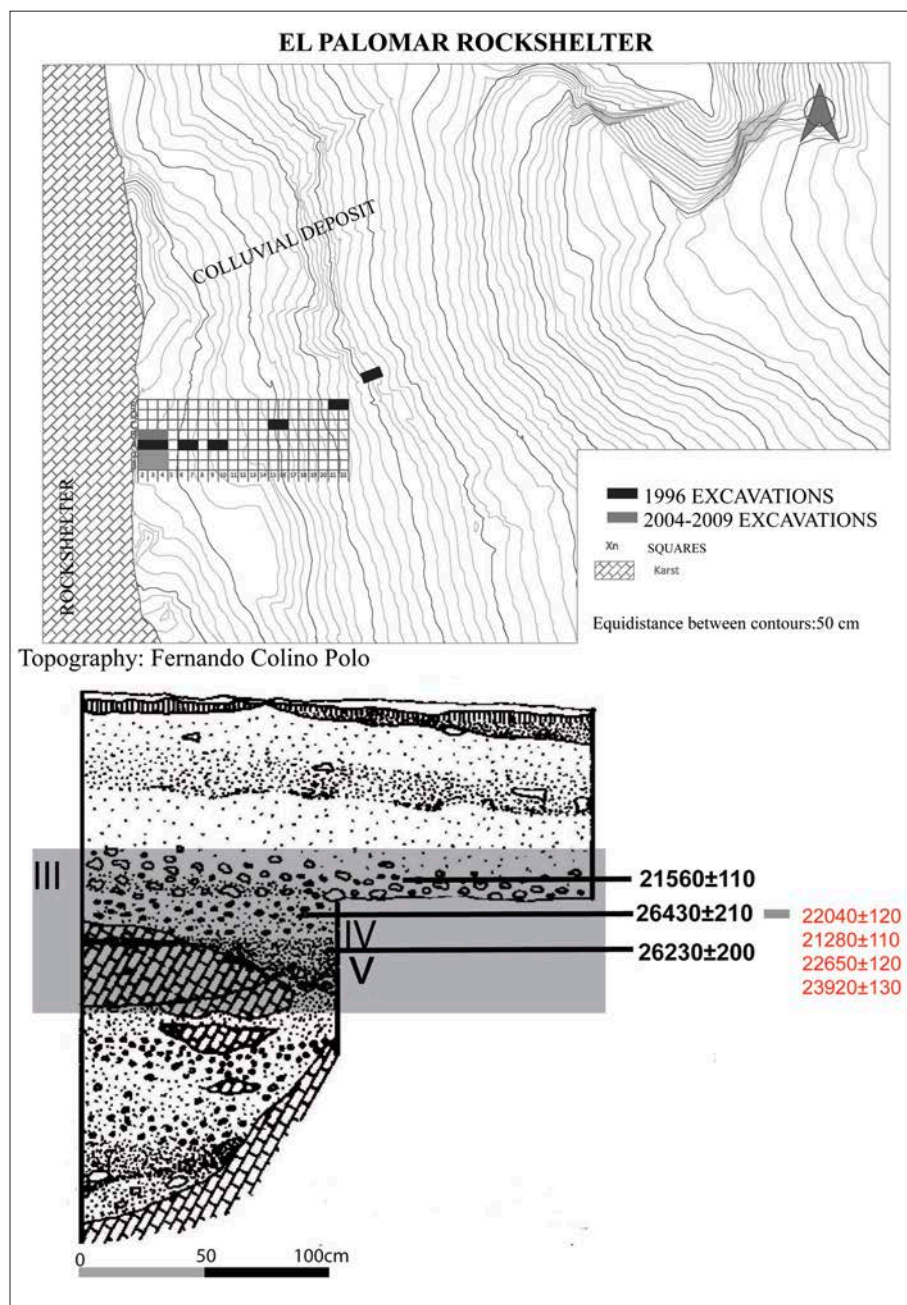


Fig. 2. Above: Topography of El Palomar Rock Shelter (colluvial deposit) with the excavation areas of 1996 and 2004-2009. Below: Strati-graphy of the deposit inside the Rock Shelter and radiocarbon dates. The three lithostratigraphic deposits related to the Gravettian, which are presented in this paper (V, IV and III), have been highlighted in grey.

Abb. 2. Oben: Topographie des Abris El Palomar mit den Grabungsflächen der Jahre 1996 sowie 2004-2009. Unten: Stratigraphie der Ablagerungen innerhalb des Abris und die Position der Radiokarbondaten. Die drei Fundschichten des Gravettien (V, IV und III), die im Text vorgestellt werden, sind grau unterlegt.

present very similar technological strategies and percentages of rock types. The main rocks are flint (which increases notably in these Early Upper Palaeolithic layers), quartzite and limestone. Quartzite and limestone occur in the immediate surroundings of the rock shelter. Flint is a common material in the Betic mountains, but the specific outcrops for El Palomar material remain unknown, and certainly do not appear in the immediate surroundings of the site.

The main technological strategies in the layers related to the Gravettian were: laminar methods, flaking methods (de la Peña Alonso & Vega Toscano 2012) and bipolar knapping (de la Peña Alonso 2011a; de la Peña Alonso & Vega Toscano 2013). However, within each one of these three methods there are different technological modalities.

Laminar methods were developed only in flint from prismatic and slightly carinated cores. Moreover, end-scrapers cores to obtain bladelets have also been found (Fig. 4). End-scrapers cores are supposedly a hallmark feature of the Aurignacian in other western and central European contexts (Bon 2000; Chiotti 2003; Teyssandier 2003). However, in El Palomar sequence this looks like a common reduction bladelet strategy within the layers with well-developed backed tools and a later chronology. This situation is similar to other regions, such as the Estremadura Portuguesa (Zilhão 1997; Almeida 2000; Aubry et al. 2007), where end-scrapers cores are a common morphotype for the Terminal Gravettian and also throughout the Upper Palaeolithic (vid. Zilhão 1997; Almeida 2000). These three varieties of bladelet-methods produced straight profile bladelets, slightly curved bladelets and very curved bladelets (Fig. 4).

The most common maintenance by-products for laminar cores were tablets, designed to correct or maintain the angle of knapping, and plunging flake-blades, to clean the knapping surface or to change the

knapping direction of prismatic and slightly carinated cores (de la Peña Alonso 2011a).

Flaking methods were developed in flint, quartzite and limestone. Discoidal flaking was the most common method, although expedient blanks that must have been from unprepared cores have been also observed (Fig. 5) (vid. de la Peña Alonso 2011a; de la Peña Alonso & Vega Toscano 2012). It must be highlighted that usually flakes were not retouched. These two types of knapping methods have also been identified in all the lower layers of the colluvial sequence (Layers XIII to VII) attributed to the Middle Palaeolithic. They evidently represent a continuity with these three Early Upper Palaeolithic layers.

Bipolar knapping has been documented only in flint and is interpreted as a recycling strategy for blanks previously knapped by freehand percussion. This strategy looks like a method to obtain a huge number of blanks with very little mental concentration and from small pieces of flint, which might not be as abundant as quartzite and limestone in the surroundings of El Palomar. In other words, bipolar knapping might be a microlithic recycling strategy to produce small barbs without retouch. The recognition of bipolar knapping was on experimental grounds and was the principal objective of previous publications (de la Peña Alonso 2011a, 2011b; de la Peña Alonso & Vega Toscano 2013, Fig. 6).

