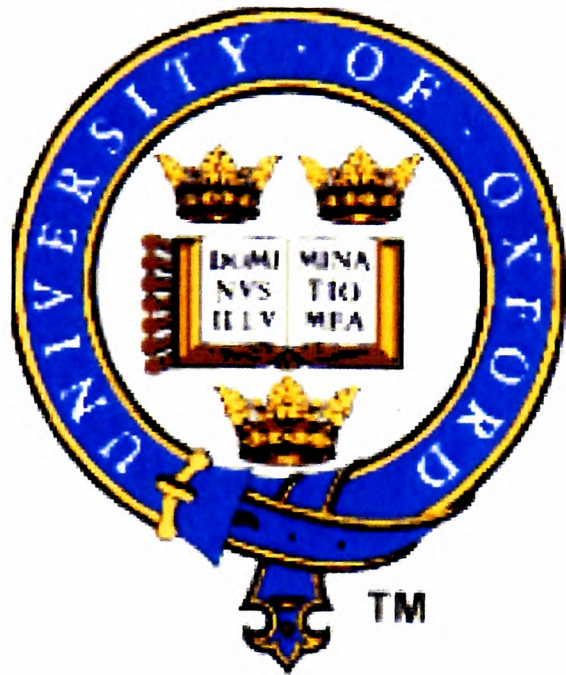
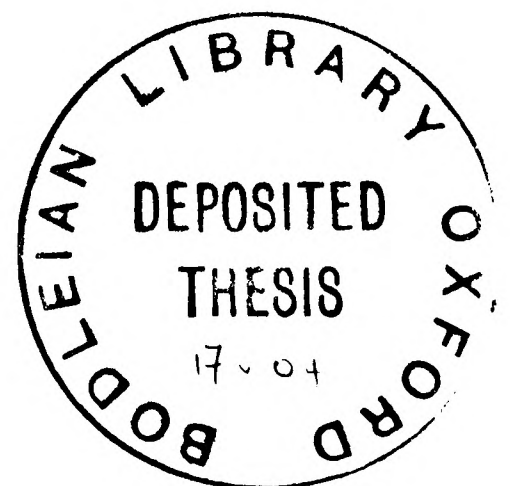


**Revisiting the 40,000 BP Crisis in Iberia:
A Study of Selected Transitional Industries
And their significance**



Thesis submitted for the degree of Doctor of Philosophy

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St. Cross College
University of Oxford**



Trinity Term 2003 [ie 2004]

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Gràcies

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A Study of Selected Transitional Industries and their significance**

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This thesis focuses on the Mid/Upper Palaeolithic Transition in the Iberian Peninsula, and questions whether this process took place as hitherto widely claimed, by testing the validity of the traditional characteristics said to portray this event throughout Europe.

Research was carried out at different levels: old archaeological collections from two transitional sites (Abric Romaní and Reclau Viver), previously unstudied, were systematically analysed and specific organic components (perforated shells) were radiocarbon dated. A thorough bibliographic database including information on these and all other Iberian sites was compiled, in order to extend the study. The theoretical perspective of the topic was also investigated, to assess epistemological factors which are so often overlooked in this field of study. The socio-political events that have marked Spain and Portugal's contemporary histories, were also studied, since they played a crucial role in shaping Palaeolithic Research in both countries.

The so-called '40,000 BP Crisis', specifically located in northern Iberia, was revisited by studying not only the traditional sites which have produced chronometric readings around that date, but also others in the same region whose transitional layers have yielded much younger dates, to see if that phenomenon really existed or has been created by generalisations that have masked vital – but ultimately uncomfortable – information.

The study of this event is also placed into the peninsular and the wider European contexts, an exercise that has disclosed the vast complexity of the Transition, in terms of both the actual archaeological record and the theoretical interpretations that have been presented so far.

Ultimately, this research calls for a revision of some of the theoretical perspectives of Palaeolithic archaeologists, as well as far more careful site and regional-level research, in order to redress the abundant misconceptions that distort our understanding of the Transition process.

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and what you can do with stone tools can only compare to those on developing cities, civil society organisations and millennium development goals. I cherish every word.

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1. Introduction

1.0. Introduction

1.1. The traditional context of the Transition

1.2. Traditional systematics

1.3. Research Questions

1.3.1. Generalisations from abroad: checking the facts at home

1.3.2. Theoretical toolkit analysis

1.4. Structure of the thesis

1.0. Introduction

This research focuses on the phenomenon of the Transition from the Middle to the Upper Palaeolithic in the Iberian Peninsula, with special reference to the site of Abric Romaní (Capellades, Barcelona), more broadly the northern Iberian sites, and to the theoretical and typological systematics that have been used hitherto in the study of the transitional process.

The exact centre of this dissertation is the development of the Transition from the latest Mousterian facies, to the appearance of the earliest Upper Palaeolithic. The latter is usually classified as early Aurignacian or simply Aurignacian in the northern area, and a rather non-descriptive and open to interpretations ‘just early Upper Palaeolithic’ in the south of the peninsula; it will also deal with those layers classified as ‘transitional’, which for the Iberian case translates into Chatelperronian. Chronologically, these parameters mean the period between 45 and 25 ky BP, yet in northern Iberia this phenomenon is called ‘the 40000 BP Crisis’, because of the early dates obtained in certain sites.

Despite the large amount of time during which this issue has been a debate topic, there is a clear paucity of works dealing with its study from a regional perspective in Iberia (contra Straus et al. 2000). The present thesis also aims to take into account the theoretical implications of the techniques used in this research. The objective of this thesis is two-fold: to bridge this gap, if only initially and partially, and to see if the aforementioned generalisations apply in this region, as well as to find out the extent in which the traditional perspectives of study (especially typological systematics) have

influenced the investigation of this phenomenon, and shaped the results of work carried out until present.

This study was undertaken for several reasons. First of all, the Transition has been the subject of scholarly debate for many years now, but it seems we are not much closer to reaching an understanding of its basics than when the discussion began.

Secondly, traditional research on the issue has been carried out mainly in SW France, and primary conclusions obtained from the analysis of this area have been extrapolated, and several tenets –outlined below- have been generalised, becoming the supposed characteristics of this process across the whole of the European continent.

Finally, in recent years, Iberia has come under the spotlight because of the long survival of Neanderthals in its southern area; examples of remains of these populations which inhabited the Iberian refugia are several, such as the Zafarraya mandible (Zafarraya, Granada), dated at *c.*27000 BP or the controversial child skeleton found at Lagar Velho (Portugal), which is dated at *c.*24500 BP. These findings do not fit into the traditional time span of the disappearance of that species are but the tip of the iceberg that is formed by multiple observations which lead us to think that the process that took place in this region could be quite different from the generalised model, created on the other side of the Pyrenees.

The expectation and generalised interest on this issue, in and outside the academic world is very much related to the fact that it is intrinsically linked to the arrival of our

species into the area, and the apparently roughly simultaneous ‘disappearance’ of the species which had been living in the region until then. The suspicious ‘coincidence’ together with the typical ‘whys’ and ‘hows’, and the speed with which theories of mass extermination were put forward have been the perfect recipe to spark the interest of many, and the production of a large amount of literature which stands as a three-sided wobbly bridge between science, public interest and complete fiction (e.g. Tattersall 1995, Auel 1980, Darnton 1996). It has also done much to prevent scientific cooperation towards the achievement of a better understanding of how the Transition took place.

Special interest is placed on the site of Abric Romaní, the reason for this being that this is the first complete study of the assemblages from the transitional layers, since their excavation in the first half of the 20th century. The first-hand study of this and the Corominas collection from Reclau Viver will be complemented by published information, wherever this is available.

1.1. The traditional context of the Transition

While a detailed bibliographical revision is the focus of the following chapter, this section’s aim is to explain how the generalising accounts of the Transition, as well as the supposed characteristics of the process became established, progressively, throughout 30 years. Only crucial and very specific works are mentioned here, as the in-depth analysis of this and the rest of the publications is done in chapter two.

- In 1973, Colin Renfrew edited *The Explanation of Culture Change: Models in Prehistory*; in section 3, P. Mellars outlined the characteristics of the Transition to the Upper Palaeolithic in southwest France. According to this author, until that moment there had been very few attempts to study the transitional process in detail. The paper's aim was 'to examine closely the evidence from one particular area in an attempt to define what the true pattern of the middle-upper Palaeolithic was' (Mellars 1973:255) turning it into the reply to the generalising and superficial literature that was available on the topic at the time (e.g. Bordes 1968b, Burkitt 1955, Coles and Higgs 1969, etc.).

Mellars selected the following points as the most significant aspects of the process as observed in Southwestern France:

- New forms of stone implements (i.e. Dufour bladelets, Font-Yves points, busqué burins and strangulated blades in the Aurignacian), which were developed throughout the period. Such implements are more complex and change at a faster rate than the Mousterian ones. Blades begin to be made through indirect percussion or the punch technique.
- Ability to shape bone, antler and ivory into a variety of relatively and carefully controlled forms (i.e. split base points from the Aurignacian assemblages).
- Appearance of 'small objects for which no obvious functional explanation can be found' which are interpreted as 'personal ornaments'.
- Specialised hunting of one species (reindeer).
- Year-round occupation of sites which in many cases had gone through interior modifications for comfort.

- Increasingly larger settlement dimensions are thought to indicate larger groups and the increase in the number of sites responds to an increase of population densities.
- Extended networks, maybe because of long distance seasonal migrations, produce the beginning of large distances contacts (150-200 kms).

Mellars' paper has been considered 'the first real synthesis' on the Transition (White 1982); although its geographical scope was clearly outlined in the introductory section, and it was meant to review previous generalisations, later works by the same author gradually cast a shadow on the regionality of his own research, to finally turn the characteristics outlined in 1973 into the 'general features of the archaeological transition from Middle to Upper Palaeolithic in Europe' (Mellars 1991:63). The complex of behavioural changes was then outlined as follows:

- In the technological field: flake technologies tend to disappear in favour of a more regular and economical blade manufacture that would display not only an increase of complexity and variety (intra-assemblage, inter-regional and across time [innovation]), but also a greater degree of standardisation and imposed form, reflecting 'mental templates'. Bone/antler/ivory technology abruptly appears in the record, with complex and extensively shaped artefacts. The same characteristics of innovation and regional diversification mentioned above for the stone tools would apply here.
- In the symbolic field: highly complex forms of representational or 'naturalistic' art are found in the record from this period onwards. Appearance of personal ornamentation in the form of very varied types of beads, pendants, etc. made from shaped bone/antler/ivory, animal teeth and exotic marine shells.

- In the socio-economic field: increase in the specialised pattern of animal exploitation including new levels of systematic hunting. Increase in population density and size of local groups. Appearance of highly structured human settlements, with clearly defined living structures.

1.2. Traditional systematics

The second focus of this research lies on the methods used until present to conduct studies like the one mentioned above. Although the aforementioned 1973 paper is considered as the first real synthesis on the subject, the truth is that the process of the Transition, understood as the scenario of the origin of anatomically modern humans (AMH), or at least their presence in Eurasia, has been the centre of debates for over a century.

The cause for such lengthy discussion and the failure to reach an understanding between the different parts has been blamed on the little concern that the disciplines involved in this research have for the logic of inference through which each of the sides reaches its conclusions and the basis on which they set out to defend them (Clark 1999).

There is an apparent divide in the study of Archaeology, which permeates the field as a whole and affects not only research, but also the aforementioned wide range of publications about issues in this field. On one hand, there are the sites, the time periods and the 'findings', and on the other, the theoretical aspects and schools of thought that more or less clearly direct the interpretation of our research results. While

this separation is understandable at the level of materials meant for the general public, its presence at the scholar stage is not only incomprehensible, but also unwise, as the example below shows.

Palaeolithic research has been mainly centred on the study of stone tool assemblages, which are the most abundant type of remains from that period, and the vast majority of those works are typologically driven approaches to the subject. The need to organise pieces found in an archaeological layer in order to facilitate its study has gone beyond the framework of auxiliary study methods to become the end product of many projects (e.g. Fullola 1979, Ripoll and de Lumley 1965, Soler 1986, etc.).

At present, in Western Europe, there are three main Palaeolithic typologies in use:

- Bordes' Typology for the Lower and Middle Palaeolithic industries (1961).
- de Sonneville-Bordes and Perrot's Typology for the Upper Palaeolithic industries (1953).
- Laplace's Analytical Typology (1957, 1974).

A fourth one can be added when considering the Spanish scene:

- Carbonell, Guilbaud and Mora's Logical-Analytical System (e.g. Carbonell and Mora 1986, Carbonell *et al.* 1983, Carbonell *et al.* 1992).

Archaeology students are taught a particular system and trained to use it, but they are not required to look into the methodology's theoretical background. When sites are excavated and pieces are typologically classified, the use of one or another of the aforementioned classification systems is used, depending on the chronological stage

to which a specific level is thought to belong, and the particular tradition in which the archaeologists working on the site have been trained. At the time of writing down the work done, the author usually states the method used, cites a reference or two, and gets on with the analyses and the results. Too little consideration is given to the influence that the chosen typological system has on the results, and these are not questioned on methodological grounds, since it is widely believed that the facts and even data speak for themselves.

Typological systematics contain an added problem when they are used to study the transition, which is that this process cannot be typologically analysed by using one of those systems, though some have been designed to work on industries of any period (e.g. Carbonell *et al.* 1983), and since different typologies focus and measure different aspects of the assemblages, change (of whatever kind) is bound to be the result of the analysis.

This thesis aims to incorporate a thorough analysis of such systems to the study of the Transition as observed in Iberia, to ascertain the influence that the application of a given typology has had over the results of the investigation. Chapter four is an in-depth revision of the main typological systematics that have been employed in Iberian research until present.

Before outlining the questions which will guide and structure the present work, perhaps it is best to mention what this thesis does not deal with, and that are issues related to the biological transition, between the two species which are the leading

roles in this story. While it is an obvious key point in the controversy, the issue is avoided and references to biological aspects are kept to a minimum, as the focus of this work is the transitional process as observed through the material assemblages from Iberian sites. Other important aspects which are not considered are faunal remains, settlement patterns, seasonality aspects, etc.

1.3. Research questions

In light of the facts exposed in the previous sections, this research sets out to find the answers to the questions outlined in the subsections below:

1.3.1. Generalisations from abroad: checking the facts at home

This section groups the questions that will be studied through the data obtained both during the fieldwork seasons and from the publications available on the subject. There will be three major points of analysis:

- Are traditional views on the Transitional process valid for Iberia? If so, do they apply to all areas of the Peninsula? The following conventional parameters are tested: results of blades and flakes indices, across the Transitional¹ assemblages, the degree of standardisation and imposed form of the Upper Palaeolithic tools present in the Iberian assemblages, the increased complexity of those tools and their geographical scope, the degree of work done on bone, antler and ivory tools and the presence and type of sophisticated art and personal ornaments.
- How different is the transitional record of the two zones in which Iberia is divided in this research?

¹ In this thesis, transitional assemblages/layers is equivalent to late Mousterian, Chatelperronian (in the case of Iberia) and earliest Aurignacian assemblages/levels. At the same time, transitional industries specifically refers to industries such as Chatelperronian, Uluzzian, etc. except in the title, when for reasons of length, transitional industries is equivalent to transitional assemblages.

- Is there any evidence to support the claims about the existence of the so-called Ebro frontier? Can we see any divisions through the archaeological record?

1.3.2. Theoretical toolkit analysis

This concerns those questions which affect the theoretical side of this research, which can be outlined as follows:

- How do typological systematics influence our interpretation of the archaeological record of the Transition? What is the extent of such influence?
- Is there any unbiased ‘final answer’? Why?

The following section will explain how the thesis is structured and where the above research questions will be addressed.

1.4. Structure of the thesis

The remainder of this thesis is organised in seven chapters, which are outlined below.

Chapter 2 is a review of the literature on the subject of the Transition in Iberia. Major works on the process as thought to have occurred in Western Europe and from which early conceptions were established are also included. It also explains the causes of the current state of archaeological research in Spain and Portugal, by analysing the historical developments which these countries have gone through since the 19th century, which have affected this field of research. The review also looks into the problems which archaeological research in the region faces when it comes to being published and what is the scope of the research and of the vast majority of published works. Attention is drawn to the increasing importance of international events, such as conferences, often held near major sites or areas in recent years. The chapter

concludes by discussing the reasons why the research questions outlined above were chosen.

Chapter 3 is a detailed account of the methodology used to study the material included in this study; this can be divided into two types of data: first-hand data obtained by myself during my personal study of the Vidal and Corominas collections (stone tools measurements, shells samples, etc.) and published information, compiled in an exhaustive bibliographic database. The history of the materials from Abric Romani's transitional layers is also included, in an attempt to clarify the present locations of such pieces. The dating project's methods are outlined in this chapter, which also looks into the problems and limitations of this study, and their causes.

In chapter 4, I investigate the epistemological aspects of the study of the Transition by looking at the development of Palaeolithic research since its very origins, in a section that relates closely to chapter 2's history of research in Spain and Portugal. In the second part, there is a detailed theoretical overview of the four typological systems most widely used in Iberian research. A practical case study sees their application to Abric Romani's transitional assemblages by different teams and finally, it also includes my own typological analysis of the materials by the Bordesian methods.

Chapter 5 is an in-depth study of what is often referred as the 40000 BP Crisis, the core of this study. It is carried out by analysing the transitional record of N Iberian sites. This includes sites which have yielded dates of *c.*40000 BP for their earliest Upper Palaeolithic layers, as well as others that do not have traces of the Upper Palaeolithic until later stages, to see if the 'crisis' is a generalised phenomenon, the exception to the rule or if indeed it ever happened.

Chapter 6 analyses the transitional scenario in S Iberia, understood as the part that lies south of the Ebro Line, following the structure of chapter 5. A thorough and critical revision of the Ebro Frontier concept opens the chapter.

Chapter 7 is an overview of the Transition on the continental record, in order to see if there is a case supporting a pan-European phenomenon as well as to give a broader context to the 40000 BP Crisis as analysed in chapter 5. 40 sites are considered across Europe, and in the second part, several hypotheses on how the Transition could have taken place in Europe, which have not been directly tested in the previous chapters are outlined and briefly explained.

In chapter 8, I will consider the general conclusions of my research, taking into account the points outlined at the end of the previous chapters. This will be followed by an explanation of the future ways in which the subject of the Transition to the Upper Palaeolithic can be developed further.

In order to reduce the personal approach to the issues that this thesis is concerned with, the third person style has been adopted from chapters 2 to 7.

2. Literature Review

2.0. Introduction

2.1. Palaeolithic Archaeology in Iberia: Practice and Theory

2.2. The Transition in Print

2.2.1. Research and Publications from Spain and Portugal

2.2.2. The International Scenario

2.3. Conclusions

2.0. Introduction

The previous chapter outlined the key points on which this research is focused. This chapter gives more detailed information on Iberian archaeology and on the whole concept of the Middle to Upper Palaeolithic Transition. While these are separate topics, in this thesis they will before the end be seen to be closely linked.

The original shape and contents of this chapter, as compiled in 1998-2000 were thoroughly modified later on, when the impossibility of carrying out first hand studies all over Iberia became a reality. Thus, specific published information on sites and assemblages has been incorporated into the analytical chapters that deal with the areas where they are located, and it is the broader literature that most concerns us here.

The present chapter in its final form accordingly focuses on the actual investigation of the Transition in a different manner: the origins of the investigation on this topic at the European level, the way in which the study was developed and the major international papers that have kept the debate alive until present.

These points are treated after a section which deals exclusively with the state of Palaeolithic research in Spain and Portugal. A primary aim of this section is to analyse the evolution of Palaeolithic research in these countries, in order to understand the background of the publications that will be referred to in later parts of the thesis. This is also crucial for the clear understanding of the influence of foreign investigations on the work of the Iberian archaeologists and the sometimes naïve acceptance of gross generalisations in subjects like the present research topic. Within

this analysis, attention is drawn to the present state of Iberian archaeology, not least the way in which it affects the publication phase of such work.

The concluding remarks of the chapter review the reasons for which the research questions of this dissertation were selected, in light of the state of this field of study, when this project began.

2.1. Palaeolithic Archaeology in Iberia: Practice and Theory

This section is a historical analysis of the development of Archaeology in Iberia, with particular stress on Palaeolithic studies, in relation to recent socio-political circumstances – largely parallel - of Spain and Portugal which have profoundly affected it.

The study of archaeological remains in Iberia began several years later than in other areas of Europe, such as France or England. Different factors intervened in causing this delay: first of all, the economic crisis which began with the early 19th century in Spain; secondly, the political instability which has characterised most of the 19th and 20th centuries both in Spain and in Portugal, and finally, the strong position of the Catholic Church, which rejected the introduction of modern theories such as Darwin's.

There were periods, like the short republican spell of 1873 in Spain, during which creationism lost ground in favour of evolutionism, which was quickly spreading around Europe, but these were too short to have a permanent effect: the constant and radical political changes prevented individuals and institutions from having enough

time to develop their work and establish themselves firmly. In general, during the 19th century, the development of Archaeology in Iberia was weak and late, by comparison with that seen in other countries (Díaz-Andreu García 1997).

Foreign mining engineers working in Madrid and Andalucía were the first people to discover Palaeolithic sites: H. Falconer and W.J. Buck worked in Gibraltar during the early 1860s, and they influenced Casiano del Prado, who focused on Almadén and the area of San Isidro, near Madrid; at the same time, C. Ribeiro, F.A. Pereira da Costa and J.F.N. Delgado undertook research in Portugal; according to Breuil and Lantier (1965), Pereira da Costa discovered the shell middens of the head of the Tagus river's old estuary in 1865. It is fair to say that the input of foreign research in Iberian archaeology –and Palaeolithic research- would only increase in the years to come, although at least it would increasingly be the work of real Archaeology scholars.

Findings such as the rock art at Altamira, made public in 1880 (by Sanz de Sautuola), did not make things easier: while its authenticity was at first questioned because of its perfection by archaeologists, this very same trait suited creationist theories perfectly², and thus, confrontation only increased. Although Díaz-Andreu (1997) observes that the middle classes were the group most interested in fostering the study of History and Prehistory, it should be noted that both in Catalunya and Cantabria, areas where the highest amount of Palaeolithic research has been carried out, early developments and their steady continuation, were due to the involvement of high society individuals and

² The perfection of the paintings and the fact that they could be compared to paintings produced by present day humans seemed to prove that high cognitive intelligence, related to art as a symbolic way of communication and the necessary intellectual capacity to produce and use such a tool, did not evolve gradually, with other biological traits, but was present at a very early date.

aristocrats, people with well-known orthodox beliefs, such as clergymen (H. Breuil, H. Obermaier, P. Wernet and J.M. Barandiarán), and aristocrats (Count of Vega del Sella and the Marquis of Cerralbo) (Estévez and Vila 1999).

This late start preceded a very slow ideological development, largely attributable to the strong conservatism of the Catholic Church all throughout the 20th century and the dictatorial regimes which lasted most of that century in both Iberian countries. Non-foreign academics favoured traditional research, being interested in avoiding confrontation with the political powers that kept them in their posts, an attitude that according to Vázquez Varela and Risch (1991) continued until the 1980s. Díaz-Andreu (1997) highlights that in Portugal, until the 1970s, there were only inaccurate descriptions of archaeological sites.

Primo de Rivera's dictatorship (1923-1930) in Spain does not seem to have adversely affected the development of archaeological studies, as the 1920s and 1930s saw a great increase in Palaeolithic findings. The Count of Vega del Sella worked and published Cueva Morín (1921), La Riera and Balmori (1930) among other sites; E. Hernández Pacheco published his investigations at La Paloma cave (1923) and J. Carballo studied several sites, three of which were Camargo, Morín and Rascaño; in Catalunya, Pallarés and Ll. Pericot studied the caves of the Montgrí area. All these developments allowed H. Obermaier's (1916) adaptation of G. de Mortillet's late 19th century French framework, which had been revised by Breuil in 1912, to the Iberian record. Conservative ideas continued to be enforced after the Spanish civil war (1936-1939), during the fascist dictatorships of Franco in Spain, and Salazar in Portugal, until 1975 and 1974 respectively.

J. Alcina Franch (1975), professor of the Complutense University in Madrid, highlighted the following points as the characteristics of Spanish archaeology between 1940 and 1970:

- a complete lack of theoretical orientation and any coherent programme of research;
- ubiquitous adherence to a descriptive or 'archaeographic' style;
- interest only in historicist interpretations (e.g. diffusion and migration were the usual explanations for contacts between groups and for stylistic and typological variations in tools, etc.);
- a deficient consideration of environmental factors and the absence of inter/multidisciplinary studies.

These things were all consequences of the habit of treating archaeology within a descriptive and historicist framework, which is still in use today.

In Portugal, Palaeolithic research was pioneered by Breuil and Zbyszewski (1942-1945, 1943), as it will be seen in chapter 6, when studying the Transitional record in that area.

