

A new explanatory model for the first Upper Paleolithic occupations in SW Iberia

Telmo Jorge Ramos Pereira.

Núcleo de Arqueologia e Paleoecologia FCHS Departamento de História, Arqueologia e Património Universidade do Algarve

telmojrperreira@gmail.com

ABSTRACT

A new explanatory model for this crucial transition in human evolution is presented here, focusing on aspects such as the physical features of the territory, the reliability of all available absolute dates, as well as the sizes and characteristics of the lithic assemblages of early upper Paleolithic contexts.

Keywords:

Raw materials; Middle/Upper Paleolithic; Iberia Peninsula

RESUM

En aquesta comunicació es presenta un nou model explicatiu d'aquesta transició crucial en l'evolució humana, emfatitzant aspectes com ara les característiques físiques del territori, la fiabilitat de totes les dates absolutes disponibles, així com les mides i les característiques dels conjunts lítics dels contextos del Paleolític Superior Inicial.

Paraules Clau:

Matèries primeres; Paleolític Superior/Mitjà ; Península Ibèrica.

INTRODUCTION

The transition from Middle to Upper Paleolithic coupled with the complexity of the Upper Paleolithic in general, and in the Southwestern Iberia in particular, is one of the most intriguing and studied topic in prehistoric research on human emergence. These studies carried out for the last 150 years are mostly focused on differences between Neanderthal and Modern Human technology, subsistence, territory exploitation, art, speciation and interaction between the two human groups (Barton & Finlayson, 2000; Carbonell et al, 2002; Dibble, Montet-White, 1988; Cortes, 2003; D'Errico et al, 1998; Otte, Laville, 1989; Duarte et al,

1999; Mellars, Striger, 1989; HUBLIN, 1998, 1999; BAR-YOSEF, PILBEAM, 2000; Cabrera, 1993; Mellars, 1998; Smith, 2000; Vega, 1990; Villaverde, 2001; Villaverde & Fumanal, 1990; Stringer, et al, 2000; Zilhão, D'Errico, 2003; Zilhão, Trinkaus, 2002; Zilhão, et al. 2001; Bicho 2000a, 2005; Mellars, 1990; among others).

In Iberia, the beginning of Upper Paleolithic is marked by the entrance of Anatomically Modern Humans (AMH) around 42ka through the Pyrenees area, with evidence for Neanderthal occupations remaining in the Southwest region of the peninsula until ~25-23ka. The variables

Rebut: 1 septembre 2010; Acceptat: 1 decembre 2010

underling in what ultimately ended with the extinction of Neanderthal populations are still unclear. Data from archaeology has not yet shown any evidence pointing towards the existence of violent encounters between the two groups. However, external aspects, such as the fact that both groups did not use the same sites at the same time and internal aspects such as the appearance of Chatelperronian in the NE regions can point to some tension between them or, at least, suggests a strong territoriality inherent to both populations.

Currently, there are three main models explaining the transition between Middle Paleolithic/Upper Paleolithic (MP/UP) in Iberia. The "Ebro Frontier" theory claims that this basin functioned as a barrier between $\approx 35\text{-}30\text{ka}$, separating Neanderthals, with Mousterian technology in the West, from AMH, with Aurignacian I and African body proportions, in the East (e.g. Zilhão, 2000). According to this model, the Chatelperronian is a regional technological variation produced by Neanderthals, whereas the Aurignacian is the first AMH techno-complex reaching the whole Iberian territory. Other authors suggest that Neanderthals were too specialized to specific and stable environmental conditions that they could not survive the Oxygen Isotope Stage (OIS) 3 climatic instability, which triggered dramatic changes and hugely decreased the amount of available resources (e.g. Finlayson & Giles-Pacheco, 2000). A third model indicates that probably both groups kept regular contacts for a long time in areas near their territorial borders. This situation would have led to a potential genetic and cultural mixing, and the following appearance of transitional material cultures, such as the Chatelperronian. Since AMH progression towards the West was slow, these populations may have reached SW Iberia carrying a Neanderthal genetic signature and Gravettian culture. However, these authors refuse LV1 (Lapedo Child) as being an evidence of the la-

test (Raposo, 2000).

