

The Middle to Upper Paleolithic Transition on the Basque Crossroads: Main Sites, Key Issues

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Abstract: *Recent field and laboratory works on the Middle to Upper Paleolithic transition in the eastern region of Cantabrian Spain are analysed from a critical perspective. From our viewpoint, the preconceptions being applied have artificially stressed the difference between a Mousterian undivided chronologically and an Upper Paleolithic understood as a whole. It is clear that either during the Protoaurignacian or in the Aurignacian, the main figures in the archaeological record are no longer Neandertals, as they are replaced by modern humans. However, most of the drastic cultural, material and economic changes do not appear to occur in our region linked in a cause-effect relationship with this phyletic change. The changes seem to be much more gradual, according to the perspective of the holistic study of the transition, except for the sudden appearance of graphic expression.*

Keywords: *Basque Country, Mousterian, Chatelperronian, Protoaurignacian, Aurignacian, Gravettian, lithics, Anatomically Modern Humans, Neandertals, behavior, symbolism, historiography*

Der Übergang vom Mittel- zum Jungpaläolithikum auf der baskischen Kreuzung: Schlüsselfundplätze und wichtigste Fragen

Zusammenfassung: Im vorliegenden Beitrag wird der aktuelle Forschungsstand zum Übergang vom Mittel- zum Jungpaläolithikum im östlichen Teil des kantabrischen Spanien, besonders im Baskenland, aufgrund von Gelände- und Laborarbeiten der letzten 25 Jahre vorgestellt und unter einem kritischen Gesichtspunkt betrachtet. Das Baskenland, auf beiden Seiten der westlichen Pyrenäen, also z.T. in Spanien und z.T. in Frankreich gelegen, ist ein Gebiet, das urgeschichtliche Populationen häufig durchquerten, wenn sie sich zwischen der Iberischen Halbinsel und anderen Teilen Europas bewegten. Es ist deswegen die Rede von der ‚baskischen Kreuzung‘.

Nachdem die paläolithische Archäologie im Baskenland über größere Teile des 20. Jahrhunderts vor allem durch die Persönlichkeit José Miguel de Barandiarán-Ayerbes geprägt war, setzte etwa mit den 1980er Jahren ein bedeutender Generationenwechsel durch neue Spezialisten ein, die neue Forschungsansätze verfolgten. Mit der wachsenden Zahl der Forscher intensivierte sich auch das Interesse an Fragen zum Übergang vom Mittel- zum Jungpaläolithikum. Vor dem Hintergrund dieser Fragestellungen wurden neue, bisher nicht bekannte Fundplätze ausgegraben, aber auch Arbeiten an bereits erforschten Plätzen unter erweiterten Fragestellungen wieder aufgenommen, so z.B. an den bekannten Fundplätzen Axlor und Lezetxiki. Vor allem die große Datenmenge, die auf diese Weise gewonnen wurde, erklärt wohl am besten den Fortschritt in der Forschung, während neue Methoden und Denkansätze in dieser Hinsicht etwas in den Hintergrund treten.

Zunächst werden die wichtigsten Fundplätze aus dem End-Moustérien vorgestellt, besonders Lezetxiki, das unter Leitung des Autors erneut ausgegraben und untersucht wird. Es wird die Notwendigkeit betont, ein solches End-Moustérien im Zeitraum zwischen etwa 48.000 und 42.000 vor heute aufgrund seiner spezifischen Charakteristika von einem allgemeinen Moustériensubstrat abzugrenzen, um so einen dynamischeren Übergangsprozess zwischen Mittel- und Jungpaläolithikum fassen zu können. Der in den bisherigen Vorstellungen hervorgehobene Unterschied zwischen einem chronologisch nicht weiter untergliederten Moustérien und einem als Ganzes verstandenen Jungpaläolithikum wird als künstlich angesehen. Im frühen Jungpaläolithikum gab es im spanischen Teil des Baskenlands lange Zeit keine Parallelen für die Abfolge Châtelperronien-Protoaurignacien-Aurignacien, wie sie für das französische Baskenland und den mittleren und westlichen Teil des kantabrischen Spanien nachweisbar ist. Dies

änderte sich mit den durch den Autor durchgeführten Ausgrabungen in Labeko Koba. Diese Höhle ist bis heute die Referenzfundstelle für das frühe Jungpaläolithikum im spanischen Baskenland und im östlichen Teil des kantabrischen Spanien. Weitere Fundstellen mit allerdings weniger vollständigen Sequenzen sind inzwischen bekannt. Das Gravettien wird in die Betrachtung des Überganges vom Mittel- zum Jungpaläolithikum einbezogen, da es nach Meinung des Autors diejenige Periode ist, in der die materielle Kultur und das symbolische Verhalten in der Region ihre endgültige Ausprägung gefunden haben.

Es werden auch neue Analysemethoden diskutiert. Hier wird u.a. auf die Bedeutung der Ultrafiltrations-Technik für die Radiokohlenstoffdaten eingegangen. Für die Gewinnung von Informationen zur Umwelt werden neben Pollenanalyse, sedimentologischen Analysen, der Analyse von Kleinsäußern sowie der klassischen archäozoologischen Analyse inzwischen regelhaft auch mikromorphologische Untersuchungen und die Analyse von Holzkohlen eingesetzt. Auch die Neuanalyse bereits seit längerer Zeit ausgegrabener Fundstellen und Funde unter neuen Gesichtspunkten führt zu weit reichenden Erkenntnissen. Hierzu gehören ein neues Interpretationsmodell für paläolithische Territorien, neue Informationen aufgrund von Analysen zur Rohmaterialherkunft und detaillierte taphonomische Analysen am Faunenmaterial. Es wird auch gezeigt, dass der Unterschied in der Bearbeitung organischer Materialien zwischen Mittel- und Jungpaläolithikum nicht so gravierend ist, wenn man nicht, wie früher geschehen, das Moustérien auf der einen Seite und das Jungpaläolithikum einschließlich des Magdalénien als Ganzes auf der anderen Seite betrachtet. Die eigentliche Entwicklung in der organischen Technologie mit zahlreichen Innovationen setzte nach Meinung des Autors erst mit dem Solutréen ein.

Der Fossilbestand aus der Zeit des späten Mittelpaläolithikums und frühen Jungpaläolithikums ist im spanischen Baskenland nicht besonders groß. Es ist klar, dass entweder während des Protoaurignacien oder während des Aurignacien die Hauptakteure nicht mehr die Neandertaler sind, da sie von anatomisch modernen Menschen ersetzt wurden. Die meisten der einschneidenden kulturellen, materiellen und ökonomischen Veränderungen scheinen in der Region jedoch nicht in einer Ursache-Wirkung-Beziehung zu diesem Wechsel in der Menschenform zu stehen. Die Veränderungen erscheinen wesentlich fließender, wenn man den Übergang aus einer ganzheitlichen Perspektive betrachtet. Auch Schmuckgegenstände und damit erste Hinweise auf symbolisches Verhalten, scheinen in Lezetxiki bereits in der Zeit zwischen 55.000 und 48.000 vor heute belegt. Eine klare Zäsur zwischen Mittel- und Jungpaläolithikum deutet sich lediglich in Hinblick auf das plötzliche Auftreten von Kunst, z.B. in Labeko Koba vor etwa 39.000 Jahren, und graphischen Darstellungen an.

Schlagwörter: Baskenland, Moustérien, Châtelperronien, Protoaurignacien, Aurignacien, Gravettien, Steinartefakte, anatomisch moderne Menschen, Neandertaler, Verhalten, Symbolik, Historiographie

Introduction

I would like to introduce the current "state of the art" about the Middle to Upper Paleolithic transition in the Basque Country, after twenty-five years of experience in the field and the laboratory. On both sides of the western Pyrenees, the Basque Country is located partly in Spain and partly in France, and between the Pyrenees and the Bay of Biscay. It is therefore a region through which prehistoric populations often travelled as they moved between the Iberian Peninsula and Europe. It contains many important Paleolithic sites, such as Isturitz, on the French side.

One option would have been a classic presentation about new developments in fieldwork during the last decade and how the archaeological record has been modified during that time. However, I think it would be more interesting, and more productive in terms of its application to other regions to "think out loud" about the profound reasons for these changes in perspective, rather than simply listing the new data.

Generational renewal: methodological and epistemological progress

During almost the whole of the 20th century, an outstanding personality, José Miguel de Barandiarán-Ayerbe, was the leading figure in Paleolithic research in the Basque Country (Barandiarán-Maestu 1967, 1988b; Barandiarán-Irizar 1976; Arrizabalaga 2005c, in press b). A priest by profession, his proximity to the great teachers of the Vienna Cultural Historical School and his training in Ethnology together with Wundt in the University of Leipzig, aroused his interest in the History of Religions and Archaeology. The Spanish Civil War brought an end to his career as a teacher and he went into exile in the French Basque Country, from where he would return with sound training and professional contacts with archaeologists such as Laplace, Bouchud, Méroc and Bordes. On his return from exile, his excavations at Lezetxiki, Urutiaga and Ekain were a field school that would have a multiplying effect in the last three decades of the century. When Barandiarán retired in the early 1970s, pupils of his, like Apellániz, Barandiarán-Maestu and Altuna, took over and carried out new research in the provinces of Vizcaya, Guipúzcoa and Navarre (Barandiarán-Maestu 1988b).

Barely ten years later, a significant generational renewal took place with new specialists who were to develop some of the new approaches in research. The increase in the number of researchers coincided with a new interest in the question of the Middle-Upper Paleolithic transition derived from the discovery of Saint-Césaire in France and, later, from the first dates for the transitional levels in the caves of El Castillo, L'Arbreda and Abric Romaní. The new generations undertook excavations (see the series of Arkeoikuska and Trabajos de Arqueología de Navarra) at sites that had been unknown previously (Antoliñako Koba, Labeko Koba, Arrillor and Aitzbitarte III) and also re-excavated from a new perspective sites that had been studied before (Axlor, Lezetxiki, El Polvorín, Bolinkoba). Through this convergence, a critical mass of new data was obtained, enabling an easier contextualisation of Basque sites in a wider regional framework. It is this achievement of a certain critical mass of sites, researchers and data that can best explain the progress in information, rather than the application of new methodologies or epistemological approaches.

However, those also exist, both through aspects such as specialisation in studies like use-wear analysis and taphonomy and by the application of models that re-locate the Basque Paleolithic in a larger geographical area than had been applied before. To put this progress in numbers, before 1975 ten sites dated between the Mousterian and Gravettian had been excavated (Barandiarán-Maestu 1980; Barandiarán-Maestu and Vallespí 1984); thirty years later many of these are being re-excavated and another dozen sites are being studied (Beguiristain, 2000; Sáenz de Buruaga 2000; Arrizabalaga 2005b; Arrizabalaga 2008).

Main sites

We shall begin this tour around the main sites (Ruiz-Idarraga 1990; Cabrera 1993; Barandiarán-Maestu et al. 1996; Cabrera et al. 2004; Montes-Barquín and Lasheras 2005; Bernaldo de Quirós et al. 2008; Arrizabalaga et al. 2009) that will lead us from the late Mousterian to the Solutrean, by which time the evolutionary trends of the

Leptolithic may be considered irreversible. We are going to cite the main stratigraphies that have been excavated in the Spanish Basque Country, and then concentrate on sequences that in our opinion have provided particularly original data. This information will be explained in greater detail in the second part of the text.

The Final Mousterian

Quite a large number of Mousterian settlements are known in the region, especially in caves (Baldeón 1987) (Fig. 1). The deposits at Venta Laperra (Ruiz-Idarraga and d'Errico 2005), Axlor (Baldeón 1999; González-Urquijo et al. 2003, 2005, 2006; Ríos et al. 2005), Kurtzia (Barandiarán-Ayerbe et al. 1960; Muñoz et al. 1990), Lezetxiki (Barandiarán-Ayerbe and Fernández-Medrano 1957; Barandiarán-Ayerbe et al. 1959; Barandiarán-Ayerbe 1960, 1963, 1964, 1965a, b; Barandiarán-Ayerbe and Altuna 1966, 1967a, b, 1970; Baldeón 1993; Arrizabalaga et al. 2005), Amalda (Altuna et al. 1990), Zerratu (Sáenz de Buruaga and Mujika 2005), Jaizkibel (Iriarte 2004), Arrillor (Hoyos et al. 1999), Murba (Baldeón 1988), Manzanos (Baldeón and Murga 1989), Mugarduia North (Montes-Ramírez 1988) and Abauntz (Mazo and Utrilla 1996) in the Spanish area, and Olha (Passemard 1924), Isturitz (Passemard 1922, 1924, 1944; Saint-Périer 1930, 1936; Saint-Périer and Saint-Périer 1952; Esparza 1995) and Gatzarria (Laplace 1966b; Sáenz de Buruaga 1991; Laplace and Sáenz de Buruaga 2002-2003) on the French side, create the mirage of large demographic growth. In reality, the traditional difficulties

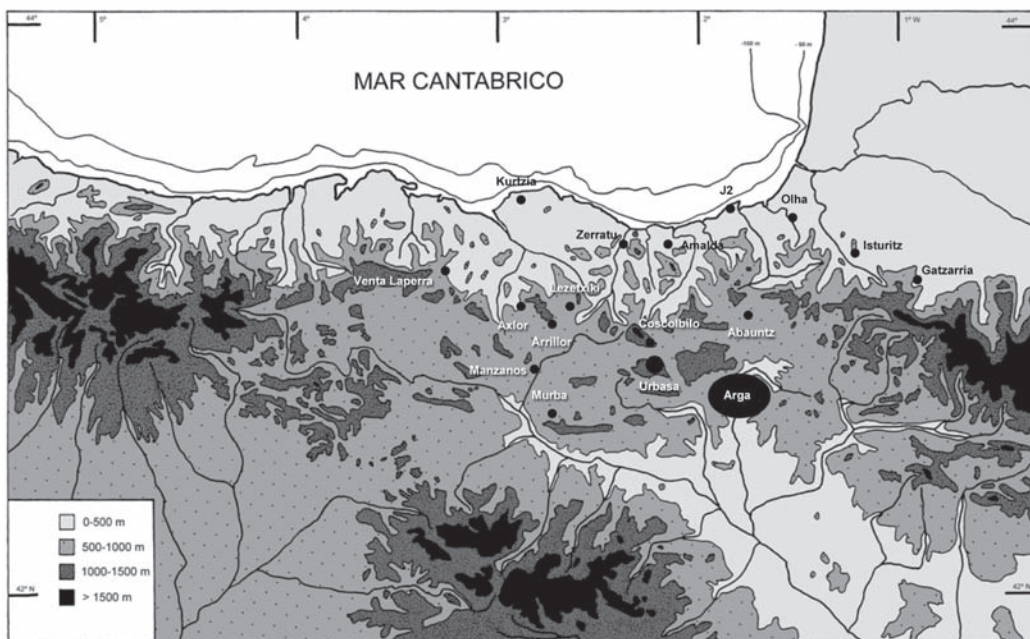


Fig. 1: The main Final Mousterian sites in the Basque Country (48-42,000 BP).

in dating the Mousterian have grouped together occupations over a long period of time within a single category. For the question being examined here, the Final Mousterian is of special importance, and this has been recognised for some years at sites such as Arrillor, Axlor and Lezetxiki. It is of vital importance to define a Final Mousterian, with different traits from the generic Mousterian, which remained stable over the millennia. If we are capable of differentiating this Final Mousterian, we shall have obtained a more dynamic and evolutionary view of the transition process between the Middle and Upper Paleolithic. We are referring to a chronological time span between 48,000 and 42,000 BP.