International developments during the second half of the 20th century, like the discovery of more and more fossil hominid remains in East Africa, complicated the explanations of all those in Iberia who refused any links with Africa. This was followed by the emergence of 'Anthropological Archaeology', which was the consequence of the work of Americanists exposed to Processualism, the penetration of French tendencies during Bordes and de Lumley's golden years, and the arrival in

Spain and Portugal of teams of American archaeologists such as F. C. Howell, L. G. Freeman and K. Butzer, just to name a few, who worked on major Iberian sites and applied their theories and methods to them. They were the ones who questioned the historical approach to research in Prehistoric Archaeology, challenging concepts such as the long-term historicist perspective of European scholars and deploring the little - if any- engagement with theory of the latter. The difference between the two perspectives lies in the fact that New World scholars were trained in Archaeology as Anthropology, and Old World ones in Archaeology as the period that chronologically precedes historical times, and it is to be considered to be 'just History, but without writing'.

Despite the political freedom gained in Spain and Portugal in the mid 1970s and the prosperity of the 1980s, when changes in the administration and new theories were being introduced, French ideas and concepts continued to be assimilated as dogma: whatever had happened in the remote past in France was assumed to have occurred in Iberia, in the same way. A good example of this is the existence of a Mousterian cult of the dead: despite the lack of burials from that period in Iberia, the existence of such a cult was taken for granted (e.g. Alonso del Real 1977:249-250), because of the findings abroad (especially French sites). It is within this ideological framework that the generalisations highlighted in chapter one, which will be studied in detail in part 2.2.2., became accepted by scholars in Iberia. This assimilatory tendency is still visible at present, especially in the area of theory and typological systematics.

While academia continued to support the French supremacy, Marxist books stopped being taboo in the 1980s, as the new influence of democracy led to an increase in

funds and university posts in many parts of Europe. The influence of this extended to Iberia. Although rupture was not allowed, new techniques and more original thought were certainly permitted, if not even encouraged.

Nevertheless, when the discovery of a Neanderthal burial associated with Chatelperronian tools and ornaments at St. Césaire by F. Lévêque (1993), in 1979, was dated to $36,000 \pm 2,700$ BP, it destroyed the bi-philetical explanation of the ethnic continuity from the lower to the upper Perigordian, proposed by D. Peyrony in 1946³. The reaction of young scholars in Spain and Portugal was to follow old traditional tendencies and continued with the traditional cultural classification and the temporal arrangement of cultures; they just added finer divisions and a more standardised language, according to Estévez and Vilà (1999). There was no room for autochthonous innovative thinking.

The 1980s did however see the beginning at last of theoretical perspectives in Spanish archaeology, which were especially influenced by the Anglo-American school. This movement produced many publications and meetings, like the Congress of Prehistoric Research Methodology held in Soria in 1981, the Symposium of Methodology and Didactics of History, Prehistory and Archaeology in Cáceres (1981), etc. although there is and there has always been in Spain a somewhat conscious avoidance of open scientific discussion, because of the micro-politics of the field (Vázquez Varela and Risch 1991), not to mention the bad theoretical training of most archaeologists, as mentioned in chapter 1, which remains the case at present. Bicho (2001) thinks that in the mid 1980s, Portuguese Palaeolithic studies dramatically increased in importance

³ Based on artefact typology, Peyrony proposed that the lower Perigordian (or Chatelperronian) developed into the Upper Perigordian (or Gravettian), a process which would run parallel to the development of the Aurignacian.

thanks to the input of American archaeologists, who started working there; the training that they gave to Portuguese graduate students at the time consolidated the importance of this field of research. In the mid 1980s, Raposo (1985) and Zilhão (1984) began to publish their studies on Portuguese Palaeolithic sites.

As regards the study of stone artefacts, the Bordesian method began to lose its supremacy in Europe during the 1990s, as data began to be collected by other methods, although in Spain traditional Palaeolithic approaches remained unchanged because no other system has proved sufficiently comprehensive, despite the attempts by Laplace in the 1970s (1962, 1974) or the 1980s' Logical-Analytical system of Carbonell, Mora and Guilbaud (1983). The problem with Bordes' typology, according to Clark and Lindly (1991) is that retouched tools do not locate themselves generally in space and time according to key sites and sequences. The main reason for its decline was that many researchers realised that local micro-traditions require the existence of identity-conscious social units that have no known ethnographic counterparts.

Unfortunately, little has changed since the 1970s, in the processes of research in Iberian archaeology: Vázquez Varela and Risch (1991) highlight the orthodoxy and descriptive character of the methods that are in use, while Estévez and Vilà (1999) stress that the accepted view of the Transition current account has not changed since the 1940s: 'there were two ethnic groups-cultures-people; Neanderthals suffer acculturation (uselessly) and later die out, and modern humans succeed because they are better at adapting to environmental changes, thanks to their natural superiority'. While that statement may sound a bit exaggerated, the literature reveals that the only

challenges to that account have originated in hypotheses put forward to explain specific details of the record, or new discoveries (*e.g.* the discovery of the Lagar Velho remains). To debate them implies defining positions on issues like acculturation, though basic interpretations still rely on old and shaky systematics.

Hence, there is a clear need for new perspectives and more research, which is able to combine the practical analysis of assemblages and collections with a thorough and comprehensive theoretical approach.

2.2. The Transition in Print

In this part, the objective is to explain the characteristics of the works upon which the literature review was performed, their scope and their problems regarding publication and circulation. This section includes as well an analysis of those papers that have dominated international debate on the issue of the Transition. Their impact on the Iberian scene, as described above will also be considered.

The search for published information on the Transition in Iberia disclosed that specific and detailed information on the topic is generally found in written works that actually originate in Spain and Portugal. The same information is either ignored in publications that reach international distribution or shyly included in the same (Carbonell and Vaquero 1996, Villaverde *et al.* 1998), but only after years of delay, as the original sources are seldom intended for circulation beyond the national borders, at the most.

Fieldwork data are usually included in excavation reports, which are submitted to the authority that granted the excavation permit and/or the money to carry out the work by which such data were obtained. They are also included in some postgraduate theses. In both cases, printed copies of such volumes can be counted in single-figure numbers and locating and accessing them is a complicated and time-consuming detective-like process.

Only in very specific cases, such as those concerning the most famous cave sites in the Cantabrian region and that of Abric Romaní in Catalunya, have excavation reports and postgraduate theses been published as monographs (e.g. González Echegaray *et al.* 1971, González Echegaray *et al.* 1973, González Echegaray 1980, Cabrera Valdés 1984, Vaquero 1992). These certainly provide large quantities of information on the data obtained during fieldwork and the analyses performed, to the great benefit of studies like the present one, but they are really exceptional cases.

Papers presented at conferences, by the teams involved in the excavations, constitute the second level of information. At present this subgroup is in a phase of growth, fuelled by the fact that the Transition and the Origins of AMH are fashionable topics and to hold meetings on them is an activity that 'sells'. Publications arising from these events are distributed among those who participated in them and advertised around those who attended. This happens both for national and international events, although the latter have fared much better and in several cases (e.g. Madrid 1991 [published by Cabrera Valdés 1993], Capellades 1995 [published by Carbonell and Vaquero 1996, Gibraltar 1998 [published by Stringer *et al.* 2000] etc.) publications often enjoy a much wider distribution. It must be noted that it is a very particular group of sites

which are the subject of presentations at international meetings. These events, and the publications which they have produced, will be discussed in detail in the following section.

Up to date information on Transition-related issues can also be found in articles published in journals of national distribution. They have however two traits which often curtail the scope of their distribution: first of all, current postgraduate research tends to focus on very particular aspects of a single archaeological level or assemblage. While attention to detail and thoroughness are to be praised and encouraged, the incorporation of the conclusions of those studies into the wider framework of the site, the region or the period are only very rarely the ultimate aim of these works.

The second major hurdle is language. At present in the field of Palaeolithic studies the *lingua franca* of the modern world, in general, is English, followed by French, for the reasons outlined above. However, the languages of publications containing the highest amount of information used in this research, ordered in descending order of numbers of works, are: Spanish, Catalan, Portuguese and Galego. English and French follow at a distance and are only used in the case of international conference papers, with the inevitable result, for works specifically relating to Iberia, already mentioned: a large number of important publications remain inside Spain and Portugal.

The most accessible information of this latter kind comes from publications intended to become undergraduate handbooks, though in their case, circulation is directly proportional to their level being not only general, but also introductory, which implies

the sacrifice of detail and facilitates the bland adoption of generalisations which is attacked in this thesis. Cases are abundant (e.g. Barandiarán *et al.* 1998).

The new technologies of electronic publication have so far had only a minor effect on this issue, but it must be noted that information on the Palaeolithic in Galicia was obtained in part from a book that was published in the World Wide Web (Bello and de la Peña 1995).

2.2.2. The International Scenario

This section takes up where the introductory comment on the origin of the generalisations about the Transition's characteristics from chapter one finished, and is intended to be a review of the major papers that have been published in the international context between 1973 and 2002, about the Transitional process, as observed in western Europe.

Research on the origins of modern humans is more than one hundred years old (Clark 1992), and the volume of literature on the Middle-Upper Palaeolithic Transition bears witness to the fact that this point has been a very controversial issue for the past thirty years. It is common for papers on the Transition to begin with a statement about the amount of time that these two topics have been under study, and a comment to the effect that we are unable to reach any conclusions, or even get closer to answering any of the questions into which this topic unfolds.

This section's aim is thoroughly to examine the key articles that have contributed to the transformation of the Middle-Upper Palaeolithic Transition into the high-profile phenomenon that it constitutes at present. Its focus is on published material from 1973 until early 2002⁴. Papers which appeared after this time have not been included here.

The careful consideration of some forty publications sheds light on why, after thirty years of intense debate, we have not come any closer to knowing how the Transition took place or how modern humans appeared in Eurasia. The reason for this is that what appears to be the most thriving topic in Palaeolithic research has been permanently trapped into two main topics:

- the characteristics of the Transition
- the question on Neanderthal acculturation

Progress has stagnated because the supporters of the different positions on these issues, broadly corresponding to the 'Out of Africa' and 'Multiregional' hypothesis dividing this area of study from a Bioanthropological perspective, have been describing what they believe to have happened repeating the same concepts over and over again, in many cases with exactly the same words, and completely ignoring what those who disagree with them have pointed out as possible flaws to be considered, thus preventing a real debate from taking place. Another very typical opening sentence illustrates this point, that about the existence of a generalised consensus on a particular explanation and the fact that it is correct (e.g. Mellars 1996a:180):

“From the spate of research carried out recently there seems to be an increasing consensus that the earliest anatomically and genetically modern populations probably originated in one specific region of the

⁴ This section reviews literature dealing with the Transition as a 'general' process. Works on particular areas and sites, especially in Iberia, will be examined in later chapters.

world (most probably Africa) and subsequently dispersed to all other regions. ... most of the latest research seems to be converging increasingly towards this hypothesis, and away from the alternative scenario of 'multiregional' or 'regional continuity' evolution..."

2.2.2.1. The characteristics of the Transition

This section details the evolution of the study of the Transition during the last 30 years, setting the scene on which the present research has been developed, highlighting the major events and publications in Western Europe.

Mellars' contribution to Renfrew's 1973 edited volume is widely considered as the 'first real synthesis of data [on] the Middle/Upper Palaeolithic Transition' (White 1982), as mentioned in chapter 1. In it, Mellars defined the transitional process as observed in the Périgord as presenting the following characteristics:

- a much wider range and complexity of tool forms [as compared to the Middle Palaeolithic]
- ability to shape bone, antler and ivory into complex forms
- appearance of personal ornaments, defined as 'small objects for which [there is] no obvious functional explanation'
- specialised hunting of one species [reindeer]
- larger dimensions of settlements suggesting larger groups
- modifications of the settlements' natural conditions, thought to indicate a more permanent home-base status than before
- existence of long-distance contacts, due to extensive seasonal migrations or some sort of trade with far away areas
- increase in population density.

It took nine years for the next major international paper to appear. White's 1982 article was published in *Current Anthropology*, together with other scholars' comments and their critiques to it. The wide distribution of the journal turned the issue of the Transition into a major international discussion. Although White's paper was intended as a critical review of previous studies (especially that of Mellars 1973), the strict limitation of the analysis to Mellars 'arbitrarily imposed framework', as Gamble put it, did not lead to the rethinking of anything; on the contrary, this review, which might have been a revision, became the origin of the transformation of those points into generalisations or even into dogma. White's insight on issues such as personal ornaments is probably his main contribution to the early days of the controversy, but his treatment of aspects relating to lithic technology and typology is rather limited and was not pursued at any length.

A swift and direct reply from Mellars (1982) followed this article, re-asserting his 1973 tenets, but these papers failed to elicit major further contributions to the debate, as both authors had intended, until seven years later, until the publication of the proceedings of the conference 'Origins and Dispersal of Modern Humans', held in Cambridge in 1987 and published in two edited volumes (Mellars and Stringer 1989, Mellars 1989c, 1990); two of its papers are analysed here.

Firstly, Mellars' paper (1989b), was based on three assumptions:

- that biological and cultural changes during the Transition were related
- that 'a complex of closely related technological changes' took place, mainly: 'a general shift from flake to blade technology, in the majority of Eurasia, with the

exceptions of areas with poor quality raw materials, appearance of well-defined forms of endscrapers and burins and of a range of morphologically new artefacts, highly distinctive and qualitative different from Middle Palaeolithic artefacts, remarkable speed with which those new artefacts appeared, production of bone, antler and ivory with the above-mentioned characteristics, greater standardisation and degree of imposed form, producing a clear pattern of morphological separation between artefact categories'

- that these changes can be identified consistently and repeatedly over large areas of Eurasia (this is the earliest example where observations from south-western France are extended on a continental scale).

In this paper, explanations for technological changes are sought through functional and technological models, and socio-cognitive factors are suggested as the causes of those aspects which cannot be explained by the proposed models. There are no explanations for any of the three assumptions on which the whole hypothesis is built: no correlations are made between biological and cultural processes, references to other papers presented at the same meeting to justify the second point are in fact clearly critical of this hypothesis (see below: Clark and Lindly 1989a) and the consistency with which that set of changes can be identified throughout the continent is not considered in any detail, when examining regions outside the core area of the Périgord. The importance of this will be made clear in future chapters.

Moreover, explanations offered by this author on two particular elements deserve to be carefully analysed at this point, and kept in mind for further observations in this section and Chapter 3:

- **Standardisation.** Faced with a complete absence of studies in this topic, which has never been empirically observed yet, Mellars noted that one has ‘to rely on intuitive impressions’ to document this aspect. Thus there is no set framework upon this point can be tested, just some feelings and impressions.
- **Increased complexity.** This is defined as ‘a composite phenomenon created by comparing the total range of Upper Palaeolithic forms, of all zones, from the earliest Aurignacian to the end of the Magdalenian, to all Lower and Middle Palaeolithic tools’. Fish and Dibble’s (1982:182) critical comment on White’s paper would be applicable here, as this is only a comparison between two periods in time, not a direct observation on the process that is analysed in here, and its relationship to the latter is not at all clear⁵. As it stands, this observation demands a global analysis, which falls far beyond the limits of this study. As Mellars himself points out: ‘... if focused on any individual Upper Palaeolithic assemblage, it is doubtful that we would see a very much wider range and variation in morphology or functional types than those represented in Middle Palaeolithic assemblages’.

Clark and Lindly’s (1989b) contribution to the volume calls for the need to pay more attention to the epistemological issues underlying this research. They highlight the role of the application of different typologies in presenting a discontinuous scenario, and scrutinise other points such as the general shift from flakes to blades, which to them is an exaggeration: cases are said to be ‘not many’ and where they do exist, such shift is only ‘slight’; hunting practices are thought to remain unchanged until the Solutrean, clearly against Mellars hypothesis. These authors criticise Mellars and

⁵ The role played by typological analyses and their influence on this issue will be studied in chapter 4.

White's papers as a whole, and blame them for concealing variability within the periods (e.g. bone technology variability in the Upper Palaeolithic), and downplaying similarities between them.

The same year, Mellars' paper in *Current Anthropology* (Mellars 1989c), approached the changes during the Transition from the behavioural perspective and related them to the existence of a new human species, which had replaced the Neanderthals. Insistence on better ('more systematic and intensive') subsistence techniques, and more complex social organisation, precedes points such as higher population densities and language, assumed because they are understood as necessary for the large regional networks, the aforementioned type of organisation and the appearance of symbolism. These three aspects, together with the appearance of complex stone, bone and antler technology are taken as proofs of 'a fundamental transformation of behaviour' in Europe. The technological sphere displays a four-fold 'radical shift': standardisation [due to specific core preparation techniques], appearance of new tools [thought to be the 'biggest innovation'], more obvious degree of imposed form [whatever obvious may mean], and complex bone/antler tools displaying the same characteristics as lithics [standardisation and imposed form]. The Upper Palaeolithic traits of Chatelperronian assemblages are attributed to the Neanderthals' acculturation by those using Aurignacian technology.

Kozłowski (1990) and Otte (1990a) point to symbolic behaviour being present already in the Mousterian (personal ornaments). They both delay changes in subsistence practices, raw materials economy and dwelling structures until the Gravettian. Kozłowski proposes continuity from the Mousterian until the Gravettian, via the

leaf/backed points industries of North-central and Eastern Europe and Otte sees the origins of the Upper Palaeolithic in particular intermediate industries (e.g. Couvin cave, Belgium), because, as he says, 'late Middle Palaeolithic culture was ready for the evolutionary jump'; he agrees with Mellars, however, that Chatelperronian assemblages are produced by acculturated groups. These views will be further dealt with in chapter 7.

Mellars refined the definition of the general features of the transition in the *Cambridge Archaeological Journal*, in 1991. Understood as 'broad generalisations, which varied in detail and precise timing', they were then outlined as follows:

- general shift from predominantly 'flake' technology to 'blade technology [not taking into account earlier claims against the generalised character of this trait (Clark and Lindly 1989a)]
- increase in variety, complexity, imposed form and degree of standardisation [characteristics still not defined beyond what was said in 1989 (Mellars 1989b)]
- complex bone, antler and ivory artefacts
- increase in tempo of technological change, degree of separation and regional diversification [without mentioning the possible influence of specific typological frameworks which may highlight these characteristics, or the differences in these parameters between the early and late Upper Palaeolithic]
- appearance of personal ornaments [ignoring Otte (1990) and Kozłowski (1990)]
- appearance of complex naturalistic art
- several socio-economic parameters: systematic hunting (*contra* Clark and Lindly 1989, Otte 1990, Kozłowski 1990), sharp increase in population density (*contra*

Clark and Lindly 1989), increase in maximum size of social groups, highly structured forms of settlement

Although all of these had been previously questioned, there is no mention of that, and no provision of additional evidence to substantiate these later statements, as opposed to plain disregard for others' publications. Here the behavioural transition is called 'an explosion in human behaviour', during which linguistic and symbolic communication emerge, as can be seen in the artefacts' morphological characteristics (standardisation, predetermination and repetition) and the living structures. Since facts about language cannot be proven, the term 'possibility' is stressed.

Writing in 1992, Klein ignores this important remark and assumes the existence of a developed language system when he attributes the existence of a social relationship network among neighbouring groups to fully modern linguistic capabilities, after quoting the points in Mellars' 1991 paper as the ones defining the radical transformation in human behaviour which occurred *c.*50-40 kya (Klein 1992). He expresses the belief that knowledge about the Transition will improve as the number of well-dated fossils and sites increases.

Clark's 1992 contribution to Dibble and Mellars' edited volume on the Middle Palaeolithic advocates the Continuity hypothesis, favoured by many other New World scholars, according to which, clinal change can be observed in the following parameters:

- technology
- raw materials procurement and use

- faunal exploitation
- symbolic and ritual behaviour
- settlement patterns

This is in line with his previous paper with Lindly in 1989. He also understands the biological and cultural processes as two separated phenomena (contra Mellars since 1989b) and warns about the problems which arise when trying to identify local micro-traditions 'on the ground'.

An example of the generalisations that appear in textbooks can be seen in Mellars' contribution to Cunliffe's 1994 edited volume, as the Transition is explained as a European process and the usual tenets are pointed out as behavioural changes in the technological, economic and social spheres, causing the emergence of fully Upper Palaeolithic communities. Here (Mellars 1994) the 'Replacement' hypothesis (also known as 'Out of Africa') is supported by examples of finds like St. Césaire's Neanderthal remains with Chatelperronian tools (supposedly acculturated), dated to 35000 BP (Lévêque *et al.* 1993), and those of Skhul and Qafzeh's modern humans with Mousterian assemblages, and the possibility that biological and cultural changes were independent is considered.

Klein (1994) disagrees with this separation, understanding 'fully modern capacity for culture' as 'the very significant adaptive advantage conferred by fully modern behaviour' to be biologically rooted. Against this same author's belief (1992) that more data will mean better knowledge, Willermet and Clark (1995) stress that data have no meaning without a paradigm that defines them, and what is really needed is to stop looking for patterns to establish the credibility of hypotheses and to understand

that each side of the debate uses selected evidence (only that which supports a particular hypothesis), and thus the analyses are biased. According to them, while Replacement advocates tend to quote fossils from west Europe, southwest Asia and Africa, Continuity supporters highlight those from central Europe, east Asia and southeast Asia. Clark (2001) states that the need for more data is only part of the problem.

In 1996, Rigaud wrote that acculturation had not taken place, because dates new at the time, proved that techno-economic transformations had happened before the arrival of modern humans, and thus there was no synchronism between biological and cultural changes (Rigaud 1996). Moreover, he stated that in Atlantic Europe (which in fact has to be interpreted as Atlantic France) and Italy, human populations had in fact decreased (*contra* Mellars since 1973). Yet in the same UISPP Colloquium, Mellars (1996b) stressed the ‘sharp increase in population density and residential group sizes’, defining once more the Chatelperronian as an acculturation product. ‘Possible systematic notation’ is added to the list of behavioural innovations, and this concept appears in the same author’s book, *The Neanderthal Legacy*, which appeared that year (Mellars 1996c), as ‘numerical systems or calendars’ among the not ‘highly discussed’ changes. The rest of the assumptions and changes remain as quoted above, with the exception of blade technology, here mentioned only as ‘improved’, acknowledging its existence prior to the Transition.

On the basis of the supposed population increase at 40000 BP, which he still defended, Mellars developed a series of detailed consequences (increase of local residential groupings and of separation of individual roles, more bounded territorial

and demographic units and complex descent and kinship systems) which were presented in his paper to the British Academy (Mellars 1996a). There is no mention to the fact that other scholars had questioned such increase in population.

Clark (1997b) blames the lack of discussion between the two opposed intellectual traditions on the differences between their biases and assumptions; according to this author, controversies like the present one 'stem from the failure to consider epistemological questions' in the disciplines involved in it. While this is likely to be true for most of the cases, this section shows that many authors not only fail to consider such factors, but they also constantly omit other scholars' input to the 'debate'. Clark denies the 'explosive' character of early Upper Palaeolithic body ornamentation, and sees an *in situ* gradual development. For him the concepts of imposed form and morphological standardisation are 'typological illusions', something which an in-depth analysis of the typological frameworks used to study the lithic assemblages of the Upper Palaeolithic should be able to ascertain. Major changes in subsistence, bone technology and art, hunting strategies and settlement patterns are clear to him only after c.20 ky BP, and not 20000 years earlier.

In 1997, Rigaud supports the absence of demographic increase and lack of major change in hunting strategies during the Chatelperronian and the early Aurignacian, but thinks that greater standardisation is indisputable, yet he fails to explain how and where he sees evidence for this trait; he also acknowledges the possible influence of typological systematics on measuring the diversity of Upper Palaeolithic forms; however far from eradicating the aforementioned generalisations, he divides Europe

into five different transitional scenarios, just making them slightly milder (Rigaud 1997).

In two further papers, Clark (1999, 2001) accuses the contributing disciplines of being discovery-driven and of having little concern for the logic of inference underlying ‘knowledge claims’. He thinks that no consensus will be reached until researchers understand the importance of the logic of inference and make it explicit.

Simek (2001) thinks that the problem lies in Mellars’ simplistic approach to culture change and the fact that old excavations’ data has been included in the analyses. It is worth noting here that while Mellars approach may indeed be simplistic, this is a criticism that could perhaps be applied equally to most or all of the researchers mentioned above, since none of them proposed an alternative perspective, as opposed to going along with the current situation, accepting or denying specific parameters outlined and refined by Mellars.

2.2.2.2. The Question about Neanderthal Acculturation

Many scholars, as noted in the previous section, had already considered the possibility that Neanderthals had manufactured Chatelperronian assemblages after having been in touch with more modern groups producing Aurignacian tools; most even gave it for granted. Yet, it was not until mid-1998, that this became a main subject of the discussion, after *Current Anthropology* published an article by d’Errico *et al.* in a supplementary monograph (1998).