Recently, a fourth new model points out that both groups from SW Iberian may have shared similar diets resulting in an important demographic balance. Since both were exploiting the same ecological niches and resources, this balance led to a delay on the progression of AMH and, consequently, to a delay of the Neanderthal extinction (Hockett & Haws, 2005). Independently of all the above-mentioned theories, it is unquestionable that Neanderthal territory decreases as AMH advance towards West. One question remains to be answered: Why do some sites from Western Iberia, with clear upper paleolithic techno-complexes, fit in a chronological period when Neanderthals still remain in Iberia? We believe that AMH progression faced some obstacles and stopped sometimes for several thousand years due to aspects related to the association of geographic features, and a balanced pressure between Neanderthals and AMH. This situation could explain the preservation of Mousterian occupations coupled with the absence of Chatelperronian and Aurignacian on the South of the peninsula, and the concomitant presence of Chatelperronian, Aurignacian and Gravettian industries in the Northern regions of Iberia.

GEOGRAPHY AND GEOLOGY

Geographically, the Iberian Peninsula is a mass of 582,860 km² in the extreme West of the European continent, separated from it by the Pyrenees raised chains. It is bounded in the North and West by the Atlantic Ocean, and by the Mediterranean Sea at its South (Ribeiro, et al, 1987). It can be divided into three different complexes: High mountains, large plateau located in the centre of the mountain chains, and large plains corresponding to the alluvial basins of the major and middle size rivers. The geological map is crossed by a vast and complex mesh of rivers (some of them of Cenozoic age), which allows an intense erosion and an

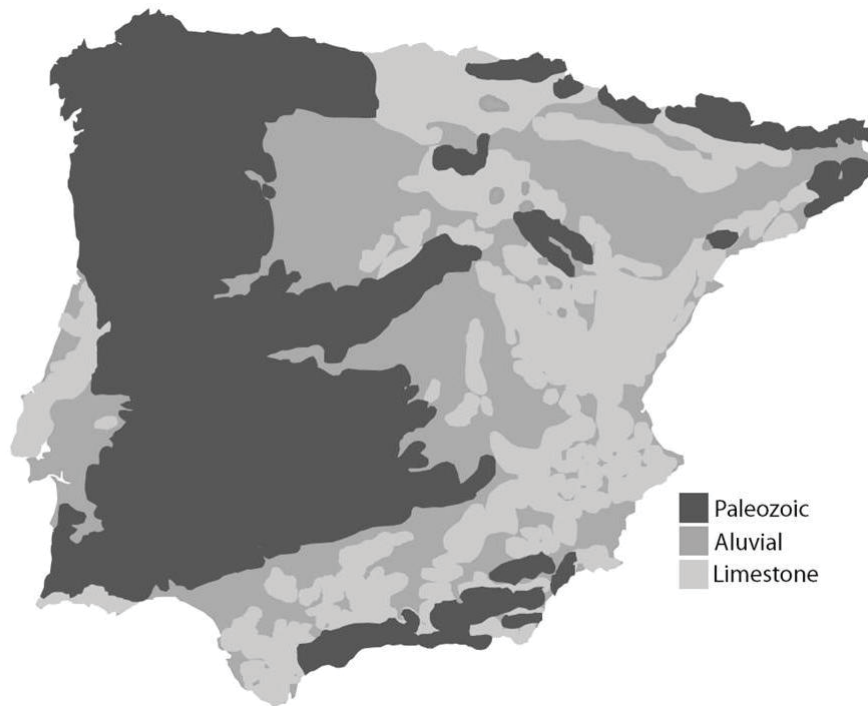


Image .- Iberia Peninsula – The three different geological regions.

ubiquitous bearing of clasts. There are eight major alluvial basins draining both to the Mediterranean Sea and to the Atlantic Ocean. Besides these, there are many other small river basins.