The site of Lezetxiki has been excavated in two different phases, by Barandiarán-Ayerbe's teams and by ourselves (Barandiarán-Ayerbe and Fernández-Medrano 1957; Barandiarán-Ayerbe et al. 1959; Barandiarán-Ayerbe 1960, 1963, 1964, 1965a, b; Barandiarán-Ayerbe and Altuna 1966, 1967a, b, 1970; Arrizabalaga 2005a, 2006; Arrizabalaga et al. 2005). The fact that the first seasons concluded in 1968, and the second phase is still in execution has made it possible to incorporate new forms of analysis and methodological approaches unused in the classic excavations (Fig. 2). The stratigraphic correspondence between the classic excavations (some 120m²) and our own (about 12m²) seem quite clear. The series begins, at the moment, in the Early Upper Pleistocene (Level VII), and is prolonged until the Bronze Age (Level I). The levels with features of the Final Mousterian are Levels IV and III, which must have been laid down between 50,000 and 47,000 BP. The characteristics of the series at Lezetxiki are especially suitable for reflections on the Final Mousterian as this site has yielded fossil humans, lithic and bone assemblages with ambiguous *chaînes opératoires* and some possible elements of body ornamentation.



Fig. 2: Current excavations at Lezetxiki.

The Early Upper Paleolithic

The Chatelperronian-Protoaurignacian-Aurignacian series, well-represented in the French Basque Country (Barandiarán-Maestu 1980) above all by the sites of Gatzarria (Laplace 1966b; Sáenz de Buruaga 1991) and Isturitz (Passemard 1922, 1924, 1944; Saint-Périer 1930, 1936; Saint-Périer and Saint-Périer 1952; Esparza 1995; Barandiarán-Maestu 1999; Turq et al. 1999), as in the central and western sectors of Cantabrian Spain, by caves such as Cueva Morín (González-Echegaray and Freeman 1971, 1973), El Castillo (Cabrera 1984; Cabrera et al. 2006) and La Viña (Forteza, 1992, 1995), had no parallels in the Spanish Basque Country before the excavation at Labeko Koba (Arrizabalaga and Altuna 2000). Interesting levels were known in cave deposits at El Polvorín (Barandiarán-Ayerbe 1958; Ruiz-Idarraga 1989; Ruiz-Idarraga and d'Errico 2008), Antoliñako Koba (Aguirre 2000, 2006), Ekain (Altuna and Merino 1984) and Aitzbitarte III (Altuna 1992, 2002, 2003), but the sequences were interrupted, with numerous breaks and little cultural material (Fig. 3).

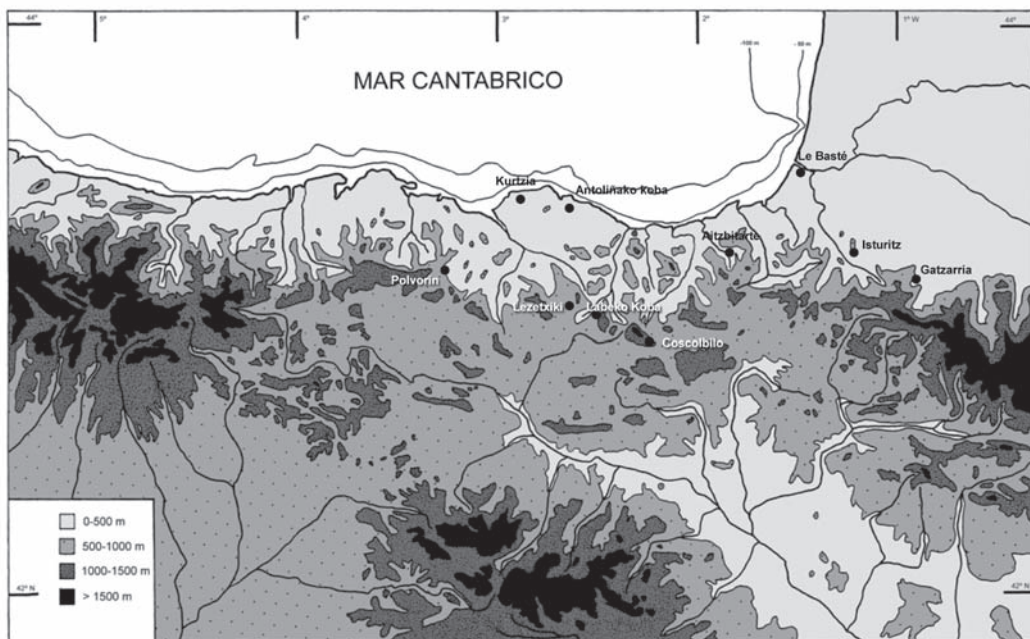


Fig. 3: The main Early Upper Palaeolithic cave sites in the Basque Country (43-29,000 BP).

In 1987 and 1988, as the consequence of a rescue operation, the cave of Labeko Koba was fully excavated under our direction (Arrizabalaga and Altuna 2000; Arrizabalaga 2002; Arrizabalaga et al. 2003). It is located in the upper valley of the River Deba, scarcely five kilometres away from Lezetxiki. Through a deposit about four metres thick, occupations between the basal Chatelperronian (Lower Level IX) and a late stage of the Aurignacian (Level III) were deposited without interruptions (Fig. 4). Although the cave was small, and its materials not always preserved in perfect conditions, it yielded a large

number of finds. The series can be divided into two phases, each one about two metres thick: in the first place the cave operated as a den for carnivores, with sporadic human presence during the formation of Level IX, later, the contribution of faunal remains to the deposit was due above all to human activity in it.

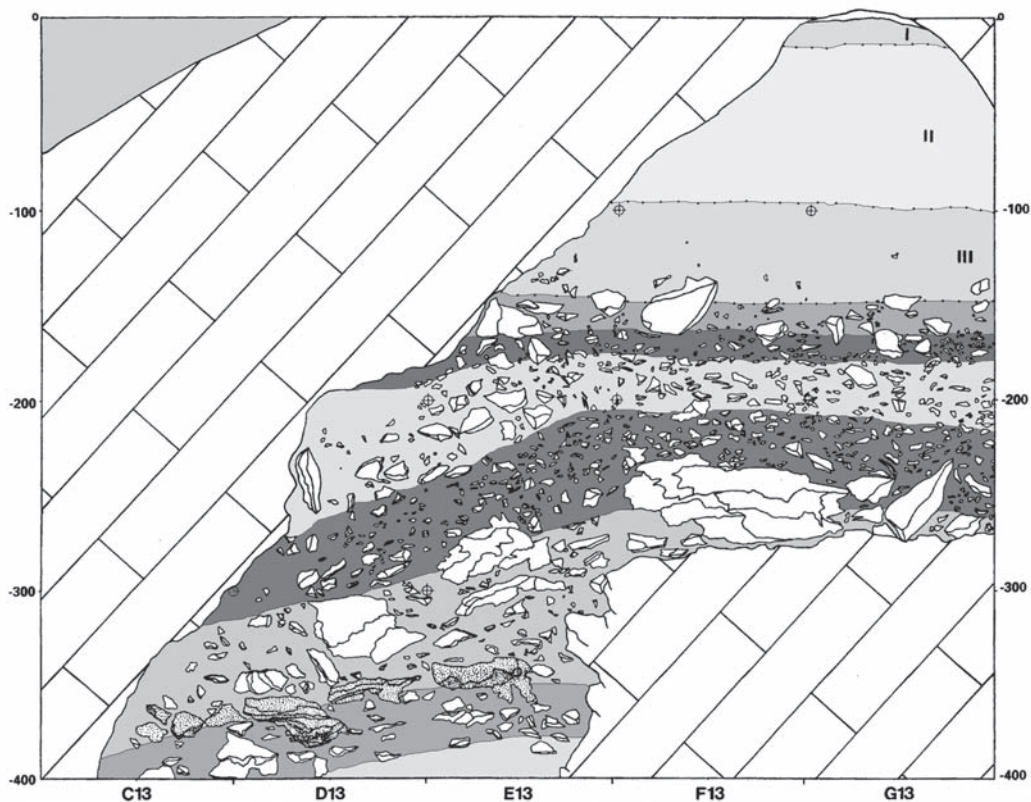


Fig. 4: The stratigraphic sequence of Labeko Koba.

As has been pointed out, the sequence at Labeko Koba is currently the reference sequence for the Early Upper Paleolithic (EUP) in the Spanish Basque Country and the eastern sector of Cantabrian Spain. It includes a brief Chatelperronian occupation (Lower Level IX), a rich Protoaurignacian level (VII) and four units attributed to the Early Aurignacian (VI, V, IV and III) in progressively more modern stages.

The Gravettian

We are including the Gravettian in this review of the Middle-Upper Paleolithic transition because we believe that it is in this period when the trends in the material culture and symbolic behavior of the regional Upper Paleolithic are seen to be irreversible (Foucher et al. in press). The most representative records numerically (in lithic assemblage and archaeozoological remains) show in some phases of the Gravettian

the last traits that in some way recall the Mousterian substrate. Once the Solutrean sequence commences, the different variables indicate these are exclusively leptolithic assemblages.

As the direct consequence of the older ages attributed to the period after the introduction of AMS dating, in a decade the Gravettian doubled its chronological range in the Basque Country (Arrizabalaga and Iriarte in press a). However, at first the number of known deposits did not increase at the same rate.

During practically the whole 20th century, the only relevant Gravettian site in the Spanish Basque Country was the cave of Bolinkoba (Barandiarán-Ayerbe 1950; Arrizabalaga 1994). However, following the excavation at Amalda (1978-1984), citations of new deposits in caves (Aitzbitarte III, Antoliñako Koba, Aldatxarren [Sáenz de Buruaga 2006], Zatoya [Barandiarán-Maestu and Cava 2001] and Alkerdi [Barandiarán-Maestu 1996, 1997]), and in the open-air (Mugarduia South [Barandiarán-Maestu 1988a; Barandiarán-Maestu et al. 2007], Pelbarte [Sáenz de Buruaga 2004], Irikaitz [Arrizabalaga and Iriarte 2003, 2005, 2008], Prado [Sáenz de Buruaga et al. 2005], and Ametzagaina [Arrizabalaga et al. in press b]) began to proliferate (Fig. 5). Discoveries of open-air Paleolithic sites are unusual in our country due to the dense vegetation cover which makes it difficult to identify them, and this differential factor of Gravettian habitats in the open-air is now a specific study topic (Arrizabalaga and Iriarte in press a, b).

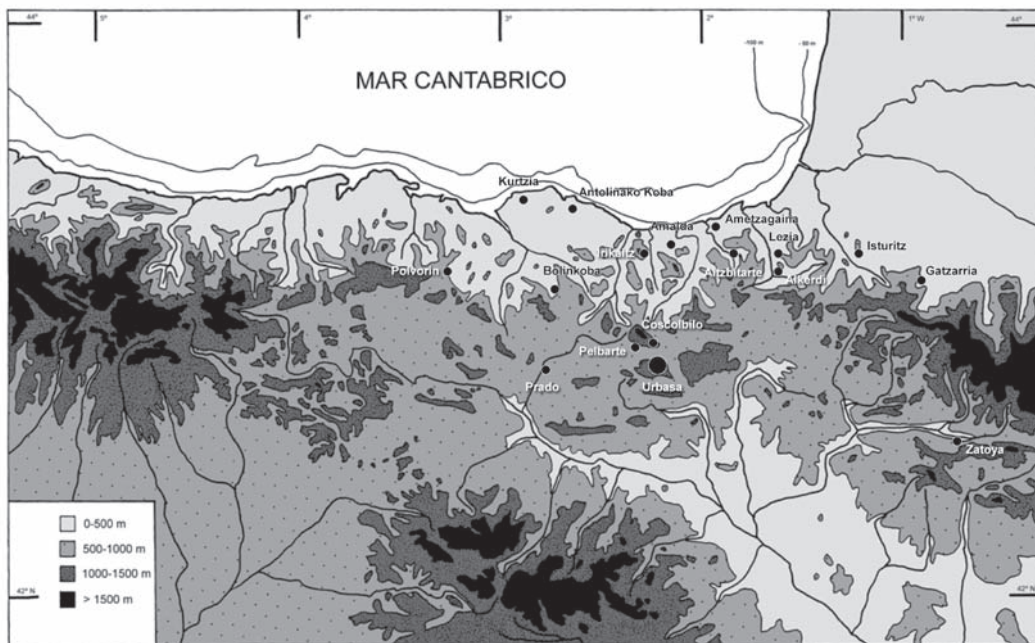


Fig. 5: The new map for Gravettian settlements in the Basque Country (29-21,000 BP).