Another striking attribute of these three layers is the low representation of formal stone tools (Fig. 7). The most representative morphotypes are backed tools, usually backed bladelets (however in Layer III there are well-defined gravettes and microgravette points, Fig. 8) and marginal retouched bladelets (Fig. 9). Some of the marginal retouched bladelets have a backed edge, however, in other cases they have inverse and semi-abrupt retouch, similar to the *Dufour* morphotype subtype *Dufour*, which is a common feature in French Protoaurignacian and Aurignacian I contexts (Sonneville-Bordes & Perrot 1956; Demars & Laurent 1989; Bordes & Tixier, 2002), see Figure 9. However, marginal retouched bladelets have also been reported from other Iberian Gravettian contexts such as Vale Comprido and Terra do Manuel (Portugal) (Zilhão 1997; Almeida 2000); Aitzbitarte III (Basque Country) (Ríos Garaizar et al. 2012) and Isturitz (Pyrenees) (Simonet 2009a). Here we want to emphasize that we do not consider this morphotype as a fossil index as is the case in the Early Upper Palaeolithic sequence of Pego do Diabo (Zilhão et al. 2010); our methodology is based primarily on the chronostratigraphy. Nevertheless, it seems that the majority of the bladelet-blanks for this morphotype come from prismatic cores because they are rectilinear blanks.

Domestic tools such as end-scrapers, burins, borers, etc. are very rare, probably because they also end up as recycled bipolar cores, as some of the bipolar pieces have demonstrated, indeed some of

Level	Laboratory reference	Sample	¹⁴ C BP	calBP (± 2σ)
1	Beta-185408	Bone	9 670 ± 40	11 310-10 750
3	Beta-185409	Bone	21 560 ± 110	26 100-25 100
4	Beta-274112	Sediment	22 040 ± 120	26 930-25 930
4	Beta-253852	Sediment	21 280 ± 110	25 760-24 880
4	Beta-253851	Sediment	22 650 ± 120	28 010-26 770
4	Beta-245815	Sediment	23 920 ± 130	29 470-28 110
4	Beta-85410	Bone	26 430 ± 210	31 850-30 690
5	Beta-185411	Bone	26 230 ± 200	31 720-30 480
6	Beta-185412	Bone	28 050 ± 230	33 110-31 950

Fig. 3. Radiocarbon AMS dates for Layers I, III, IV, V and VI of El Palomar Rock Shelter. Note that the four dates on sediments (Layer IV) are younger than the ones on bone.

Abb. 3. AMS-Radiokarbondaten aus der Schicht IV von El Palomar. Die vier Datierungen an Sediment sind jünger als die Daten an Knochen.

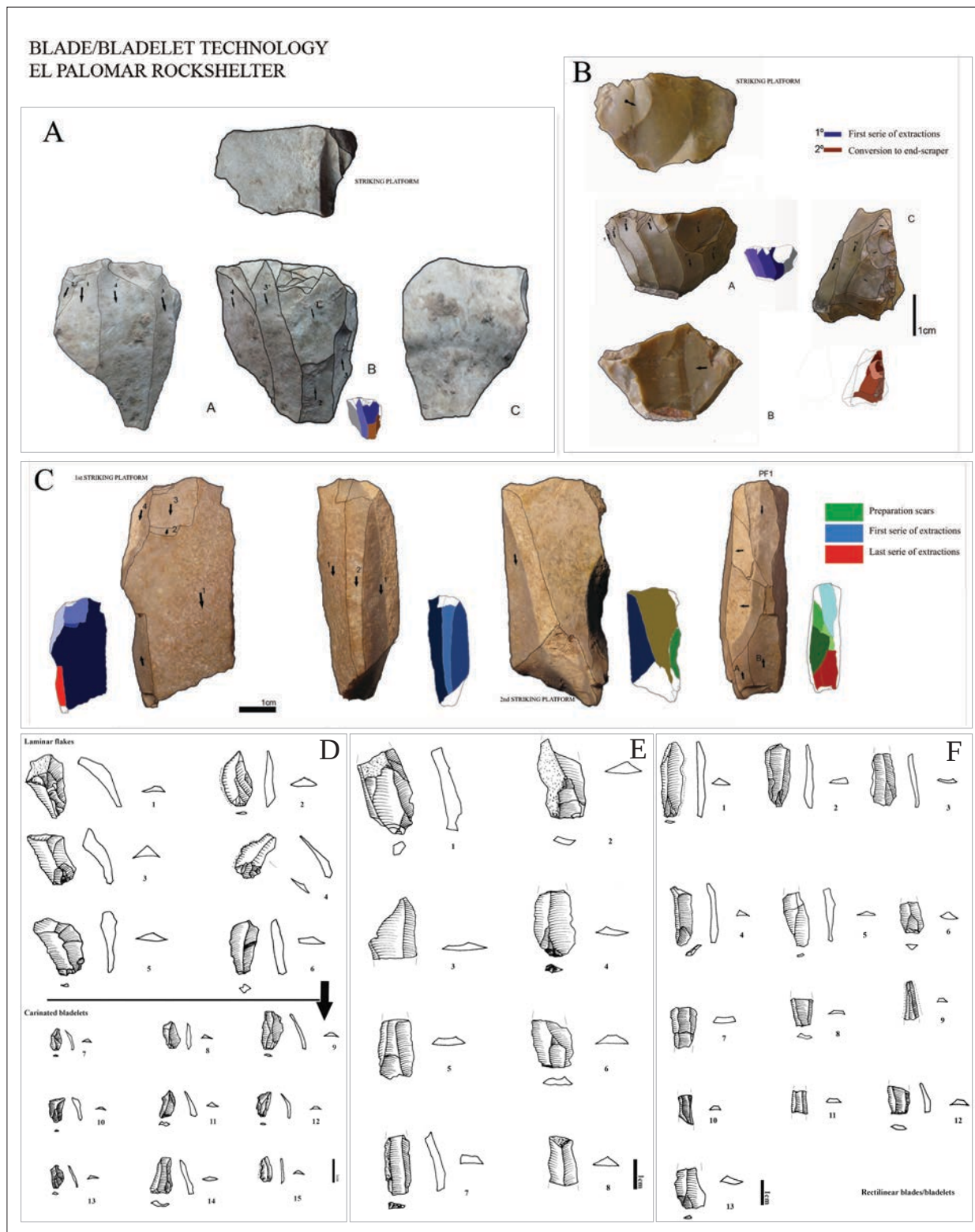


Fig. 4. Some examples of the laminar technology of El Palomar Rock Shelter. A: Slightly carinated prismatic core (Layer V); B: Bladelet core transformed to an end scraper (Layer IV); C: Prismatic core (Layer III); D: Laminar flakes and carinated bladelets probably coming from a carinated core (Layer III); E and F: Rectilinear blades and bladelets (Layer III); A and B same scale.