Geologically, Iberia is formed by magmatic, metamorphic and sedimentary rocks from the Proterozoic period to the present day (Caride del Niñan, 1994). The availability of flint can be roughly subdivided into three main contexts (Figure 1):

- Limestone regions, where flint is highly available inside limestone formations, and on secondary contexts in river and moraine deposits. The presence of flint can be characterized as very predictable in these areas;

- Alluvionary regions, where flint is available with a gradient dispersal, being the

areas adjacent or near limestone outcrops more predictable to have flint nodules than regions located further away. This makes its presence and usage also predictable, but in a gradient way since there is a progressive decrease of raw material and, consequently, a more or less empirical knowledge of that progression;

- Paleozoic regions, where, by its nature, flint does not exist in primary position and, therefore, is also very rare in secondary contexts even in big alluvionary basins. Yet, theoretically, it is possible to find it in river areas on areas adjacent to limestone regions if the river crosses a flint outcrop or secondary deposit. From a pragmatic point of view, finding flint in these regions is basically a strike of chance.

The foremost Western Iberia strip can be more

or less individualized by a North-South imaginary line connecting Cabo de las Peñas in the North, and the Guadalquivir river's mouth at its South. As in the rest of the Peninsula, this region is geologically very complex. There are two main areas:

- The Hesperic Mass, mostly located in the interior, formed during the Pre-Cambrian and Palaeozoic Era. It is geologically comprised of schist, marble, greywacke, quartzite and granite and occupies around 85% of the territory;

- The Sedimentary Edges, mainly located in the Western Centre and South, with several small and disperse shreds in between, formed during Mesozoic/Cenozoic Era to present days. These regions are comprised by limestone deposits in which the Turonian,

Bajocian and Cenomanian layers often have flint outcrops and occupy the remaining 15% of the territory.

Rivers and mountains are, even today important natural barriers, but the formers are also, in a longitudinal point of view, preferential pathways for people and animals. Therefore, the geographic characteristics of Iberia have probably contributed to an irregularity in AMH progression and occupation of the territory, leading both groups to occupy tangential territories for thousands of years. Is so, then the borderlines between Neanderthals and AMH were probably more of an irregular and denticular shape than a straight one.

ARCHAEOLOGY

Since the middle of 1990's, the occupation of

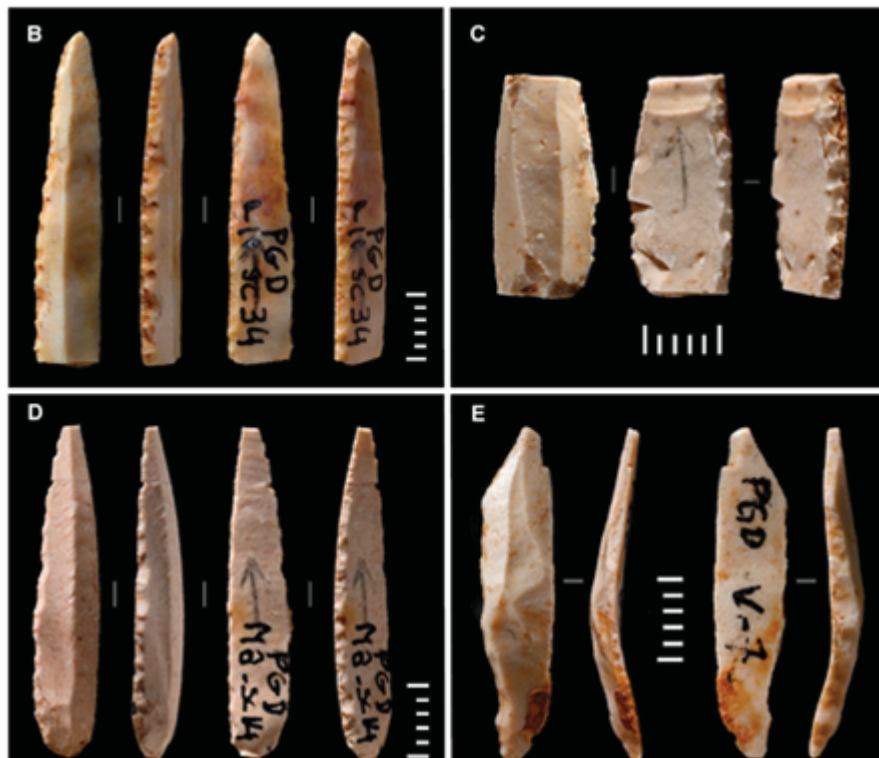


Image 2.- The three different points from Early Upper Paleolithic. Up left: Dufour bladelets from Pego do Diabo.