Site	Lab. number	Method	Material	Date	Layer and cultural group	Reference
Arrillor	OxA-6084	AMS	Charcoal	45,700 ± 1200	Amk. Mousterian	Hoyos et al. 1999
Arrillor	OxA-6251	AMS	Bone	45,400 ± 1800	Amk. Mousterian	Hoyos et al. 1999
Arrillor	OxA-6250	AMS	Bone	43,100 ± 1700	Smk-1. Mousterian	Hoyos et al. 1999
Axlor				41,900	3/4. Mousterian	González Urquijo et al. 2003
Kurtzia				41,400 ± 2500	Mousterian	Muñoz et al. 1990
Arrillor	OxA-6106	AMS	Bone	37,100 ± 1000	Lmc. Würm III	Hoyos et al. 1999
Isturitz	Gif-98238	¹⁴ C		36,550 ± 610	C4d base. Protoaurignacian	Turq et al. 1999
Bidart	Gif-2767	¹⁴ C		≥ 35,000	Alluvial deposit	Mamezkurrena 1979
Isturitz	Gif-98237	¹⁴ C		34,630 ± 610	C4d techo. Protoaurignacian	Turq et al. 1999
Labeko Koba	Ua-3324	AMS	Bone	34,215 ± 1265	IX inferior. Chatelperronian	Arrizabalaga 2000a
Labeko Koba	Ua-3321	AMS	Bone	31,455 ± 915	VII. Protoaurignacian	Arrizabalaga 2000a
Aitzbitarte III	Ua	AMS	Bone	31,210 ± 860	Va. Aurignacian	Altuna 2003
Aitzbitarte III	Ua	AMS	Bone	31,000 ± 835	Va. Aurignacian	Altuna 2003
Labeko Koba	Ua-3322	AMS	Bone	30,615 ± 820	V. Early Aurignacian	Arrizabalaga 2000a
Ekain	I-11056	¹⁴ C	Bone	≥ 30,600	IXb. Aurignaco-Perigordian	Altuna 1984
Labeko Koba	Ua-3325	AMS	Bone	29,750 ± 740	IX superior. Protoaurignacian	Arrizabalaga 2000a
Isturitz	Beta-136049	AMS	Bone	29,400 ± 370	C3b. Techo. Aurignacian	Barandiarán-Maestu 1999
Aitzbitarte III	Ua	AMS	Bone	28,950 ± 655	IV	Altuna 2003
Zatoya	GrN-23999	¹⁴ C	Bone	28,870 +760 -690	Ilbam. First third UP	Barandiarán-Maestu and Cava 2001
Aitzbitarte III	Ua	AMS	Bone	28,320 ± 605	IV	Altuna 2003
Isturitz	Beta-136048	AMS	Bone	28,290 ± 240	C3b. Techo. Aurignacian	Barandiarán-Maestu 1999
Aitzbitarte III	Ua	AMS	Bone	27,580 ± 550	IV	Altuna 2003
Amalda	I-11664	¹⁴ C	Bone	27,400 ± 1100	VI. Gravettian	Altuna et al. 1990
Amalda	I-11665	¹⁴ C	Bone	27,400 ± 1000	VI. Gravettian	Altuna et al. 1990
Antolinako Koba	GrN-23786	¹⁴ C		27,390 ± 320	Lmbk sup. Gravettian	Aguirre 2000
Alkerdi				26,470 ± 470	Gravettian	Barandiarán-Maestu 1996
Aitzbitarte III	Ua-2244	AMS	Bone	25,380 ± 430	VI. Gravettian	Altuna 1992
Aitzbitarte III	Ua-2245	AMS	Bone	24,920 ± 410	VI. Gravettian	Altuna 1992
Aitzbitarte III	I-15208	¹⁴ C	Bone	24,910 ± 770	V. Gravettian	Altuna 1992
Aitzbitarte III	Ua-2627	AMS	Bone	24,635 ± 475	VI. Gravettian	Altuna 1992
Aitzbitarte III	Ua-2626	AMS	Bone	24,545 ± 415	VI. Gravettian	Altuna 1992
Aitzbitarte III	Ua-2628	AMS	Bone	23,830 ± 345	VI. Gravettian	Altuna 1992
Aitzbitarte III	Ua-2243	AMS	Bone	23,230 ± 330	V. Gravettian	Altuna 1992
Aitzbitarte III	Ua-1917	AMS	Bone	21,130 ± 130	VI. Gravettian	Altuna 1992
Ekain	I-13005	¹⁴ C	Bone	20,900 ± 450	VIII. Würm III/IV	Altuna 1984

Table 1: Radiocarbon chronology of the Basque Country.

Among the many new features that have been reported, the most striking ones are in connection with the open-air settlements, many of them true workshops located in areas near the sources of flint. In addition to the assemblage at Mugarduia South, we would like to highlight the two recent finds of the series at Irikaitz and Ametzagaina, in both cases located in areas with economic interest. Both sites possess problems in common for the preservation of organic materials (they lack fauna and even charcoal that could be dated) and even for sedimentary sections in a primary position. However, the lithic materials found at the two sites are very abundant and convergent with the hypothesis of successive Gravettian occupations over a long period of time. From both the technological and the typological points of view, these assemblages are clearly different from the Gravettian found in caves and display a diversified industry with a high degree of entropy, possibly highly conditioned by functional biases.

The impact of new forms of analytical tests

Archaeological Positivism used to describe the science as a three-legged stool, which would not hold up if any leg was missing. The three supports of Archaeology (chronology, stratigraphy and material culture) have clearly lost some of their weight in recent decades, but they are still of vital importance in the structuring of archaeological thought. In the question being tackled here, the chronology has been especially critical as, until recently, the limits to the validity of radiocarbon dating meant that the transitional deposits could not be dated (Table 1). In this respect, the new analytical methods related with geochronology are forcing a rapid re-structuring of the general framework.

Shifting the chronological horizon: From AMS to the ultrafiltration technique

In view of the interim results, we might think of the ultrafiltration technique as the third radiocarbon revolution (Fig. 6). It has enabled an older range of dates to be obtained, as well as guaranteeing beforehand that the sample is capable of providing a valid result (Nitrogen Screening). Together with the support of tests not used before (U/Th, Thermoluminescence, OSL), it is drawing a new regional time framework, with absolute dates that are significantly older than the ones previously available (Maroto et al. 2005; Rasines 2005; Vaquero et al. 2006). In this way, we have been able to situate Level III at Lezetxiki (ca. 47,000 BP) in the Final Mousterian, and we have brought forward the first dates for the Upper Paleolithic in Labeko Koba to 42,000 BP (Stuart et al. 2004). Obviously, the use of the same technique at other sites should cause an overall movement of the chronological framework towards older dates. In this new context, the debate of the last fifteen years about the dates for Level 18 at El Castillo, or others for L'Arbreda and Abric Romani loses its significance.

The introduction of less universal methods than radiocarbon for the study of Mousterian levels in caves (U/Th) or at open-air sites where no organic materials have been preserved (TL and OSL) should finalise the regional sequence; very especially for sites as Lezetxiki with heavy problems to be dated in an accurate way (Falguères et al. 2005/2006).



Fig. 6: Taking samples from a bone retoucher for the radiocarbon dating.

Completing the mesh of environmental information

During the last twenty years, it has become usual to apply a common protocol of environmental analysis to Pleistocene deposits. Palynological studies (Sánchez-Goñi 1991; Iriarte and Arrizabalaga 1999; Iriarte et al. 2005; Ruiz-Zapata and Gil-García 2005), sedimentology and the study of micromammals have, among others, complemented the more traditional archaeozoological study of the remains of large mammals.

Equally, other forms of study, such as micromorphology and anthracology are being applied more occasionally at a number of sites. In recent decades, this common protocol has been extended to all the key transition sites. A considerable number of sites belonging to the period had been excavated in the first decades of the 20th century, so that much of this type of information had been missing. However, some of the most interesting new information has been obtained from the re-excavation of sites such as Axlor or Lezetxiki, where the first phases of research had been deficient in these methodologies.

The extension of this common protocol has other repercussions. The resolution of pollen studies has been increased by combining the traditional sampling in columns with selective horizontal sampling. In particular, the study of the contents of hyenas'

coprolites, and the sedimentary contents of sealed bone shafts, has produced interesting results in Labeko Koba (Iriarte 2000) and also in Lezetxiki (Arrizabalaga et al. in press a). At Labeko Koba this procedure made possible to fill in some gaps in the pollen column and to verify a situation that had been suspected during the fieldwork. In the glacial maximum, when very little firewood was available in the surroundings of the cave, bones of the animals that had been hunted were crushed into small fragments and used as fuel in place of wood (Arrizabalaga 2000a; Yravedra et al. 2005).

In a similar way, the range of sedimentology and micromorphology applications is widening, from a more geoarchaeological and less classically environmental point of view. The application of these disciplines to a new phenomenon – open-air sites – is revolutionising what we thought we knew about the sedimentary origin of Basque Pleistocene deposits. For example, the wind-borne origin of the sediments, traditionally under-estimated in the whole of the Iberian Peninsula, has taken on an unsuspected significance.

These simple measures (extensive application of a common protocol, improvement in the resolution of the analytical tests, movement of karst sedimentary environments to the exterior) have contributed to a more accurate and older chronological framework, resulting in a radically different sequence from what we imagined, although still riddled with gaps in our knowledge waiting to be filled.

Towards a more profound interpretative framework

The importance of the contribution of new analytical methods to all kinds of archaeological debates is undeniable. However, numerous archaeological sites were excavated years ago and lost information cannot always be recovered by applying new methods to the remaining sections or materials deposited in museums. A change in the way of seeing these records, an original interpretation, may cast new light on these, apparently exhausted, sites, once they have been re-located on an enriched conceptual map. As Telesforo de Aranzadi, a classic scholar of Basque Archaeology put it: *"Eyes only see what they look at, and they only look at what they already know. We might add that if they do not find what they are seeking, they say there is nothing"*. In order to revert this simplification of archaeological reality, we must attempt to open new horizons where the information already available, and that to be found in the future of our sites, can be re-examined.

New interpretation model of the Paleolithic territory

Owing to the changes in the socio-political situation during the 20th century, the different Spanish regions have seesawed between the most Jacobin centralism to extreme federalisation. In the peripheral regions with their own languages and with political demands still to be settled, none of these situations have facilitated an untroubled understanding of the concept of historical region. Applied to Paleolithic prehistory, if any attempt to study the area of the western Pyrenees as a regional unit was questioned politically by the Centralist State, more recently it has proved difficult to go beyond the map of the autonomous region in a quasi-federal situation. Among the different kinds of region used in Geography (natural, historical, economic, sociolinguistic) the most

suitable for the study of Paleolithic societies would appear to be the Natural Region. However, we should not forget the difficulties that this concept involves, particularly as regards marking the boundaries of the unit of study in contrast or opposition with neighbouring regions (Ordoño and Arrizabalaga in press).

Not long ago (Arrizabalaga 2007), we reflected on the pertinence of using the area of the so-called "Basque crossroads" as the unit of study applied to Paleolithic research. In essence, the concept of crossroads comes from the awareness that the modern Basque Country lies at the centre of large "natural" regions (the northern coastal strip, the Castille North Plateau, the Ebro Valley, the western Pyrenees and the Aquitaine depression) of which it forms part. In addition to this characterisation as the crossroads between regions, its own geographical location halfway between the Iberian Peninsula and the European continent also meant that it would have played the role of multidirectional corridor along which animal species and human populations travelled. In addition with them their material culture, their potential prey, many of their raw materials and a flow, difficult to measure, of symbols and ideas (Arrizabalaga et al. 2007).

If we examine the archaeological record, this view of mixing and exchange of all types is more explanatory than the traditional autonomous view of the Basque region. Clearly, our starting point is a particular geographical circumstance, not applicable to the rest of Cantabrian Spain, and therefore our conclusion is a paradox: this hybrid character of the Paleolithic cultures at the Basque crossroads, instead of making them resemble contemporary societies in Aquitaine, the French Pyrenees or Cantabrian Spain, gives them their own identity.

A region was established, characterised by its opening-up to all the neighbouring natural regions, with which it only shared a relative part of their respective specificities.

The sources of raw materials feed-back the information about the archaeological territory

As we have already noted, a substantial part of the record recovered in our fieldwork (practically all of it) is made up of the lithic implements and the remains of ungulates hunted by humans and carnivores. Changes in perspective about each part of the record should therefore be especially strict in order to get the most out of the information collected. In the case of the lithic assemblage, the study of the sources of the raw materials used has made some significant contributions in recent years (Tarriño 2006). With this variable, it is easy to apply quantitative techniques and objective sampling strategies. It even provides relevant information with a superficial reconnaissance and unaccustomed eyes.

Thus, for example, as sources of high-quality flint are relatively common in the region, it becomes the raw material used almost exclusively during the Upper Paleolithic. In earlier periods (Arrizabalaga 1999a, in press a), however, clear differences can be seen. In the Acheulian series at Irrikaitz, flint was only used in a proportion of 5%, while throughout the Basque Mousterian the frequency of the use of this raw material varied between 38% and 90% of the lithic series. The threshold of 99% of the assemblage was only crossed in the Upper Paleolithic.