This paper did not challenge pre-established and taken-for-granted traditional links between Neanderthals and Chatelperronian, and anatomically modern humans and Aurignacian, despite abundant comments stressing important doubts about such equivalences as replies to the paper (see comments by Conard, etc.), but it shook the foundations of arguments in favour of acculturation put forward by White, Otte, Hublin, Mellars, etc. years earlier, by challenging their hypotheses one by one. Whether they succeeded in modifying those authors' views on the topic is something different, but after twenty-five years of running in circles around the concept of the Transition and its characteristics, d'Errico *et al.* at least forced Palaeolithic scholars to pause and consider an improved and bolder version of the hypothesis that considered Chatelperronian as an independent technological and cultural transformation, unrelated to the Aurignacian phenomenon. This is known as the 'Indigenist' hypothesis.

This paper concocts a mixture of attempts to 'maximise accuracy', for example by discarding Vindija because of its well-known stratigraphic and sedimentological problems (but see chapter 7), with a distortion of existing evidence to support their hypothesis that Chatelperronian layers will always underlie Aurignacian ones when found at the same site; they quote the sites of El Pendo (Spain) and Le Piage and Roc-de-Combe (France) as support to such belief, simply claiming that their sequences, with Aurignacian underlying Chatelperronian layers were proved to be stratigraphically disturbed.

In 1998, at a conference in Gibraltar, Rigaud stressed the relationship between the MTA type B and the Chatelperronian industries, originally stated by Bordes (1968a),

but highlighted that Chatelperronian assemblages overlying Mousterian deposits always tend to have a larger number of Mousterian artefacts. He also concluded that, despite the two being contemporaneous at *c.*37000 BP, the MTA(b) had appeared earlier (Rigaud 2000, 2001). At a later meeting in Foz Côa (Portugal) that same year, he thoroughly analysed the controversial stratigraphies of Le Piage and Roc-de-Combe and convincingly concluded that those sequences are highly problematic; quoting from Rigaud's paper presented in a meeting held at Gibraltar in 1998 (Rigaud 2000:29):

“... the interstratification of the Aurignacian and the Chatelperronian at Le Piage is highly suspect and that the homogeneity and independence of these archaeological horizons should be tested...”

“At Roc de Combe ... sedimentological phenomena elements might be responsible for the contamination of the archaeological assemblages...”

Mellars defended his adhesion to the Acculturation (or Population Dispersal, PDH) hypothesis by basing the arguments of three papers (Mellars 1999, 2000a, b) on the ‘evidence’ provided by El Pendo (considered stratigraphically disturbed since 1982 by Hoyos and Laville), Le Piage and Roc-de-Combe, already mentioned, and a ‘careful’ selection of dates, according to Zilhão and d’Errico’s comments to his paper in 1999. For him, Aurignacian appeared first, *c.*40-38000 BP and Chatelperronian only emerged between *c.*36-34000 BP, as a result of Aurignacian influence.

In 1999, the Indigenist model supporters presented a total of thirty sequences where Chatelperronian underlies Aurignacian O/I deposits, and three more, from Italy, where Uluzzian precedes Proto-Aurignacian remains. Far from questioning any of these stratigraphies, they plunged into a radically critical analysis of the Spanish and

Pyrenean sites that have yielded the earliest dates for the Aurignacian: Reclau Viver's oldest Aurignacian is classified as a palimpsest of Aurignacian and Chatelperronian, Arbreda is discarded because of bioturbation and cave bear denning episodes, Abric Romani's earliest Upper Palaeolithic is defined as a palimpsest of Aurignacian and Gravettian composition and level 18 of El Castillo is said to contain a mixture of Aurignacian and Mousterian or Chatelperronian. They again discarded El Pendo, Le Piage and Roc-de-Combe.

In fairness to these researchers it must be highlighted that they opted to draw comparisons only among dates obtained by the same method, and in the case of ^{14}C , they differentiated from those taken from bone and those obtained from charcoal samples. In four sites, ^{14}C dates on bone present Chatelperronian at *c.*38000 BP or older, and the earliest Aurignacian is obtained from charcoal samples at *c.*36-37000 BP. Hublin (2000) points to the fact that with standard deviations usually between 600 and 1000 years, overlapping of those dates is more than likely.

The indigenists failed to explain why Neanderthals from below the so-called Ebro Frontier, championed by one of them (Zilhão), remained excluded from processes undergone by the rest of Neanderthal groups in contact with Aurignacian moderns, since there is no evidence for Chatelperronian remains south from the Ebro, although Aurignacian is to be found there. Nevertheless, a rather strange idea is starting to be associated with that frontier; as of late, it is invoked as an example of long term coexistence between the two species, when the concept, though lacking supportive evidence, has been revamped to express a separation between both species (Zilhão 1993, 1997, Zilhão and d'Errico 1999).

Clark (2001) accused the indigenists of 'radical archaeological essentialism' for dismissing all the evidence that conflicts with their preconceptions, as they set out to prove – whatever it takes – that no acculturation process took place. Clark thinks that their model is undermined by strong correlations between climate and stratigraphic frameworks of the kind explained below. The weakest pillars upon which the Indigenist model is based are: their belief that Chatelperronian and Aurignacian units can be differentiated clearly, as they are 'typologically discrete' and that Neanderthals produced Chatelperronian assemblages while Aurignacian ones are the work of modern humans.

Harold and Otte (2001) consider the indigenists' conclusions to be premature, and repeat the warnings against using El Pendo, Le Piage and Roc-de-Combe as evidence of any sort. Despite this, some authors continued to make use of those stratigraphic sequences, as mentioned above and Harold and Otte still believe that current evidence favours the Acculturation/PDH side.

The discrepancy over adaptation to different environmental conditions can be summarised as follows:

- the indigenists think that modern humans would have difficulties to adapt to mild woodlands (in areas like the Périgord or south from the Ebro) until after the Arcy Interstadial, by which time (a warmer period) there are no Chatelperronian remains. The subsequent colder conditions would have favoured their dispersal.
- PDH supporters defend the view that warm conditions would have been favourable for modern humans' dispersal and bad for Neanderthals, who would

retreat to *refugia*. According to this perspective, events would have taken place earlier than suspected by indigenists and a longer period of contact would have taken place. They should now explain what stopped moderns at the north bank of the Ebro (if anything at all) and how did Neanderthals survive for 10000 years under the warm conditions which must certainly have prevailed in southern Iberia's environments.

Supporters of the Acculturation hypothesis are left to explain how could the number of personal ornaments found at Grotte du Renne be higher than the total number of such pieces found in Aurignacian contexts, since Neanderthals were supposed to be either copying them without understanding, or collecting such items from modern humans' sites in various ways (White 1993).

Another intriguing point is the one according to which the members of this group think that stratigraphy proves them right: Aurignacian sequences seem to eventually replace and survive the Chatelperronian, after taking over its stronghold areas, like south western France, but how did Mousterian groups become acculturated, if there are no Aurignacian layers between Late Mousterian and Chatelperronian, since it appears that they are always afterwards, if present at the same site?

Supporters of the Indigenist model must be granted at least the fact that they got the debate going once more, after twenty-five years of what some have called a '*dialogue de sourdes*' (dialogue of deaf people) (Clark 1994b). At present, it is important to keep discussions alive and take into consideration observations made by others. This does not mean that perspectives should invariably be rectified, but merely that,

progressively, additional information should be acknowledged, studied and if verified, incorporated into the bigger picture, as small steps forwards allow us to progress.

2.3. Conclusions

This chapter has reviewed not only the principal publications that have turned the Middle/Upper Palaeolithic Transition into such a famous debate, but also the causes why research in Iberia has been so influenced by international writings and developments on the matter.

In many aspects (*e.g.* typological systematics, traditional periodisation) researchers in Iberia have done no more than adopt uncritically whatever went on abroad. As mentioned above, instead of creating their own regional sequences, which could have been compared to the classical periodisations imported from France, de Mortillet's scheme of the Palaeolithic to be imported to Iberia, and when Bordes published his typology, many went head over heels to make the local Iberian assemblages fit into his categories. When it comes to the Transition, the same happened, and regions simply adopted Replacement/Multiregional explanations and hypotheses depending on which was the one that suited them best, instead of examining with an open mind the archaeological evidence of their sites and seeking to account for it.

As time passed, it became clear that Iberia was somewhat of a special case: several northern sites yielded very old dates for the Aurignacian and very young dates have been assigned to Neanderthal remains from the south.

In future chapters, Iberia will be shown to have some of the most important sites for the investigation, yet neither a high nor a progressive level of autochthonous research has ever accompanied this abundance of material. As has been shown, socio-political events prevented Spain and Portugal from beginning to study the Palaeolithic at the time when other countries did, and this had serious consequences.

The sections above prove that there is a serious need to study the process of the Transition as it happened in Iberia, at different levels. Firstly, the characteristics that have been attributed to the phenomenon by foreign researchers who have not themselves studied the evidence from the peninsula should be tested against the actual archaeological record, to see if the characteristics of the Transition in southwestern France are indeed applicable to this area. Inter-regional differences inside Iberia must be considered too.

Secondly, the typological systems that have been applied to the study of the Transition record should be analysed and compared. It is crucial to determine their influence, their differences, their real aims and their value in modern Palaeolithic research.

The following chapter will describe how these two objectives will be approached here and will also detail the techniques used to analyse the data obtained during the fieldwork season.

3. Research Design and Methodology

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3.1. Selection of study areas and sampling

3.1.1. Selected traits for study

3.1.2. Selecting specific areas and sites

3.1.3. Museum Collections

3.1.4. Abric Romaní: History of Excavations and Archaeological Collections

3.2. Research Design

3.2.1. Data Collection Methods

3.2.1.1. Publications database

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3.2.2. Methods of Data Analysis

3.2.2.1. The Interpretation of the Transitional Record

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3.2.2.3. Particularities of the Record in the Iberian Peninsula

3.3. Limitations of the Study and Particular Problems

3.4. Summary and Conclusions

3.0. Introduction

In 1999, when work on this thesis began, the volume of literature concerned with the Transition to the Upper Palaeolithic in Iberia available was considerable. Chapter 2 constituted a thorough review of the same, upon which the research questions of the current study were formulated.

The present chapter serves two purposes: firstly, to discuss the research design followed in this study, including the sampling, data-collection and analytical methodology used to attempt to answer the aforementioned questions, and secondly, to detail the reasons why this approach was adopted, the problems encountered when conducting the study and the limitations of the research.

3.1. Selection of study areas and sampling

The following two sections of this chapter will specify the criteria selected as the focuses of this research, including transitional characteristics, geographical areas and individual sites chosen for detailed study.

3.1.1. Selected traits for study

The seven major generalisations that characterise the most widely accepted paradigm of the Transition can be divided into three different categories:

In the technological field: flake technologies tend to disappear in favour of a more regular and economical blade manufacture that would display not only an increase of complexity and variety (intra-assemblage, inter-regional and across time [innovation]), but also a greater degree of standardisation and imposed form,

reflecting 'mental templates'. Organic technology abruptly appears in the record, with complex and extensively shaped artefacts. The same characteristics of innovation and regional diversification mentioned above for the stone tools would also apply here.

- In the *symbolic* field: highly complex forms of representational or 'naturalistic' art are found in the record from this period onwards. There is also the appearance of personal ornamentation in the form of very varied types of beads, pendants, etc. made from shaped bone/antler/ivory, animal teeth and exotic marine shells.
- In the *socio-economic* field: increase in the specialised pattern of animal exploitation including new levels of systematic hunting. Increase in population density and size of local groups, and appearance of highly structured human settlements, with clearly defined living structures.

Of these, the following were selected as those which could best be studied in the Iberian archaeological collections to which access could be obtained:

higher percentage of blades than flakes

greater degree of standardisation and imposed form

increased complexity and geographical variety

appearance of complex bone/antler/ivory technology

appearance of sophisticated art and personal ornaments.

The strategy was to examine, using the original evidence, the degree to which each of these tenets is applicable to the phenomenon of the Transition between the Middle and the Upper Palaeolithic in Iberia.

Aspects relating to the broad socio-economic spectrum, such as the patterning of faunal remains, types of hunting strategies, population sizes and spatial analyses of settlements are not included in this research, apart from references to published

information where the latter is directly relevant. The importance of these things is fully recognised, but the constraints under which a research student has to operate mean that one can only address a few aspects of the chosen topic, regardless of what one might wish.

However, this research is not limited to the study of the materials included in the transitional assemblages. Emphasis is equally placed on the theoretical perspectives from which previous workers have approached this field, as it is clear that these have strongly influenced the various interpretations of the remains from those layers. Thus, detailed analyses of issues concerning the different theories and approaches to this study will also be provided (chapters 4 and 7).

3.1.2. Selecting specific areas and sites

This study originally set out to be the first thorough regional approach to the transition in the whole Peninsula, but practical considerations dictated that it had to be limited to sites in which transitional layers had already been excavated, and where permission to study the material was granted to the author. Thus, far fewer sites are mentioned or discussed in detail here, than originally planned.

Such a cut in the geographical span was not without benefits, however, because it allowed for the long needed theoretical review of the subject mentioned above, which could be produced without depending on the outcome of travel grants and fieldwork research applications.

When a final decision about the areas on which the research would concentrate had to be taken, the Catalan region was chosen as a starting point, because permits to study

its museum collections were easy to obtain, fieldwork was already taking place there and publications of previous studies were abundant.

Cantabria is the region of Iberia where archaeological research has been taking place for the longest period of time, due to the early discovery (and controversy) of the rock art at Altamira and other caves. Moreover, the clear differences between the interpretations of this region's archaeological record and that of Catalunya made it an obvious candidate to form part of this study.

The divergences between these two regions seemed to offer a chance to test whether the nature of the transition was really as standardised and consistent from area to area, as has been supposed. At the same time, the differences that these two regions display against the traits observed in several places in southern areas call for the inclusion of at least a brief comparative study between the two halves of Iberia, a factor which offers the chance to explore the controversial Ebro Line hypothesis (Zilhão 1993, 1997).

3.1.3. Museum Collections

The “fieldwork” for this research was carried out in four different seasons, from 2000 to 2002, and it entailed the study of different museum collections; this part describes the characteristics of the different visits and the developments that took place while the author was working in Spain.

In January 2000, the author travelled to Banyoles, a town close to the area of the Reclau Caves in the province of Girona (Northern Catalunya), and studied the materials from the ‘basal Aurignacian’ layer of Reclau Viver cave that were

excavated by J. Corominas during the 1940s, but had never been studied before or published. Access to the materials from the modern excavations was restricted because a member of the team which is digging at the site at present is currently working on his thesis, and, despite the fact that his interest is mainly in the raw materials and their provenance, his supervisor did not allow the author to access any of the pieces from the modern excavations. At the Banyoles Museum, however, access to the storage area was freely granted and the author was invited to help herself to the boxes containing the Corominas' collection. Storage there was organised in medium size cardboard boxes, in some cases containing smaller boxes, where pieces like bladelets were kept. A visit to the caves took place on 21/01/2001.

After finishing the study of that collection, the author travelled to Capellades, the town below which the site of Abric Romaní is located. In the local Museum, currently dedicated to the traditional ways to make paper, she studied the pieces from layers 2 and 4 (called 'earliest Aurignacian' and 'latest Middle Palaeolithic' respectively) kept in that centre. A member of the team currently working at the site's excavations brought materials to her. This collection is kept in big cardboard boxes, marked with the layer number. Two of the boxes were marked as 'layer 4 or 6'; these materials were not included in the study, because their exact provenance could not be exactly ascertained. The same person who provided the materials to study took the author to visit the sites of the Capelló cliff, at the time when work to turn the area into an Archaeological Park was in progress. This took place on 26/01/2001.

In February 2000, to complete the study of the Capellades materials, work on the pieces kept in the Archaeological Museum of Catalunya in Barcelona (MAC) began.

Very rapidly, the author realised that the material housed there was much more than she had expected to find after a preliminary enquiry, and it became clear that at least another long visit would be necessary in order to study the complete Vidal⁶ collection's pieces.

Back at Oxford later that winter, work on a more systematic way to record the characteristics of the materials began, in preparation for the following spell of fieldwork, which was to focus on the pieces stored in the MAC. This produced the Lithic Record Form. It must be stressed that although researchers like G. Laplace and N. Soler had studied a few pieces from this centre, some of those exhibited from 1939 to 1983, the vast majority of the Vidal collection had never been studied before.

Work on this collection continued in May and June 2001, using the new Lithic Record Form. This was also used to study the pieces kept at the Library-Museum of Victor Balaguer, in Vilanova (Tarragona), where A. Romaní had worked from 1916 to 1927. It currently stores a handful of pieces from layers 2 and 4, two *Cypraea pyrum*, two pottery shards and a small travertine block containing bone and stone pieces. The exact original stratigraphical position of this block is unknown, and therefore the invitation to study it was declined.⁷

During this visit, the author had the opportunity to meet Professor E. Ripoll, now President of the Royal Academy of Arts of St. Jordi, in Barcelona, who had excavated

⁶ This collection is named after Lluís Marià Vidal, who worked with Amador Romaní at the site the latter had discovered, from 1909 to 1911.

⁷ According to Romaní (Romaní i Guerra 1917a), it belonged to a stalagmitic formation overlaying one of the 'lower layers'.

in Abric Romaní during 1956-1962. Much important first hand information on his work at the site was provided by him.

Later that summer, the Lithic Record Form was used to study the materials found in possible transitional layers of Gorham's cave (Gibraltar) by Waechter, during the 1947-1954 excavations. This work was carried out at the laboratory where members of the team were studying materials from the current excavations. Part of the week was used to learn at first hand the application of the Logical-Analytical System (Carbonell and Mora 1986, Carbonell *et al.* 1992), which is the one used by this group to classify the materials typologically. Some more time was used to discuss the Lithic Record Form with the director of the excavation, who was interested in adopting parts of it to complement his own recording system. The materials studied were stored in cardboard boxes.

The final fieldwork season took place in the winter of 2001-2002, and was three-fold. After having received a grant of NERC funds to date 5 samples from the worked bone and shells found by Romaní in level 2, Dr. T. Higham from the Research Laboratory for Archaeology and History of Art in Oxford travelled to Barcelona in December and took samples of the materials to be dated in Oxford. After a formal application and a lengthy discussion with Professor M. Molist, director of the MAC, Dr. Higham and the author had the full cooperation of the staff of the centre. Nine samples were taken as detailed in section 3.2.1.4. NERC funds to date two more samples were obtained in the winter of 2002. The preliminary results of this project are presented in chapter 5, although further research on the pieces examined was on-going at the time when this thesis was submitted.

In early January 2002, the author was invited to visit Dr. M. Walker at Murcia University, who directs the excavations at the site of 'Sima de las Palomas del Cabezo Gordo', in Murcia, because an AMS date of $34,450 \pm 600$ BP obtained the previous summer on a fragment of burnt bone attached to a fragment of a Neanderthal mandible gave a layer of the site a chronology of 55,000 to 35,000 BP (Walker personal communication). Although Dr. Walker would himself have preferred a careful study of 'all the pieces from all the layers', the author decided to focus on the materials from the layer where the mandible was found. The materials from this excavation are kept in individual plastic bags, which are stored, grouped by layers in shoeboxes. The greater part of the week was spent on visiting the site and compiling literature on the Palaeolithic sites of the Spanish southern Levant, but due to sudden illness the author had to cut the visit short and return to Barcelona. Once she had recovered, a final visit to the MAC to finish the study of the Vidal collection was made. On this occasion, the author assisted the curators in organising and cataloguing these pieces.

3.1.4. Abric Romaní: History of Excavations and Archaeological Collections

The Capelló is a travertine cliff full of caves and rock shelters, created by the water dripping from the rock, since the Quaternary period until the present day, because of the existence of a former lake in the area where the town of Capellades is presently located. The cliff is formed by three cornices, at some 50 m above the present right bank of the Anoia river, just below the town on Capellades, some 50 km NW from Barcelona⁸. Cornices I and II are fossil, and number III is currently forming.

⁸ This is the very same process that created the Reclau Caves, among which figures Reclau Viver.



Figure 1: Location of the Capelló cliff in Catalunya (Digital Chart of the World, Pennsylvania University).

The numerous cavities have had several uses along the years. In war times, villagers used them as hiding places, and some, including Abric Romaní, have been used as chapels, as civil cemeteries in the early 19th century, and even cattle graves, which may explain Abric Romaní's original name - *La Bauma del Fossar Vell* (the rock shelter of the old grave in Catalan) - and the state of its uppermost layers. It must also be borne in mind that a part of this particular cave, most likely the southwest area, was destroyed in the mid 19th century by stone quarry work.

Archaeological research in the Capelló area began in 1905. A period of intense activity⁹ in that zone, which would last until 1916, brought the biggest discovery on 9 August 1909, when Amador Romaní (1873-1930), a prominent businessman from a local family dedicated to the production of paper, and one of his sons, Conrat, dug a small trench at *La Bauma del Fossar Vell* and discovered a few lithic implements and a human cranium, which is now lost. Abric Romaní rock shelter (41° 30'N, 2° 20'W) is located between the Capelló's cornices I and II, 280 m above sea level. Its opening is

⁹ Overall, Amador Romaní is credited with the discovery of 18 archaeological sites in the area, in total.

towards the South East and has an exceptionally wide and clear view over the valley of the Anoia river. The measurements of the cave at the beginning of the excavation were: 22m wide, 6m deep, 3m high and around 12m of deposits (Romaní i Guerra 1917a).

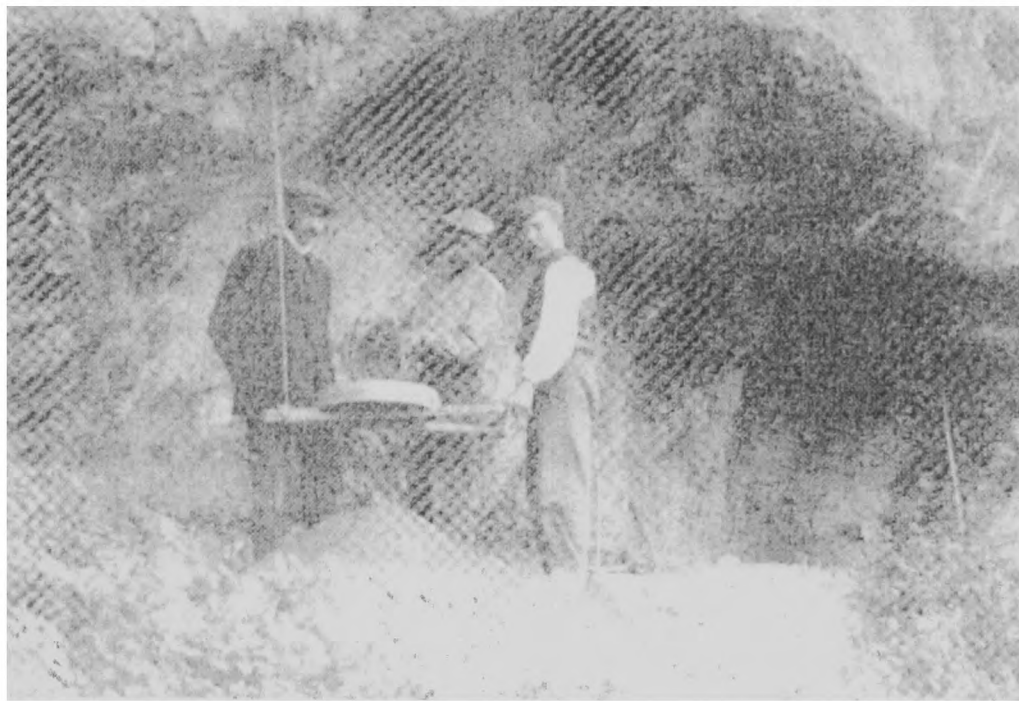


Figure 2: Abric Romaní in 1909, shortly after the first excavation works began (from Bartrolí *et al.* 1995).

Excavation works coordinated by the *Institut d'Estudis Catalans*, began in earnest on 07/11/1909, and until 1910 were directed by N. Font i Sagué, and his assistant M. Cazorro. After his death, L.M. Vidal took over the direction (although he rarely visited the site, and A. Romaní was the one who actually conducted the work), and in 1911, the first paper on the site, renamed after its discoverer, and a few other sites of the area was published (Vidal 1911). Vidal did not publish anything else on Abric Romaní and little is known about his involvement with the site after this point, but the initial excavation project that he had been directing did finish during that year. Romaní continued working on the site at least in 1914, when he explored the southern part of the shelter, and found another little cave, which he called 'coveta sud' (Catalan for southern little cave).

During Romaní's excavations, two test pits were dug out, to try and ascertain the depth of the deposits, and Vidal published the first scheme of the stratigraphic sequence in his 1911 paper. Later workers have subsequently republished this with only small changes.

In 1916, Romaní moved south to Vilanova (Tarragona), to take up a job at the Biblioteca-Museu Víctor Balaguer, where he would become a curator, until 1927, and this is probably why research at Abric Romaní slowed down during this period, together with the lack of institutional and economical support such as had been received just after the discovery. Nevertheless, sporadic work continued there until 1930 - we have written information about works done between 1924 and 1927 – when Romaní died.