Western Iberia (e.g. the Estremadura region in Portugal) by AMH was pointed as starting between 29ky and 27ky. These groups carried Aurignacian techno-complexes and its distinctive artifact was the Dufour (sub type Dufour) bladelet. Known Aurignacian contexts are still few and Dufour points were found only in cave settings. Some open-air sites were also associated to this techno-complex but because of the absence of absolute dates and Dufour bladelets, their association to the Aurignacian is still questionable. Around 26ky, Aurignacian was already substituted by Early Gravettian industries (Zilhão, 1995). Recently, a claim has been made that Gravettian industries are the first ones that can clearly be assigned to AMH in Iberian contexts. This interpretation is based on the fact that the supposed Aurignacian artifacts are few in number and, hence, can be statistically attributed to be part of the Gravettian. Accordingly to this scenario, there would be a direct transition from the Mousterian to Gravettian-like assemblages (Bicho, 2003).

An understanding of this transitional period in this region has to rely on a combination of facts:

- a) Aurignacian sites are few and discrete;
- b) Stratigraphic sequences show that Gravettian always overlaps the Mousterian ;
- c) There are several UP sites with dates around 41ky and 28ky (e.g., Gato Preto, Fonte Santa, Pego do Diabo, Vale Boi and probably Vale Comprido - Cruzamento) (Zilhão, 1995);
- d) Some of the Mousterian contexts present date between 32-26ky;
- e) Several Gravettian sites show absolute dates similar or earlier than 27ka.

Sites with small sets of artifacts coming from Early Upper Paleolithic layers are Pêgo do

Diabo (Figure 2a) and Vale Boi-Rockshelter (Figure 2b). The antiquity of the first and its culture re-assigned to Aurignacian was recently confirmed (Zilhão et al., 2010); at Vale Boi, the layers beneath Early Gravettian show an unknown Upper Paleolithic type of flint point (Bicho, personal communication). In both sites, these artifacts are almost the only remains from the occupation and represent altogether less than one dozen units. Sites with large sets are Fonte Santa, Casal Filipe, Vale Comprido – Cruzamento and Gato Preto. Fonte Santa, dated from 35,5ky to 40,4ky, presents a completely different technology and a very characteristic point: the Casal Filipe Point (Figure 2c). Casal Filipe has no absolute dates but because of the presence of the Casal Filipe tool-type, it was associated to Fonte Santa (Zilhão, 1995). Vale Comprido was associated to Gravettian, but was dated from 30,3ky by TL on flint artifacts (Zilhão, 1995). Gato Preto is a clear Terminal Gravettian occupation. Here one hearth was identified and dated from 40,7ky to 36,5ky, its integrity was tested by dozens of refittings (Almeida, 2000). These values, initially rejected, were recently accepted (Zilhão, personal communication), since this combustion structure was not associated with the occupation, but slightly under it, representing an early occupation of the site. A graphic with the absolute dates from these sites can be seen in Figure 3.