It is evident that the outcrops of flint have not moved; it was the human groups who gradually enlarged the radius of their expeditions in search of supplies, until they finally took in all the regional flint outcrops, however far away they were. Nevertheless, in addition, the precise source where each type of flint was obtained can be determined (see, for example, Tarrío and Normand 2002), and a map can be drawn with the network of exploitation and distribution of this resource. Hence, at the Basque crossroads we know of three main outcrops and some smaller ones with the types of flint used in the Paleolithic. We can also determine, in great detail, all the classes of flint brought by trade or exchange from southwest France, and, with less precision, neighbouring regions in the Iberian Peninsula. In this way, our "cartography" of the provenance of lithic resources in each level enables us to demonstrate the introduction in the region of flint coming from places over 100km, or even 300km away, after the Early Gravettian (Irikaitz), although in very small percentages (Arrizabalaga and Iriarte 2008). The provenance of these raw materials enables us to verify the validity of the model of crossroads-region.

This study has yet another implication. Of the three outcrops in the region cited above, two are situated on the high land (700-900m) in the interior, while only one is located near the coast. It was traditionally thought that Upper Pleistocene groups lived in a generally periglacial environment and therefore preferred to settle in coastal regions below 400m in altitude.

With this premise, during the last eighty years, the strategy for searching new Paleolithic settlements has concentrated on caves in coastal areas, and it was thought pointless to look for coetaneous settlements in inland regions. The proof that these areas were visited in search of lithic raw materials (which then appear at sites in the lowlands) has made it necessary to change that strategy, resulting in a spate of new interpretations of open-air sites (in derived position or with dating problems) as Gravettian (Arrizabalaga and Iriarte in press a, b), Solutrean or Magdalenian (Barandiarán-Maestu et al. 2006). Several of the new open-air sites mentioned above follow this pattern.

From Paleontology to Archaeozoology: much more than a change in name

Our region has a solid tradition of paleontological studies, of the fauna found in natural deposits and of the remains recovered from human accumulations. These taxonomical studies have been carried out by specialists trained in Zoology and animal Paleontology, and are exemplary from the point of view of taxonomic determination, or sex, age and seasonality patterns in the occupations represented in the levels. However, they traditionally tended to study the stratigraphic units together, exactly as the archaeologists gave them to the specialists.

The contribution of the archaeozoological view to these studies improves the analysis in several ways: it reduces the importance of the formal value of the stratigraphic units detected during the excavation, includes a more economic perspective of the exploitation of animal resources and, and, in general, better involves the human factor in the characterisation of the occupations. The transition from traditional Paleontology to the modern archaeozoological view, of more inter-disciplinary research, has enabled the introduction of new parameters and discussions. Among these, we must note the classic one about the supposed different hunting behavior between Neandertals (opportunistic) and modern humans (specialised).

In our regional record, it has been seen that this debate has been encouraged by the mirage of a single Mousterian record: owing to the difficulty in dating the Mousterian, situations separated by tens of millennia have been interpreted as coetaneous. If we try not to emphasise the difference artificially, and examine the world of the transition in perspective (Castaños 2005), the zoograms of many Final Mousterian levels (for example, Lezetxiki or Axlor) are very similar to those of the Early Aurignacian (for example, Labeko Koba). From this viewpoint we can speak of a true transition, different from its appearance if we only examine the poles of the series (undifferentiated Mousterian vs. Magdalenian). Levels of specialisation in a single taxon of about 45-60% (red deer in Level IV at Lezetxiki or large bovids in the Aurignacian series at Labeko Koba) characterise alike accumulations attributed the last Neandertals and the first Cro-Magnons.



Fig. 7: A cave bear skeleton in layer M of Lezetxiki.

In a similar way we can take a new look at the evidence of the transition in the light of the other great debate on the taphocenosis of Final Mousterian and EUP deposits (Arrizabalaga et al. in press a). The caves were used alternatively by humans and carnivorous animals (hyenas, lions, wolves and bears among others), particularly during these transition phases. It is not always easy to identify which is the main cause of the accumulations of bones, or which remains should be attributed to humans and which to carnivores. The series at Lezetxiki and Labeko Koba provide especially interesting examples of how this discriminatory taphonomic analysis (Martínez-Moreno 2005a) can

be approached. At the former site, we have striking evidence of the contributions of bears, such as bear skeletons themselves in undisturbed anatomical position and numerous puncture holes made by their bites (Fig. 7). The case of Labeko Koba is more complex, as the action of the hyenas is clearly visible (gnawed bones, coprolites, pressure fractures) and yet it is only the main source of bones in Level IX, whereas it was Modern Human who introduced most remains in the deposit (Fig. 8).

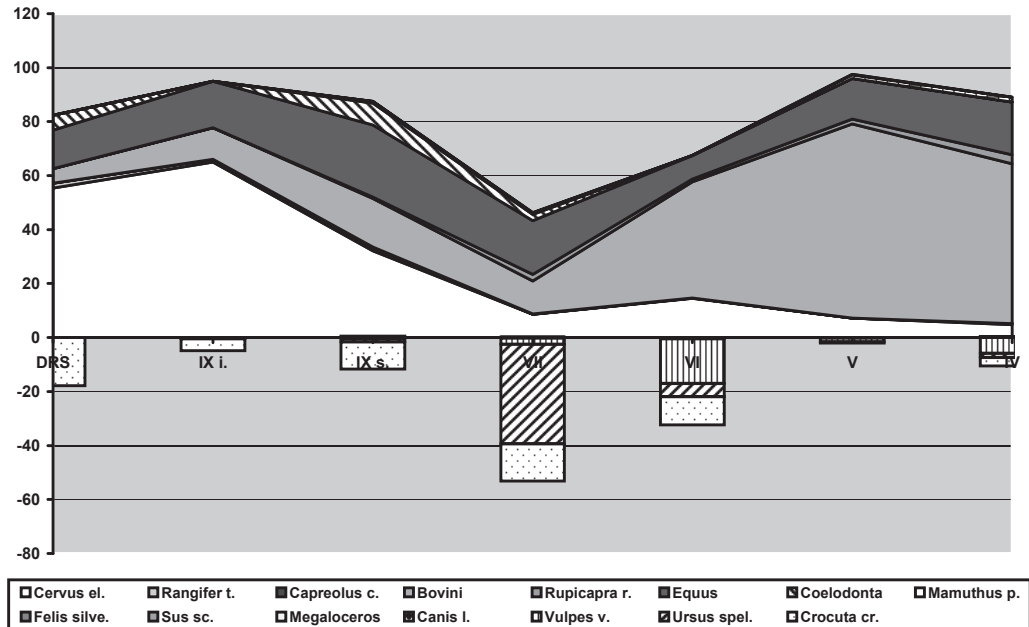


Fig. 8: Carnivores and ungulates through the different levels of Labeko Koba.

As more advanced protocols are applied to the study of collections, we are finding that traditional Palaeontology gave priority to the human component in the accumulation of bone remains, and we can now see that they are the result of mixed contributions.

"Poorly elaborated" bone industries

As seen in the previous section, we have to struggle against an established state of the question that emphasised the difference between the Middle and Upper Paleolithic by recurring to two simple approaches: interpreting the Mousterian as a whole, as there was no way of establishing a chronological order, and by contrasting it with the best known or most characteristic series in the Upper Paleolithic, in our case, the Magdalenian. In these circumstances the differences are very striking.

Thus, the dichotomy was established between poorly-elaborated bone industries in the Middle Paleolithic vs. carefully worked bone industries in the Upper Paleolithic. However, if we study the different variables sequentially, we can see a true transition

between one behavior and the other, at least in our region. The key lies in the definition of the so-called contingent bone industries. Bone retouchers, punches, bones retouched with the same techniques used in the lithic assemblage and the resulting sub-products (bone flakes) would be characteristic of late Mousterian series (Martinez-Moreno 2005b).

However, with the single exception of some bone points (only about 20 split-based points in La Viña, Covalejos, El Castillo, Polvorín and Labeko Koba for the entire Cantabrian region; see map in Liolios 2006), which progressively enrich EUP assemblages, this definition could also fit most of the Chatelperronian, Protoaurignacian and Aurignacian series in the Basque Country (Mujika 1991), as we can see in the figures from Labeko Koba (Mujika 2000). Even at the end of the Gravettian, characterised by a bone fossil-guide (Sonneville-Bordes 1971, 1972) from the French Basque site of Isturitz (also at Usategi, Bolinkoba and Aitzbitarte III) except for this eponymous site, bone assemblages are still characterised by "contingent" implements", with retouchers identical to the Mousterian ones still predominating. The true development of bone industries, with the successive invention of needles, rods and harpoons, or the massive presence of bone points, occurred in the Solutrean.

Certain changes can be seen in the selection of raw materials, because the use of deer antlers has only been recorded in our region in the Upper Paleolithic, whereas bone was used exclusively in the Mousterian. For the moment, we shall not refer to elements of body ornamentation, such as pendants, as these will be dealt with in a later section. Therefore, bone points are the implements that draw the main dividing line between Middle and Upper Paleolithic assemblages, especially the split base points, which are quite rare at sites in the Iberian Peninsula. However, bone points have been documented at several sites in northern Spain (El Conde [Arbizu et al. 2005], El Castillo [Morán and Tejero 2006; Giménez-La Rosa 2006] and Lezetxiki [Fig. 9]) in Mousterian or transitional contexts.

A possible example was found at Lezetxiki, at the base of Level V, provisionally dated to 50,000 BP. In the same context, a whole punch was found, whose fragmented end could look like a bone point. In any case, a more dubious and badly-preserved specimen in the Chatelperronian level at Labeko Koba was identified directly as a bone point, possibly for the simple reason that it was found in an Upper Paleolithic context.



Fig. 9: Bone point from Lezetxiki.

The lithic record. Variable geometry to study the Leptolithic

Although it must be admitted that the lithic assemblage is the most extensively studied part of the archaeological record and has provided data for our series in the most universal way, some important variations still exist in the methodological approaches of different scholars which make it difficult to interrelate all the assemblages to be studied (Bon et al. 2002).

The traditional approach to the study of the lithic record (practically the only one until the mid 1980s) was the typological study according to empirically tested type-lists. Simply choosing either the Bordes or the de Sonneville-Bordes type-list implied assuming that the series to be studied was Middle or Upper Paleolithic. The use of two similar but not symmetrical typologies emphasised the differences between assemblages and made the typological study of the leptolithisation process impossible. In this respect, Laplace's analytical typology (Laplace 1966a), transversely applied to any chronology, has had the contrary effect since the publication of the study of Ekain (Merino 1984). The epistemological renewal promoted by Laplace's School of Analytical Typology goes deeper than the reappraisal of typology itself. It extends to a holistic view of lithic assemblages, which should be studied in their different structures: physical (raw material), typometric, technological, modal and morpho-technical. Further parameters have been added to these in recent years, such as functional (use-wear analysis) and spatial (intrasite or intersite analysis) studies.

Some general conclusions can be proposed in connection with the analysis of the transition process at the Basque crossroads (Ríos 2005, 2007). It has already been explained how the increase in the use of flint and the enlargement of the geographical radius of its provenance was a gradual process from the Final Mousterian until the Gravettian. The typometric variable, repeatedly cited, has rarely been studied in detail, and the literature is full of vague citations to "series mainly of blades" or "assemblages with few flakes" (Arrizabalaga 1999b). Some typometrically blade or bladelet forms are found throughout the basal sequence at Lezetxiki, although they co-exist with predominantly centripetal *chaînes opératoires* (Arrizabalaga 2006). In fact, the striking presence of these elements in Levels III and IV has caused certain confusion among the authors when ascribing these units to either the Mousterian or the Aurignacian.

It is very different from the proximate series at Labeko Koba (Arrizabalaga 2000b; Ríos 2008), where the highest ratio of blades in the assemblage is found in the Chatelperronian, and then decreases linearly through the other levels (Arrizabalaga 2002). This does not prevent the presence, albeit in decreasing percentages, of elements that show the sporadic use of centripetal exploitation schemes and a high number of non-blade forms. Some highly specific exploitation mechanisms are known in certain phases, such as the prismatic (burinoid) cores in the Protoaurignacian from which the bladelets were obtained that were then retouched as Dufour bladelets (Bon 2002; Bon et al. 2002; Normand 2002; Arrizabalaga and Maíllo 2008).

The more traditionally typological modal and morph-technical variable deserves a special mention (Arrizabalaga 1993, 1995). The increase in the mode of abrupt retouching and the implements linked with it (such as backed and Dufour bladelets) in the first place, and the burin mode after that, gradually takes the place of the more typically Mousterian

substrate modes (simple and *écaillé* modes) (Fig. 10). This process accelerates in certain phases (like the Protoaurignacian), followed occasionally by striking regressions (such as the Early Aurignacian). The process culminates in the Gravettian, with a high intra-series entropy and inter-series polymorphism. Once the Gravettian comes to an end, the weight of substrate elements becomes insignificant in general (Arrizabalaga 1994).



Fig. 10: Retouched blade from the transitional levels of Lezetxiki.

Towards a new paradigm: the leap from the fossil human to complex behavior

July 1979, with the discovery of Saint-Césaire, is a chronological landmark in the compulsory change of model to interpret the Middle to Upper Paleolithic transition. By questioning the traditional understanding of the roles of technical and symbolic behavior amongst Neandertals and Cro-Magnons, a crisis was created in the interpretation model of the period, successively worsened by insecurity in the chronological framework and such unforeseeable factors as the dates of the paintings at Grotte Chauvet.

In contrast with the interpretation drawn by different scholars (as Harrold 2000), in our opinion we are in the classic scenario of paradigm change. As Renfrew put it in "The Dawn of Civilisation", multiple converging factors question the foundations of the discipline, which had been considered unmovable until then. Everything related with human beings and their symbolic behavior is especially affected by this revolution in thought.