In 1917 Romaní published a short paper (1917b) and a museum guide (1917a) with detailed information about the remains found at the site, and re-worked his original notes and excavation diaries, and in 1918, he donated his personal collection of invertebrate remains from the excavation to the Natural Sciences Museum of Barcelona¹⁰.

The first notice of “pirate” activities at the site dates from 1926, when Romaní reported that they had destroyed the remnant section number 1, which included parts of levels 1 to 7 (Bartrolí *et al.* 1995), and Laplace (1962:37) mentions that a survey was carried out at the site in 1937, to ascertain the possibility of performing further work.

¹⁰ These included some of the shells studied in chapter 5.

The second phase of the works, under Professor E. Ripoll, was carried out from 1956 to 1962. In 1959, G. Laplace collaborated in the excavation campaign, which began in July and lasted 10 weeks, and studied part of the collections, applying his typological system (Laplace 1962). In 1961, Professor H. de Lumley joined the research. Important international papers (Ripoll 1957) were published for and after the V INQUA Congress held in Nice in 1957. During the meeting, an excursion to Abric Romaní was organised, during which A.C. Blanc compared Abric Romaní's layer 2 to Riparo Mochi's level 6, classified as Perigordian II, according to Peyrony's system (see chapter 7).

In 1975, Ripoll and de Lumley worked at Romaní once more, and from 1976 to 1978, sporadic works (cleaning of sections, collection of samples, etc.) took place at the site, directed by Llongueras, from the MAB¹¹, while L. Freeman initiated a study of the adjacent shelter, Abric Agut, which he left unfinished. No published information exists from this period.

In 1983, Abric Romaní began being excavated by the CRPES of Girona (*Centre de Recerques Paleo-Eco-Socials*, which is Catalan for Centre of Palaeo-Eco-Social Research) and later by the Archaeology Department of the University of Tarragona (formerly University of Barcelona in Tarragona, and currently called Rovira i Virgili University). This work is still ongoing, directed by Professor E. Carbonell.

¹¹ The Archaeological Museum of Catalunya (Barcelona) was then called Museu Arqueològic de Barcelona (MAB).

Abric Romaní's materials are at present located in several different Spanish institutions. The following paragraphs provide a reconstructive account of how they ended up in their present locations and the reasons why they are scattered. The story is quite a complicated one, but it is worth recording, before any comments on the significance of the site, because it shows how it came about that no-one has ever previously studied all of the surviving material.

Originally, pieces dug out by Romaní, from 1909 onwards, were sent to Barcelona regularly; the first lots were sent to Font i Sagué, at the Geology Museum where he was a member of the directive board, on 03/03/1909 and 23/03/1909. The archives of the Geology Museum in Barcelona contain a note regarding their arrival and acceptance on 13/03/1910. On 30/06/1910, Romaní sent the first of several batches addressed to Vidal, in this case materials from layer 4 (according to his diary (Bartrolí *et al.* 1995): 26 endscrapers, 6 small endscrapers, 4 flints, 4 retouched flints, 25 *henutits*¹², 44 points, 25 retouched endscrapers and a molar, possibly human). Later on followed the material he had obtained from layer 2 and 3. Furthermore, lots including pieces from layers 6, 9, 11, and 13 were also sent.

In 1919, Bosch Gimpera mentions that the collection is kept at the MAB. More materials, which Vidal had kept at his home, were sent to the Natural Sciences Museum of Barcelona when he died in 1922, according to his last will, as noted by Serra Ràfols in 1930. In 1936, this museum arranged for this set to be sent to the MAB.

¹² A type of mollusc.



Figure 3: Abric Romaní in 1928 (from Bartroli *et al.* 1995)

In 1937, during the Civil War (1936-1939), all the collections at the MAB were packed up (exhibited lots separately and stored materials by site groups) to protect them from the blitz, and in 1938 they were sent to Agullana (in the Empordà region, on the border with France) in trucks. At the end of the war, they returned to the MAB.

When the refurbishment of the MAB Prehistory Galleries was completed, later in 1939, some transitional lithic and faunal-malacological materials from Abric Romaní were exhibited in Gallery III, case number 1, according to the Museum Guide edited in 1955, and remained on display until 1983, when further refurbishment work had to be carried out in that Gallery. A part of the group was exhibited again from 1985, after the work had finished, and they remain exhibited there at present.

The rest of the collection was never on display, and remained in the old storage area in the basement, packed since 1937. In 1984, it was moved to the storage room on the

first floor, still packed. It remained very much like that until the author started to study the collection.

After the initial project in collaboration with institutions in Barcelona finished, Romaní kept the pieces he found in later years in Capellades, and it was a project of his to create a museum similar to the one in Vilanova, where those remains could be exhibited, yet he did not live to see this happen. After a lot of discussions and negotiations with the municipal government, in 1948, part of that collection was put on display at the newly created Museu Molí Paperer of Capellades, until the late 1990s, when they were boxed and stored at the same, in order to create more space to include another room dedicated to the traditional manufacture of paper.

In 1959, G. Laplace studied layer 2's assemblage which was in the collection at Capellades (216 lithics in total), plus eight pieces from the MAB. In 1986, N. Soler included Abric Romaní in his thesis, after only having classified typologically (by Laplace's system) the artefacts at Capellades. He acknowledged not having looked at the Barcelona collection, and having been unable to identify all the pieces Laplace mentioned in 1962, in Capellades.

M. Vaquero thought the Barcelona collection to have been lost (Vaquero 1992:20,61) and thus based his seminal work on the transitional industries of the site only on the collections stored in Capellades (and other materials, as mentioned in chapter 3, to which the author was not given access, although in fact the difference is little, because due to the doubts about their original stratigraphic location, they would not have been used in this thesis).

When the author contacted M. Vaquero, current co-director of the excavations at Romaní, in 2000, she was told that the materials belonging to layers 2 and 4 were stored in Capellades and at the MAC. It was while working at the latter that Mrs. A. Casanovas told her of the materials at Vilanova, and a few other pieces¹³ stored at the National Archaeological Museum in Madrid. It is believed they were sent there in exchange for materials from other archaeological sites, from which the MAB did not have any pieces in the 1950s or earlier, although which materials were received in exchange for those from Romaní is unknown.

The author studied all the lithic, worked bone and malacological transitional material kept at Barcelona, Capellades and Vilanova; table 1 shows the volume of material from the Transitional layers in the different museum collections and the quantity of items studied for this research. This study is accordingly the most complete analysis of the layers related to the Mid-Upper Palaeolithic Transition at Abric Romaní to date.

	CAPELLADES (Museu Moli Paperer)		BARCELONA (Museu d'Arqueologia de Catalunya)		VILANOVA (Biblioteca-Museu Victor Balaguer)	MADRID (Museo de Arqueologia Nacional)
	1	2	1	2	1&2	1&2
LAYER 2	?	198	461	220	9	NONE
LAYER 4	?	191	52	39	1	

Table 1: Amounts of pieces in each collection (1 = total number of pieces in the collection, 2 = total number of pieces studied).

¹³ The following are currently in Madrid: 2 fragments of breccia, two perforated *Cypraea* shells and 10 lithic pieces lacking any stratigraphical reference.

3.2. Research Design

Because of the developments explained above, the main focus of the study is on the Transitional layers of Abric Romaní, since it is a body of material that the author was able to study as a whole. Important practical experience and information about work at other sites was gained too, but the fragmentary state of the available information can contribute little to the present study. Nevertheless, data from Reclau Viver cave collected during another museum visit are also used when analysing the particularities of the Reclau caves, in the second part of chapter 5.

3.2.1. Data Collection Methods

This section describes the types of methods used to collect and analyse data. The research for this thesis has been carried out at two different levels: on one hand, specific characteristics outlined as hallmarks of the Transition as a general pan-continental phenomenon are looked for through analyses of the information and data obtained during the fieldwork seasons. On the other hand, the methods used by former scholars working on this topic are evaluated, in order to achieve a greater understanding of the epistemology of the results they presented.

These two levels require different types of analyses, according to the nature of the data belonging to each of them. Here, the methods used to gather information on these two separate but complementary aspects of this topic are explained. They are organised according to the types of data collected. How these were used is the subject of the next section.

3.2.1.1. Publications database

A database of the published information on research performed on the Transition in the Iberian Peninsula was produced during the academic year 1999-2000. The thorough review made a clear case for the need to study the Transition from the perspective of more recent research in Western Europe.

This database is important in itself, for various reasons: it contains information on several publications that are not included in the references' sections of the papers that are most accessible (e.g. Muñoz and Pericot 1975: on their excavations at Ermitons cave) to Palaeolithic researchers (Soler and Maroto 1987b, 1990, Maroto and Soler 1990), or even doctoral theses (Soler 1986, Maroto 1994); it is the only compilation comprising information published in Catalan, English, French, Galego, Italian, Portuguese and Spanish; many sources – especially the earliest ones, and regional bulletins and journals – were obtained from the library of the MAC, as they are unavailable anywhere else. Overall, it contains over 700 entries, which have been systematically organised by the author using EndNote software. The ones included in the Bibliography section at the end of this thesis are only those mentioned or referred to in the text.

Originally, the compilation did not include any information on the epistemology of the studies. New work to find out the basis on which the various interpretations of the archaeological record had been produced concentrated on two areas: the developing history of concepts such as Aurignacian, Perigordian etc. and the theories of the typological systems used to classify the lithics; the latter was followed by several tests to assess how they worked in practice.

While the original database is the foundation of the parts of this thesis in which sites that were not included in the fieldwork are studied, the large and complex material gathered on the theoretical and epistemological aspects constitutes the sole subject of chapter 4.

3.2.1.2. The Lithic Record Form (LRF)

The author designed a form, so that information on the lithics could be collected in a uniform manner. This form is an A4 sheet with a multivariate questionnaire on the front, in which the different characteristics of each piece can be noted and with space on the back to draw the piece and write down any extra relevant information¹⁴. The pieces were examined by eye and under a magnifying glass if deemed necessary.

To design the form, a large number of publications were consulted (including Barton 1988, Bisson 2000, Inizan et al. 1999, etc.); the most influential one was Inizan et al. 1999 as it provides useful information for all the different characteristics and the possible variables which proved important in this research. The form first took shape during the first fieldwork season in Banyoles (Girona, Catalunya), although it was later adapted, extended and modified several times as research proceeded and the research design evolved. It can be divided in three parts:

- 1) *General Information*: this section serves to record information on the date of the analysis, the museum where the collection is stored/exhibited, the box number in which the particular piece is kept, the date when it was excavated (if known), the director/group in charge of the work at the time, the site's name, the layer, the picture number (if one was taken) and the professional

¹⁴ Examples and graphic material for this section has been included in the appendices' section.

picture's reference if the centre had a professional photographer take a picture of the piece/s.

Although most pieces included here had not been previously studied, the boxes storing this material were often labelled as 'Mousterian', 'Aurignacian', etc. This was also recorded.

The pieces' numbers (in the museum collections) were noted down, and they were also given another number by the author, from a series that would identify them in the framework of the present research. When pieces lacked a museum reference number and time allowed, the author undertook that task with guidance from the responsible museum staff. Other 'general' information was the date when the items were studied, the collection's name, and the references of the pictures taken.

If a particular piece was identified as having appeared in any article, the typological method through which it was classified was also marked. A preliminary and very basic classification followed this section.

2) *Piece Morphology*: Here, the formal characteristics of each piece were measured and recorded. The piece's morphology was established, by measuring its length, width and thickness, and presence of cortex (rated as 0%, 5%, 25%, 50%, 75% and 100%). Measurement was done using a Vernier Caliper, and measurements were taken according to the metric system, because this is the one used in Spain and Portugal and it would make it easier to compare this information with the published data. In this study, following various other authors, length and width were measured as those of the containing rectangle, thickness was measured at the mid point between edges

2 and 4, as explained by Dibble and Debénath (1994:17-18, see also Roe 1964).

Traits such as the number and direction of percussion waves in dorsal surface scars were not recorded in writing, because they are much better appreciated in the drawings overleaf.

Several other measurements could have been taken, but at the moment, and for the present study, the primary dimensions were considered to be sufficient to provide a general statement of the morphology of these lithic industries, given that the material available for measurement was far short of providing proper samples for detailed statistical analysis and comparison. With regard to the latter, the author has gone as far in this thesis as she believes to be appropriate at this stage. Undoubtedly, if further and more complex technological studies of the collections are carried out in the future, information such as platform width and thickness, etc. may be needed.

The raw material type and its colour were also noted down. Because the study does not deal in depth with raw materials provenance or chemical composition, the colour was only assessed by sight and classified simply as white, black, brown, etc. or grey and black, etc. in the case that two different colours were present (the order being the one with larger extent first). The platform's morphology was categorized according to the types: cortical, plain, dihedral, faceted, *château-de-gendarme*, winged, pecked, spur, linear, punctiform or not present.

It was considered important to note the condition of the piece, whether it was broken¹⁵ or not, and if so, which part was present, and if it had any patina.

3) *Analysis of Edges and Retouch Characteristics*: The next part of the examination was the analysis of the edges and the type of retouch. Retouch was thought to be particularly important as a potential means to provide information on standardisation, complexity and geographical diversity. Because of the way in which the major two collections studied (Abric Romani and Reclau Viver) have been stored, distinguishing between minor and irregular retouch and utilisation marks or damage was a serious difficulty, and this is explained in section 3.4. Pieces were examined as having four notional edges, and the retouch in each of them was classified as 0%, 5%, 25%, 50%, 75% and 100%.

For each edge, the following characteristics were recorded:

- a) Position of retouch: direct, inverse, alternate, bifacial or crossed.
- b) Distribution of retouch: continuous, discontinuous or partial.
- c) Delineation of retouch: rectilinear, convex, concave, denticulate, serrated, *cran*, shoulder, nose, tongue, tang, irregular or regular.
- d) Angle of removals: abrupt, crossed-abrupt or low.
- e) Morphology of retouch: parallel, subparallel, scaled or stepped.
- f) Extent of retouch: invasive, short or covering

The above traits and possible options for each were adapted from Inizan *et al.* (1999). Several changes were required, to include clearer descriptions of the

¹⁵ While preparing the data for statistical analysis, this section was complemented by adding another category to assess the extent of the breakage, and judging from the drawings, it was recorded if that was major or minor. Pieces with major breakage were discarded when calculating indices of length and width, and often had to be excluded altogether from typological classifications.

characteristics for burins and truncations, as well as the possibility of very short extent of retouch and the option of edge damage.

Finally, the pieces were drawn on the back of the page, as will be explained in detail below. The aim was to collect as much information as possible, and make a sufficiently detailed record of each specimen, to the extent that visits to the collections would not need to be repeated, if it was found out later during the analysis that some other kind of information could play an important role in answering any of the questions.

The lithic record form was not created in order to construct another typology, but as a means to study the assemblages from the Iberian Transitional layers and to compare these research results with those of previous workers, by using the information gathered applying the different typological frameworks, as well as to identify the differences and specific biases inherent in all typologies used to analyse such collections.

A polythetic approach (Andrefsky 1998:65) was considered more appropriate than any other based on a single aspect of the pieces, because of the variability presented by the collections, and also because of the author's interest not only in retouched pieces, but also in the debitage component of the same assemblages.

After each visit, data collected using the form described above were fed into a computer, using the Windows Excel 2000 application. Each question had a column, and each variable was given a number. This was considered more appropriate than a Database programme, because of the possibility to perform calculations. Another

advantage in using Windows Excel is that converting the files into SPSS (Statistical Package for the Social Sciences) files is quite straightforward. Further information on this subject is provided in the next section.

3.2.1.3. Pictures

On the back of each form, the pieces were drawn in three views, with the platform and the bulb of percussion placed at the bottom of the image: dorsal surface, profile and ventral surface. In addition, the outline shape of the platform was also drawn, if complete or sufficiently present to be informative. In the drawings, the dorsal scars, direction of ripples, presence and extent of retouch and other characteristic marks (like breakages, etc.) were also indicated.

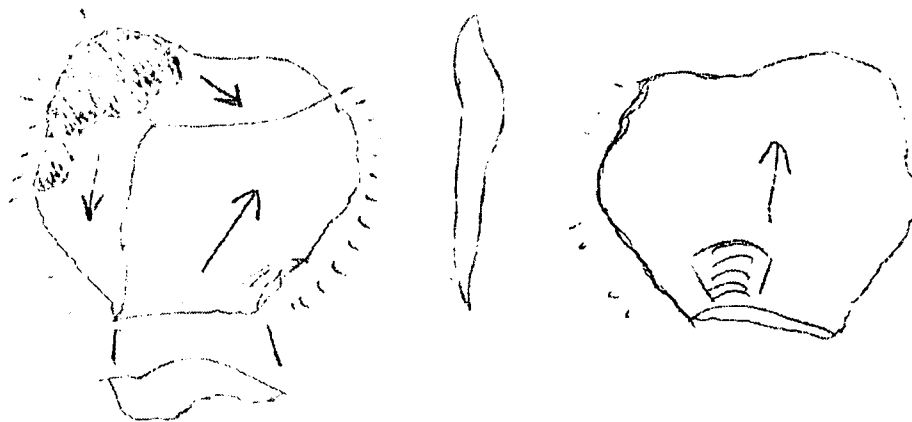


Figure 4: Example of drawing of a piece in the back of the LRF.

After all the pieces in a museum box had been studied, they were arranged on an A4 foam mat and photographed by the author. Important pieces were individually photographed too. At the MAC, the professional photographer took pictures of several blades and bladelets groups, and of the worked bone pieces and perforated shells (including close-ups of the perforations themselves). He also produced slides of the same.



Figure 5: Picture taken by the author.

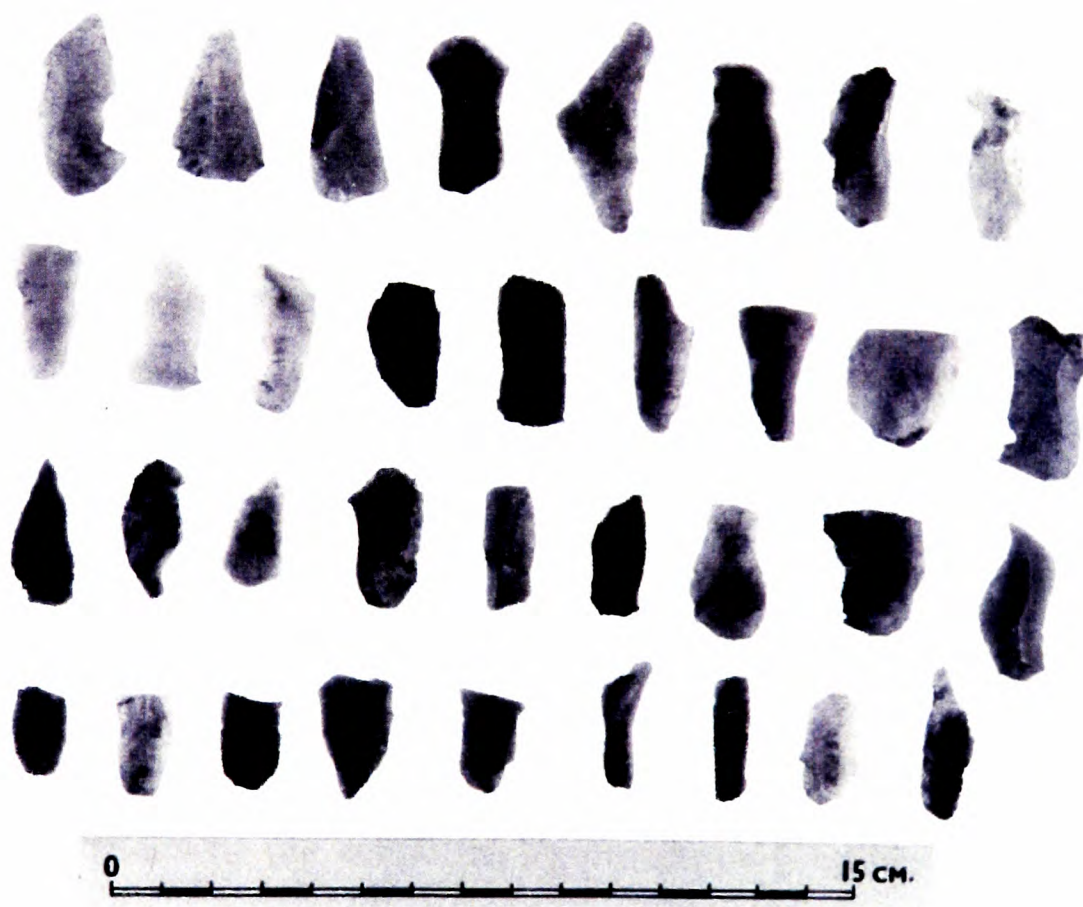


Figure 6: Group of pieces from the Vidal Collection (layer 2).

The author took pictures of the sites and the surrounding areas; special activities such as the sampling for the dating project were also recorded in this way.



Figure 7: Abric Romaní in 2001.

3.2.1.4. Sampling for AMS dating

Apart from the typological and technological study of the lithic materials in the collections kept in the museums visited, this research also includes the results of a dating project, which was funded by NERC, and made it possible to complement the study of the lithic assemblage of Abric Romaní's layer 2 with chronometric dates from items that have taken into the site and worked by humans. The following lines explain how the perforated shells were treated in order to obtain the samples that were later dated. The details of the actual dating process will be described in the next section. This description has been provided at the author's request by Dr. T. Higham of the Research Laboratory for Archaeology and the History of Art, and she quotes his own words:

Four samples of calcium carbonate from marine shells excavated at Abric Romani were dated using the Accelerator Mass Spectrometry (AMS) method at the Oxford Radiocarbon Accelerator Unit (ORAU) at the University of Oxford.

The shells were drilled at the Barcelona Museum. Approximately 70 milligrams (mg) of carbonate was obtained from the perforated shell artefacts. We used a Kemet ultra-precision multi-purpose micro-grinder ("ELECTER-GX") standard drill with tungsten carbide drill pieces.



Figure 8: Kemet ultra-precision multi-purpose micro-grinder ("ELECTER-GX") standard drill.

In addition, three bone points from Abric Romani were sampled for possible AMS dating using the same methods. Unfortunately these proved to have no remaining collagen and were all failed for dating.

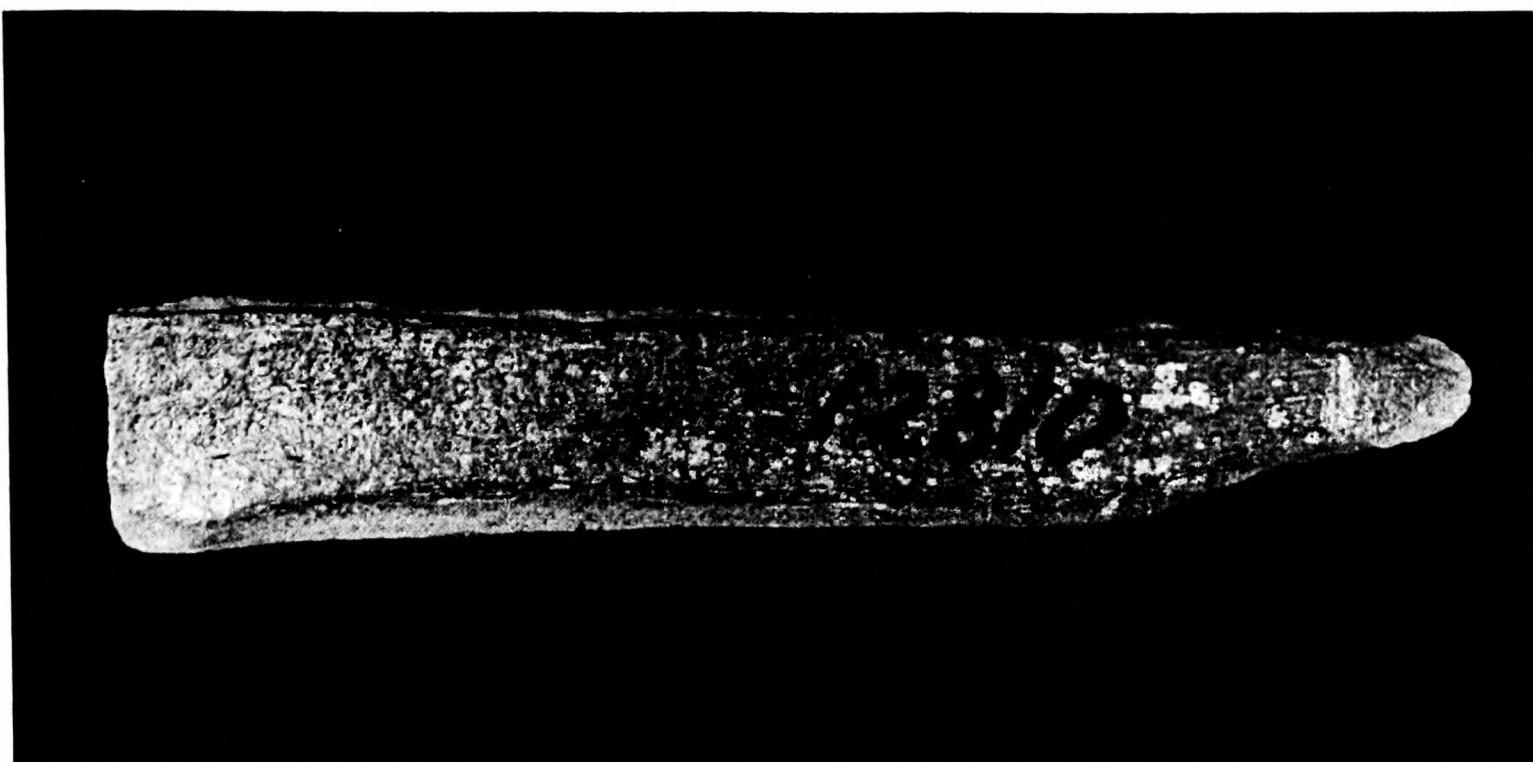


Figure 9: Bone piece of the Vidal collection (level 2), which was sampled for dating.