Abb. 4. Beispiele der Klingentechnologie von El Palomar. A: Gekielter, prismatischer Kern (Schicht V); B: In einen Kratzer transformierter Lamellenkern (Schicht IV); C: Prismatischer Kern (Schicht III); D: Klingenförmige Abschlüsse und Lamellen, die wahrscheinlich von einem gekielten Kern stammen (Schicht III); E und F: Gerade Klingen und Lamellen (Schicht III); A und B gleicher Massstab.

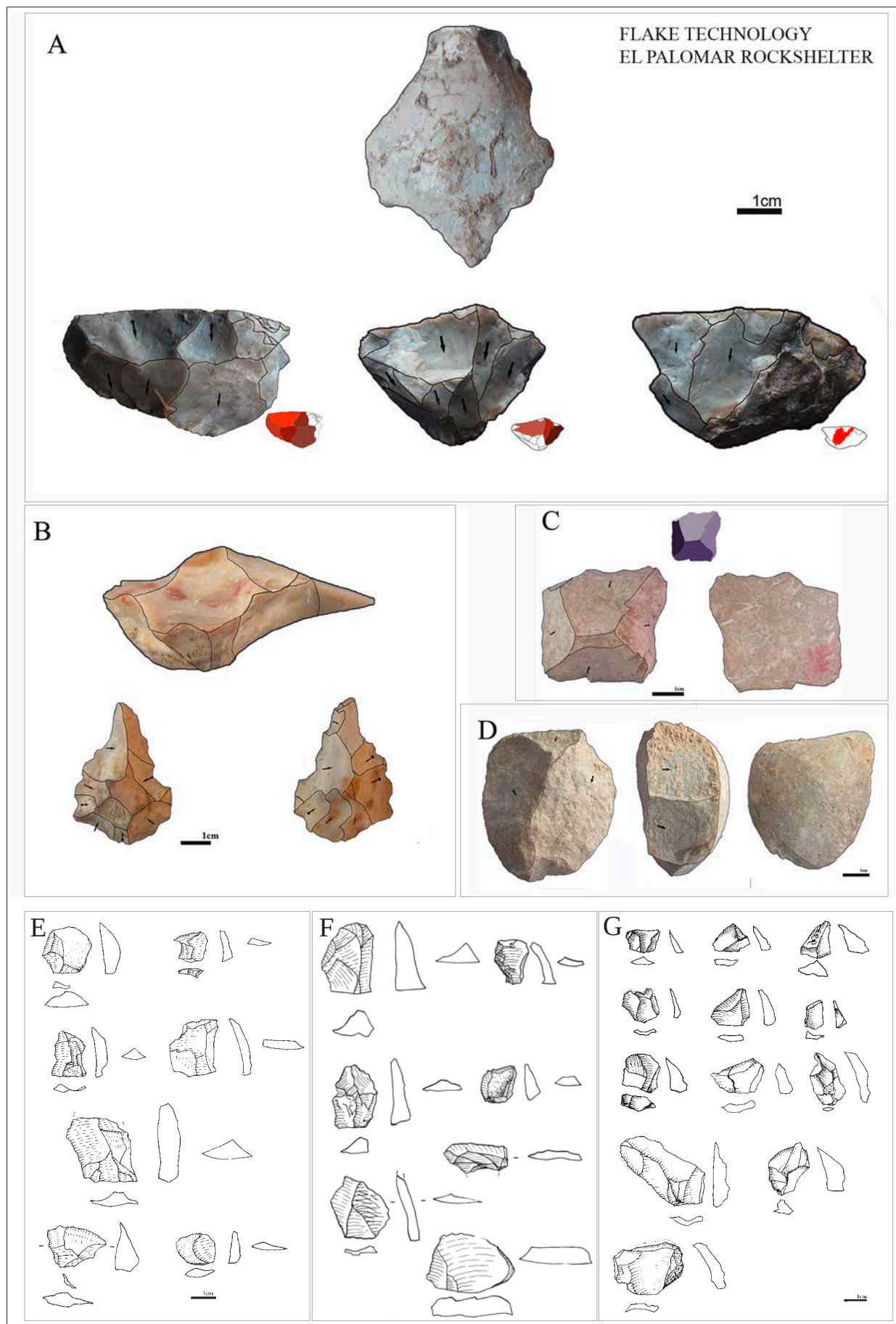


Fig. 5. Legend on following page.

Abb. 5. Legende auf folgender Seite.



Fig. 6. Above: Splintered pieces interpreted as bipolar cores of Layers V, IV and III. Below: Bipolar blanks from bipolar knapping of Layers V, IV and III.

Abb. 6. Oben: Ausgesplitterte Stücke, die als bipolar Kerne angesprochen werden aus Schicht V, IV und III. Unten: Bipolare Grundformen aus Schicht V, IV und III.

them still retain parts of the previous retouched edges.

Summarizing, the main three goals of the lithic technology of El Palomar V, IV and III Layers for flint were: bipolar blanks, marginal retouched bladelets

and fully backed tools. In other words, the microlithic factor in flint appears to have been one of the most important lithic strategies together with workshop production (in flint, quartzite and limestone) in order to obtain non-retouched flakes (Fig. 7).

Fig. 5. (previous page) Some examples of the flaking technology at El Palomar Rock Shelter. A: Unifacial centripetal core in flint (Layer V); B: Discoidal centripetal core in flint (Layer V); C: Unifacial centripetal core in limestone (Layer V); D: Unprepared core in quartzite (Layer III); E: Flakes in quartzite (Layer III); F: Flakes in limestone (Layer III); G: Flakes in flint (Layer III). Note that within the different examples there are pseudo-Levallois flakes and pseudo backed flakes, typical of discoidal reduction methods.

Abb. 5. (vorige Seite) Beispiele der Abschlagproduktion aus El Palomar. A: Unifazialer, zentripetaler Kern aus Feuerstein (Schicht V); B: Diskoider, zentripetaler Kern aus Feuerstein; C: Unifazialer, zentripetaler Kern aus Kalk (Schicht V); D: Unpräparierter Kern aus Quarzit (Schicht III); E: Abschlge aus Quarzit (Schicht III); F: Abschlge aus Kalk (Schicht III); G: Abschlge aus Feuerstein (Schicht III). Innerhalb der verschiedenen Beispiele sind auch Pseudolevallois-Abschlge und Pseudorckengestumpfte Abschlge, die typisch fr die diskoider Abbautechnik sind.

Retouched pieces from El Palomar Rock Shelter	Level V	Level IV	Level III
End scraper		1	7
End scraper and borer			1
Borer		1	
Burin		1	3
Truncation	2	4	5
Denticulate	1	1	1
Gravette Point			2
Microgravette Point			8
Backed bladelet	3	14	50
Denticulate bladelet		2	
Notched bladelet			1
Notched			4
Side scraper			1
Marginal retouched bladelet	15	46	23
Flakes and blades with some retouch	18	30	23
Total	39	100	129

Fig. 7. Retouched pieces from El Palomar Rock Shelter, Layers V, IV and III.

Abb. 7. Retuschierte Stücke aus El Palomar Schichten V, IV und III.

Mallaetes Cave

In the central area of the Mediterranean region, the oldest levels of Mallaetes Cave (Valencia) in the Mondúver mountain range, have a very similar lithic technology to the one highlighted for El Palomar, and seem particularly suitable for the discussion at hand.