The capricious distribution map of fossils in the period

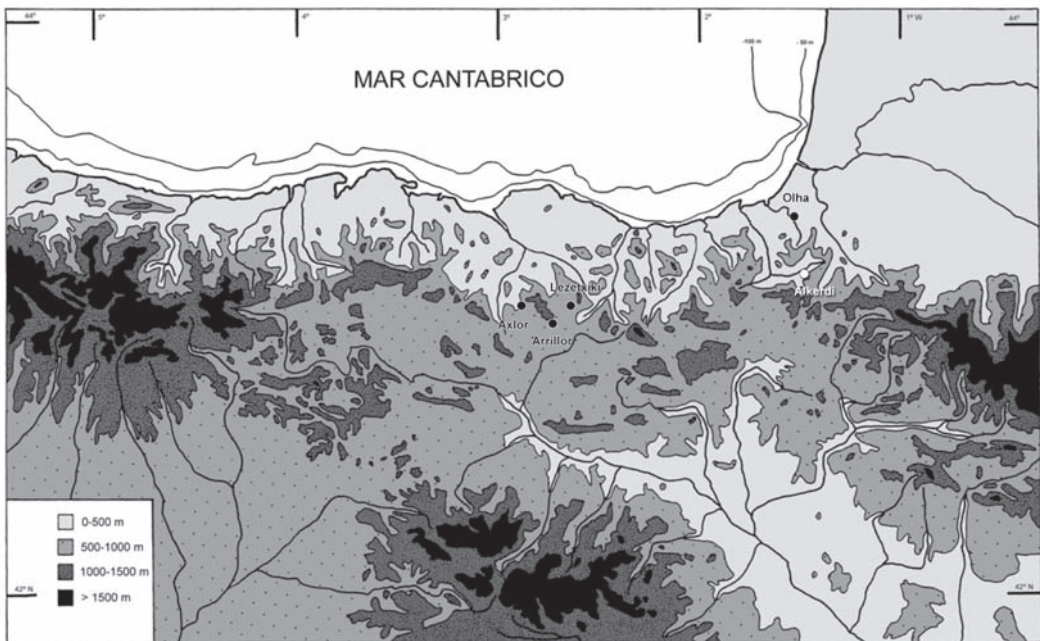


Fig. 11: Sites with Middle and Upper Paleolithic human remains in the Basque Country.

As in Western Europe as a whole, the spatial and chronological distribution of human fossils is far from random. The accumulative effect of the Mousterian gathers together, within the assemblage of Neandertal fossils, human remains separated by a hundred thousand years in time (Fig. 11), from the end of OIS 6 (humerus at Lezetxiki [Basabe 1966; Garralda 2006]) to the middle OIS 3 (mainly teeth from Lezetxiki IV and III [Basabe 1970] [Fig. 12], Arrillor [Bermúdez de Castro and Sáenz de Buruaga 1999] and Axlor [Basabe 1973]). The collection is small and very restricted in its study because of the limited eloquence of the teeth. However, apart from the remains out of context at Isturitz (Normand 2006) and in a not clear series at Unikoté (Michel 2005), the Upper Paleolithic sample is even smaller: a single tooth at the cave of Alkerdi (Barandiarán and Cava unpublished) in the Pyrenees, of Gravettian age.



Fig. 12: Human (Neandertal) teeth from the Lezetxiki transitional layers.

This minimal catalogue of specimens before the Solutrean makes it difficult to assign the behavior observed in parallel to one or another phylum. To recur to inference or analogy with other regions is, in our opinion, an unsatisfactory solution. To give an example, although most of the fossils in southwest Europe associated with the Chatelperronian are Neandertal, the characterisation of the Chatelperronian layer at Labeko Koba is not substantially different from the level above it. We would rather incline to suppose it was due to an occupation by Anatomically Modern Humans.

But most importantly, we lack definite proofs in any direction. We can recall the discussion about the human remains from El Sidrón, finally settled by dating the bones as final Neandertal (Forstea et al. 2003). Basically, where fossil remains are found (some ten individuals at El Sidrón), there is no material sequence or stratigraphy – and vice versa. In the Basque Country, as in the rest of northern Spain and much of southwest Europe, there is practically no fossil record for the whole of the Aurignacian. Under these circumstances, it is clear that we are lacking all information about possible funerary behavior.

Body ornamentation, the first symbolic behavior

It is not easy to track down the first objects that might have been used as pendants. In the first place, we must mention the deficient conservation of our record, which affects organic materials above all. It is also necessary to consider the visibility of these objects, in a large material record, with abundant bones, for example. In this respect, the earliest pendants are atypical as they tend to use side notches (or a notch on only one side) instead of perforations to suspend the object. Finally, we have to struggle against a consolidated state of opinion that resists questioning established models.

In the sequences being studied here, the earliest evidence comes from Lezetxiki. Two malacological remains from Level IVc could clearly have been used as pendants, and another two at the base of Level III suggest the same possibility (Arrizabalaga et al. 2008). One of the latter, a red *Spondylus*, must have held a high symbolic value, as it was found some 500km from the sea (the Mediterranean) where it originated. Although its use as a pendant remains to be proven, its individualisation as an ornamental object seems to be evident. We might also consider demonstrated that the shells found in Level IV were directly used as beads and that the fourth shell was not used for food (it is polished). Therefore, the use of body ornamentation between 55,000 and 48,000 BP appears to be proven. After that time, it will disappear from the sequence at Lezetxiki.

The sequence re-appears about 41,000 BP in the Protoaurignacian level at Labeko Koba. In this Level VII, the use of amber pearls as a raw material, undoubtedly for a decorative purpose, was described for the first time in northern Spain (Arrizabalaga 1995). In addition to Levels VII and V at Labeko Koba, amber pearls have been recovered in parallel layers at Cueva Morín (Arrizabalaga 1995), El Pendo (Álvarez-Fernández et al. 2005), Isturitz (Normand 2006) and Gatzarria (Sáenz de Buruaga 1991). At the Basque crossroads, it is necessary to wait until the Gravettian, for example at Bolinkoba (Barandiarán-Maestu 1973), to find further objects made from amber or malacological objects used as body ornamentation.

However, the Protoaurignacian and Early Aurignacian series at Isturitz has yielded large numbers of pendants made from amber, steatite, shells and teeth (some of them human: Normand 2006). With this single exception in the Basque Country, it is easy to argue that, in this aspect, the more ancient specimens are far more noteworthy than those of the EUP.

The earliest artistic behavior

Apart from the supposedly decorated Mousterian cobble-stone from the cave of Axlor (García-Díez and Barandiarán-Maestu in press), in this aspect of the archaeological record, the dividing line between behavior in the Middle and Upper Paleolithic appears to be clearly established. In this respect, the excavations at Isturitz have recovered a large number of objects, which remain unpublished, with dates of about 38,000 BP. The outlook to the south of the Pyrenees is much more modest.

The parietal art that has been dated is mainly no older than the Early Magdalenian. Using traditional criteria of style and typology, the deeply carved exterior engravings at Venta Laperra cave (García-Díez et al. 2008) have been attributed to the Aurignacian-Gravettian artistic cycle. In support of this attribution, two absolute dates have been obtained, by using TL (Arias et al. 1999), for a layer of calcite associated with the engravings; both of them are Gravettian (25.498 ± 2.752 BP and 22.949 ± 2.752 BP).

Several objects from Labeko Koba, beginning in Level VII (Protoaurignacian), dated to about 39,000 BP, have been considered portable art. Above all, a small cobble-stone is decorated with a deep engraving which appears to represent the back of an ungulate (García-Díez and Arrizabalaga 2000) (Fig. 13). The Early Aurignacian levels also include artifacts, such as a decorated smoothing tool and several bones with incisions. Apart from the finds in Level 18 at Cueva del Castillo these are the oldest portable art objects that have been published in northern Spain. The situation becomes more normal in the region from the Gravettian: figurative drawings have been found at El Castillo, and linear motifs at many caves, including Bolinkoba where several bone shafts are engraved (Barandiarán-Maestu 1973). In addition, the bone points at Isturitz usually have engraved lines on their bevelled ends.



Fig. 13: Small cobblestone from Labeko Koba decorated with an engraving.

Final reflections

Research into the Middle to Upper Paleolithic transition at the Basque crossroads has made a great deal of progress in the last two decades (Arrizabalaga 2008). This has been through the influence of global factors, such as the paradigm change produced by the find of Saint-Césaire, regional factors such as the concern with the chronological framework, and purely local influences, such as the generational renewal. All these factors converge in an intense change in the ways of thinking, including the homogenisation of field and laboratory methodologies and the proposal of hypotheses different from received archaeological thought. In our region, methodology had focused on the successive description of the Middle Paleolithic and the Upper Paleolithic (Arrizabalaga and Iriarte in press c).

Such a simple change in approach as attempting to describe the transition period between them, without any preconception of which human species was active in each level, has enabled the comparison of what exactly changed in the period 45,000-35,000 BP. Very briefly, I shall insist that the preconceptions being applied have artificially stressed the difference between a Mousterian undivided chronologically and an Upper Paleolithic understood as a whole. It is clear that either during the Protoaurignacian or in the Aurignacian, the main figures in the archaeological record are no longer Neandertal, as they are replaced by modern humans. But most of the drastic cultural, material and economic changes linked in a cause-effect relationship with this phyletic change do not appear to occur in our region and from our viewpoint. The changes seem to be much more gradual according to the perspective of the holistic study of the transition (Arrizabalaga and Iriarte 2006). Some of them begin to be glimpsed in the Final Mousterian; others increase in importance during the Upper Paleolithic, but rarely coinciding with the phyletic change between Neandertals and Anatomically Modern Humans, and instead during the Gravettian or even in the Solutrean. Only graphic expression, above all parietal art, due to its sudden appearance, may suggest the model of an abrupt change in contrast with the idea of gradual evolution.

To the next question (how and why can this apparent continuity between two different human species be explained?), we can only reply, provisionally, that the behavioral differences between both species may have been over-emphasised. From a purely archaeological point of view, forgetting anthropologists' proposals for a while, this gradualist model deserves to be studied more carefully in other regions. A possible hypothesis is that this circumstance is a characteristic only of the Basque Country, because of its situation at the crossroads, on the way to and from other geographical areas (French Pyrenees, Aquitaine, Northern Spain and Ebro Valley) with more "typical" models of change. Without doubt, fieldwork and laboratory study will be able to prove or disprove this hypothesis in the coming decades.

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References

- Aguirre, M. 2000: El paleolítico de Antoliñako Koba (Gautegiz-Arteaga, Bizkaia): secuencia estratigráfica y dinámica industrial. Avance de las campañas de excavación 1995-2000. *Illunzar* 4, 39-81.
- Aguirre, M. 2006: Antoliñako koba (Gautegiz-Arteaga). *Arkeoikuska* 2005 (2006), 80-84.
- Altuna, J. 1984: Historia de las excavaciones. Descripción del yacimiento. Resumen estratigráfico del relleno. Utilización del espacio. Dataciones absolutas. In: Altuna, J. and Merino, J. M. (eds.), *El yacimiento prehistórico de la cueva de Ekain (Deba, Guipúzcoa)*. Eusko Ikaskuntza Serie B1, 17-45.
- Altuna, J. 1992: Dataciones de radiocarbono para el Perigordense Superior del País Vasco. *Munibe (Antropología - Arkeología)* 44, 31-32.
- Altuna, J. 2002: Cueva de Aitzbitarte III (Errearteria). *Arkeoikuska* 2001 (2002), 128-130.
- Altuna, J. 2003: Cueva de Aitzbitarte III (Errearteria). *Arkeoikuska* 2002 (2003), 116-118.
- Altuna, J. and Merino, J. M. (eds.) 1984: *El yacimiento prehistórico de la cueva de Ekain (Deba, Guipúzcoa)*. Colección Beca José Miguel de Barandiarán 1. Eusko Ikaskuntza Serie B1. San Sebastián.
- Altuna, J., Baldeón, A. and Mariezkurrena, K. (eds.) 1990: *La Cueva de Amalda (Zestoa, País Vasco)*. Ocupaciones paleolíticas y postpaleolíticas. San Sebastián: Eusko Ikaskuntza.
- Alvárez-Fernández, E., Peñalver, E. and Delclòs, X. 2005: Presencia de ámbar local en los niveles auriñacienses de Cueva Morín y El Pendo (Cantabria, España). In: Montes-Barquín, R. and Lasheras, J. A. (eds.), *Neandertales cantábricos: estado de la cuestión*. Madrid: Monografías del Museo Nacional y Centro de Investigación de Altamira 20, 385-395.
- Arbizu, M., Arsuaga, J. L. and Adán, G. E. 2005: La Cueva del Forno/Conde (Tuñón, Asturias): un yacimiento del tránsito del Paleolítico Medio y Superior en la Cornisa Cantábrica. In: Montes-Barquín, R. and Lasheras, J. A. (eds.), *Neandertales cantábricos: estado de la cuestión*. Madrid: Monografías del Museo Nacional y Centro de Investigación de Altamira 20, 425-441.
- Arias, P., Calderón, T., González-Sáinz, C., Millán, A., Moure, A., Ontañón, R. and Ruiz, R. 1999: Dataciones absolutas para el arte rupestre paleolítico de Venta Laperra (Carranza, Bizkaia). *Kobie (Paleoantropología)* 25, 85-93.
- Arrizabalaga, A. 1993: Grotta Morín (Cantabria, Spagna). Livelli del Paleolitico superiore iniziale. *Archivio de Tipologia Analitica* 1993. Siena.
- Arrizabalaga, A. 1994: Individualización morfológica de los buriles gravetienses. *El Noailense de Bolinkoba*. *Munibe (Antropología - Arkeología)* 46, 33-51.
- Arrizabalaga, A. 1995: La industria lítica del Paleolítico Superior Inicial en el Oriente Cantábrico. Unpublished Ph.D. thesis. Vitoria: Universidad del País Vasco.
- Arrizabalaga, A. 1999a: El aprovisionamiento en materias primas líticas durante la génesis del Leptolítico: el Cantábrico oriental. *Rubricatum* 2, 97-104.
- Arrizabalaga, A. 1999b: Metrical characterization of the lithic industries. In: Barceló, J. A., Briz, I. and Vila, A. (eds.), *New Techniques for Old Times*. Computer Applications and Quantitative Methods in Archaeology. BAR International Series 757. Oxford: Achaepress, 209-212.
- Arrizabalaga, A. 2000a: El yacimiento arqueológico de Labeko Koba (Arrasate, País Vasco). Entorno. Crónica de las investigaciones. Estratigrafía y estructuras. Cronología absoluta. In: Arrizabalaga, A. and Altuna, J. (eds.), *Labeko Koba (País Vasco)*. Hienas y Humanos en los albores del Paleolítico superior. *Munibe* 52. San Sebastián: Sociedad de Ciencias Naturales Aranzadi, 15-72.
- Arrizabalaga, A. 2000b: Los tecnocomplejos líticos del yacimiento arqueológico de Labeko Koba (Arrasate, País Vasco). In: Arrizabalaga, A. and Altuna, J. (eds.), *Labeko Koba (País Vasco)*. Hienas y Humanos en los albores del Paleolítico superior. *Munibe* 52. San Sebastián: Sociedad de Ciencias Naturales Aranzadi, 193-343.