Several samples of bone and charcoal previously collected from the site by Prof. R.E.M Hedges (ORAU) in collaboration with Prof. R. Sala (Rovira i Virgili University) from the Level A and B excavations respectively at A. Romani, in 1995, were examined for their potential for AMS dating; a tooth (horse) sample and a charcoal sample were also AMS dated successfully. The tooth dentine was extracted at ORAU using a Kemet drill.

3.2.2. Methods of Data Analysis

This section contains a detailed explanation and description of the ways in which each aspect of the research programme has been approached and studied. A brief mention of the epistemological aspects of studying the Transition is made first, to explain the approach of the author in the next chapter. In the following subsection, there is a discussion of the reasons why the Transition came to be perceived as a generalised

continental phenomenon, wherever it occurred. The crucial place of Iberia in this process is also considered, in terms of the regional diversity of assemblages and of hypotheses particular to the area.

3.2.2.1. The Interpretation of the Transitional Record

The lack of concern with epistemology in Palaeoanthropology and Archaeology, especially among European researchers, is not difficult to appreciate, and has many aspects, for example, the absence of studies that integrate fieldwork research with a solid review and thorough questioning of the theoretical ground on which the methods for that analysis are based. This has frequently been commented upon by some American scholars, much more prone to take these issues into consideration (e.g. Clark and Lindly 1989a, Clark 1992, 1997a, etc.), but their remarks seem to have had little success in changing the traditional ways in which old and new researchers in Europe work, as the latter ignore the implications of overlooking such issues and carry on applying whatever method of analysis they have been using since they graduated.

This thesis is an attempt to follow the advice of those who insist on taking epistemology into account. One of its aims is to highlight the importance of the theoretical aspects of this field of study and to show how conclusions reached may be profoundly affected by inflexible use of one or another type of analytical approach.

Before getting into the analysis of the data gathered by fieldwork and from the literature in chapter 4, the origins of concepts that we use daily in this field, like “Mousterian”, are traced, and the evolution of their meaning is followed, in order to see that many of the key terms have had very different implications through the years

and, depending on who uses them nowadays, they may still mean very different things. It is unrealistic to aim at analysing all the material dealing with these issues, but in the following chapter a section (4.1.) is devoted to a brief study of the most emblematic publications of early and mid 20th century scholars, combined with modern syntheses and publications to show how these were integrated into the Palaeolithic research done by Spanish and Portuguese scholars.

Another side of the epistemological analysis studies the methods that have been traditionally used to conduct the research, which in Iberia – as for many other parts of Europe - has been mostly typological. In section 4.2., a thorough review of the publications that laid the foundations of the different methods is complemented by consideration of the different papers written to criticise one or more aspects of such perspectives, usually by other scholars who would subsequently devise their own rival classification method.

Once these aspects have been assessed, the different studies that have been performed on Abric Romaní by the different teams who have worked at the site since it was first discovered are synthesised and compared, first among each other and finally against the typological results of this study (section 4.3.). The aim is not to fuel more criticism, but to understand clearly what using a specific approach entails, when reaching conclusions on the topic, and what difference it makes, in terms of typological systematics, to work with the assemblages of those layers as a whole, because they had previously only been studied partially.

To present the results of her typological study, the author decided to use the Bordesian approach. This should not be taken to imply that this system is better or more correct than others that will be thoroughly reviewed and critically analysed in the second part of chapter 4. The decision was taken because at the moment, *la méthode* – understood as Bordes’ Lower and Middle Palaeolithic typology and de Sonneville-Bordes and Perrot’s typology for the Upper Palaeolithic - is the only one that provides a *lingua franca*, which facilitates the discussion and understanding of the contributions of many different workers in this subject.

3.2.2.2. The Transition as a generalised continental phenomenon

“Despite the rapid expansion of archaeological knowledge of the Palaeolithic over the past several decades, some generalized interpretative frameworks inherited from previous generations of researchers are remarkably tenacious” (Bar-Yosef and Kuhn 1999)

Before focusing on the ways in which the transitional characteristics have been studied, it is important to consider what is implied by some of the basic terms of the discussion, which are “flake”, “blade” and “bladelet”, to avoid confusion in subsequent chapters.

Inizan *et al.* (1999:141) consider that “flake” is a general term for a fragment of hard stone that is removed from a core. Different types of flakes exist, depending on the moment or stage along the *chaîne opératoire* at which it was detached: thus, preparation or preliminary flakes are those removed while preparing a core, knapping or *debitage* flakes are the ones that go on to become tools by subsequent work on their edges, most usually, and retouch or shaping flakes are created when manufacturing a tool.

As M. Brézillon (1977:99) makes clear, the differentiation between flakes and blades is quite hazy. There are different points of view of which the following are just some noteworthy examples. Brézillon quotes Nouel's definition of blades (1949:132), as those pieces that are twice as long as they are wide or more, the rest being flakes. This was the basic line followed by de Sonneville-Bordes (1960:20). For J. Tixier (1963:37) too, blades are flakes whose length is at least two times greater than their width.

A. Leroi-Gourhan (1964:13) takes a different, and perhaps more refined approach, when he states that when the length/width ratio is 2/1, the piece is a long flake, if it is 3/1 it is a 'bladey flake' (*éclat laminaire*), and only if it is 4/1 can the piece be considered a blade.

Bar-Yosef and Kuhn (1999:323) define a blade as a flake which is more than twice as long as it is wide, but highlight technical aspects such as the presence of parallel or slightly convergent edges and one or more ridges running parallel to the long axis (the *lame vraie* of de Sonneville-Bordes (1960:20)). Jelinek (1976:90) also emphasized these traits, which indicate the use of a special technique of manufacture.

Cheyrier (1956:230) proposes to reserve the noun *lamelles* (bladelets) for all those blades which are not more than 5cms long, and this is followed by de Sonneville-Bordes (1960:20). In his study of the Epipalaeolithic of the Maghreb, Tixier (1963:36-39) proposes that bladelets are less than 50 mm long or 12 mm wide, while Leroi-Gourhan *et al.* (1978:162-163) classify as bladelets those blades which are 4 to 6 cm

long. Bar-Yosef and Kuhn (1999:323) define bladelets as ‘especially small narrow blades’, generally between 1 and 1.5 cm wide.

Barton (1992:264, after Bordes 1961) defines a flake as a product of debitage that has a length to width ratio of less than 2:1. This thesis follows this definition and thus will consider as blades those whose length to width ratio is 2:1 or more. Regarding bladelets, it follows Tixier’s parameters.

The following two sections examine the specific traits said to characterise the transition on which this thesis focuses. First of all, those related to technological factors will be defined and the methods used to determine their presence or absence at the sites studied in chapters 5 and 6 will be explained. Where the available literature does not provide a clear explanation of how to address the study of a specific tenet, the author explains how the analysis has been performed in this research.

The second part concerns traits such as the appearance of representational or naturalistic art and of personal ornamentation. To study these two aspects, a much more simple approach has been performed, due to the scarcity of such materials in Iberia. Nonetheless, this thesis includes the results of the dating of several perforated shells found at Abric Romaní by the discoverer of the site, which had not been radiometrically dated before, although their presence has been regarded as a clear proof that the Transition at the site took place at around 40000 years BP (Carbonell and Vaquero 1996:427, Bartrolí *et al.* 1995:66).

The characteristic generalisations about the Transition will be discussed regionally, because of the structure of chapters 5, 6 and 7, and site by site; for each of them, the information available will be studied according to the analyses described below.

a) Technological Frameworks

The first characteristic highlighted when defining the Transition was first clearly described in 1989 as a “general shift from flake to blade technology” and later expressed as a “general shift from predominantly ‘flake’ technology to ‘blade’ technology”, “improved blade technology (quantitatively and technically)” and simply “increased blade technology” (Mellars 1989b:340, 1991:63, 1996c:393, 2000a:44).

The origins of the association between Palaeolithic industries and anatomically modern humans and considered to lay in the classifications made by early excavators during the 19th and early 20th centuries, who divided the Stone Age into three periods and classified sites yielding large bifaces, choppers and chopping tools as Lower Palaeolithic, Middle Palaeolithic if they contained a flake-based industry and if the assemblages were dominated by blades, they assumed them to be Upper Palaeolithic.

Nowadays we know that in several regions – Europe, Africa (see McBrearty and Brooks 2000 for a detailed study of many cases) and the Near East - there is evidence for blade production during the Middle Palaeolithic and the Middle Stone Age, since at least 200,000 years ago and perhaps substantially earlier; thus, the origin of the Upper Palaeolithic cannot be equated to the first appearance of blades, nor can this be

linked to the appearance of the first anatomically modern humans¹⁶, since early examples of the latter are associated with Middle Palaeolithic or Middle Stone Age strata where industries were manufactured by typical centripetal or convergent Levallois techniques (e.g. Skhul and Qafzeh), and there are also examples of Neanderthal remains unearthed from layers containing blades manufactured by non-Levallois techniques (e.g. Saint Césaire, see Lévêque 1993).

Mellars fails to address fully the issue of the presence of blades in Upper Palaeolithic assemblages, as it is not the fact of their appearance that is new, but their ubiquity at that time, because (as we have just seen) prior to this moment, blades existed, but their presence was never so pervasive. Bladelets, though, are the real innovation, and their appearance might be due to the introduction of soft hammer and indirect percussion knapping techniques.

In chapter 5, the assemblages of Abric Romaní and the transitional layers at other northern Iberian sites will be studied morphometrically and compared, to see the quantities of blades and flakes they contain. Data from the LRF will be analysed statistically in order to find factors related to this framework, to see if it is actually applicable to the sites. This will be done considering the three types of blanks, fully discussed in chapter 4, when describing the assemblages from Abric Romaní: flakes, blades and bladelets, the latter being considered by many workers to be the real innovation in terms of blade production, as just suggested.

¹⁶ The earliest known examples of modern humans are – at the time of the writing of this thesis – those from Herto in the Middle Awash Valley, Ethiopia, dating from 160,000 years ago, and associated with a final Acheulean industry with some signs of MSA technology (Stringer 2003, White *et al.* 2003, Clark *et al.* 2003).

The comparison will be made at two levels in the case of assemblages directly studied by the author of this research: that of blanks (excluding pieces too broken for certain classification but including pieces that did not fit into the typological classification of the artefacts – i.e. debitage as well as tools) and at the level of types according the results obtained from applying Bordes' system in chapter 4, across layers (Upper-Middle Palaeolithic) and taking into account typological restrictions.

For other sites, not directly studied by the author, similar analyses will given, as far as possible, when enough information about length and width of blanks/types is provided by the literature available.

The results of these analyses will be presented by means of tables with the actual numbers of pieces for each category, as well as their percentages to facilitate inter-assemblage comparisons, and displaying those values in bar charts, scatter plots and cumulative frequency charts.

There are other often-repeated tenets related to technology, which must be discussed and defined before proceeding to consider the Iberian assemblages. These were first outlined as “the originality of new forms and varieties of stone tools through 25ky” and “diversity and rapid changes of tool forms in the Upper Palaeolithic” (Mellars 1973:257, 1982:238, emphasis added).

Papers kept on being published on the issue and factors such as “the appearance of well-defined forms (endscrapers and burins)”, or “a range of morphological new artefacts, highly distinctive and with a higher degree of imposed form”, “the increase

in variety, complexity and degree of standardisation” etc. (Mellars 1989b:340, 1991:63, 1996a:182) but the accompanying chronological commentary made clear that these are traits appreciated when considering the Upper Palaeolithic as a whole, which could therefore be used as bullet points under headings such as ‘general features of the transition’; there is nothing much that occasional clarifications of the sort ‘these are broad generalisations which varied in detail and precise timing’ (Mellars 1991) can do to return to the original and non-generalising tone of the discussion.

These are traits that will be looked for in the following chapters, though we must always bear in mind Bar-Yosef and Kuhn’s perspective (1999), which highlights the historical point on the sophistication and complexity attached to the appearance of prismatic blades, which is likely to come from the association by many authors of these blanks with anatomically modern humans, and the complexity supposedly found in transitional assemblages may actually be a product of the same mistaken equation. Indeed, Mellars (1989b:341-345) noted that the increased complexity is a phenomenon created by comparing the total range of Upper Palaeolithic forms (of all zones, across the Upper Palaeolithic) to all Lower and Middle Palaeolithic tools, which is not really possible if focusing on any one Upper Palaeolithic assemblage, which is what the main part of the fieldwork for this research was about. It is surprising to see how such a clear statement about the need to implicate the whole of the Upper Palaeolithic in the discussion of such a single trait seems to have been forgotten in so many subsequent papers.

In the absence of clear definitions for the factor of variability, this thesis looks into it in the following manner: a first perspective is inter-assemblage variations in types. Comparative studies of the amounts of types and how genuinely representative they are will be performed, in the case of materials studied by the author: between layer 2 with materials from Reclau Viver. It is also taken into account that the latter does not constitute the whole assemblage found at that level. The latter analysis is also important from the perspective of inter-regional variations. Published information will be used to carry out similar analyses with materials from other sites.

The case for variability across time, understood as “innovation”, cannot be discussed here, as it would need to use materials from assemblages throughout the Upper Palaeolithic as a whole, which is beyond the scope of the present study; general remarks on this topic will be included in the final chapter of this thesis.

The higher degree of standardisation is likely to be related to the technology involved in the manufacture of blades and bladelets, as prismatic blade techniques have an unusually high degree of control over the dimensions and shapes of the end products, obviously complemented by the advantages offered by the use of new percussion techniques (soft hammer and punch) techniques, which also are geared to provide the knapper with a greater control and to achieve more uniform final products.

The difficulty in observing this characteristic in the pieces concerned here is that there is an extreme paucity of publications in which information or guidelines to perform such study is given, and thus it is no easy matter to decide on the parameters and the traits which one can use to make a decision on the existence or absence of ‘higher

standardisation'. Mellars' personal approach (1989b:345) is that 'in the absence of systematic analyses, one has to rely on intuitive impressions'. In this study, the author decided not to follow such advice and attempted to observe whether any degree of standardisation was present, through the systematic observation and quantitative-qualitative study not only of the morphology of the pieces as a whole, but also of the retouch characteristics recorded in the LRF (but see section 3.3.), as well as by studying the comparative measures' clusters of the tools most represented in the assemblages of Abric Romaní layer 2 and Reclau Viver. To work with the large amount of information recorded via the aforementioned questionnaire, data - introduced into Excel applications - were transferred into SPSS files, which is software designed to carry out statistical analyses.

The statistical study of data related to the aspect of standardisation, as present at Abric Romaní, was three-fold: first of all, in relation to types of tools, measurements of length and width, applied earlier to considerations regarding typological analyses and indices of flakes and blades, are grouped here typologically, in order to see whether, within each category, there are specific sets of preferred dimensions. This will be observed in the study of the tool types most represented both in Abric Romaní's layer 2 and the earliest Upper Palaeolithic assemblage from Reclau Viver, according to the typological analysis performed in chapter 4 and excluding pieces that are too badly broken, but taking into account those which were damaged but could still be reliably assessed.

Actual numbers of pieces classified by type, raw materials used, etc. will be given as well as percentages. Comparisons will be made between layers of Abric Romaní as

well as Abric Romaní's layer 2 and Reclau Viver's materials, and results will be provided graphically as well as by means of tables analysed in the text.

It is crucial to bear in mind the role played by the 'Frison effect' (Jelinek 1976) when considering both matters related to standardisation and imposed form. Jelinek outlines the factors which archaeologists must take into account when considering assemblages and the formation of the archaeological record in which they were embedded. Although all of them (nature of the tasks performed in the site, proximity of lithic resources and their quality, size and structure of the groups, and length and periodicity of their occupations) apply to this research, that of the fact that 'the tool kit ultimately abandoned at the site is the result of the modification of an original set of tools and may be quite different in form from the original set' (Frison 1991) is of paramount importance when assessing those two factors.

The "appearance of complex bone/antler/ivory technology" was much simpler to deal with, because the quantities of material, in the sites that are included in this thesis are very small. The remains of this kind found at Abric Romaní, which had not been studied before, as they belong to the Vidal collection, are now kept in Barcelona. The author was able to study them personally, as will be explained below. For the rest of the sites, wherever material of this type was present, information has simply been drawn from the literature; larger quantities of such material were certainly excavated at other sites, such as Arbreda, Reclau Viver, El Castillo and Cueva Morín, than was the case at Abric Romaní.

Abric Romani's bone artefacts were photographed during the study of the Vidal collection both by this researcher and the professional photographer of the museum. A couple of pieces were also sampled, as explained above, at the same time as the perforated shells.

b) Symbolic Sphere

It is in this part that the association between anatomically modern humans and the various perceived cognitive advantages of our species over Neanderthals tend to be emphasized, though the strength of the association between materials in this category and any particular hominid type is as unclear as was the case with blade technology.

There are two kinds of archaeological evidence belonging this category: naturalistic art and personal ornaments. In the past, explanations for their abrupt appearance at this moment have been looked for in relation with population growth, appearance of language, different behavioural and cognitive capacities and development, but - especially regarding the artistic component - they are regarded as an "explosion of symbolic behaviour" (e.g. Mellars 1991:64). M. Conkey (1983:221-222) stressed the fact that any such 'explosion' is clearly a matter of perspective and scale. Looking at it from the present day, we certainly seem to be dealing with some kind of sudden outburst, though it needs to be remembered that the Upper Palaeolithic lasted some 2000 decades, and if the artistic objects and forms that are known to us at present were evenly distributed throughout that time, it would only amount to a few depictions or carved bones per year in each region where they are have been found. In fact, not much can be said for the appearance of sophisticated art in the Iberian Peninsula, in relation to the Transition itself, as there is none documented as yet for

that period, and this absence is indeed considered to be significant in the analytical part of this volume.

Nevertheless, the appearance of personal ornaments, understood as ‘small objects for which no obvious functional explanation can be found’ (Mellars 1973:259), is certainly demonstrable, and is a point this research had the chance to investigate much further. It was always known that Romani had dug out several perforated shells and fish vertebrae, since they had been mentioned, albeit seldom, in the literature, and in the case of the shells, never carefully studied, probably because they were part of the MAC, Vilanova and Madrid (MAN) collections. The author found the stored ones (the ones in the public exhibition have been there for 20 years now) in a paper envelope during her first visit to Barcelona, and on her return to Oxford in 2001, an application for NERC funds to date both shells and worked bone implements was presented and proved successful. Five dates were awarded at the time, with the possibility of considering further analyses in the future. This chance was taken the following year, and two more analyses were performed then, this time on organic material (charcoal and a horse tooth fragment) extracted from the travertine wall of the rock shelter in 1995¹⁷.

In the following paragraphs, the text printed in italics has been contributed at the author’s request by Dr. T. Higham of the Research Laboratory for Archaeology and the History of Art at Oxford University, as he carried out the actual dating.

¹⁷ These samples were internal materials of the Research Laboratory for Archaeology and History of Art at Oxford.

When attempting to date the perforated shells, it was taken into account that one potential source of error in the radiocarbon dating of carbonates is that they may be prone to isotopic exchange or recrystallization under certain depositional circumstances. Recrystallization describes the process in which bicarbonate ions within the depositional environment, precipitate onto the carbonate material which is to be dated. The bicarbonate may be of the same radiocarbon age, but there is the distinct possibility that it could also be older or sometimes younger. It is important, then, that this material be identified so that problematic samples can be set to one side. Alternatively, it is sometimes possible for specific affected samples to be rigorously cleaned to obtain only autochthonous, unaltered carbonate.

Powder X-ray diffractometry (XRD) was used to check the crystallinity of each sample carbonate. All were found to be the aragonitic form of calcium carbonate, as opposed to the calcitic form. Since recrystallised carbonate is only manifest in the form of calcite, this is a good check on sample homogeneity and suggests strongly that the carbonate is unaltered and therefore acceptable for AMS radiocarbon dating.

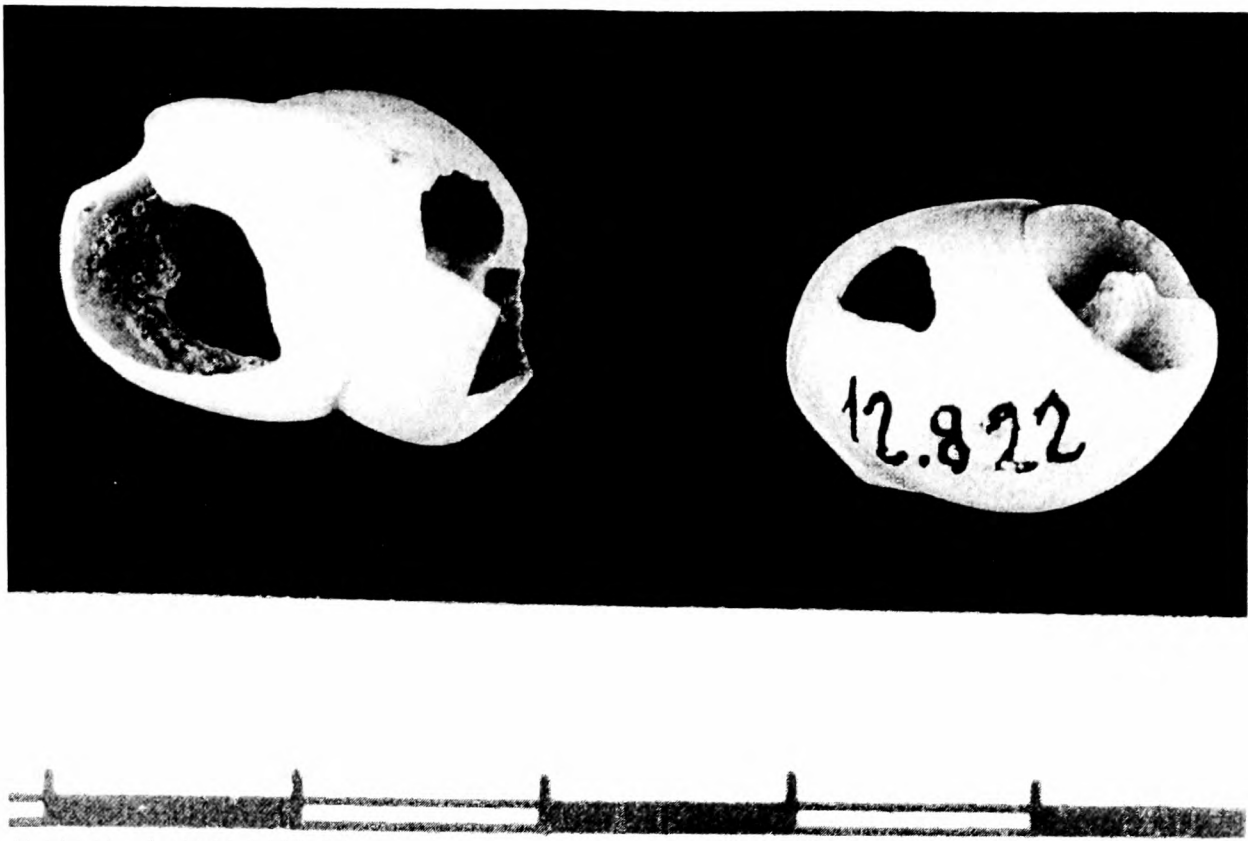


Figure 10: Two of the shells sampled from the Vidal collection.

The carbonates were prepared as follows: a small sample of the carbonate powder (30 milligrams) was weighed and loaded into a glass reaction vessel. The reaction vessel contains a side-arm into which was pipetted 2 mls of concentrated orthophosphoric acid. The vessel was attached to a vacuum line and actively pumped for 15 minutes. A water trap was placed on the line to remove water droplets. After the pumping the reaction vessel was sealed and the acid tipped onto the carbonate where it reacted, producing CO_2 . The vessel was placed in a warm water bath and the reaction proceeded in vacuo for 30-45 minutes, until all bubbling had ceased. The CO_2 from the reaction was then cryogenically distilled and volumetrically measured to determine the carbon yield. All dated carbonates were within acceptable thresholds. The stable isotope ratios for carbon were measured using a mass spectrometer and the carbon was then converted into graphite using the method described below, and AMS dated.