Mallaetes Cave was discovered in the 1940s and excavated in the same decade by Luis Pericot and Francisco Jordá (SIP 1947, 1948, 1949, 1950). Since then, and until today, this site has constituted the main reference for Mediterranean Early Upper Palaeolithic. This is because of the seminal publications by F. Jordá and L. Pericot (Jordá 1954; Pericot 1942) followed by a field campaign directed by F. Jordá and J. Fortea in 1970. This was the source of an overview article on the Upper Palaeolithic in this area (Fortea & Jordá 1976), as well as several doctoral dissertations about different subjects such as the faunal remains, the pollen and the sedimentary formation of the site (Davidson 1989; Dupré 1988; Fumanal 1988).

There are two radiocarbon dates for the Early Upper Palaeolithic layers of the 1970 East pit, which are: KN-I/ 926: 29590 ± 560 BP (layer XII, at the very bottom) and 20890 ± 300 BP (layer VI at the upper part); and an AMS date (Beta Analytic 25120 ± 240 BP) of a charcoal fragment attached to the occipital human remains (Arsuaga et al. 2002) found in the 1948 excavation of Sector E and ascribed to the Gravettian.

The basal levels of this cave, attributed to the Early

Upper Palaeolithic, (collections from the surveys of the 1940s and 1970s) (Old Diaries and Fortea & Jordá 1976) have been the object of a recent technological revision (vid. de la Peña Alonso 2011a, 2013 for a detailed description). This revision took into account the stratigraphy published in the survey conducted in 1970 and the stratigraphic sections of the old excavations (Mallaetes excavation diaries from 1946 to 1949). Although the old excavations were conducted in arbitrary spits, the researchers Pericot and Jordá always recorded the thickness of the excavated sections. Moreover, in some sectors they drew the natural strata including the depths. The combination of these two types of information allowed us to produce a stratigraphic reference for some parts of this lithic collection (de la Peña Alonso 2011a, 2013). Parts of the old excavations which could be related to some of the stratigraphic documented profiles were: FGH, I and the first test-trench.

The most important conclusion of this recent revision is that an interpretation of an Aurignacian occupation of the site cannot be defended because there is no industrial evidence to support this conclusion (for a further discussion see de la Peña Alonso 2011a, 2013). In contrast, there are several layers which typologically can be associated to the so called Gravettian, because of the great representation of backed tools, such as microgravettes, gravettes, backed blades, fléchettes, etc. In fact, the most notable technological features highlighted for El Palomar Layers V, IV and III have also been found in these Mallaetes levels (Sectors FGH, I, E, D and first test-trench). The features are: unipolar knapping methods for blades/bladelets from prismatic and slightly carinated cores, the production of bladelets from carinated end-scrapers, and the regular occurrence of non-predetermined flaking methods to obtain unretouched flakes and, finally, the routine use of the bipolar knapping technique to obtain blanks as a recycling strategy for flint.

However, the principal difference between these two sites is in the percentages of the domestic tools. In most of the revised sectors of Mallaetes Cave, end-scrapers are one of the principal formal tools (de la Peña Alonso 2011a, 2013). As we have seen the representation of "domestic" tools was much lower in layers at El Palomar (Figs. 7 & 10). The reason might be the functional bias of these two sites. On the one hand, as we have already said, El Palomar is associated with workshop tasks (in quartzite, limestone and flint) and a mass production of bipolar barbs and retouched bladelets for flint, probably for hunting. On the other hand, most of the revised levels of Mallaetes, although displaying the general technical character of El Palomar, show a greater representation of domestic tooling, usually in the form of different morphologies of end-scrapers (Fig. 10). Perhaps, at specific times, Mallaetes was the venue for specialized tasks such as hide processing.



Fig. 8. Backed tools (mainly backed bladelets) from Layers V, IV and III of El Palomar Rock Shelter. Note that piece I is probably a broken Gravette point and J is a reused semi-crested blade.

Abb. 8. Rückengestumpfte Werkzeuge (meist Rückenmesser) aus Schicht V, IV und III aus El Palomar. Das Stück I ist wahrscheinlich eine gebrochene Gravettespitze und das Stück J ist eine wieder verwendete Kernkantenklinge.



Fig. 9. Marginal and semi-abrupt retouched bladelets from Layers V, IV and III of El Palomar Rock Shelter. Note that most of the pieces are made on rectilinear blanks (A, B, C, D, E, F, H, J, K, L, M, N, P and Q).

Abb. 9. Marginal und halbsteil retuschierte Lamellen der Schichten V, IV und III aus El Palomar. Die meisten Stücke wurden aus geraden Grundformen hergestellt (A-F, H, J-N, P und Q).

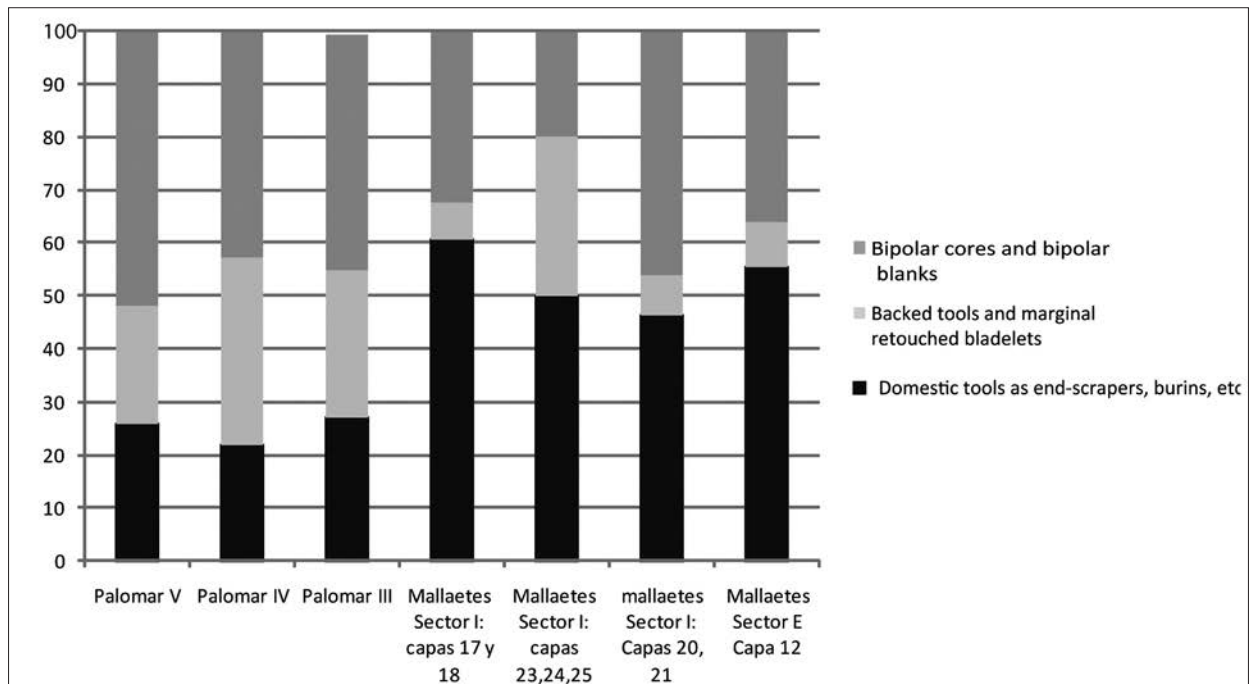


Fig. 10. Representation of bipolar cores, bipolar blanks, backed tools, marginal retouched bladelets and domestic tools of El Palomar Rock Shelter and Mallaetes Cave.