- Arrizabalaga, A. 2002: La industria lítica del yacimiento del Paleolítico superior inicial de Labeko Koba (País Vasco). In: Bon, F., Maíllo Fernández, J. M. and Ortega i Cobos, D. (eds.), *Autour des concepts de Protoaurignacien, d'Aurignacien archaïque, initial et ancien. Espace, Temps y Forma, Serie I/15*. Madrid: Universidad Nacional de Educación a Distancia, 117-134.
- Arrizabalaga, A. 2005a: Two tales of two caves? La transición Paleolítico medio/superior en el Cantábrico Oriental. In: Santonja, M., Pérez-González, A. and Machado, A. (eds.), *Gearqueología y Conservación del Patrimonio. Actas de la IVª Reunión de Gearqueología*. Madrid, 81-93.
- Arrizabalaga, A. 2005b: Últimos neandertales y primeros cromañones. Perspectivas desde la encrucijada vasca. In: Montes-Barquín, R. and Lasheras, J. A. (eds.), *Neandertales cantábricos: estado de la cuestión*. Madrid: Monografías del Museo Nacional y Centro de Investigación de Altamira 20, 557-575.
- Arrizabalaga, A. (ed.) 2005c: *Diario Personal* (author: J. M. de Barandiarán). Volumen I (1917-1936). Desde los primeros trabajos científicos, hasta el inicio del exilio. Sara Bilduma 6. 2 volumes. San Sebastián: Fundación José Miguel de Barandiarán.
- Arrizabalaga, A., 2006: *Lezetxiki* (Arrasate, País Vasco). Nuevas preguntas acerca de un antiguo yacimiento. In: Cabrera, V., Bernaldo de Quirós, F. and Maíllo, J. M. (eds.), *En el Centenario de la Cueva de El Castillo: el ocaso de los Neandertales*. Santander: Centro Asociado de la UNED de Cantabria, 291-310.
- Arrizabalaga, A. 2007: Frontières naturelles, administratives et épistémologiques: l'unité d'analyse dans l'Archéologie du Paléolithique (dans le cas basque). In: Cazals, N., González Urquijo, J. E. and Terradas Batlle, X. (eds.) *Frontières naturelles et frontières culturelles dans les Pyrénées préhistoriques*. Santander: Universidad de Cantabria, 27-37.
- Arrizabalaga, A. 2008: Veintisiete años después del "Auriñaciense y Perigordense en el País Vasco". Nuevas investigaciones de campo acerca del Paleolítico superior inicial en el País Vasco. *Veleia* 24-25, 425-444.
- Arrizabalaga, A. in press a: La dialéctica sílex/otras MMPP en la evolución de las materias primas líticas durante el Paleolítico vasco. Algunas consideraciones técnicas, económicas y culturales. In: Domínguez-Bella, S. and Ramos-Muñoz, J. (eds.), *IVª Reunión de trabajo sobre Materias primas líticas durante la Prehistoria* (Villamartín, Cádiz, 2007).
- Arrizabalaga, A. (ed.) in press b: *Diario Personal* (author: J. M. de Barandiarán). Volumen II (1936-1953). Los años de exilio. Vida y obra en el País Vasco Continental. Sara Bilduma 8. 2 volumes. San Sebastián: Fundación José Miguel de Barandiarán.
- Arrizabalaga, A. and Altuna, J. (eds.) 2000: *Labeko Koba* (País Vasco). Hienas y Humanos en los albores del Paleolítico superior. *Munibe* 52. San Sebastián: Sociedad de Ciencias Naturales Aranzadi.
- Arrizabalaga, A. and Iriarte, M. J. 2003: El yacimiento arqueológico de Irikaitz (Zestoa, País Vasco). Descripción del depósito y caracterización industrial de su nivel IV. XI Reunión Nacional de Cuaternario. Oviedo: AEQUA, 205-210.
- Arrizabalaga, A. and Iriarte, M. J. 2005: Irikaitz (Zestoa, País Vasco). Estudio preliminar del Paleolítico inferior en el sondeo "Geltoki". In: Bicho, N. (ed.) *O Paleolítico*. Faro: Universidade do Algarve, 267-275.
- Arrizabalaga, A. and Iriarte, M. J. 2006: El Castelperroniense y otros complejos de transición entre el Paleolítico medio y el superior en la Cornisa Cantábrica. Algunas reflexiones. In: Maíllo Fernández, J. M. and Baquedano, E. (eds.) *Miscelánea en homenaje a Victoria Cabrera*. Zona Arqueológica 7, Vol. I. Alcalá de Henares: Museo Arqueológico Regional de la Comunidad de Madrid, 358-370.
- Arrizabalaga, A. and Iriarte, M. J. 2008: Irikaitz (Zestoa, País Vasco). Tafonomía dun depósito pleistocénico ao aire libre. In: *Homenaxe a Xosé María Alvarez Blazquez. II: Estudos sobre Paleolítico*. Pontevedra: Instituto do Estudos Miñoranos, 139-162.
- Arrizabalaga, A. and Iriarte, M. J. in press a: El Gravetiense en la encrucijada. Actualización de la información y propuesta de relectura para el caso vasco. In: *Homenaje a F. G. Cádiz: Universidad de Cádiz*.
- Arrizabalaga, A. and Iriarte, M. J. in press b: Les gisements archéologiques gravettiens en plein air dans le Pays Basque péninsulaire. Un phénomène émergente. In: Goutas, N., Pesesse, D., Guillermin, P. and Klaric, L. (eds.), *À la recherche des identités gravettiennes: actualités, questionnements et perspectives*.
- Arrizabalaga, A. and Iriarte, M. J. in press c: Through the Looking-Glass. The most recent years of Cantabrian Research in Middle to Upper Palaeolithic Transition. In: Camps, M. and Chauhan, P. (eds.), *A Sourcebook of Paleolithic Transitions: Methods, Theories and Interpretations*. Springer.
- Arrizabalaga, A. and Maíllo, J. M. 2008: Technology vs. Typology? The Cantabrian Archaic Aurignacian/Protoaurignacian Exemple. In: Aubry, T., Almeida, F., Araujo, C. and Tiffagou, M. (eds.), *Space and Time: Which Diachronies, which synchronies, which Scales?/Typology vs. Technology*. UISPP, Lisbon 2006, Session C 65. B.A.R. International Series 1831, 133-139.

- Arrizabalaga, A., Altuna, J., Areso, P., Elorza, M., García, M., Iriarte, M. J., Mariezkurrena, K., Mujika, J., Peman, E., Tarrío, A., Uriz, A., Viera, L. and Straus, L. G. 2003: The Initial Upper Paleolithic in Northern Iberia: New Evidence from Labeko Koba. *Current Anthropology* 44, 413-420.
- Arrizabalaga, A., Altuna, J., Areso, P., Falgueres, C., Iriarte, M. J., Mariezkurrena, K., Pemán, E., Ruiz Alonso, M., Tarrío, A., Uriz, A. and Vallverdú, J. 2005: Retorno a Lezetxiki (Arrasate, País Vasco): nuevas perspectivas de la investigación. In: Santonja, M., Pérez-González, A. and Machado, A. (eds.), *Geoarqueología y Conservación del Patrimonio. Actas de la IVª Reunión de Geoarqueología*. Madrid, 63-80.
- Arrizabalaga, A., Álvarez-Fernández, E. and Iriarte, M. J. 2008: *Spondylus* sp. at Lezetxiki Cave (Basque Country, Spain): First Evidence of its use in Symbolic Behaviour during the Aurignacian in Europe. In: Ifantidis, F. and Nikolaidou, M. (eds.), *Spondylus in Prehistory: New Data and Approaches. Contributions to the Archaeology of Shell Technologies*. B.A.R. Oxford, 7-12.
- Arrizabalaga, A., Bernaldo de Quirós, F., Bon, F., Iriarte, M. J., Maillou, J. M. and Normand, C. 2009: Early evidence of the Aurignacian in Cantabrian Iberia and the North Pyrenees. In: Camps, M. and Szmíd, C. (eds.), *The Mediterranean from 50.000 to 25.000 BP: Turning points and new directions*. Oxford: Oxbow, 255-292.
- Arrizabalaga, A., Bon, F., Maillou, J. M., Normand, C. and Ortega, I. 2007: Territoires et frontières de l'Aurignacien dans les Pyrénées occidentales et les Cantabres. In: Cazals, N., González Urquijo, J. E. and Terradas Batlle, X. (eds.) *Frontières naturelles et frontières culturelles dans les Pyrénées préhistoriques*. Santander: Universidad de Cantabria, 301-318.
- Arrizabalaga, A., Iriarte, M. J. and Villaluenga, A. (et al.) in press a: Labeko Koba y Lezetxiki (País Vasco). Dos yacimientos, una problemática común. In: Baquedano, E. and Rosell, J. (eds.), *Cubiles de hiena (y otros grandes carnívoros) en los yacimientos arqueológicos de la Península Ibérica. Zona Arqueológica 9. Alcalá de Henares: Museo Arqueológico Regional de la Comunidad de Madrid*.
- Arrizabalaga, A., Tapia, J. and Iriarte, M. J. (et al.) in press b: El campamento gravetiense de Ametzagaina (Donostia, País Vasco). Avance a su estudio. *Munibe (Antropología – Arkeologia)* 60.
- Baldeón, A. 1987: El Paleolítico Medio en el País Vasco. Unpublished Ph.D. thesis. Bilbao: Universidad de Deusto.
- Baldeón, A. 1988: El yacimiento de Murba. *Estudios de Arqueología Alavesa* 16, 7-160.
- Baldeón, A. 1993: El yacimiento de Lezetxiki (Gipuzkoa, País Vasco). Los niveles musterienses. *Munibe* 45, 3-97.
- Baldeón, A. 1999: El abrigo de Axlor (Bizkaia, País Vasco). Las industrias líticas de sus niveles Musterienses. *Munibe* 51, 9-121.
- Baldeón, A. and Murga, F. 1989: Útiles paleolíticos en una gravera del río Zadorra, Afluente del Ebro. Alava. *Kobie (Paleoantropología)* 18, 113-122.
- Barandiarán-Ayerbe, J. M. 1950: Bolinkoba y otros yacimientos prehistóricos de la Sierra de Amboto. *Cuadernos de Historia Primitiva* 2, 75-112.
- Barandiarán-Ayerbe, J. M. 1958: Excavaciones en Carranza: Bortal, Venta la Perra, Polvorín. *Vizcaya* 10, 49-52.
- Barandiarán-Ayerbe, J. M. 1960: Exploración de la cueva de Lezetxiki en Mondragón (trabajos de 1957, 1959 y 1960). *Munibe* 12, 273-310.
- Barandiarán-Ayerbe, J. M. 1963: Exploración de la cueva de Lezetxiki (campana de 1962). *Munibe* 15, 87-102.
- Barandiarán-Ayerbe, J. M. 1964: Exploración de la cueva de Lezetxiki en Mondragón (campana de 1961). *Munibe* 16, 56-59.
- Barandiarán-Ayerbe, J. M. 1965a: Exploración de la cueva de Lezetxiki (Mondragón) (Campana de 1963). *Munibe* 17, 52-64.
- Barandiarán-Ayerbe, J. M. 1965b: Exploración de la cueva de Lezetxiki (Mondragón) (Campana de 1964). *Munibe* 17, 38-51.
- Barandiarán-Ayerbe, J. M. and Altuna, J. 1966: Excavación en la cueva de Lezetxiki (Campana de 1965). *Munibe* 18, 5-12.
- Barandiarán-Ayerbe, J. M. and Altuna, J. 1967a: Excavación de la cueva de Lezetxiki (Campana de 1966). *Munibe* 19, 79-106.
- Barandiarán-Ayerbe, J. M. and Altuna, J. 1967b: Excavación de la cueva de Lezetxiki (Campana de 1967). *Munibe* 19, 231-246.
- Barandiarán-Ayerbe, J. M. and Altuna, J. 1970: Excavación de la cueva de Lezetxiki (Campana de 1968). *Munibe* 22, 51-59.