For the dating of the tooth dentine sample, the “collagen” (protein) fraction is targeted at Oxford. The routine pre-treatment method is outlined in Bronk Ramsey et al. (2000). First, the bone is decalcified using dilute hydrochloric acid (HCl). This removes the bone carbonate fraction, which comprises c.80% of the bone by weight, leaving unpurified collagen. This collagen fraction was then further purified using sodium hydroxide (NaOH), which removes humic (degraded plant material) components. An additional HCl wash was then given. Interspersed within this the sample was rinsed with distilled water. The collagen was then gelatinised in a weak acid and placed in an incubator for 20 hours. Finally, the gelatin was filtered using an ultrafilter, which removes small molecular weight components from the gelatin, which could be contaminants. Finally, the sample was freeze-dried and weighed.

Charcoal was prepared for AMS dating by sequential rinses in hot (80°C) 1M HCl for one hour, hot 0.5 M NaOH and finally with hot 1M HCl again for the same period. Between each wash, the charcoal was rinsed to neutrality with distilled water. Finally, it was dried and weighed.

Isotopic analyses (C, N) of the bone gelatin, and combustion of the samples for AMS radiocarbon dating was undertaken using a Europa ANCA Roboprep interfaced to a Europa 20/20 mass spectrometer all operating under continuous-flow mode.

Graphite was prepared by reduction of CO₂ over an iron catalyst in a H₂ atmosphere at 650°C, prior to AMS radiocarbon measurement. The graphite was then loaded into aluminium target heads for AMS dating using the new Oxford HVEE accelerator. The

conventional radiocarbon ages BP are reported with reference to Stuiver and Polach (1977).

The dates that were obtained are listed and discussed in chapter 5. The perforated shells were also the subject of a qualitative study, as the author studied their location, provenance and types of perforations. Y. Taborin's thorough study (1993) was used as a guide and reference volume to do this.

3.2.2.3. Particularities of the Record in the Iberian Peninsula

Both fieldwork results and literature analyses are combined in order to shed some light on the scenario of the Transition in chapters 5, 6 and 7, to see how the generalisations detailed in the previous section can be applied to explain the archaeological record of the area.

The previous chapter mentioned the reasons why Catalunya and Cantabria have been the areas where research first started, and has been carried out for longer. The transitional traits have been applied to both, yet those working on the main sites of these Iberian regions do not agree on the nature of the process: while the Catalan record seems to present an abrupt transition, a replacement crisis, its Cantabrian counterpart leads scholars in that area to advocate a much more continuous process, likely to fit more easily into the Multiregional hypothesis, of which they are advocates. To complicate matters even further, some researchers believe in an internal horizontal division across Iberia (the so-called Ebro Line or frontier), which would at the time of the Transition have separated the Franco-Cantabrian region from the rest of Iberia, less studied, where Neanderthals may have survived for some 10000 years

longer than in the regions to the north of this proposed line. When publicly questioned on the facts supporting this hypothesis, its main enthusiast, Zilhão, assured the author that there are specific environmental studies to sustain the claim. The author was able to contact the researcher in charge of such studies, M.F. Sánchez-Goñi, and she provided copies of her articles, which are analysed in chapter 6, in order to see if there is really a solid base for such a frontier, rather than its being created by a historical research bias, which has favoured the northern areas in terms of amount of research, over what would seem a totally empty central Iberia. This supposed emptiness would be rather surprising, since central Iberia is a region known to have had several sites in the Lower and Middle Palaeolithic periods.

3.3. Limitations of the Study and Particular Problems

At the start of the project, letters requesting permission to access and study the collections from transitional assemblages in Iberia were sent to all Archaeology Museums and researchers known to have some collections in their laboratories. In response, emails and letters were received, granting permission to study and further assistance if needed, to all but three collections. In one case (Foz do Enxarrique, Portugal) refusal of permission was due to the fact that the collection was being studied for publication, while in the case of two Murcian sites, they were dropped from the list because it was thought that the pieces did not belong to transitional layers. In the summer of 2001, when one of the layers of Sima de las Palomas del Cabezo Gordo was dated to 34450 ± 600 BP, the director of the excavation sent an invitation to study the pieces. However, since the work on this collection is not yet completed, no data from this study are included in this thesis, and in fact the date just quoted is far from definitive (Dr. Higham, personal communication).

Regarding the rest of the sites, regrettably the University's requirement that the thesis be completed in three or at most four years, and constraints of funding, meant that it was only possible to cover a small part of the whole body of material in any detail. Having said this, this present section is really intended to deal with the difficulties encountered by the author when carrying out the project in the form in which it finally ended up, thanks to these various circumstances.

In order to systematise data collection, the author used the aforementioned Lithic Record Form, but the aim of thorough observation and detail had to be balanced against the large amounts of material and the schedules of the centres which house the collections; these are described below. In several cases, although the centres were open, the author was not allowed to study any piece at times when the person responsible for the collections or the supervisor of the storage/study areas was not present.

The decision to postpone the typological analyses of the pieces until the author had returned to Oxford was taken in order to allow greater time to measure and record aspects of the pieces, which could not be observed again once they were put away. This measure was helpful in terms of time-saving while abroad, but it complicated decisions back in Oxford, as the subjective nature of the typological systematics was complemented by the high amounts of edge damage present in the pieces studied, due to storing them in boxes where they are in constant touch with one another and in some cases, like the MAC's collection, they have been moved back and forth around Catalunya on several occasions, by cars and lorries. It is very difficult to tell if a

specific area where the retouch is irregular or short or partial or all of these together, is in fact real retouch or just modern edge damage, caused at various times during a century of bad preservation and unrest. In several cases the author had to decide on her own and highly doubtful examples were always discarded. Ideally, one needed to have the specimens actually present to refer to during this stage of the analysis, or at the very least to have spent much more time on the difficult ones. These things were simply not possible.

In Banyoles, the director of the museum generously gave direct access to the storage area, where the collections are kept. Working hours were from 9am to 2pm and from 5pm to 8pm, Tuesday to Sunday. The museum closes on Monday so on Mondays it was only possible to access the research area when the director's assistant was there.

In Capellades, the schedule of the museum was 9am to 2pm and 3pm to 6 pm. The archaeologist who supervised this author's work visited often, but she did not have to depend on him to access the study room: so as long as the museum staff were in, she could work without any problems.

In Barcelona, the author liaised with the curator of prehistoric collections and was generously treated. She had to negotiate directly with the keeper, for the collections to be taken out of the storage area. The boxes containing materials from the transitional assemblages of Abric Romaní were sent all at once (together with many others containing various other [irrelevant] collections!) but they had to be returned gradually as the study advanced.

This museum employs a professional photographer, who happily assisted in taking pictures and slides. The museum waived the fees for those, and this is gratefully acknowledged.

Working hours were from 8am to 3pm, Monday to Friday, when the curators were present. Research was conducted in the 'researchers' room', where the author was given a desk, and the prehistoric collections' curator would stop by every morning at least once, to ensure that everything was fine. Access to the storage rooms in this centre is seriously difficult due to internal conflicts of interest. The author had the rare opportunity to enter both of the storage rooms, although she was not allowed to retrieve any materials by herself.

Extended bibliographical research was performed at this museum too, because it houses one of the most important Archaeology libraries in the country, in which very important local works from the early 20th century were found. Access is normally restricted to museum staff only, but the author was allowed entrance and the right to take out any material she needed.

The study of the collections from Abric Romani, kept at Capellades presented the most serious problem in this research. When the author contacted Dr. M. Vaquero, back in 1999, to request permission to study the materials from the site's layers 2 and 4, she was told that the pieces were divided between two centres: the museum in Capellades and the MAC in Barcelona. Vaquero's own doctoral thesis (1992) had

studied the Capellades collections, but when the group of pieces he studied were compared to the ones this author was given to study, a very strange picture emerged, as the following scatterplots show:

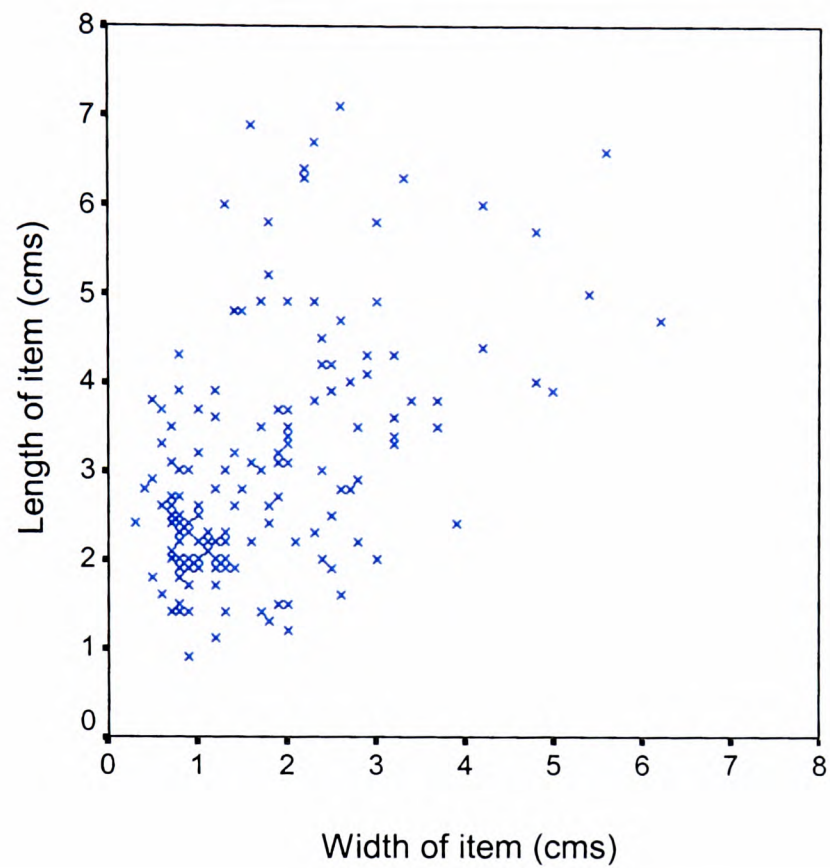


Figure 11: Scatterplot marking the width and length of the pieces from layer 2 studied by Vaquero (1992).

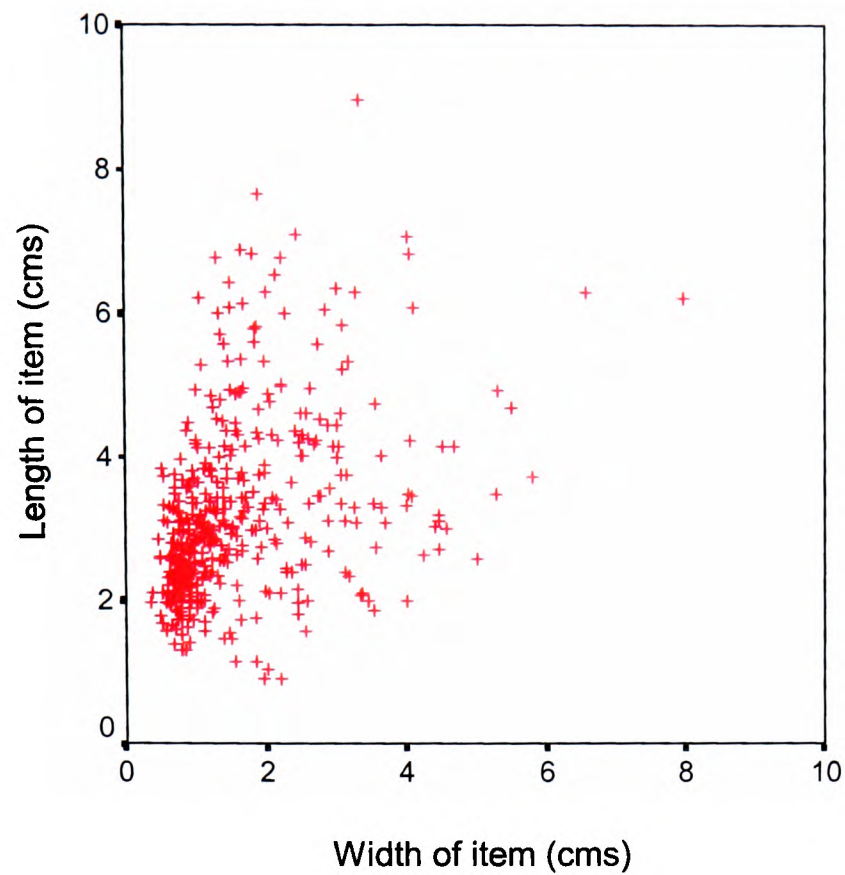


Figure 12: Scatterplot of the pieces from layer 2 studied by the author.

The first study includes 844 pieces from layer 4 and 154 from layer 2, but the author, who recorded all materials from boxes marked as 'layer 4' and 'layer 2', could only count 209 pieces from layer 4, while there were 197 from layer 2. She did not study the boxes marked as 'layer 4 or layer 6', but the materials in there do not account for the differences between the totals. This matter was investigated once the fieldwork was over, and such differences are explained by the fact that the first researcher was apparently able to include materials recovered during unofficial excavations, the whereabouts of which were not revealed to this researcher.

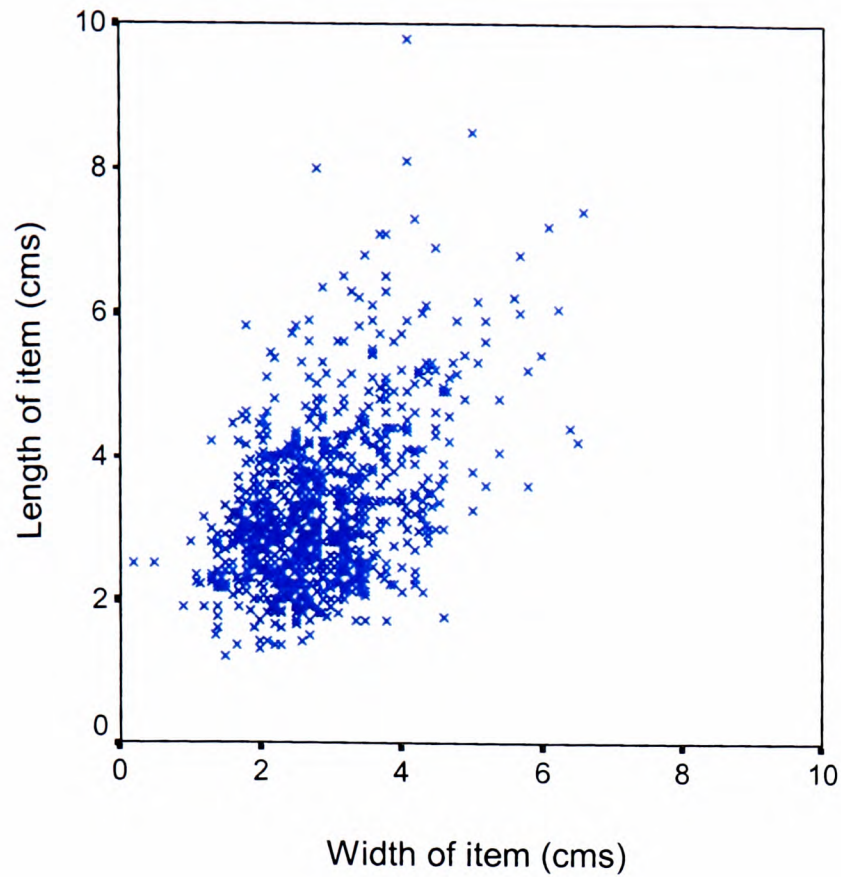


Figure 13: Pieces from layer 4 studied by Vaquero (1992).

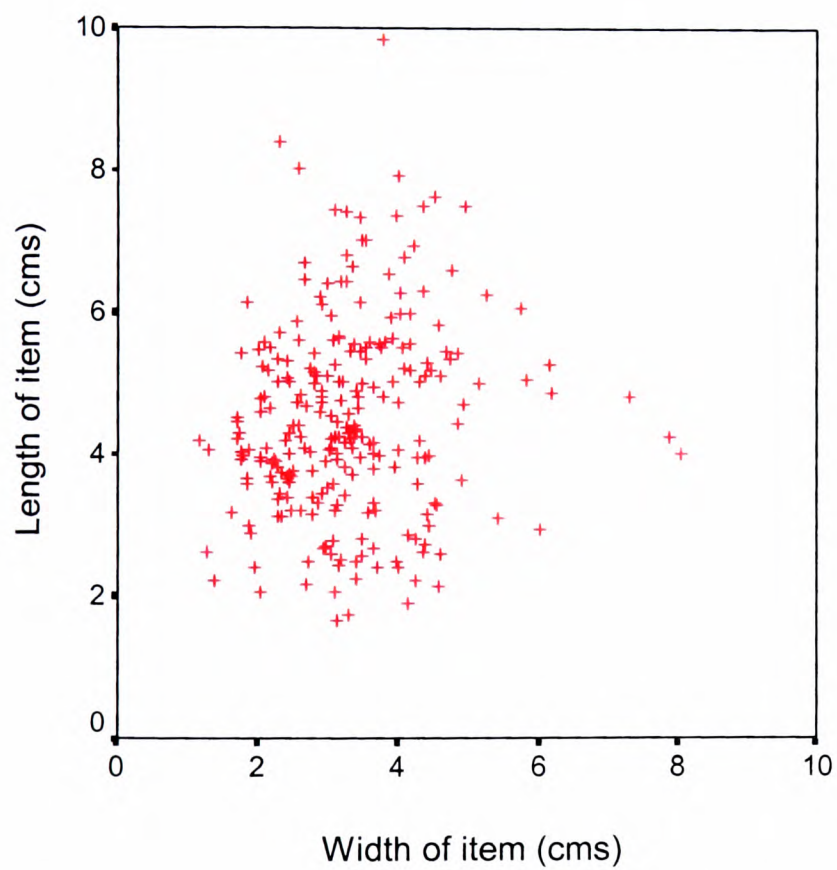


Figure 14: Pieces from layer 4 studied by the author during her fieldwork.

Information on the remaining collections from other sites has been obtained from the literature, so the scope for analysis is limited. Nevertheless, publications have been studied not only to know about the sites that could not be studied personally, but also to learn from what perspectives research was conducted and what system of

classification was employed in each case. All of this information constitutes the 'fieldwork' material used in the author's analysis of the theoretical aspects of Palaeolithic studies, and especially of the Transition to the Upper Palaeolithic in these sites.

Information collected on the edges of the pieces with the LRF has not been included in the thesis, as when this was attempted, the author encountered many difficulties: there was no published material to compare it with, it was hard to relate it to the tenets beyond very general terms, etc. It was considered that the results obtained needed major work which could not be done in time to be included before the thesis was submitted, and it was driving the focus of the study away from the test of the generalisations, which the author set out to do.

3.4. Summary and Conclusions

This chapter has previewed those that follow and it has looked into the various main issues: first of all, the selection of the areas and sites for study, was discussed along with the development of the fieldwork seasons; then, the research design was explained in detail, according to each of the research questions and the data collection methods.

In the section on data analysis methods, both quantitative and qualitative analyses to be performed were briefly described, after a thorough consideration of the different frameworks chosen among the several generalisations that characterise current views on the transition. The issues that are particular to the Iberian Peninsula were also

highlighted, as well as the limitations of the study, as experienced during the fieldwork seasons and at Oxford.

The techniques involved in collecting the samples of the worked bone pieces and the shells of Abric Romaní and their treatment to perform the dating project were also briefly discussed.

Chapter 4 will contain a thorough review of the theoretical aspects involved in Palaeolithic research, with special emphasis on the controversies present in the study of the transitional phenomenon, as explained above, in the section on the interpretation of the record.

The analyses introduced above and the points highlighted in the next chapter will be applied to the study of the Iberian transitional assemblages in chapters 5 and 6, the latter focusing on the regions south of the Ebro river, and chapter 7 will concentrate on the Transition in other areas in Europe.

4. Epistemological Background and Typological Systematics

4.0. Introduction

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4.3.2. Present Research

4.3.2.1. Layer 2

4.3.2.2. Layer 4

4.4. Conclusions

4.0. Introduction

In the previous chapter, the two different types of analyses included in this thesis were defined as: on one hand, a thorough revision of the theoretical perspectives applied to Palaeolithic research, and more precisely to the Transition to the Upper Palaeolithic, and on the other hand, a test of the sustainability of the generalised characteristics that are said to mark the process across the continent.

This chapter deals with the first of these, in the following manner: first, it contains a review of the historic development of the logic and theory that have influenced the progress of Palaeolithic research. In that section, the origins and changes suffered by the terminology used by Palaeolithic researchers working on the Transition are traced and highlighted, in order to provide a clear understanding of what those terms actually meant in different moments since this type of studies began, and what they mean in the present theoretical conception.

The second part concerns an analysis of the typologies most widely used in Spain to approach the Mid-Upper Palaeolithic Transition. The analysis is twofold: on one hand, the typologies' guidelines and characteristics are reviewed separately and compared, to comprehend their differences, at all levels, and especially the impact of their application. On the other hand, the typological analyses that have been performed at Abric Romaní since its discovery are evaluated and their results compared, first among themselves, then against this research's results.

In chapter two, the lack of concern with the theoretical perspectives instinctively applied to the study of the Palaeolithic was reported. The following pages are an

attempt to study how this tendency started and to correct the situation that affects so many works in this field.

4.1. The Logic of Enquiry: Definitions and Historical Evolution

The combination of several factors, including an appropriate socio-political basis and the extremely rich archaeological record, made France the birthplace of Palaeolithic research, around the mid 19th century. Since then, French perspectives and systematics have guided and strongly influenced the practices of Palaeolithic researchers all over Europe, including Iberia, and they continue to do so at present.

Currently, one of the characteristics of the research carried out by Old World researchers is the little concern that these workers show for the epistemological side of their methods, which is reflected in the perspectives they apply when interpreting the results produced by their research. No attention is paid to the different meanings and usage of research terminology. Confusion is bound to arise if we are not aware that the same word can mean very different things to various people. This situation is not new: G. Chauvet already pointed it out in 1896:

“...encore faut-il s’entendre sur le sens des mots et je ne suis pas sûr que tous les archéologues mettent la même forme sous le mot grattoir”
¹⁸(Chauvet 1896:323)

In order to systematise the study of the historic developments of today’s present frameworks and terminology, this section follows Sackett’s periodisation of the History of French Palaeolithic Prehistory (Sackett 1988b). The following lines will focus on the expressions related to the layers that are concerned with the Mid-Upper

¹⁸ “... it is necessary to agree about the meaning of words and I am not sure that all archaeologists place the same shape of tool under the typological category end-scraper”

Palaeolithic Transition, which will be called 'Transitional Layers'; that is to say, the latest Middle Palaeolithic or Mousterian, the so called 'transitional' industries (in the case of Iberia the Chatelperronian) and the earliest Upper Palaeolithic or Aurignacian.

- The Heroic Era (until c.1860): In 1836, C. J. Thomsen suggested a threefold division for human history and prehistory – the 'Three Age System' that would eventually become the traditional way to structure chronological periods.

During this era, pioneers like J. Boucher de Perthes (1847, 1860), established the existence of the Palaeolithic or 'Old Stone Age', by demonstrating the association of human remains with those of extinct animals.

- The Formative Era (c.1860-1900): This period sees the establishment of prehistoric Archaeology as a scientific discipline. E. Lartet (1864, 1866) subdivided the Old Stone Age into stages according to the presence of faunal remains from major Pleistocene mammals. He proposed the following classification:

- 1) The *Hippopotamus Age*, which would include the axes found at Saint Acheul.
- 2) The *Cave Bear and Mammoth Age*, where he placed the site of Le Moustier. He noted that sometime towards the end of the Aurignac phase, characterised by worked bone and ivory, reindeer appeared.
- 3) The *Reindeer Age*, when that animal predominated, and two types of industries were characteristic:

- a. *Laugerie Haute*: when flint points and arrowheads were worked into leaf-shaped items.
- b. *La Madeleine* (also at Laugerie Basse): during which bone implements became more common, but the craftsmanship was thought to be simpler.

This scheme was held until 1880 and became the basis for subsequent methods of classification, as we will see below. Together with H. Christy, Lartet published the *Reliquiae Aquitanicae* (1875).

Lartet's pupil, G. de Mortillet, was the first to divide the Palaeolithic in 'archaeological terms' (Sackett 1991), according to types of artefacts – *fossiles directeurs* – and consistently naming successive epochs after sites, a practice started by his mentor, when he named the industries between the Mousterian and Solutrean layers after the site of Aurignac, and placed them towards the end of his second period. de Mortillet's classification (1869) became the standard framework for Palaeolithic research at that time:

1) Lower Palaeolithic:

- a. *Chellean*: almond-shaped axe-heads of St. Acheul type. Fauna characterised by *Elephas antiquus*, *Rhinoceros merckii* and Hippopotamus. Later, d'Acy and d'Ault du Mensil (unknown reference) introduced the *Acheulean* between the Chellean and the Mousterian.
- b. *Mousterian* (part of the Cave Bear and Mammoth Age): with industries using only flakes to form points and scrapers, and with the presence of Neanderthals.