RAW MATERIALS

Anatomic Modern Humans were highly specialized and dependent on the production of flint blades over prismatic core. Therefore, this was directly related with their survival and reproductive fitness. Their slowly, but firm progression towards West sustains this perspective. Flint was highly available in the Great Plains of Central Europe and when this raw material was not abundant, the geographic features of this territory allowed long travels for its acquisition. This situation did not significantly change in Eastern Iberia. Generally, in Iberia,

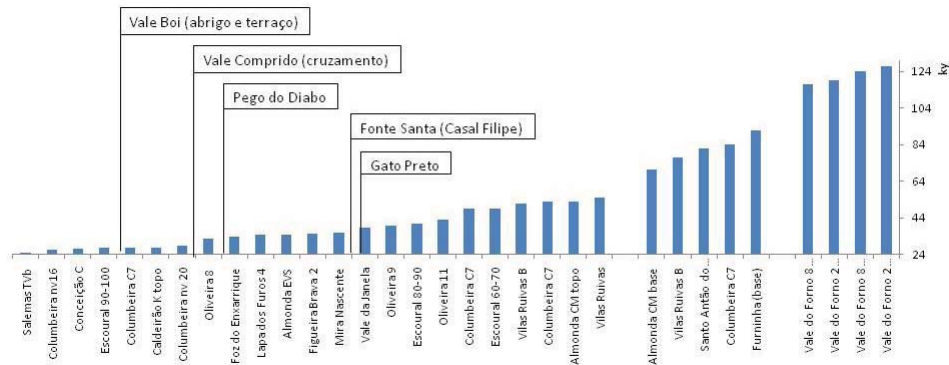


Image 3.- Middle and Early Upper Paleolithic sites from Southwest Iberia.

flint outcrops are common, but very located in space, which may have conditioned the designed pathways (Bicho, 2001; 2002). During the progression towards West, AMH entered in the vast Hesperic Mass, a rough terrain where flint was not available. This situation may have jeopardized their strategies and weakened success rates in addition to the demographic pressure from Western Neanderthals, which had, not only a diverse diet (Hockett & Haws, 2005; Bicho, 2009 personal communication) but also a variety of good raw material. Paradoxically, trapped in what was their last resort of territory, Neanderthal occupied a region with high quality raw materials such as quartzite, quartz, but especially flint. This gave them a seriously advantage in relation to AMH.

The combination of these two aspects, that is diet and raw material availability, would give Neanderthal populations a unique advantage, favored the optimization of the exploitation of natural resources, allowing a richer and diverse diet and, therefore, an increase of the reproductive fitness. Groups in the AMH “front line” were stuck in the non-flint territory not only because of the Neanderthal pressure, but also because of the Eastern AMH groups. In such a situation, these AMH had to enlarge the exploited territory (with the consequent demand

of higher quantities of energy) or replace flint by local raw materials.

Together, these factors retained the AMH front line in the non-flint territory and their progression towards West for more than 10 000 years, leading to a change in western AMH background culture. These populations show not only a very important role of local raw materials, but also the use of flint almost only for the production of two specific sets of artifacts. One was the hunting equipment (that allowed a successful subsistence) and the other was tools associated with the production of ornaments (guaranteeing the identity and style of the group in relation to Neanderthals and other AMH groups). This delay in Eastern territories was so long and had such a major impact in AMH culture that even after they reach the western most flint rich regions they did not went back to the previous “flint-majority tradition” that characterizes UP assemblages elsewhere in Europe. By contrast, the archaeological data in western Iberia shows that AMH tradition was based in local raw materials and the use of flint just for specific tools. We interpret that the orographic characteristics of the terrain made that option of an “all-flint assemblage” very expensive from an energetic point of view.

FINAL REMARKS

Within our proposed framework, the SW Iberian UP sites dated between 41 and 28ka may represent sets of preliminary surveys performed by scout groups, which may have used the Tagus and Guadalquivir valleys and the Southern edge of the Algarve coast, probably in demand for flint. They would then return to their original territory. Based on actualistic studies on hunter-gatherers, these would have been high-risk activities. Also, especially because of the lack of simultaneous occupation of the same sites by both groups, it is hard to believe that Neanderthal and AMH populations were not aware of what was happening in their territory. Therefore, both groups of populations should have had a quite good control of their territory. In addition, our proposal would explain why these transitional MP/UP archaeological sites are: a) located in flint-rich regions; b) have few artifacts since they represent short-term occupations by small groups; c) have different artifact repertoires because their existence is related to different ethnographic groups; and d) did not have continuity in time.