- Barandiarán-Ayerbe, J. M. and Fernández-Medrano, D. 1957: Exploración en la cueva de Lezetxiki en Mondragón (trabajos de 1956). *Munibe* 7, 69-80.
- Barandiarán-Ayerbe, J. M., Aguirre, A. and Grande, M. 1960, Estación de Kurtzia, Barrica-Sopelana (1959). Bilbao: Servicio de Investigaciones Arqueológicas de la Excm. Diputación Provincial de Vizcaya.
- Barandiarán-Ayerbe, J. M.; Boucher, P. and Fernández-Medrano, D. 1959: 3ª Campaña de excavaciones en el yacimiento prehistórico de Lezetxiki. 1ª Campaña en el de Kobatxo. Garagarza-Mondragón. *Munibe* 11, 17-19.
- Barandiarán-Irizar, L. 1976: José Miguel de Barandiarán, Patriarca de la Cultura Vasca. San Sebastián: Sociedad Guipuzcoana de Ediciones y Publicaciones.
- Barandiarán-Maestu, I. 1967: El Paleomesolítico del Pirineo Occidental. Bases para la sistematización tipológica del instrumental óseo paleolítico. *Monografías Arqueológicas III*. Zaragoza: Universidad de Zaragoza.
- Barandiarán-Maestu, I. 1973: Arte mueble del Paleolítico Cantábrico. *Monografías Arqueológicas 14*. Zaragoza.
- Barandiarán-Maestu, I. 1980: Auriñaciense y Perigordense en el País Vasco: Estado Actual. *Munibe* 32, 325-333.
- Barandiarán-Maestu, I. 1988a: Actividad arqueológica en Navarra. 1986-1987: Yacimiento de Mugardua Sur (Urbasa). Campaña de 1987. *Trabajos de Arqueología Navarra* 7: 319-321.
- Barandiarán-Maestu, I. 1988b: Prehistoria: El Paleolítico. *Historia General de Euskal Herria*. Auñamendi, Donostia.
- Barandiarán-Maestu, I. 1996: Le Paléolithique supérieur au Pays Basque et dans le Bassin de l'Ebre (1990-1995). In: Otte, M. (ed.), *Le Paléolithique supérieur européen. Bilan quinquennal 1991-1996*. UISPP, Congrès de Forlì. ERAUL 76, 319-322.
- Barandiarán-Maestu, I. 1997: El paleolítico y el epipaleolítico. *Arqueología de Vasconia Peninsular*. Isturitz 7. *Eusko Ikaskuntza*, 5-21.
- Barandiarán-Maestu, I. 1999: La cueva de Isturitz (Pyrénées-Atlantiques). Memoria de la campaña arqueológica de excavaciones en la Sala de Saint-Martin del 1 al 30 de julio de 1999. D. F. S. de fouilles programmées, S. R. A. Aquitaine.
- Barandiarán-Maestu, I. and Cava, A. 2001: El Paleolítico superior de la cueva de Zatoya (Navarra): actualización de los datos en 1997. *Trabajos de Arqueología de Navarra* 15, 5-99.
- Barandiarán-Maestu, I. and Vallespi, E. 1984: Prehistoria de Navarra. *Trabajos de Arqueología Navarra* 2 (2ª ed.). Pamplona: Museo de Navarra/Institución Príncipe de Viana.
- Barandiarán-Maestu, I., Benítez, P., Cava, A. and Millán, M. A. 2007: El taller gravetiense de Mugardua sur (Navarra): identificación y cronología. *Zephyrus* 60, 15-26.
- Barandiarán-Maestu, I., Cava, A. and Alday, A. 2006: Ocupaciones de altura e interior durante el Tardiglaciario: la Llanada alavesa y sus estribaciones montañosas. In: Maíllo Fernández, J. M. and Baquedano, E. (eds.) *Miscelánea en homenaje a Victoria Cabrera*. Zona Arqueológica 7, Vol. I. Alcalá de Henares: Museo Arqueológico Regional de la Comunidad de Madrid, 534-550.
- Barandiarán-Maestu, I., Fortea, J. and Hoyos, M. 1996: El Auriñaciense tardío y los orígenes del Gravetiense: el caso de la región cantábrica. XIII International Congress of UISPP. Colloquium XII, Forlì, 263-293.
- Basabe, J. M. 1966: El húmero premusteriense de Lezetxiki (Guipúzcoa). *Munibe* 18, 13-32.
- Basabe, J. M. 1970: Dientes humanos del paleolítico de Lezetxiki (Mondragón). *Munibe* 22, 113-124.
- Basabe, J. M. 1973: Dientes humanos del Musteriense de Axlor (Dima; Vizcaya). *Trabajos de Antropología del C.S.I.C.* XVI(4), 187-202.
- Beguiristain, M. A. 2000: Paleolítico Medio en Navarra, nuevos datos para una síntesis. *SPAL* 9, 209-224.
- Bermúdez de Castro, J. M. and Sáenz de Buruaga, A. 1999: Étude préliminaire du site Pléistocène supérieur à hominidé d'Arrillor (Pays Basque, Espagne). *L'Anthropologie* 103-4, 633-639.
- Bernaldo de Quirós, F., Arrizabalaga, A., Maíllo, J. M. and Iriarte, M. J. 2008: La Transición Paleolítico medio-superior en la región centro-oriental de la Cornisa Cantábrica. In: Homenaje al Profesor Eduardo Ripoll Perelló. *Espacio, Tiempo y Forma – Prehistoria y Arqueología, Serie I-Nueva Época* 1, 33-46.
- Bon, F. 2002: A brief overview of Aurignacian cultures in the context of the industries of the transition from the Middle to the Upper Paleolithic. In: Bar-Yosef, O. and Zilhão, J. (eds.), *Towards a definition of the Aurignacian*. *Trabalhos de Arqueología* 45. Lisboa: American School of Prehistoric Research/Instituto Português de Arqueologia, 133-144.
- Bon, F., Maíllo, J. M. and Ortega i Cobos, D. (eds.) 2002: Autour des concepts de Protoaurignacien, d'Aurignacien archaïque, initial et ancien: unité et variabilité des comportements techniques des premiers groupes d'hommes modernes dans le Sud de la France et le Nord de l'Espagne. *Espacio, Tiempo y Forma, Serie I/15*. Madrid: Universidad Nacional de Educación a Distancia.

- Cabrera, V. 1984: El yacimiento de la Cueva de 'El Castillo' (Puente Viesgo, Santander). *Bibliotheca Praehistorica Hispana XXII*. Madrid: Instituto Español de Prehistoria.
- Cabrera, V. (ed.) 1993: *El Origen del Hombre Moderno en el Suroeste de Europa*. Madrid: Universidad Nacional de Educación a Distancia.
- Cabrera, V., Arrizabalaga, A., Bernaldo de Quirós, F. and Maíllo, J. M. 2004: La transición al Paleolítico superior y la evolución de los contextos auriniacienses (50.000-27.000 BP). In: Fano, M. (ed.), *Las Sociedades del Paleolítico en la Región Cantábrica*. KOBIE (Serie Anejos) 8. Bilbao: Diputación Foral de Bizkaia, 141-208.
- Cabrera, V., Bernaldo de Quirós, F. and Maíllo, J. M. (eds.) 2006: *En el Centenario de la Cueva de El Castillo: el ocaso de los Neandertales*. Santander: Centro Asociado de la UNED de Cantabria.
- Castaños, P. 2005: Revisión actualizada de las faunas de macromamíferos del Würm antiguo en la Región Cantábrica. In: Montes-Barquín, R. and Lasheras, J. A. (eds.), *Neandertales cantábricos: estado de la cuestión*. Madrid: Monografías del Museo Nacional y Centro de Investigación de Altamira 20, 201-207.
- Esparza, X. 1995: La cueva de Isturitz. Su yacimiento y sus relaciones con la Cornisa Cantábrica durante el Paleolítico superior. Colección Aula Abierta 82. Madrid: Universidad Nacional de Educación a Distancia.
- Falguères, C., Yokoyama, Y. and Arrizabalaga, A. 2005/2006: La Geocronología del yacimiento pleistocénico de Lezetxiki (Arrasate, País Vasco). Crítica de las dataciones existentes y algunas nuevas aportaciones. *Munibe (Antropología – Arkeologia)* 57/II, 93-106.
- Fortea, J. 1992: Abrigo de La Viña. Informe de las campañas 1987 a 1990. Excavaciones arqueológicas en Asturias. Oviedo, 19-28.
- Fortea, J. 1995: Abrigo de la Viña. Informe y primera valoración de las campañas 1991-1994. Excavaciones Arqueológicas en Asturias, 1991-94. Oviedo, 19-32.
- Fortea, J., Rasilla, M. de la, Martínez, E., Sánchez-Moral, S., Cañaveras, J. C., Cuezva, S., Rosas, A., Soler, V., Julià, R., Torres, T. de, Ortiz, J. E., Castro, J., Badal, E., Altuna, J. and Alonso, J. 2003: La cueva de El Sidrón (Borines, Piloña, Asturias): Primeros resultados. *Estudios Geológicos* 59, 159-179.
- Foucher, P., San Juan, C., Sacchi, D. and Arrizabalaga, A. in press: Le Gravettien des Pyrénées. *Paléo* 20.
- García-Díez, M. and Arrizabalaga, A. 2000: Soporte lítico con decoración lineal en el yacimiento de Labeko Koba (Arrasate, País Vasco). In: Arrizabalaga, A. and Altuna, J. (eds.), *Labeko Koba (País Vasco)*. Hienas y Humanos en los albores del Paleolítico superior. *Munibe (Antropología – Arkeologia)* 52, 377-383.
- García-Díez, M. and Barandiarán-Maestu, I. in press: The case of Axlor Rockshelter (Vizcaya, Spain) and the evidence for artistic activity in the European Middle Palaeolithic.
- García-Díez, M., Eguizabal, J. and Arrizabalaga, A. 2008: La cueva de Venta Laperra. El grafismo parietal paleolítico y la definición de territorios gráficos en la región cantábrica. Bilbao.
- Garralda, M. D. 2006: Los Neandertales en la Península Ibérica. *Munibe (Antropología – Arkeologia)* 57/III, 289-314.
- Giménez-La Rosa, M. 2006: La colección antigua de arte mueble e industria ósea. In: Cabrera, V., Bernaldo de Quirós, F. and Maíllo, J. M. (eds.). *En el Centenario de la Cueva de El Castillo: el ocaso de los Neandertales*. Santander: Centro Asociado de la UNED de Cantabria, 471-492.
- González-Echegaray, J. and Freeman, L.G. (eds.) 1971: *Cueva Morín. Excavaciones 1966-1968*. Publicaciones del Patronato de las Cuevas Prehistóricas de la Provincia de Santander VI. Santander.
- González-Echegaray, J. and Freeman, L.G. (eds.) 1973: *Cueva Morín. Excavaciones 1969*. Publicaciones del Patronato de las Cuevas Prehistóricas de la Provincia de Santander X. Santander.
- González Urquijo, J. E., Ibáñez Estévez, J. J. and Ríos, J. 2003: Abrigo de Axlor (Dima, Bizkaia). *Arkeoikuska* 2002 (2003), 78-81.
- González Urquijo, J. E., Ibáñez Estévez, J. J., Ríos, J. and Bourguignon, L. 2006: Aportes de las nuevas excavaciones en Axlor sobre el final del Paleolítico Medio. In: Cabrera, V., Bernaldo de Quirós, F. and Maíllo, J. M. (eds.), *En el Centenario de la Cueva de El Castillo: El ocaso de los Neandertales*. Santander: Centro Asociado de la UNED de Cantabria, 269-290.
- González Urquijo, J. E., Ibáñez Estévez, J. J., Ríos, J., Bourguignon, L., Castaños, P. and Tarrío, A. 2005: Excavaciones recientes en Axlor. Movilidad y planificación de actividades en grupos de neandertales. In: Montes-Barquín, R. and Lasheras, J. A. (eds.), *Neandertales cantábricos: estado de la cuestión*. Madrid: Monografías del Museo Nacional y Centro de Investigación de Altamira 20, 527-539.
- Harrold, F. B. 2000: The View from across the Pyrenees: Changing Perspectives on the Middle-Upper Paleolithic Transition in Spanish Prehistory. *Espacio, Tiempo y Forma, Serie I/13*, 79-87.
- Hoyos, M., Sáenz de Buruaga, A. and Ormazabal, A. 1999: Cronoestratigrafía y paleoclimatología de los depósitos prehistóricos de la cueva de Arrillor (Araba, País Vasco). *Munibe (Antropología – Arkeologia)* 51, 137-151.