Abb. 10. Häufigkeiten von bipolaren Kernen und Grundformen, rückengestumpften Werkzeugen, marginal retuschierten Lamellen und Werkzeugen aus El Palomar und Mallaetes.

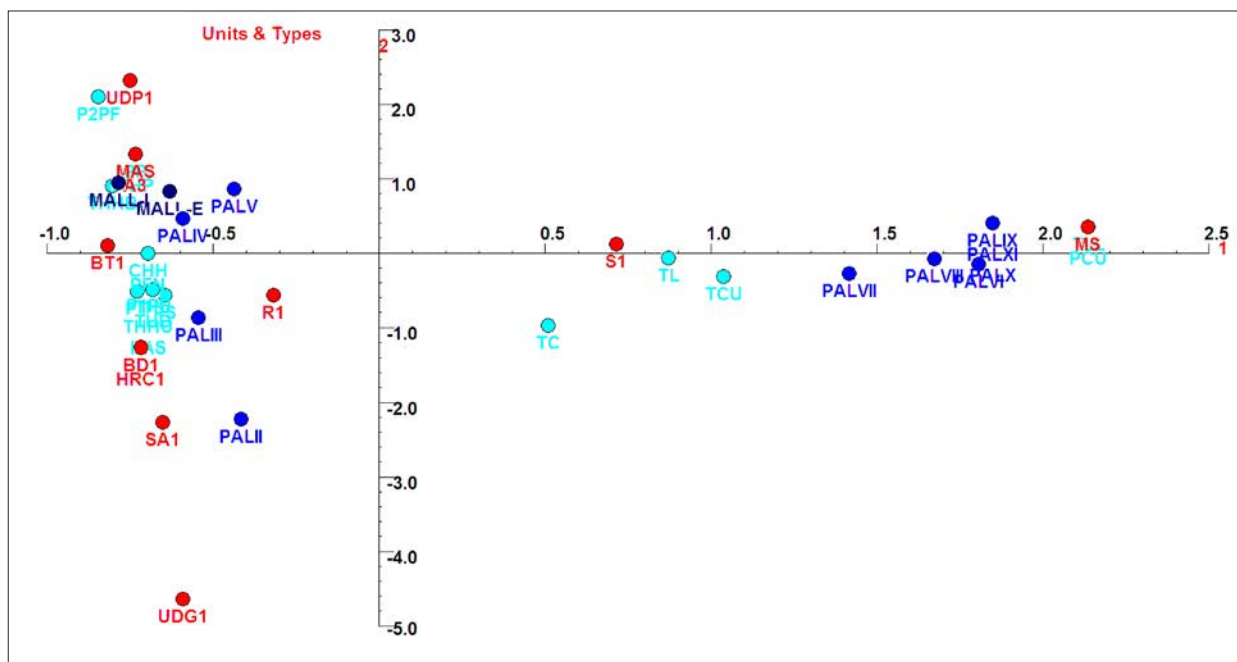


Fig. 11. Correspondence analysis of Levels II to XIII from El Palomar Rock Shelter and sectors I and E from Mallaetes Cave. The cases are the stratigraphic layers (in blue) and the variables of the different technological (light blue) and typological (red) characteristics. On the top left Palomar (V and IV) and Mallaetes sectors (E and I) layers have been grouped. The end result is proof of their close techno-typological relationship. Moreover, as can be seen, their chronology is also quite alike.

Abb. 11. Korrespondenzanalyse des lithischen Materials aus den Schichten II-XIII aus El Palomar und den Sektoren I und E aus Mallaetes. Die stratigraphischen Einheiten dienen als Fälle (blau). Als Merkmale dienen technologische Charakteristika (hellblau) und typologische Charakteristika (rot). Oben links gruppieren sich die Schichten V und IV aus El Palomar mit den Schichten aus den Sektoren E und I aus Mallaetes. Diese Sortierung belegt ihre enge technologische Verwandtschaft. Zusätzliche haben die Schichten eine ähnliche Chronologie.

To substantiate this hypothesis of technological convergence, but functional variation between these two sites, we performed a correlation analysis between El Palomar Layers V, IV and III and some of the basal Gravettian levels from Mallaetes (Fig. 11). This exercise was intended to test whether there really are grounds for an association between the sequences. As can be seen in Figure 11, they have clear convergence, both technologically and typologically.

Cendres Cave is another sequence which may contain similar technological features to the ones highlighted for El Palomar and Mallaetes (Villaverde & Roman 2004; Villaverde et al. 2007-2008, de la Peña Alonso 2011a). It is located in Teulada-Moraira Alicante, just beside the actual shoreline. It was first excavated in the 1970s, but since the 1980s the archaeological excavations are directed by Valentín Villaverde. However, the information about the Gravettian layers (XV and XVI) is mainly preliminary (Villaverde & Roman 2004; Villaverde et al. 2007-2008). In principle, based on known data of levels XV and XVI, the major typological groups are similar to those at El Palomar, although the percentage representation of morphotypes differs slightly, maybe because there is also another functional intention.

The techno-typological convergence between levels V, IV and III at El Palomar and most of the basal Layers of Mallaetes Cave shows a particular cohesive unit within the Mediterranean Gravettian, which differs from other so-called Gravettian contexts in the Mediterranean region. However, before discussing the evidence for Gravettian, a brief description of Early Upper Palaeolithic interpretive challenges might produce a better understanding of the Mediterranean area and explain previous interpretations from other archaeological contexts.

Discussion

The Early Upper Palaeolithic of the Mediterranean region is still not well understood. There have been five different technocomplexes proposed for the Early Upper Palaeolithic of this area and yet its image is quite fuzzy. These five technocomplexes are: the Protoaurignacian, in Catalonia, mainly represented in l'Arbreda Cave (Soler & Maroto 1987a, 1987b, 1990); the Middle and the Evolved Aurignacian, supposedly represented at Ratlla del Bubo, Beneito and Bajondillo and open air sites, such as Ronxes (Faus 1988; Iturbe & Cortell 1992; Iturbe et al. 1993; Casabo 1997a, 1997b, 2000, 2001, Cortés 2007a, 2007b); the Gravettian itself, also called "Iberian Gravettian" in the central-eastern part of the Peninsula (Fortea & Jordá 1976; Fortea et al. 1983; Villaverde et al. 2007-2008, Fullola et al. 2007) and the Final Gravettian, only defined for Catalonia at Roc de la Melca and Balma de la Griera (Soler 1979-1980; Fullola et al. 1994). The fifth technocomplex is the 'indeterminate Early Upper Palaeolithic', at the sites of Cova Gran (Catalonia)

(Martínez-Moreno et al. 2009), Foradada Cave (Alicante) (also attributed to the Aurignacian) (Casabó 1997a, 1997b, 2000, 2001) or Higueral de la Valleja (Malaga) (Jennings et al. 2009) (Fig. 12).