ACKNOWLEDGEMENT

I would like to thank my dear friends and colleagues Vera Aldeias and Susana Carvalho, for the corrections in the first abstract and again Vera Aldeias for the corrections on this paper.

BIBLIOGRAPHY

ALMEIDA, F. (2000): The Terminal Gravettian of Portuguese Estremadura. Technological variability of the lithic industries.

BAR-YOSEF, O., & PILBEAM, D. (2000): The Geography of Neandertals and Modern Humans in Europe and the Greater Mediterranean. *Cambridge, Peabody Museum, Bulletin* 8.

BARTON, C., & FINLAYSON, R. (2000): Neandertals on the edge: 150th anniversary

conference of the Forbes' Quarry discovery, Gibraltar. In C. Barton & R. Finlayson, (pp. 2000-2000). Oxford: Oxbow Books.

BICHO, N. (2000): Paleolithic Occupation and Environment of Central and Southern Portugal during Isotopic Stages 2 and 3. In P. Vermeersch & J. Renault-Miskovsky, *European Late Pleistocene Isotopic Stages 2 & 3: Humans, their Ecology and Cultural Adaptations* (pp 43-56)

BICHO, N. F. (2003): The extinction of Neandertals and the emergence of the Upper Paleolithic in Portugal. *Promontoria*, 3, 173-228.

CABRERA, V. (1993): *El Origen del Hombre Moderno en el Suroeste de Europa*. (V. Cabrera). Madrid: Universidad Nacional de Educación a Distancia.

CORTÉS, M. (2003): El tránsito Paleolítico Medio-Superior en la última frontera: Neandertales y humanos modernos en el sur de la Península Ibérica. *Pliocénica*, 3, 107-116.

DIBBLE, H. L., & MONTET-WHITE, A. (1988): *Upper Pleistocene Prehistory of Western Eurasia* (pp. 225-232). University of Pennsylvania, Philadelphia.

DUARTE, C., MAURÍCIO, J., PETTITT, P. B., SOUTO, P., TRINKAUS, E., VAN DER PLICHT, H., et al. (1999): The early Upper Paleolithic human skeleton from the Abrigo do Lagar Velho (Portugal) and modern human emergence in Iberia. *Proceedings of the National Academy of Sciences of the United States of America*, 96(13), 7604-9.

FINLAYSON, C., & GILES-PACHECO, F. (2000): The southern Iberian Peninsula in the late Pleistocene: geography, ecology, and human occupation. In C. Stringer, R. Barton, & J. Finlayson, *Neandertals on the Edge* (p.

139–159). Oxford: Oxbow Books.

HOCKETT, B., & HAWS, J. (2005): Nutritional ecology and the human demography of Neanderthal extinction. *Quaternary International*, 137(1), 21–34.

HUBLIN, J. (1998): Comment, in D'ERRICO, F.; ZILHÃO, J.; BAFFIER, D.; JULIEN, M.; PELEGRIN, J. – “Neanderthal Acculturation in Western Europe? A Critical Review of the Evidence and Its Interpretation”. *Current Anthropology*, 39(Supplement), S1–S44.

HUBLIN, J. (1999): “Derniers néandertaliens et premiers européens modernes.”. Pour la *Science*, 22(hors), 110–118.

MELLARS, P. (1990): *The Emergence of Modern Humans. An Archaeological Perspective* (pp. 1990–1990). Edimburgo: Edinburgh University Press.

MELLARS, P. A. (1998): Comment, in D'ERRICO, F.; ZILHÃO, J.; BAFFIER, D.; JULIEN, M.; PELEGRIN, J. – “Neanderthal Acculturation in Western Europe? A Critical Review of the Evidence and Its Interpretation.”. *Current Anthropology*, 39(Supplement), S1–S44.

MELLARS, P., & Stringer, C. (1989): *The human revolution: behavioural and biological perspectives on the origins of modern humans*. (P. Mellars & C. Stringer) (pp. 1989–1989). Edinburgh: Edinburgh University Press.