2) Upper Palaeolithic:

- a. *Aurignacian*: divided into two facies: Laugerie Haute and La Madeleine, and initially three stages:
 - i. *Aurignacian*: which he later suppressed and incorporated into the Magdalenian.
 - ii. *Solutrean* (Laugerie Haute) named after the site of Solutré (Saône-et-Loire), where he thought there was no bone industry.
 - iii. *Magdalenian* (La Madeleine), when a simplification of retouch is accompanied and compensated by the profusion of worked bones, engravings and carved objects.

The periods above represented delimited temporal phases within a unilinear succession directed by technological evolution that was thought to be valid for the whole of western Europe.

In 1872, Bailleau published his excavations at the Grotte des Fées, the first known case of Chatelperronian layers being excavated, but he did not propose the definition of a separate type of industry, which was not recognised until later.

In 1873, de Mortillet redefined Lartet's Aurignacian as the first phase of the Magdalenian period, because of the presence of worked bone and ivory remains in both types of assemblages, which he thought were missing from the

Solutrean layers, a factor that connected these with the Mousterian period. This arrangement was criticised during the 1880s and 1890s by both E. Cartailhac (1896) and E. Piette (1895, 1896).

- ***The Traditional Era*** (c.1900-1950): E. Cartailhac was the seminary mentor of H. Breuil, and this relationship influenced the latter's perspectives in relation to the establishment of the basic Upper Palaeolithic culture-historical structure, by proving that de Mortillet's refusal to recognise the Aurignacian as a separate entity that was found before the Solutrean was a mistake. This argument started what is commonly known as *La Bataille de l'Aurignacien* (Harrold 2000, Sackett 1991, Zilhão and d'Errico 1999).

By using a geographically extensive database, Breuil challenged de Mortillet's periodisation and proved that the Aurignacian stratigraphically preceded the Solutrean. In 1906, Breuil divided the Leptolithic (he seldom used the term Upper Palaeolithic) of southeastern France and northwestern Spain into three main evolutionary stages, as follows (Breuil and Lantier 1965:141-144):

- 1) *Aurignacian*: a period with the same faunal assemblage as the preceding Mousterian (mammoth, woolly rhino, cave bear and hyena, with later additions such as horse and various *bovidae*) which was subdivided into three parts:
 - a. *Lower Aurignacian* (Allier): with Chatelperron points, ill-produced blades, little bone industry, and no art.

- b. *Middle Aurignacian*: with keeled scrapers with fluted retouch, nosed scrapers, burins, notched blades and worked bone, like the Aurignac point, the *fossile directeur* of the period.
- c. *Upper Aurignacian*: multiple blunt-backed blades and laminar tools' divisible into various levels:
 - I. *Bos del Ser* level: resembles the one at the site of Chatelperron.
 - II. *Laugerie Haute* level: with Gravette points.
 - III. *Bayacian* level: (Lacorre) between Lower Gravettian and Aurignacian.
 - IV. *Gravettian*: Gravette points. Sublevels:
 - 1. Noailles burins and angle micro-burins.
 - 2. Font-Robert points.

2) *Solutrean*

3) *Magdalenian*

Soler (1982) highlights that the term Aurignacian was chosen by Breuil and Cartailhac in 1906 as a homage to E. Lartet, who excavated the cave of Aurignac in Comenges (Gascoigne) in 1860 and classified the remains of that site as belonging to the Cave Bear Age. Breuil also created a more subtle division between the Mousterian and the Upper Palaeolithic industries, based upon the presence/absence of certain *fossiles directeurs*.

According to Harrold (2000), Breuil understood the industries as manifestations of shared tool making and other cultural habits, indicative of

some degree of shared culture. His proposals were synthesised in his 1913 paper, into a system of schemes, which framed the Upper Palaeolithic systematics. This regarded the Upper Palaeolithic as a virtual self-contained stage of culture history, produced by fully modern human beings. Prior to Breuil, the Transition had been thought to be just a passage from a lower to a higher cultural stage. In 1913, Breuil defined the Transition as the replacement of “Mousterians” (i.e. Neanderthals) by “Aurignacians” (i.e. anatomically modern humans), gradually and as an *in situ* progression (Harrold 1991).

Sackett (1991) outlined Breuil’s conclusions as follows:

1. The record does not show directional cultural evolution, except in the broadest sense.
2. Temporal changes represent successive contacts and mutual influences between several groups and replacement episodes.
3. The Upper Palaeolithic was not a unilinear sequence to any significant degree.
4. In comparing regional sequences, one should expect to find significant disparities.

D. Peyrony, a regional prehistorian of the Périgord, challenged Breuil’s formulation, in 1933. Peyrony had originally accepted that classification (1923), and related Aurignacian industries to an increasingly cold environment, through faunal and vegetational remains. Now, however, he drastically reorganised Breuil’s Aurignacian complex (Peyrony 1933) into two industrial traditions, behavioural expressions of two different races of *Homo*

sapiens, Combe-Capelle for the Perigordian and Cro-Magnon for the Aurignacian, evolving in parallel:

1) Breuil's Lower and Upper Aurignacian became the *Perigordian*, divided into stages:

a. *Perigordian I-III* (Lower Perigordian): blades blunted along one edge, curved to meet a straight sharp edge in a point (Chatelperronian knives), sidescrapers, endscrapers, mediocre burins on truncation and small worked bone pieces. Stages related to sites in this manner:

I. Chatelperron

II. Bos-del-Ser and La Ferrassie E¹⁹

III. Laugerie Haute

b. *Perigordian IV-V*, later increased to include VI and VII, suggested by F. Bordes (Upper Perigordian): Mousterian forms disappear, endscrapers decrease in number, burins show a great development (dihedral and angle varieties), blade points and retouched backed blades, Gravettian blades.

2) Breuil's Middle Aurignacian became his *Aurignacian*: divided into five stages:

I. Carinated endscrapers on thick nodules and flakes, nosed endscrapers, typical Aurignacian blades, on which endscrapers and burins can feature, strangled blades and flat bone points with split base.

¹⁹ The cryoturbation suffered by this level produced the long-standing and widespread misconception that presented the Lower Perigordian as a mixed industry.

- II. *Burins busqués* and flat lozenge-shaped bone points with a flat cross-section.
- III. Lozenge-shaped points with an oval cross-section.
- IV. Biconical points with round cross-section.
- V. Carinated and nosed endscrapers and high percentage of burins.

Peyrony was the first to suggest the presence of synchronous interstratified industries within the Upper Palaeolithic. It must be borne in mind that both Peyrony and Bordes thought the Perigordian to be a local French tradition, while the Aurignacian was intrusive from the east. According to them, the Lower Perigordian people survived the 'invasion' as a Middle Perigordian, and returned after the Aurignacian ended, as the Upper Perigordian. In the case of Bordes, his political ideas (he was well known for being a great nationalist) and his role in the French Resistance during the II World War may perhaps have influenced his perspectives and interpretations.

Peyrony considered sedimentological data and faunal remains as climatic indicators, yet he selected and discarded excavated items. He worked in the Périgord all his life, and only in his final years attempted to extend his scheme outside that area. Although he rejected de Mortillet's sequence, the industries attributed to his parallel phyla were ordered into rigid sequences whose stages correlated fairly narrowly with what he saw as specific regional zones (Sackett 1988a).

Breuil's publications (e.g. 1905, 1906, 1907, 1909b, 1909a, 1911, 1912, 1935, 1937, 1938) guided and shaped the practice of a new generation of researchers, the work of which have been called 'straight Archaeology' (Sackett 1981). One of these workers was D. Garrod, though she did not agree with Breuil on all points.

Garrod first coined the terms 'Chatelperronian' and 'Gravettian' in 1936 to replace Breuil's 'Lower Aurignacian' and 'Upper Aurignacian'; the reason for this is her belief that Peyrony's Lower and Upper Perigordian were not directly related as a part of a single developing tradition. It needs to be remembered, that these were originally applied on a wider regional scale than they are today, especially after she reworked her 1938 paper (Garrod 1953).

- ***The Bordesian Era*** (c.1950-1980): The most important point of this period is the innovation represented by Bordesian systematics. The Bordes and de Sonneville-Bordes and Perrot typologies (e.g. Bordes 1961, de Sonneville-Bordes and Perrot 1953) as such, will be studied in the second part of this chapter and will, therefore only be mentioned briefly in the present section. Other highlights were a more refined excavation methodology and a growing role for the sciences; they produced a significant increase in the degree of resolution of the archaeological record's analyses, a fact that benefited from the new habit of keeping all remains found. Chronostratigraphies began to be produced.

Underlying most of the thinking of this phase was *La méthode Bordes*. It was indeed a major new departure, as it produced a common descriptive language and moved systematics away from the use of stereotypes based on the dependence on *fossiles directeurs*, by using typologies and quantitative techniques.

However, all these innovations were combined with a clear but implicit conservatism; this can be appreciated in the acceptance of Peyrony's scheme by the Bordes (although they modified his view of the Perigordian II (de Sonneville-Bordes and Perrot 1955, 1954a, b, 1956a, b) and Perigordian III (Bordes 1958); they defended their views on the latter until Movius' work at Abri Pataud in 1960 (Movius 1977)).

F. Bordes' major contribution was his work on the Mousterian, a term defined by Bahn (Bahn 2001:303) as

“... first used for Middle Palaeolithic artefacts recovered from the lower shelter at Le Moustier (Dordogne, France), excavated by Lartet and Christy... then extended to include assemblages showing a high proportion of flakes, sidescrapers, points, occasional bifaces and the use of prepared-core techniques...dated between the late Riss and the late Würm glaciations (c.180-30,000 BP)...”.

Bordes' work on the Mousterian is only of passing interest to this thesis, but it is mentioned here because it is of fundamental importance to the development of many lithic classification schemes, and he adopted similar approaches in his work on the Upper Palaeolithic, often with his wife, D. de Sonneville-Bordes.

Bordes (1968b) distinguished the following facies or variants of the Mousterian:

- *Typical Mousterian*: with Levallois technique, handaxes only exceptionally, 20-25% scrapers, points, *limaces* are rare, no backed knives and a low percentage of notches and denticulates.
- *Charentian Mousterian*: two variants

- *La Quina*: high percentage (50% to 80%) of scrapers (simple, complex, bifacially retouched and transverse), *tranchoirs*, some endscrapers (carinated and nosed), scalariform retouch, no backed knives, no handaxes, numerous notches, relatively few denticulates and very little or no Levallois technique at all.
- *La Ferrassie*: a simpler subfacies of the preceding one (Bordes 1968b:101), its characteristics are identical, but with fewer transversal sidescrapers than La Quina variant, and long and flat Levallois flakes, and thus, presence of Levallois technique.
- *Denticulate Mousterian*: no handaxes, no backed knives, few or no points, 25% maximum of sidescrapers (often of poor quality) and very high percentage of denticulates
- *Mousterian of Acheulean Tradition*: two evolutionary facies (with presence of Upper Palaeolithic types of tools)
 - *Type a*: numerous triangular, cordiform and subcordiform handaxes, varied flake tools, some notches and many denticulates.
 - *Type b*: few and rather poorly made handaxes, few sidescrapers and many denticulates and backed knives (he saw this variant as the source of the Lower Perigordian, which he believed evolved at the same time that Neanderthals became anatomically modern humans).
There is an increase of Upper Palaeolithic types.

At one stage, Bordes suggested the 'Vasconian', as an additional Mousterian variant of N. Spain and the extreme south of France (Bordes 1968b).

G. Laplace (1957, 1961, 1974) accepted both Peyrony's two phyla, but argued that the Chatelperronian or Lower Perigordian represented the 'undifferentiated synthetotype' from which both the Upper Perigordian and Aurignacian phyla had emerged, after which they evolved into separate traditions, because it presents both Mousterian elements and *fossiles directeurs* of the latter ones.

Sackett (1991) regards Laplace's work as the apogee of the preoccupation with lithics, because he treated lithics almost as if they were evolving biological lineages. Typological classification was indeed the ultimate goal of Laplace's method, which will be analysed in the following section.

Another perspective on the Chatelperronian was that of T. Lynch (1966), a student of H. Movius, who after a careful review of the literature, concluded that it did not exist. He considered that the Chatelperronian of the sites of Le Moustier, La Ferrassie, Roc-de-Combe-Capelle, Trou de la Chèvre, La Quina and Grotte du Renne was actually a mixture dominated by physically contaminated Mousterian, that of Laussel, Gargas and Châtelperron impoverished Aurignacian, and the one of Fontenioux and Les Cottés just mechanical admixtures of Aurignacian and Mousterian layers. Nevertheless, his view was soon superseded by new excavation results, which presented more data supporting the existence of the Chatelperronian as a real technological stage.

- The Contemporary Era (c. 1980 onwards): Nowadays it is usually agreed that the Chatelperronian is a valid early Upper Palaeolithic industry, by virtue of

its lithic typology and technology, bone and antler artefacts and personal ornamentation items. Harrold (1981) characterises it as containing a high number of prismatic blades, Chatelperronian points, endscrapers, burins, retouched blades, sidescrapers, notches, bone industry and use of ochre. The main matters for debate concern its authorship and its relationship to the other Upper Palaeolithic facies, notably the Aurignacian.

An important point to bear in mind when studying the Transition is that 'Aurignacian' is the classification that has suffered the greatest number of changes throughout time, as reported in section 4.1; it is very likely that this situation is a major cause of the present lack of consensus on how to define this entity, pointed out by Davies (1999). The latter author shows that the ideas of five highly reputed scholars on what exactly constitutes the Aurignacian and how it can be divided are completely different.

In the sphere of terminology, only de Sonneville-Bordes, Delporte and Djindjian use the same words, but they have very different connotations. A clear example of this is the following: to de Sonneville-Bordes and Delporte, level F of La Ferrassie is Aurignacian I (called 'Ferrassie type'), while Aurignacian I for Djindjian is found in his levels K7, K6 and K5 of that site; for him, Peyrony's level F is Aurignacian IV, which for de Sonneville-Bordes and Delporte is only found in La Ferrassie's level H''.

Both Laplace and Demars use completely different terms, thus de Sonneville-Bordes and Delporte's Aurignacian 0 is Laplace's Protoaurignacian and

Demars' Aurignacian Ia. Their Aurignacian I is Laplace's Ancient Aurignacian and Demars' Aurignacian Ib and Ic (though here the disagreement is only terminological, since Demars uses the same sites and levels as they do); de Sonneville-Bordes and Delporte's Aurignacian II is Laplace's Evolved Aurignacian and Demars' Aurignacian IIa/b. From here onwards Demars uses the same terminology as de Sonneville-Bordes and Delporte, but the meanings are different. Laplace's Evolved Aurignacian (second stage), identified in La Ferrassie H'', is de Sonneville-Bordes and Delporte's Aurignacian III, but level H'' of La Ferrassie is Aurignacian IV for them, which in Laplace's terminology is called Final Evolved Aurignacian.

The above examples, to which more can be added, clearly demonstrate that Palaeolithic Archaeology research is far away from reaching a consensus on the meaning of very important terminological issues. This situation must be addressed, or at least acknowledged clearly when studying any aspects related to the Aurignacian before attempting to analyse concepts which hinge upon the basics, such as models of population dispersal (Davies 1999, 2001) and acculturation hypotheses (e.g. Zilhão and d'Errico 1999, etc.).

In 1968, F. Bordes listed the Aurignacian characteristic types as follows:

- fine blades, often with bold scalar retouch
- scrapers on the end of such blades
- burins (development of different types but never as numerous as during the Perigordian)

- special endscrapers on thick blades or small blocks with narrow fluted (lamelliform) retouch (carinated and nose-shaped, similar to La Quina type or La Micoque)
- strangled blades, especially during the early Aurignacian
- bone implements: awls, batons, pierced antler bars, smoothing tools, flat elongated spearheads with a split base

For Kozłowski (1990), the diagnostic elements of the Aurignacian are two:

- high lamellar transversal retouch
- lateral scalariform retouch

In the debate about the origins and earliest appearance of the Aurignacian in southwestern Europe, Zilhão and d'Errico (in Mellars 1999) synthesise the characteristics of Aurignacian technology as follows:

- production of large blades from single-platform prismatic cores shaped through extraction of crested blades
- careful preparation of blade cores by edge abrasion or faceting of the platform and systematic use of soft hammers; parallel-sided blades with lipped platforms are retouched into knives and endscrapers
- re-use of debris from prismatic core preparation and renewal (thick cortical blades are shaped as scrapers and burins).

For Rigaud (2001), it is the systematic production of bladelets from carinated pieces what makes the biggest difference, as the presence of blade production and even bladelet-like products in the Mousterian is nowadays well-known.

At present, the 'Protoaurignacian' mentioned by Laplace, is specifically characterised by Broglio (1996) as having:

- a strong bladelet component: abundant Dufour bladelets with bilaterally pointed and with a combination of direct marginal retouch and invasive, semi-abrupt and ventral retouch
- marginally backed pieces

these two points are considered affinities with the Aurignacian found in the Middle East, at *c.*36 ky BP.

The Contemporary Era also witnesses two other factors: increasing participation by American workers, who will usually question the epistemological basis of the methodology and the perspectives of research in Old World areas, and an increasing feeling of dissatisfaction with the Bordesian conceptual scheme, although the lack of a real alternative to la méthode Bordes has made many workers stick to it and overlook its shortcomings. According to Clark and Lindly (1991), the realisation that the local microtraditions posited by many European archaeologists require the existence of identity-conscious social units that have no known ethnographic counterparts is the main reason for the decline of typological systematics, as mentioned in chapter 2.

It is on *la méthode Bordes* and the alternatives that have been proposed and implemented in Iberian Archaeology that the next section will focus.

4.2. Typological Systematics

The literature is full of definitions of the term 'typology'. There are no two authors who are in complete agreement on how to define it, and what its ultimate goal is supposed to be. The kinds and numbers of typologies are just as many.

This section deals with the systems applied to the study of the Iberian Palaeolithic, with special emphasis on the phenomenon of the Transition. After a few general considerations on typological systematics, the main four theoretical systems used by researchers to study the Transition will be summarised and discussed. This part is organised historically: first *la méthode Bordes* and de Sonneville-Bordes and Perrot's system, then, Laplace's Analytical Typology and lastly the Logical-Analytical system used by Carbonell and others, so that their gradual introduction and adoption by the workers in Iberia can be described at the same time.

Following the theoretical analysis, the application of the different systems to the study of the upper most layers of Abric Romaní will be reviewed and the different results compared. The final section concerns the work of the author in relation with the typological analysis of those assemblages. This will precede the concluding remarks to this chapter.

Chang (1967:71) wrote that archaeologists spend between 80 and 90% of their time classifying materials. This systematic arrangement of remains into types and subtypes

based upon specific attributes, which will depend on the particular research goals of the classification is what we call a Typology. Odell (1981:321) highlights the fact that its objective is the summarisation of data for descriptive purposes; at the same time, it facilitates the study of the assemblage and the comparison between types within a group or against different sets of similar materials. Both Andrefsky (1998) and Bahn (2001:457) stress the role of typologies in relation to the formation of chronologies and culture history.

Although the attributes that will form the core of the system are determined by the needs and the professional training of the researcher as well as the type of study to be carried out, all typologies share the following characteristics:

- They must be replicable
- There has to be a set of methodological norms to administer the criteria that determine which specimens are included in each type

One of the arguments related to the issue of typologies divides scholars between those who think there should be regional systems for each kind of objects (e.g. Eiroa et al. 1999, Cahen and Van Noten 1971), and those who think that a universal typology is the answer to the problem (e.g. Bordes 1971:212, Bisson 2000).

Lithic typologies can be divided in two categories:

1. Morphodescriptive: this type does not consider functionality to be as effective a determinant as fashion and style as regards the design of the pieces. Examples of this category are Bordes (1961) and de Sonneville-Bordes and Perrot's (1954a) typologies.
2. Morphotechnical: the techniques to manufacture the pieces and also their use (Heinzelin 1962) are the main focus. This group includes the Analytical typology of Laplace (1974) and the Logical-Analytical system of Carbonell, Mora and Guilbaud (1983).

The following lines will focus on the methodology and philosophical principles involved in each of the four (counting Bordes' typology and de Sonneville-Bordes and Perrot's typology as two different systems) most frequently used systems in Iberia. Although many know Bordesian systematics to perfection, brief explanations of the two typologies are included here to highlight the main aspects, to facilitate the task of those who are not so familiar with that variant and to provide some balance to the section.

4.2.1. *La Méthode Bordes*

F. Bordes (1968b:22) defined typology as follows:

“... science that makes it possible to define, recognise and classify the different varieties of implements encountered in prehistoric deposits. It is a difficult but indispensable discipline”

His typology for the Lower and Middle Palaeolithic was developed during the end of the 1940s and throughout the 1950s, and its goal was to provide a system to describe and statistically and graphically compare assemblages on the basis of their entire lithic composition, therefore eliminating the need to use the *fossiles directeurs* on which his

predecessors had based all previous classifications. According to Bordes (1968b), his method takes into account the totality of artefacts, and not only a few *fossiles directeurs*. This is not actually true: it must be stressed that cores, unretouched flakes and blades and other debitage pieces are not considered to be tools, and thus, are not counted (Merino 1980).

Debénath and Dibble (1994) highlight three essential principles of the method:

1. The number of objects should be a minimum of 100, and it is best if it is around 300 (because of the indices' calculations and the importance of percentages).
2. The assemblage should not be affected by biases in recovery or curation.
3. The assemblage should represent a homogeneous depositional unit.

Bordes defined a total of 85 types in three groups (62 tools on flakes, 15 bifacial tools and eight types of cores), and listed them in a certain order which remains constant and allows the production of cumulative graphs, which were thought to be the best to indicate general trends: in the independent coordinate axis there is the aforementioned list, and in the dependent coordinate axis the percentage values of the types. Calculating each percentage and adding it to the previous, thus ending always in 100%, the percentages of the different types are plotted in the graph.

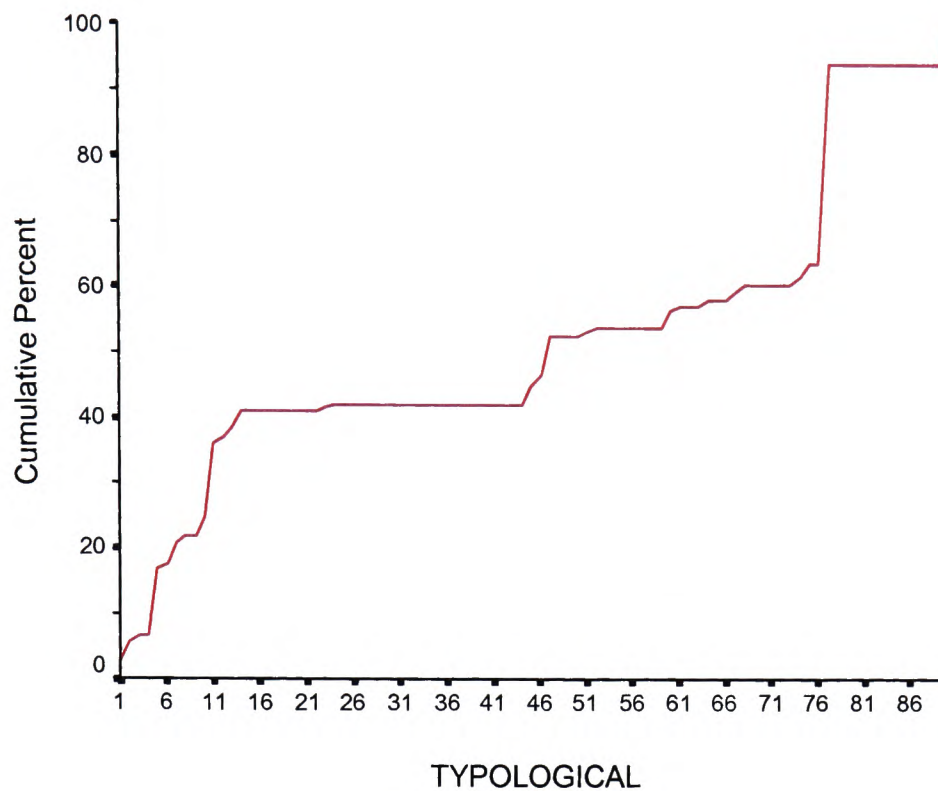


Figure 15: Cumulative graph of the Corominas collection from Reclau Viver.

He believed assemblages were characterised in three different ways: by the types represented, their relative proportions and the techniques used to make them. The way in which he organised the analysis was the following: first, technologically depending on if the pieces were Levallois or not, then according to the type of blank (flakes, blades or points) and finally by the type of platform. Then, tools were grouped into the types of the list mentioned above, and the graphs produced. Two types of count – and therefore of graphs – were obtained: the real one (63 types, all of them but the handaxes, which were on a separate list) and the essential count (also excluding the Levallois pieces and slightly retouched flakes).