The persistence of Mousterian industries has been argued for several decades at Gorham's Cave (Gibraltar) and, more recently, at Carihuela Cave (Granada) and some Portuguese sites. The former site was excavated in the middle of the twentieth century by J. A. Waechter and three publications resulted (Waechter 1951; Zeuner 1953; Waechter 1964). These described a sequence associated with the Middle and Upper Palaeolithic. Upper Palaeolithic levels (B and D) were linked initially to the Magdalenian levels of Parpalló Cave. Moreover, the study of sedimentological deposits by F. E. Zeuner was the first to raise, from a palaeoclimatic point of view, the hypothesis that the Mousterian was prolonged in the southern peninsula, because several levels with this industry were attributed (in the terminology of the time) to the second phase of the last glaciation, equivalent to the end of what is now called MIS 3. This hypothesis was reformulated later, using the same methodological principles, at Carihuela (Vega Toscano et al. 1988; Vega Toscano 1988; Vega Toscano 1990) and reaffirmed in the pollen sequence of this site (Fernández et al. 2007). Subsequently, the same hypothesis was proposed for Gorham's (Finlayson et al. 2006) and Portuguese sites such as Oliveira Cave (Zilhão 2006).

On the other hand, it is clear that up to the present no Protoaurignacian sites have been found in the south or the inner part of the Iberian Peninsula. This has led to the Ebro frontier hypothesis (Zilhão 1997; Zilhão et al. 2010), in which it is proposed that the beginning of the Early Upper Palaeolithic was delayed as a consequence of the Middle Palaeolithic persistence. Moreover, following this theory, an Evolved Aurignacian or Aurignacian III-IV, such as the one defined in French Aquitaine, is expected as the first expression of the Upper Palaeolithic (see Zilhão et al. 2010). However, in the Valencian bibliography (south of the proposed 'Ebro frontier') there are references, published in local journals, to open air sites related to other Aurignacian variants - see the cases of Les Ronxes and Las Dueñas in Alicante (Moriel et al. 1985; Faus 1988) or the open air sites from Castellon province (Casabo et al. 2010). Moreover, north of this supposed frontier there are also references to open air sites related to the Aurignacian such as Cal Coix and Can Crispins (Soler 1982, 1982-1983). This situation might be creating a false impression about the beginning of the Upper Palaeolithic in mainstream journals, because these local publications often remain unknown and are not taken into account in syntheses (d'Errico et al. 1998; Zilhão et al. 2010).

A further complication is that (with the exception of l'Arbreda cave) Evolved Aurignacian sites are not

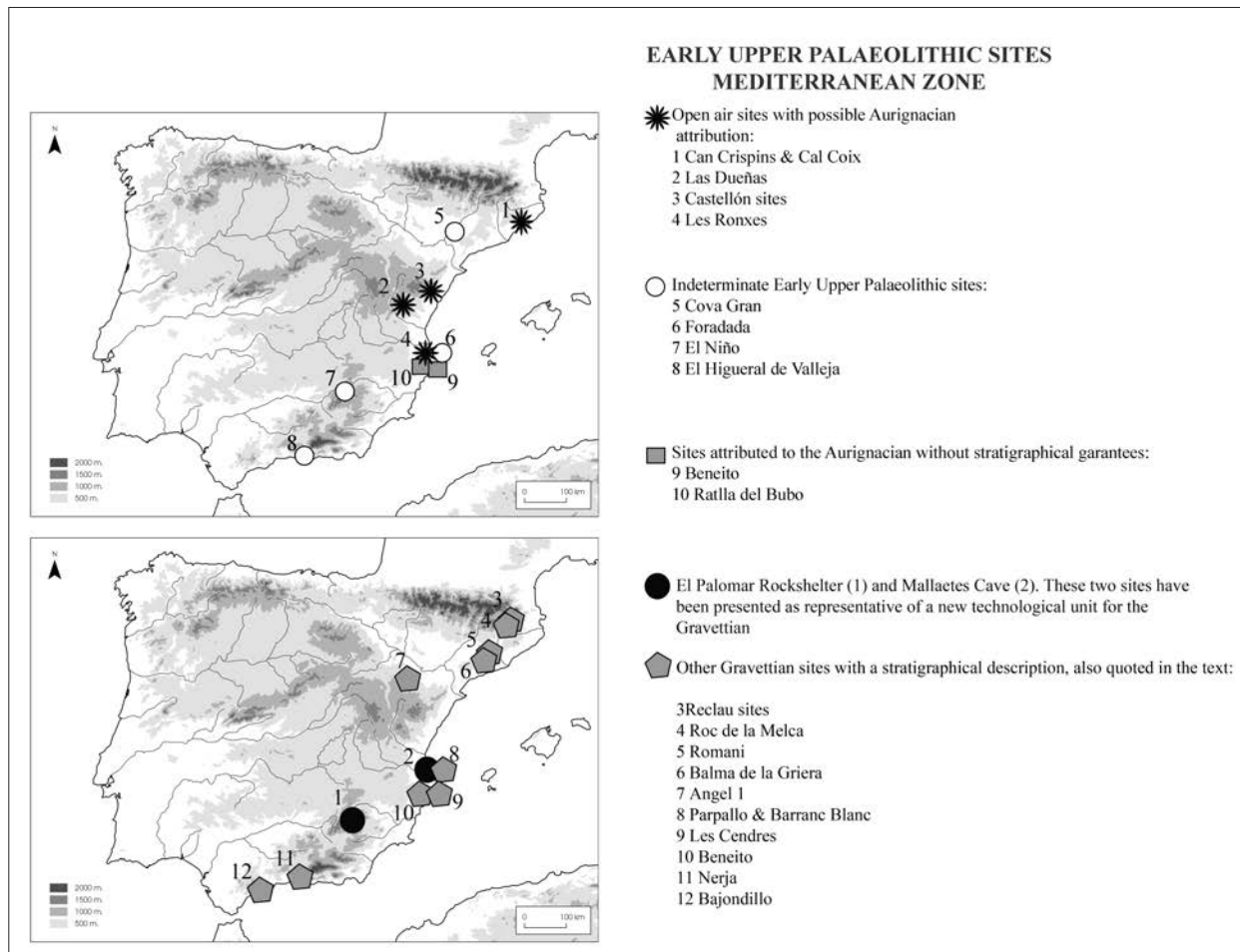


Fig. 12. Some of the Early Upper Palaeolithic sequences quoted in the text. Above: Open air sites with putative Aurignacian industries, indeterminate Early Upper Palaeolithic sites and sites with Aurignacian attribution, but with various chronostratigraphic problems. Below: Gravettian sites.