OTTE, M., & LAVILLE, H. (1989). *L'Homme de Néandertal 7: l'extinction*. (M. Otte & H. Laville) (Études et ., pp. 1989–1989). Liège.

RAPOSO, L. (2000). The Middle-Upper Paleolithic Transition in Portugal. In C.Stringer,

R. Barton, & J. Finlayson, *Neanderthals on the Edge* (pp. 95–109). Oxford: Oxbow Books.

SMITH, F. (2000): The Fate of the Neanderthals. *Scientific American*, 282(4), 106–107.

STRINGER, C., BARTON, R. N., & FINLAYSON, C. (2000): *Neanderthals on the edge: 150th anniversary conference of the Forbes' Quarry discovery, Gibraltar*. (C. Stringer, R. N. Barton, & C. Finlayson). Oxford: Oxbow Books.

VEGA, L. G. (1990): La fin du Paléolithique moyen au sud de l'Espagne: ses implications dans le contexte de la Péninsule Ibérique. In *Paléolithique moyen récent et Paléolithique supérieur ancien en Europe (Colloque International de Nemours, 9–11 mai 1988)* (Mémoires d., pp. 169–176). Paris: Musée de Préhistoire de l'Ile de France.

VILLAYERDE, V. (2001): *De neandertales a cromañones. El inicio del poblamiento humano en las tierras valencianas*. (V. Villaverde). Valencia: Universitat de València.

VILLAYERDE, V., & FUMANAL, M. P. (1990): Relations entre le Paléolithique moyen et le Paléolithique supérieur dans le versant méditerranéen espagnol », In M. D. France, *Paléolithique moyen récent et Paléolithique supérieur ancien en Europe (Colloque International de Nemours, 9–11 mai 1988)* (pp. 177–183). Paris: Mémoires du Musée de Préhistoire de l'Ile de France.

ZILHÃO, J. (1995): *O Paleolítico superior da Estremadura portuguesa* (2 vols), Colibri.

ZILHÃO, J. (2000): The Ebro Frontier: a Model for the late extinction of Iberian Neanderthals. In C. Stringer, R. Barton, & J. Finlayson, *Neanderthals on the Edge* (pp. 111–121). Oxford: Oxbow Books.

ZILHÃO, J., & D'ERRICO, F. (2003): The Chronology of the Aurignacian and of the Transitional Technocomplexes. Dating, Stratigraphies, Cultural Implications. In J. Zilhão & F. D'Errico, (pp. 2003-2003). Lisboa: Instituto Português de Arqueologia.

ZILHÃO, J., & D'ERRICO, F. (2003): The chronology of the Aurignacian and Transitional technocomplexes. Where do we stand. The Chronology of the Aurignacian and of the Transitional Technocomplexes: Dating, Stratigraphies, Cultural Implications. Lisboa: Instituto Português de Arqueologia, *Trabalhos de Arqueologia*, 33, 313–349.

ZILHÃO, J., & TRINKAUS, E. (2002): Portrait of the Artist as a Child. The Gravettian Human Skeleton from the Abrigo. Retrieved from <http://www.bristol.ac.uk/archanth/staff/zilhao/lapedobook2002.pdf>.

ZILHÃO, J., AUBRY, T., & CARVALHO, A. (2001): Les premiers hommes modernes de la Péninsule Ibérique. Actes du Colloque de la Commission VIII de l'UISPP. In J. Zilhão, T. Aubry, & A. Carvalho, *Trabalhos de Arqueologia*. Lisboa: Instituto Português de Arqueologia.

ZILHÃO, J., DAVIS, S. J., DUARTE, C., SOARES, A. M., STEIER, P., WILD, E., et al. (2010): Pego do Diabo (Loures, Portugal): dating the emergence of anatomical modernity in westernmost Eurasia. *PloS one*, 5(1), e8880. doi: 10.1371/journal.pone.0008880.

D'ERRICO, F., ZILHAO, J., JULIEN, M., BAFFIER, D., PELEGRIN, J., TABORIN, Y., et al. (1998): Acculturation in Western Europe ? *Evolution*.