- Iriarte, M. J. 2000: El entorno vegetal del yacimiento paleolítico de Labeko Koba (Arrasate, País Vasco): análisis polínico. In: Arrizabalaga, A. and Altuna, J. (eds.), *Labeko Koba (País Vasco). Hienas y Humanos en los albores del Paleolítico superior*. Munibe (Antropología – Arkeologia) 52, 89-106.
- Iriarte, M. J. 2004: Monte Jaizkibel (Hondarribia). *Arkeoikuska* 2003 (2004), 157-160.
- Iriarte, M. J. and Arrizabalaga, A. 1999: El marco ambiental del Paleolítico superior inicial: datos arqueobotánicos. XXIVº Congreso Nacional de Arqueología, Tomo 1. Cartagena, 53-60, Cartagena.
- Iriarte, M. J., Gómez-Orellana, L., Muñoz-Sobrino, C., Ramil-Rego, P. and Arrizabalaga, A. 2005: La dinámica de la vegetación en el SW peninsular durante la transición del Paleolítico Medio al Paleolítico Superior. In: Montes-Barquín, R. and Lasheras, J. A. (eds.), *Neandertales cantábricos: estado de la cuestión*. Madrid: Monografías del Museo Nacional y Centro de Investigación de Altamira 20, 231-253.
- Laplace, G. 1966a: Recherches sur l'origine et l'évolution des complexes leptolithiques. *Mélanges d'Archéologie et d'Histoire de l'École Française de Rome, Suppl.4*. Paris.
- Laplace, G. 1966b, Les niveaux Castelperroniens, Protoaurignaciens et Aurignaciens de la grotte Gatzarria à Suhare en Pays Basque (Fouilles 1961-1963). *Quartär* 17, 117-140.
- Laplace, G. and Sáenz de Buruaga, A. 2002-2003: Typologie analytique et structurale des complexes du Moustérien de la Grotte Gatzarria (Ossas-Suhare, Pays Basque) et de leurs relations avec ceux de l'abri Olha 2 (Cambo, Pays Basque). *Pyrenae* 33-34, 81-163.
- Liolios, D. 2006: Reflections on the role of bone Tools in the definition of the Early Aurignacian. In: Bar-Yosef, O. and Zilhão, J. (eds.), *Towards a definition of the Aurignacian*. *Trabalhos de Arqueologia* 45. Lisboa: American School of Prehistoric Research/Instituto Português de Arqueologia, 37-51.
- Mariezcurrera, K. 1979: Dataciones de radiocarbono existentes para la prehistoria vasca. *Munibe* 31, 237-255.
- Maroto, J., Vaquero, M., Arrizabalaga, A., Baena, J., Carrión, E., Jordá, J., Martínón, M., Menéndez, M., Montes-Barquín, R. and Rosell, J. 2005: Problemática del Paleolítico Medio reciente en el Norte Peninsular. In: Montes-Barquín, R. and Lasheras, J. A. (eds.), *Neandertales cantábricos: estado de la cuestión*. Madrid: Monografías del Museo Nacional y Centro de Investigación de Altamira 20, 101-114.
- Martínez Moreno, J. 2005a: Una aproximación zooarqueológica al estudio de los patrones de subsistencia del Paleolítico Medio Cantábrico. In: Montes-Barquín, R. and Lasheras, J. A. (eds.), *Neandertales cantábricos: estado de la cuestión*. Madrid: Monografías del Museo Nacional y Centro de Investigación de Altamira 20, 209-230.
- Martínez Moreno, J. 2005b: Comportamientos y tecnologías polémicas: las industrias en hueso "poco elaboradas" y objetos simbólicos del Paleolítico Medio Cantábrico. In: Montes-Barquín, R. and Lasheras, J. A. (eds.), *Neandertales cantábricos: estado de la cuestión*. Madrid: Monografías del Museo Nacional y Centro de Investigación de Altamira 20, 349-367.
- Mazo, C. and Utrilla, P. 1996: Excavaciones en la cueva de Abauntz (Arraiz). *Campañas de 1994 y 1995. Trabajos de Arqueología Navarra* 12, 270-279.
- Merino, J. M. 1984: Industria lítica del yacimiento de Ekain. In: Altuna, J. and Merino, J. M. (eds.), *El yacimiento prehistórico de la cueva de Ekain (Deba, Guipúzcoa)*. San Sebastián: Eusko Ikaskuntza, 65-175.
- Michel, P. 2005: Un repaire würmien d'hyènes des cavernes: La Grotte d'Unikoté (Iholdy, Pyrénées-Atlantiques, France). In: Montes-Barquín, R. and Lasheras, J. A. (eds.), *Neandertales cantábricos: estado de la cuestión*. Madrid: Monografías del Museo Nacional y Centro de Investigación de Altamira 20, 131-150.
- Montes-Barquín, R. and Lasheras, J. A. (eds.) 2005: *Neandertales cantábricos: estado de la cuestión*. Madrid: Monografías del Museo Nacional y Centro de Investigación de Altamira 20.
- Montes-Ramírez, L. 1988: El Musteriense en la Cuenca del Ebro. *Monografías Arqueológicas* 28. Zaragoza: Universidad de Zaragoza.
- Morán, N. and Tejero, J. M. 2006: Preliminary analysis on bone implements of Aurignacian levels (18, 16) at El Castillo cave (Cantabria, Spain). In: Cabrera, V., Bernaldo de Quirós, F. and Maíllo, J. M. (eds.), *En el Centenario de la Cueva de El Castillo: el ocaso de los Neandertales*. Santander: Centro Asociado de la UNED de Cantabria, 459-469.
- Mujika, J. 1991: La industria ósea del Paleolítico Superior y Epipaleolítico del Pirineo Occidental. Unpublished Ph.D. thesis. Bilbao: Universidad de Deusto.
- Mujika, J. 2000: La industria ósea del Paleolítico Superior Inicial de Labeko Koba (Arrasate, País Vasco). In: Arrizabalaga, A. and Altuna, J. (eds.), *Labeko Koba (País Vasco). Hienas y Humanos en los albores del Paleolítico superior*. Munibe (Antropología – Arkeologia) 52, 355-376.

- Muñoz, M., Sánchez Goñi, M. F. and Ugarte, F. 1990: El entorno geo-ambiental del yacimiento arqueológico de Kurtzia. Sopela-Barrika. Costa occidental de Bizkaia. *Munibe (Ciencias Naturales)* 41, 107-115.
- Normand, Ch. 2002: Nouvelles données sur l'Aurignacien de la grotte d'Isturitz (commune de Saint-Martin-d'Arberoue; Pyrénées-Atlantiques) à travers l'industrie lithique de la Salle de Saint-Martin. In: Bon, F., Maïllo, J. M. and Ortega i Cobos, D. (eds.), *Autour des concepts de Protoaurignacien, d'Aurignacien archaïque, initial et ancien: unité et variabilité des comportements techniques des premiers groupes d'hommes modernes dans le Sud de la France et le Nord de l'Espagne*. Espacio, Tiempo y Forma, Serie I/15. Madrid: Universidad Nacional de Educación a Distancia, 145-174.
- Normand, Ch. 2006: Les occupations aurignaciennes de la grotte d'Isturitz (Saint-Martin-d'Arberoue; Pyrénées Atlantiques; France): synthèse des données actuelles. *Munibe (Antropología – Arkeologia)* 57/II, 119-129.
- Ordoño, J. and Arrizabalaga, A. in press: Territorial patterns during Middle-Upper Palaeolithic Transition in Cantabrian Iberia. In: Djindjian, F., Kozłowski, J. K. and Bicho, N. (eds.), *Palaeolithic hunter-gatherers' concept of territory*. UISPP Lisbon 2006, Colloquium C16.
- Passermard E. 1922: La caverne d'Isturitz (Basses-Pyrénées). *Revue Archéologique* XV.
- Passermard, E. 1924: Les Stations Paléolithiques du Pays Basque et leurs relations avec les Terrasses d'alluvions. Bayonne: Imp. Bodiou.
- Passermard, E. 1944: La caverne d'Isturitz en Pays Basque. *Préhistoire IX*. Paris: Presses Universitaires de France.
- Rasines, P. 2005: El final de la transición. Dataciones de las primeras ocupaciones del Paleolítico superior en el centro de la Región Cantábrica. In: Montes-Barquín, R. and Lasheras, J. A. (eds.), *Neandertales cantábricos: estado de la cuestión*. Madrid: Monografías del Museo Nacional y Centro de Investigación de Altamira 20, 577-587.
- Ríos, J. 2005: Características de la producción lítica al final del Paleolítico Medio en el País Vasco. El caso del nivel B de Axlor (Dima, Bizkaia). In: Montes-Barquín, R. and Lasheras, J. A. (eds.), *Neandertales cantábricos: estado de la cuestión*. Madrid: Monografías del Museo Nacional y Centro de Investigación de Altamira 20, 333-348.
- Ríos, J. 2007: Industria lítica y sociedad en la Transición del Paleolítico Medio al Superior en torno al Golfo de Bizkaia. Unpublished Ph.D. thesis. Santander: Universidad de Cantabria.
- Ríos, J. 2008: Nivel IX (Chatelperroniense) de Labeko Koba (Arrasate, Gipuzkoa): gestión de la industria lítica y función del sitio. *Munibe (Antropología – Arkeologia)* 59, 25-46.
- Ríos, J., González-Urquijo, J. and Ibáñez-Estévez, J. J. 2005: Abrigo de Axlor (Dima). *Arkeoikuska* 2004 (2005), 75-79.
- Ruiz-Idarraga, R. 1989: Azagayas de base hendida en el yacimiento del Polvorín (Venta Laperra D, Carranza, Bizkaia). *Kobie* 18, 47-54.
- Ruiz-Idarraga, R. 1990: El complejo Auriñaco-Perigordienense en el País Vasco. *Munibe (Antropología – Arkeologia)* 42, 23-32.
- Ruiz-Idarraga, R. and d'Errico, F. 2005: Cueva de Ventalaperra (Valle de Carranza). *Arkeoikuska* 2004 (2005), 96-97.
- Ruiz-Idarraga, R. and d'Errico, F. 2008: Cueva del Polvorín (Valle de Carranza). *Arkeoikuska* 2007 (2008), 92-94.
- Ruiz-Zapata, B. and Gil-García, M. J. 2005: Los neandertales cantábricos: su paisaje vegetal. In: Montes-Barquín, R. and Lasheras, J. A. (eds.), *Neandertales cantábricos: estado de la cuestión*. Madrid: Monografías del Museo Nacional y Centro de Investigación de Altamira 20, 275-284.
- Sáenz de Buruaga, A. 1991: El Paleolítico Superior de la Cueva de Gatzarria, Zuberoa, País Vasco. *Anejos de Veleia, Series Maior* 6. Vitoria-Gasteiz: Servicio Editorial Universidad del País Vasco.
- Sáenz de Buruaga, A. 2000: El Paleolítico Inferior y Medio en el País Vasco: síntesis de datos y algunas reflexiones. *SPAL* 9, 49-68.
- Sáenz de Buruaga, A. 2004: Las primeras manifestaciones del Paleolítico superior antiguo en Araba y la explotación de las materias primas silíceas: algunas reflexiones. *Estudios de Arqueología Alavesa* 21, 1-16.
- Sáenz de Buruaga, A. 2006: Cueva de Aldatxarren (Mendaro). *Arkeoikuska* 2006, 115-125.
- Sáenz de Buruaga, A. and Mujika, J. A. 2005: Cueva de Zerratu, en Astigarribia (Mutriku). *Arkeoikuska* 2004 (2005), 144-153.
- Sáenz de Buruaga, A., García-Rojas, M. and Retolaza, I. 2005: Aproximación a la interpretación tecnológica del conjunto industrial de tradición gravetiense de Prado (Burgeta, Araba). *Estudios de Arqueología Alavesa* 22, 51-68.

- Saint-Périer, R. de 1930: La grotte d'Isturitz I. Le Magdalénien de la Salle de Saint Martin. Archives de l'Institut de Paléontologie Humaine 7. Paris.
- Saint-Périer, R. de 1936: La grotte d'Isturitz II. Le Magdalénien de la Grande Salle. Archives de l'Institut de Paléontologie Humaine 17. Paris.
- Saint-Périer, R. de and Saint-Périer, S. de 1952: La grotte d'Isturitz III. Les solutréens, les aurignaciens et les moustériens. Archives de l'Institut de Paléontologie Humaine 25. Paris.
- Sánchez-Goñi, M. F. 1991: Analyses palynologiques des remplissages de grotte de Lezetxiki, Labeko et Urutiaga (Pays Basque espagnol). Leur place dans le cadre des séquences polliniques de la région cantabrique et des Pyrénées Occidentales. Thesis. Paris: Institut de Paléontologie Humaine.
- Sonneville-Bordes, D. de 1971: Un fossile directeur osseux du Périgordien supérieur à burins de Noailles. Bulletin de la Société Préhistorique Française 68, 44-45.
- Sonneville-Bordes, D. de 1972: À propos des sagaies d'Isturitz. Bulletin de la Société Préhistorique Française 69, 100-101.
- Stuart, A. J., Kosintsev, P. A., Higham, T. F. G. and Lister, A. M. 2004: Pleistocene to Holocene extinction dynamics in giant deer and woolly mammoth. Nature 431, 684-689.
- Tarriño, A. 2006: El sílex en la cuenca Vasco-Cantábrica y Pirineo Navarro: caracterización y su aprovechamiento en la Prehistoria. Monografías del Centro de Investigación y Museo de Altamira 21. Madrid.
- Tarriño, A. and Normand, Ch. 2002: Procedencia de los restos líticos en el Auriniaciense antiguo (C4b1) de Isturitz (Pyrénées-Atlantiques, Francia). In: Bon, F., Maíllo, J. M. and Ortega i Cobos, D. (eds.), Autour des concepts de Protoaurignacien, d'Aurignacien archaïque, initial et ancien: unité et variabilité des comportements techniques des premiers groupes d'hommes modernes dans le Sud de la France et le Nord de l'Espagne. Espace, Temps y Forma, Serie I/15. Madrid: Universidad Nacional de Educación a Distancia, 135-144.
- Turq, A., Normand, C. and Valladas, H. 1999: Saint-Martin-d'Arberoue: Grotte d'Isturitz", Bilan Scientifique 1998. Bordeaux: Direction Régionale des Affaires Culturelles, Service Régional de l'Archéologie.
- Vaquero, M., Maroto, J., Arrizabalaga, A., Baena, J., Carrión, E., Jordà, J. F., Martínón, M., Menéndez, M., Montes, R. and Rosell, J. 2006: The Neandertal-Modern Human Meeting in Iberia: A Critical View On The Cultural, Geographical and Chronological Data. In: Conard, N. J. (ed.) When Neanderthals and Modern Humans Met. Tübingen Publications in Prehistory. Tübingen: Kerns Verlag, 419-439.
- Yravedra, J., Baena, J., Arrizabalaga, A. and Iriarte, M. J. 2005: El empleo de material óseo como combustible durante el Paleolítico Medio y Superior en el Cantábrico. Observaciones experimentales. In: Montes-Barquín, R. and Lasheras, J. A. (eds.), Neandertales cantábricos: estado de la cuestión. Madrid: Monografías del Museo Nacional y Centro de Investigación de Altamira 20, 369-383.