Abb. 12. Verbreitung einiger der im Text beschriebenen frühen jungpaläolithischen Inventare. Oben: Freilandfundplätze mit möglichen Aurignacien-Inventaren, unbestimmten frühjungpaläolithischen Inventaren und Aurignacien-Inventaren mit stratigraphischen Problemen. Unten: Fundplätze des Gravettien.

convincingly present in the Mediterranean region based on the material published so far. From the lithic analysis point of view Mallaetes cannot be used to support an Aurignacian occupation (for a detailed discussion see de la Peña Alonso 2011a, 2013), although this was proposed in the 1970s. On the other hand, Bajondillo Cave level 11 presents a lot of uncertainties and, recently, it has been even attributed to the Gravettian (oral communication at the Altamira International Congress by Marreiros & Cortés, October 2011). The chronology of this site is highly problematic because of the enormous standard deviations of the AMS dates (Cortés 2007a, 2007b) and because the TL dates of the supposedly Aurignacian levels show a more recent chronology. Following the TL dates, Bajondillo would be the youngest Aurignacian site in Western Europe, overlapping with the Gravettian development from other western areas. Moreover, the techno-typological description of Bajondillo 11 seems neither completely

consistent with a typical Aurignacian nor with an Evolved Aurignacian / Aurignacian III-IV, as it was first proposed (Cortés 2007a, 2007b). It should not be overlooked that in this layer there is no blade technology *sensu stricto*, only bladelet strategies having been cited (probably because of the size of the local nodules). Following the French classification (vid Bordes & Texier 2002; Chiotti 2003), the interpretation of an Aurignacian cannot be supported because *Dufour* bladelets are absent (according to Cortés's analysis, 2007a) and end-scrapers (tools) and flaking methods predominate. It seems that required attributes were overlooked when the name Aurignacian was applied to Bajondillo 11.

Beneito and Ratlla del Bubo have been also been labelled Evolved Aurignacian sites (Iturbe & Cortell 1992; Iturbe et al. 1993), but a careful look at publications of both these sites demonstrates that the excavation methodology did not follow stratigraphic rules, which means that they should be excluded from

the discussion. Moreover, the Early Upper Palaeolithic (Aurignacian and Gravettian) assemblages from Beneito were separated in an *a posteriori* analysis of the lithic industries, creating *ex profeso* "lithic levels" or artificial industrial distinctions and ignoring the stratigraphy. In other words, the lithics and faunal remains were adapted to the schema of Aurignacian-Gravettian succession, instead of following stratigraphic differences and stressing the particularities of the techno-typology. In addition, it must be highlighted that at both sites backed industries were reported within the Aurignacian levels.

The Foradada site was also first defined as Aurignacian and later as "indeterminate Early Upper Palaeolithic" (*sic*). However, its typological description (following Laplace's typology) (Casabó 1997a, 1997b, 2000, 2001) suggests that it is related to El Palomar, Mallaetes or Cendres, with a high percentage of splintered pieces (which might also be bipolar cores as seen in El Palomar and Mallaetes), backed morphotypes, and a predominance of end-scrapers (as the principal domestic tool) together with marginally retouched bladelets.

Indeed, it must be highlighted that the presence of end-scrapers or marginally retouched bladelets has sometimes been the sole criterion for the presence of the Aurignacian in southern Iberia. This seems a highly problematic approach, because it resembles the old fossil index analysis. Moreover, the revision of well stratified sequences such as at El Palomar and Mallaetes clearly demonstrates that supposedly unique Aurignacian features (such as end-scrapers or marginally retouched bladelets) are present in assemblages chronostratigraphically more recent than the Aurignacian, and with clearly well-developed backed tools (in other words, typologically defined **also** as Gravettian). Given this contradictory evidence where *fossiles directeurs* of both techno-typological traditions (Aurignacian and Gravettian) were present, most researchers preferred to classify assemblages as Aurignacian rather than exploring other possibilities, such as local technological developments. They also tended to ignore the fact that chronostratigraphy should be the deciding factor in any study.

An interpretation similar to the one for Foradada has been used for Cova Gran, which has been described not only typologically but also technologically. It still is considered as "indeterminate Early Upper Palaeolithic" (*sic*) (Martínez-Moreno et al. 2009). It has some supposedly Aurignacian technological features, but then again, it looks as though the classification "indeterminate" has been applied because the lithics do not fit a previously defined Aurignacian variety (Protoaurignacian, Typical or Evolved Aurignacian). Results from this site succeed in demonstrating that radiocarbon dating should not guide classification of assemblages as Early Upper Palaeolithic.

As we have already stated, Gravettian industries

were amongst the first recognized as belonging to the Upper Palaeolithic in the Mediterranean region (Siret 1891; Pericot 1942; Jordá 1954). In addition, since the middle of the 20th century it was clear that the Perigordian model of South-western France did not fit in this region, thus Garrod's terminology was adopted early on (*vid.* Jordá 1954). Sites were classified either because of their chronology, which was similar to that of sites called Gravettian in other parts of western Europe, or by following the old typological methodology, for example, because of the appearance of backed industries (the fossil index method).

It must be stressed that in comparison to the Aurignacian there is an important representation of Gravettian sites from Catalonia to Málaga. Nonetheless, it must also be said that most of the sequences are old excavated series e.g. Reclau, Romaní, Siret's collection, etc. (Siret 1891; Laplace 1966; Cacho 1981, 1982); and some have a lack of proper stratigraphic descriptions e.g.: Huesa Tacaña, Fontanal del Onil (Soler 1956; Iturbe et al. 1993). Finally, most of the recent Gravettian levels have only been published in a very preliminary way which makes a broader discussion about this entity particularly difficult (Fullola et al. 2007), see for example, L'Arbreda, Davant Pau, Roc de la Melca, Balma de la Griera, Ángel Cave, etc. (Soler 1987a, 1987b; Soler & Maroto 1990; Fullola et al. 1994; Utrilla et al. 2010).

The work of Miralles (1982a, 1982b) defined the main typological characteristics of the Gravettian in the Central area (the present commune of Valencia). Apart from the backed industries (gravettes, micro-gravettes and backed blades / bladelets) the marked presence of end-scrapers and a low percentage of burins at all the reviewed archaeological sites were highlighted. Recently, it has been stressed that the same typological characteristics occur throughout the Mediterranean zone and furthermore that there are uniform techno-typological characteristics throughout the Gravettian sequence (Fullola et al. 2007). Furthermore, a Mediterranean "Iberian Gravettian" has been tentatively proposed that could have evolved from the local Late or Evolved Aurignacian. However, the new sequences associated with the Gravettian in the Mediterranean region are only known from very preliminary descriptions and they show different typological characteristics from the ones found at El Palomar and Mallaetes, i.e. the dominance of burins in Bajondillo 10, Nerja or Ángel Cave, or the presence of side-scrapers and denticulates in Balma de la Griera (Fullola et al. 1994; Cortés 2007a, 2007b; Jordá et al. 2008; Utrilla et al. 2010). It should also be noted that all these sites have different chronologies, and are not restricted to a limited time range. These differences may be because of diachronic or synchronic cultural variations or because of functional changes. The variability should be discussed in terms of technology and functional analyses, and not just by the appearance or absence of

certain index fossils thought to characterize the Early Upper Palaeolithic assemblages of this region. Nevertheless, it is clear that the preliminary information does not point to a monolithic development amongst these first Gravettian industries. Moreover, regarding the possibility of an evolution from Aurignacian to Gravettian, it seems also extremely difficult to use the data presently documented because, as we have already argued, the evidence does not strongly support the presence of an Aurignacian (*vid. supra*).

In addition to all the evidence reviewed in the Mediterranean region, it should be remembered that in the South-western area of Iberia the importance of the Gravettian industries has also been emphasized as the first manifestation of the Upper Palaeolithic, mainly from the site of Vale Boi (Marreiros et al. 2010, 2012). Moreover, after the revision of the Estremadura Portuguesa made by Bicho (2000, 2005), the Aurignacian in the Portuguese area has also been suggested to be non-existent or vestigial. However, it should be clarified that Bicho's proposal (2000, 2005) was made discussing the Portuguese evidence, not the Mediterranean area. What happens in the Portuguese zone is not necessarily identical to what happens in the South-eastern area; this is an assumption that must be demonstrated, although these previous proposals reinforce the discussion just outlined. Furthermore, we think that it is perhaps premature to affirm that the Gravettian forms a unit in the Southern area (*vid. supra*). There may have been transmission of artistic and symbolic items (see Bicho et al. 2004, 2009, Marreiros et al. 2010), but from the point of view of the hunter-gatherer economy (hunting strategies, lithic and bone technology, etc.), there is still much work to be done, mainly from a solid chrono-stratigraphic basis.

Final remarks

In summary, the main problems with interpretations of the Early Upper Palaeolithic of the Mediterranean area have been:

- Scarce data and the lack of long, well defined stratigraphic sequences (Fullola et al. 2007). Some ambitious hypotheses have been made about the beginning of the Upper Palaeolithic in this region, for example, the Ebro frontier hypothesis (d'Errico et al. 1998; Zilhão 1997, 2006; Zilhão et al. 2010; Bradtmöller et al. 2012; Schmidt 2012; Jiménez Espejo et al., 2013). However, the actual scenario might be the result of research bias and maybe in the future, when new excavations are evaluated, genuine Aurignacian facies or new techno-typological Early Upper Paleolithic units might be demonstrated. It should be kept in mind that since the 1970s few new Early Upper Palaeolithic sites have been discovered. Moreover, classical collections, such as the

Siret sites (Siret 1891; Cacho 1981, 1982), have not been systematically revised.

- The evidence has been forced to fit into the Western European schema of other areas (Iturbe et al. 1993; Zilhão et al. 2010), ignoring the fact that local developments are also possible. As a result, researchers label assemblages "indeterminate Early Upper Palaeolithic assemblages" when they do not fit the expected Western European mould. In other situations the mere presence of a few *fossiles directeurs* are said to characterize the full "Aurignacian" technical package. This practice ignores all the original technological characteristics and nuances and gives a false impression that the start of the Upper Palaeolithic was contemporaneous throughout Europe (but see the case of Eastern Europe or Italy, where local technocomplexes have been recognised).
- The Gravettian, even if it was one of the first cultures to be recognized, has not been the object of any new hypotheses since the 1950s, and most studies of it are still in their preliminary stages. As a result, the Gravettian has been oversimplified as a monolithic culture and has been reduced to identification by typology.

Based on data from El Palomar and Mallaetes it can be argued that there is a particular technological dynamic in what has been called Iberian Gravettian in the Mediterranean area. Moreover, following the chronological data of these two sites, this technological unit developed during two periods (circa 31-30 kyr cal BP and circa 26-25 kyr BP) identified in the Palomar Rock Shelter sequence which are linked with some of the basal levels (Sector I and FGH) of Mallaetes (de la Peña Alonso 2011a, 2013). The most notable features of these two sites are unipolar knapping methods for blades / bladelets from prismatic and slightly carinated cores, the production of bladelets from carinated end-scrapers and the regular occurrence of flaking methods and use of the bipolar technique to obtain blanks as a recycling strategy. For the moment this techno-typological unit has no correlate in other geographical areas in the Iberian Peninsula (*vid. de la Peña Alonso 2011a*), even if some of its technological strategies have also been reported in other Iberian Gravettian contexts (Aubry et al. 2007). Based on the finding of the occipital bone in Mallaetes cave (Sector E layer 12) this techno-typological unit can be associated with *Homo sapiens* (Arsuaga et al. 2002), and also with the development of a regional tradition of portable art, from the evidence in the Mallaetes collection (Sector D capa13) (Villaverde 1994; de la Peña Alonso 2011a, 2013).

It seems clear that when backed tools spread, as part of a new hunting strategy, we can say with some

confidence that the Upper Palaeolithic is definitely established in the Mediterranean region, even though we might not be able to calibrate its variability within this region.

Two possibilities can be drawn for the contextualization of the new techno-typological unit recognized at El Palomar and Mallaetes. On the one hand, this new technological variety might be the first robust technological tradition related to the Upper Palaeolithic in the Mediterranean area following the Mousterian. On present evidence this assertion seems quite plausible.

On the other hand, the possibility that current evidence for the Early Upper Palaeolithic might be the result of a bias in research programs into the Palaeolithic should also be considered. As we have already stressed, from the sequences with appropriate stratigraphic descriptions, it cannot be argued that Aurignacian technocomplexes occur in most of this territory. Nonetheless, new revisions have to be made following stratigraphic distinctions in sequences such as Beneito or Rátlla del Bubo. Furthermore, it should be borne in mind that open air sites (such as Les Ronxes or Las Dueñas) might also have a key role to play in this conundrum, since they are claimed to have Aurignacian features (Moriel et al. 1985; Faus 1988; Casabó 1997a, 1997b, 2000, 2001; Casabó et al. 2010).

Along with the revisions suggested here, it should be kept in mind that the interpretation of Early Upper Palaeolithic sites of this region need not duplicate the schemas described in other regions. There is no reason to believe that the first appearance of the Upper Palaeolithic has to be the Protoaurignacian or other Aurignacian facies defined elsewhere. One of the greatest problems in the interpretation of the southern Mediterranean sequences is that the schema of "classic" regions as in the Périgord is still expected (vid. Iturbe et al. 1993; Zilhão 2006; Zilhão et al. 2010), and the evidence is sometimes forced to fit that expectation. These expectations seem to be a heritage from the old particularism schemas (de la Peña Alonso 2012).

This newly defined technological assemblage within the Mediterranean Gravettian thus adds more evidence to the already known variability of the Gravettian in the Iberian Peninsula (de la Peña Alonso 2009, 2011a), where in the Portuguese Estremadura alone four different chronological and technological facies of this culture have been defined (Ancient Gravettian, Fontesantense, Final Gravettian and Terminal Gravettian) (Zilhão 1997, Almeida 2000) or, in the Northern area, where so called Noaillian assemblages have a completely different techno-typological characterization (de la Peña Alonso 2011a). It looks as though there may be other technological varieties associated with the Gravettian, even if much research remains to be done to establish what these variants might be (Arrizabalaga & de la Peña Alonso 2013). It therefore looks as though the Iberian Peninsula provides a paradigmatic example of the so called "big

mosaic" (Mussi & Roebroeks 1996) for this time period. It seems that when careful technological analyses are carried out, instead of simply assuming similarity, the diversity of this Pan-European phenomenon begins to appear. Moreover, in the region described here, Gravettian development appears to be strongly related to the beginning of the Upper Palaeolithic. This situation has been also suggested in other parts of Iberia, such as the Atlantic region (vid. Bicho 2000, 2005; Marreiros et al. 2010).

Finally, the particular nature of the technical assemblages defined at El Palomar and Mallaetes, reaffirms the strong lithic regionalism that occurred in the technocomplexes that replaced Middle Palaeolithic assemblages throughout Europe. Moreover, it seems that in Eurasia this long process of cultural exchange was anything but monolithic.

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