The precise shape of the ascending line of the cumulative graph allows comparisons with other assemblages and is itself seen as diagnostic, in the case of the Middle Palaeolithic, of the kind of Mousterian facies to which the assemblage belonged. Depending on which kind of line is obtained, the assemblage is classified as Quina/Ferrassie type, Typical Mousterian, Mousterian of Acheulean Tradition (type a

or b) or Denticulate Mousterian. Bordes thought that these reflected cultural differences among different groups or tribes, which coexisted in the same areas but did not influence each other to any considerable extent. He swiftly dismissed criticisms to this hypothesis as well as any other attempts to explain the variations (1968b:146-149), such as Mellars 'evolutionary hypothesis' (1969) and Binford and Binford's functional explanation (e.g. Binford 1973).

Bordes also designed typological and technological indices of aspects such as percentage of pieces manufactured by Levallois technique, percentage of scrapers, of Quina type scrapers, backed knives, etc. They are graphically represented by proportional rectangles. Technical indices reflect technological characteristics such as the importance of Levallois technique, blade numbers and faceted platforms.

To sum up, Bordes's method brought order to the mid-20th century chaos of Lower and Middle Palaeolithic Archaeology, and provided a common descriptive language. It also got rid of *fossiles directeurs* and achieved standardisation and replicability, which provided the system with an aura of objectivity, and masked its flaws for several years (Bisson 2000).

Bordes' statistical method was adapted to the Upper Palaeolithic by de D. Sonneville-Bordes and J. Perrot, in 1953. Their typology's chronological span covered the period from the Lower Perigordian (or Chatelperronian) to the Azilian. de Sonneville-Bordes used it in sites of the Périgord, Corrèze, Haute-Loire and Lot departments; Perrot applied it to certain Near Eastern sites.

Another type list was created, this time with 93 types, and cumulative graphs with a descriptive objective produced. Nevertheless, it is crucial to bear in mind that this system does not constitute a simple extension of the Bordes' method. Harrold (1991) stresses that it was devised to detect well-differentiated types and *fossiles directeurs*, which were used because of their short-lived existence and also because they are well-defined chronologically in the framework of a culture (Gamble 1990:149); thus this variant's objective was the differentiation not of contemporaneous population groups, but of the chronologically successive traditions along the Upper Palaeolithic. The *fossiles directeurs* identified by these authors were:

- bone/antler Aurignacian points
- Noailles burins
- Font-Robert points
- Solutrean points
- Upper Magdalenian points
- antler Azilian harpoons

This system also requires non-selected, homogeneous collections, and a minimum of 100 pieces, for significant results to be obtained, and it works best with more than 200 (de Sonneville-Bordes 1960:26). Only typological indices were taken into account: endscrapers, burins, perçoirs, dihedral burins, burins on retouched truncation, and Aurignacian endscrapers.

The most important contribution of Bordesian systematics is that they provided a lingua franca for typologists. The thorough independently conceived studies of assemblages were transformed into explanations about the Palaeolithic materials which other authors were able to understand and repeat. Despite being considered a

fundamental leap forward, however, they also had several shortcomings, which have been highlighted for over 20 years now (e.g. Fish 1979), yet not a great deal has been done to solve this problem. Many scholars have criticised a number of aspects of the approach or indeed of the method itself as a whole, but only in exceptional cases has further work been carried out to find alternatives. Criticism, according to Bisson (2000) exists on two different levels:

- Subjectivity: the classification was based solely on morphology, and the similarity among the tools was defined intuitively, built on Bordes' expertise (e.g. Mellars 1982:238), the 'typological eye' required according to Bordes (1971), and the discrete differences in type of frequencies. Intuitive classifications by different scholars led to inconsistency (Djindjian 1977, Dibble 1987, Barton 1988, Rolland 1981, cases of reported inconsistencies can be found in Jelinek 1976, Fish 1979, Dibble and Pelcin 1995).
- Theoretical issues, the following are outlined:
 1. differences between description and classification.
 2. role of typology in archaeological research (Sackett 1991, Bisson 2000).
 3. relationship between types and hominids' behaviour and cognition (Mellars 1996c, Bisson 2000).
 4. relationship between morphology and material and environmental constraints (Mellars 1996c).

Debénath and Dibble (1994) suggest that many workers carry on using this system out of respect for its historical importance. Perhaps it is important to highlight what Sackett (Sackett 1988a) proposes, which is to stand on Bordes' shoulders and move on, rather than remain in his shadow.

In Iberia, *la méthode Bordes* was considered 'the reality', and data had to be adjusted inside its framework. The "chronocultures", as Estévez and Vila (1999) call the Aurignacian and other industries, were already known and defined, according to the southwestern French record, so the only thing left to do was to identify them in the Iberian record.

Any deviation from, or criticism of, this orthodoxy was harshly attacked and dismissed; a good example of this is the evaluation of Laplace's doctoral thesis by E. Ripoll (Estévez and Vila 1999) as 'methodological, chronological and geographical confusion'.

Nevertheless, some established scholars did point out that Bordesian systematics were far from perfect (e.g. Maluquer de Motes 1963:21) rejected the identification and classification of cultures formulated from the lithics). Moreover, the closed character of the type list forced those workers who had problems classifying pieces which they considered important to explore alternatives to *la méthode* (Fullola 1979), or even to create their own type lists (Villaverde 1984). However, these authors were just exceptions, and the vast majority followed the imposed system, which spread all over Europe.

4.2.2. The Analytical Typology of Laplace

G. Laplace (1974) wrote that 'typology', a word coined in 1841, really means the science of the human types, considered from the perspective of the relationships between organic and mental characteristics, and in the sense concerned with

Prehistoric studies, the science of type elaboration which facilitates the analysis of a complex reality and the classification (systematic or taxonomic).

The Analytical Typology was the response to the need for a rational and systematic perspective of the objects, beyond the simple empirical observation of their morphology (Laplace 1974). He considered the Bordesian method to be empirical or spontaneous, and thus, opposed to his rational and systematic approach.

This system is closely linked to the hypothesis devised by Laplace to explain the technological change represented by the 'first laminar industries' (*sic*) (Laplace 1966b), which he called the "Aurignaco-Gravettian Synthetotype". This is the name of the process of industrial evolution, from a basic polymorphism with a tendency towards a typological enrichment, which accelerates during the Chatelperronian, the base from which the early Upper Palaeolithic complexes would have evolved. It has three stages (Undifferentiated Aurignaco-Gravettian Synthetotype/Pre-apogetic stage [phases 1, 2 and 3], Differentiated Aurignaco-Gravettian Synthetotype/Apogetic stage [phase 4] and the Final or specialisation stage [phase 5]) (Montes 1988):

1. *Relative Immobility* (Acheulian and Mousterian): typical assemblages are stable (sidescrapers, points, denticulates and bifaces) and the introduction of new types of tools is very rare.
2. *Abrupt Acceleration* (Mousterian of Acheulian Tradition type B): while the Mousterian traits decrease, there is an intake of several new tools, such as burins, endscrapers and backed pieces, as well as laminar pieces.
3. *Undifferentiated Synthetotype* (Archaic and Ancient Chatelperronian, evolved from a 'regressive' Mousterian of Acheulian Tradition with a high number of

denticulates): new tools are established and their increase accelerates. This is the source of forms which will be characteristic of the Aurignacian and Gravettian complexes.

4. *Differentiated or Evolved Synthetotype*: new techno-complexes are segregated (carinated endscrapers groups, backed points groups, laminar groups, denticulate regressive groups and leaf point groups in Central Europe) although some types are lost.
5. *Specialisation and perfecting phase*: some types are lost, but those selected become increasingly perfected. This is the origin of the Aurignacian *sensu stricto*, as well as the Proto-Gravettian, Gravettian and Epigravettian complexes.

According to Laplace (1961), these different phases are triggered by climatic oscillations, which produce changes in the balance of the environmental physical and biological conditions.

The Analytical Typology was primarily designed to study Upper Palaeolithic assemblages (Bisson 2000), despite Laplace's (1966b) own words:

“Tel est le projet de la typologie analytique qui s’efforce d’élaborer une terminologie valable pour tous les ensembles industriels, indépendamment de leur âge et leur distribution.”²⁰

It revolves around a type-list of 105 primary types, some of which may be combined, thus extending the number ever further. This typology emphasises the differences in retouch characteristics, which differentiate six separate modes: simple, abrupt, flat, elevated, burin and scaled, from which the typological orders are organised:

²⁰ “Such is the project of the Analytical Typology, which strives to create a valid terminology for all the assemblages, independently of their age and their location”.

1. *Simple/Flat retouch*: sidescrapers, points, endscrapers and denticulates.
2. *Abrupt retouch*: abrupt pieces, truncated pieces, perforators, backed points, backed blades, backed double points, truncated backed points, truncated backed blades, bitruncated pieces.
3. *Plain retouch*: leaf types.
4. *Carinated/Elevated retouch*: carinated sidescrapers, carinated points, carinated endscrapers and carinated denticulates.
5. *Burin retouch*: burin types.
6. *Scaled retouch*: Scaled types.

Each type in these orders has one to three letters, e.g. sidescrapers are “R” (for *racloirs* in French), backed points are “PD” (for *pointes à dos* in French) followed by a number or a letter, depending on particular retouch characteristics (in the case of Truncations: T1 is a truncated piece with a marginal retouch, T2 is a truncated piece with a invasive retouch and Tx is a truncated piece with a ‘*Piquant Trièdre*’ retouch. This is followed by another number, which refers to the type of edge: a T11 is a truncated piece with marginal retouch and a straight edge, a T12 is the same but with an oblique edge and a T13 has an angled edge.

Laplace differentiated four diagnostic indices, derived from de Sonnevill-Bordes and Perrot’s system (1953): of primary types, of composite tools, restricted of primary types and of typological groups or families. He also had two technical indices: laminar of primary types and of microlithism.

The system was first published in 1964 and later modified in 1972, so users must be aware that there are modifications to take into account and should employ conversion

charts such as those provided by Merino (1980:232, 237, 165, 227, 311, 387, 419). A fundamental criterion for the correct application of this method was that a representative sample is needed. This does not refer to ensuring a determinate number of tools, as in the Bordes' system, but to considering the record as a palimpsest of human activities during a specific period, defined by a causal element. This is the reason why Laplace related stratigraphy and evolutionary stages to environmental factors, which would have affected human occupation.

Apart from being condemned by those who regarded Bordesian systematics as the orthodoxy in typological classification (see Ripoll's comments above), Laplace's method has also been criticised by many authors because of several internal factors.

Bisson (2000) considers this method to be abstruse, and more difficult to apply than the Bordesian one. The terminology (examples already mentioned) is a clear example of the increased level of complexity, which inhibits the use of the system as a *lingua franca*.

Milliken (1991) highlights that the system allows no room for morphological variations which may have occurred during the life of a tool, something which also applies to Bordesian systematics (pointed out in that case by Jelinek (1976)). She stresses that focussing on the similarities between objects leads to the suppression of vast amounts of information, by merely summarising the variability among artefacts and reducing the numbers of dimensions of variability that ought to be taken into account to those specified by Laplace.

It is important to highlight that this method does not really signify a radical departure from *la méthode Bordes*, as Laplace implies (1974:92), since many aspects, such as the indices that he uses, are re-worked from Bordesian systematics.

The Laplace system's complexity seems actually to have helped the increasing popularity of the Bordesian method in Spain, and thus, Laplace's earliest publications were completely ignored and remain largely unknown even to present Analytical Typology users. Nevertheless, in the early 1970s, Catalan amateurs and university students requested the assistance of foreign professionals, to top up Prehistory university courses, considered by Estévez and Vila (1999:159) to be 'obsolete and useless'. In France, both de Lumley and Laplace agreed to help. Laplace organised a colloquium in Morella (Castelló)²¹, similar to those he used to hold at Arudy (French Pyrenees), where he personally explained his method. This was a turning point for many workers and university students, who – mesmerised by Laplace's personality and troubled by the beginning of criticisms arising against the Bordesian method – began at last to apply his system instead of that of Bordes.

The main type of graph used by Laplace is the bar chart, yet in papers like the one on Abric Romaní or in monographs about how to apply his method, he does not include any diagrams, and that makes it difficult to appreciate the role of these figures within the classification.

²¹ The exact date is unspecified by Estévez and Vila (1999).

4.2.3. The Logical-Analytical System

The last system to be explained in this thesis was created as a solution to the inability of the previous systems to consider lithic objects as something dynamic. Until its invention (Airvaux 1987, Carbonell et al. 1983), typologies had characterised lithics as static and inert systems, and had focused on their aesthetics and morphology. Carbonell et al. (Carbonell et al. 1983) considered the language used as uncritical, and the descriptions illogical.

The Logical-Analytical System focuses on time, and how technology and tool are related inside the chaîne opératoire; this gives the system the possibility of being universal, because these elements and their interaction are present at any time. The evolution of any object takes place according to the tripolar dynamic among three elements:

- Functional: way in which the object is/was used
- Morphotechnical: shape of the piece
- Potentiality: theoretical ability of intervention²²

The hierarchy among these three elements varies in time; the change takes place through the 'Transfer' concept, depending on environmental and human conditions.

Historically, Carbonell *et al.* divide time in three periods:

1. Bio-functional period: spontaneous production of tools.
2. Bio-morphotechnical period: systematic forms are repeated with the appearance of precise morphological elements.
3. Bio-potential period: potentiality to obtain shapes from abstraction.

²² This term is not explained further by the authors.

However, it is unclear what chronology is associated with each of the aforementioned periods.

Regarding the Morphotechnical element, the process by which a natural object becomes a human-made entity is the following: a basic unit (Ba) in time 0 (t_0), is divided into two or more objects in time 1 (t_1); each of these can be either positive or negative (positive if it is an object detached from the main unit, negative if it is the main unit after action), thus the BP1aG (positive bases of 1st generation, after *base positiva de primera generació* in Catalan) and BN1aG (negative bases of 1st generation) are created. If work proceeds to a time 2, and if working on a BP1aG, this becomes a BN2aG (negative base of 2nd generation), and yields BP2aG (positive bases of 2nd generation), and so forth.

It is not explained how to differentiate between positive and negative bases of 1st generation, if worked through a technique other than knapping with a hard/soft hammer (e.g. splitting it in pieces by throwing the core at something) or what happens if work progresses on the negative base of 1st generation after t_1 . Further problems arise when studying a prehistoric assemblage: BN2aG must be distinguished from BN3aG, BN4aG, etc. This makes the 'time as the main determinant' concept lose all its explanatory power.

The system of analysis is the following:

For the Morphotechnical elements, negative bases and positive bases compose any assemblage. The first group is divided between negative bases of production (BNP)

[cores]²³ and negative bases of configuration (BNC) [retouched pieces]. BNP are studied to determine several traits:

- at the object level:
 1. number of interaction surfaces [platforms]
 2. location of platforms
 3. continuity of interaction edges
 4. sequence of production
- at the structural level:
 5. configuration mode
 6. characteristics of retouch
 7. centripetal character
 8. obliquity [of angle]
 9. depth [extent of angle]
 10. continuity [of retouch]

The BNC are analysed following Laplace's system, explained above, for the retouch characteristics (mode, depth, direction, delineation [continuity] and morphology) and applying the indices of length and elevation [smallest retouch divided by the thickness of the piece].

Positive bases, pieces that have not suffered any extraction on their volume [unretouched flakes or blades], are analysed as one single category²⁴, and the only differentiation in this section depends on whether the platform is present [what can be determined in a complete piece or if the proximal part is present but these are

²³ Parts within square brackets are personal explanations by the author, not included in Carbonell *et al.* works, and are added for clearer understanding of their method.

²⁴ This is due to the difficulty of establishing discriminatory criteria for the type of interaction by which they were produced.

undifferentiated] or not [reworked area in a complete piece or sole presence of distal and/or central parts of a broken item, undifferentiated]. The characteristics studied in these types are the following:

- Platform of interaction

11. Corticality²⁵

12. Type

13. Transformation

14. Delineation

- Dorsal face

15. Corticality

16. Dorsal scars

- Ventral face

17. Delineation

18. Bulb

- Sections

19. Transversal

20. Sagittal

The orientation of the pieces is also different from that usually found in other typological systems: the widest part of the object is placed at the bottom, and description begins on the most heavily worked side of the piece, whichever that may be.

²⁵ Amount of cortex present in a piece or a particular area of it.

The Potentiality of the element is established through one out of three geometric models (thus limiting the variables that may characterise a piece to only three). And the Functionality aspect is left to Microwear research techniques.

This typology has been applied in several sites like Rota I (Cádiz) (Carbonell and Canal 1981); in Catalunya, it has been used in the study of the terraces of the Ter river, Puig d'en Roca Excavació (Palli 1976), Puig d'en Roca III (Canal and Carbonell 1979, Serra 1981), Cau del Duc de Torroella de Montgrí (Vert 1977) and Abric Romaní (e.g. Vaquero 1992), as we shall see below; in France, it has been employed at La Llabanere (terraces of the Tet river) (Collina Girard 1975), La Butte de Foure (Collina Girard 1975) and Lazaret (de Lumley 1969, 1979).

The difficult terminology, abundance of acronyms and other problems associated with this system are obvious. Perhaps less clear, but equally problematic is the fact that morphological variability of the negative bases, according to Carbonell *et al.*, is the result of several factors: intraspecific variability (technical, social, economical etc.) and structural variability (location of the object in the temporal sequence and its function). In the latter, changes to the volume and the morphology of the piece are caused by exploitation and creation (*sic*) respectively, and thus, similar objects can belong to different categories. The researcher has to choose which one predominates, a difficult or impossible task if dealing with other than experimental collections, created in his/her presence; this results in the attribution of the objects to one or another category by inference, and as a direct result of this the subjective character that the authors tried to avoid and suppress from the start, is introduced in the system.

It is regrettable that the authors do not offer further information about how their diagrams are constructed (e.g. see Vaquero 1992) or what their real use is, as that would enable other workers to apply their methods, should they wish to do so.

There have been other attempts to create new organisational methods (e.g. Bisson 2000, etc.), but none of them has been successful in achieving greater objectivity without losing intelligibility and precision, which is the base for creating a way of communicating with colleagues easily. When a satisfactory system of this kind exists, and is regularly used, a *lingua franca* develops. This sole trait is the key to the persistence and survival of *la méthode* Bordes, and those who have attempted to develop new methods to replace it seem never to have succeeded in preserving the ease and clarity at the centre of Bordesian systematics.

4.3. Typological Analyses of Abric Romaní's Transitional Layers

This section is divided into two parts. First of all, a review of the application of the systems described above to the study of Abric Romaní by the different researchers who have worked at the site, or have included it in their studies, will present a comparative example of the practical application of different typological systematics to the study of the same assemblages.

This part follows up the section which described the history of Abric Romaní and its collections in chapter 3, where events were explained chronologically and in detail, so, here the focus is on works specifically concerning the typological analyses of layer 2 and layer 4.

In the second part, the results of the typological study performed during this research are presented. This has been done using a Bordesian perspective, mainly because it was considered crucial to provide the clearest possible understanding for readers by means of the lingua franca that is provided by the system, something which the alternative typologies have clearly failed to produce. In the first instance, the possibility of presenting the results in all four systems analysed above was considered, but there were many difficulties in applying the Analytical Typology using the drawings of the back of the LRF, without having the actual pieces at hand. To apply the Logical Analytical Typology can be easily done by sorting data in Excel files dividing them into cores, unretouched pieces and retouched ones, but the generalised character of this typology and its terminology, and the impossibility to differentiate between generations proved not only confusing, but also time-consuming and unable to generate results.

4.3.1. Published information

The following part is a review of the different typological analyses which have been performed on the Transitional layers of Abric Romani, organised in four different subsections, chronologically and grouped by the typological systematics used by different workers, as studied from the literature. It gives concrete examples of the use of each of the theoretical methods outlined in section 4.2. and the fact that they were applied to the same assemblages – although the number of pieces varied – will allow a final part with concluding remarks from an overall comparison, both theoretically and practically.

4.3.1.1. The work of Amador Romaní and L.M. Vidal

The methods and analyses of the first excavators at the site can be reconstructed from the following papers: Vidal 1911, Romaní 1917a and 1917b and the publication of Romaní's excavation diary by Bartrolí *et al.* in 1995.

Vidal followed what he called the 'de Mortillet' classification, which he defined as:

“... the Mousterian epoch was followed by the Solutrean, preceded by a Transitional epoch called Aurignacian, and in the end, there was the Magdalenian.” (Vidal 1911:280)

Bartrolí *et al.* (1995:66) understand this to signify the traditional de Mortillet's order, which would place the Aurignacian right before the Magdalenian; however, a closer reading of Vidal's explanation does clearly indicate otherwise. The author takes the view that 'de Mortillet's order' means the use of archaeological terms, as opposed to Lartet's faunal stages. This is backed by the fact that, by the time when Vidal wrote the paper, Breuil's publications challenging de Mortillet's hypothesis were already widely spread, and also by the fact that Cartailhac, who strongly opposed de Mortillet's perception, as seen in part 4.1. corresponded with both Romaní and Vidal, and did study the materials from layer 2 himself, something which he might not have taken the trouble to do if he thought that the researchers working at the site did not share his thinking.

Vidal classified the Abric Romaní uppermost archaeological layers as Magdalenian (layer 2) and Mousterian (layer 4), explaining that the lack of Solutrean remains between them must have been due to the fact that the Solutrean did not spread towards certain areas in Europe and, quoting Frapoint (no reference included), he

mentioned many cases in France, Belgium, Germany and Britain where there were Magdalenian deposits directly on top of Mousterian layers.

In the last footnote in his 1911 paper, however, Vidal mentioned a meeting with E. Cartailhac, who, having examined Abric Romani's materials, thought they ought to be classified as Aurignacian, because of the abundant shells, rather than because of the tools found there. Vidal admitted that Cartailhac's opinion was that of an expert, and should be mentioned and taken into account, yet he decided to keep his own conclusions, stated in the previous paragraph.

According to Vidal (1911), the Magdalenian deposit was below 2m of red soil, containing a femur of a large bovid, possibly from a modern burial; the Magdalenian level was some 50cm thick, and underlying it there was a stalagmitic crust, 40cm thick, except inside the northern cave, where layer 2 and layer 4 were in contact.



Figure 16: Examples of personal ornaments from layer 2 at Abric Romaní.

Layer 2 included (Vidal 1911:275): several flint ‘knives’ of a maximum length of 8cm, with thin edges and rounded tips, blunted by use. There were also small ‘leaves’, mostly measuring 2cm long and 4mm wide, likely to be the products of knapping. Many cores were also found.

There were also bone objects, like an awl made from deer antler, a 17cm horse bone barely worked and a scapula from which a thin needle had been detached. Other objects included a few *nummulites atacica* (a lower tertiary fossil), some flint ‘disks’ (proximal fragments of flakes or blades), a small flint pendant and perforated marine shells: many *Cypraea pyrum* Linneus (see figure 1: the first two from the left), abundant *Nassa reticulata* Linneus, *Nassa mutabilitis* Linneus, *Neritula neritea* Linneus, a *Mitra striatula* and a *Pleurotoma undatiruga*. There were also fish vertebrae from the species *Salmo* and *Trutta*, also perforated (see below) and an ochre fragment.



Figure 17: *Salmo* and *Trutta* vertebrae worked to make personal ornamentation.

He described layer 4 as containing ‘a great quantity of flints’ (Vidal 1911:277), as being separated from lower deposits by another stalagmitic crust, also as being absent in the northern cave. Those flints were described as triangular, some having one or two retouched edges, but the vast majority unretouched. There were also several river pebbles (4-9cm in diameter), typical Mousterian points, discoidal and rectangular endscrapers, broken ‘knives’ and retouched points, interpreted as weapons.

In 1917, Romaní published a paper on some materials from the site and a guide to the Museum where he was working at the time, which also contained information about several objects from Abric Romaní, exhibited there, and apparently donated by him to that institution.

A detailed reading of his Catalan Sciences Institute paper (Romaní i Guerra 1917b) renders somewhat equivocal its inclusion in this review, as Romaní describes several flints (mainly discoidal flakes) and a few worked bones obtained by himself, after the

first excavation period and the collaboration with Vidal had finished, but there is no stratigraphical attribution of these objects to any specific layers, only a reference (1917b:209) saying that they belong to the four uppermost layers of the site. This would mean layers 2, 4, 6 and 8, and thus it was decided not to take account of the information given in this paper in the present review as it is not possible to separate any materials from the Transitional layers from those from the rest.

In the guide to the Museum of Vilanova (Tarragona), Romaní did not include any information on the excavation works, but described the site at length and the remains found in the upper layers (2 and 4). He mentioned (Romaní i Guerra 1917a:23) the perforated *Cypraea* shells, the ochre remains (note that there was more than one piece), a human femur (which led him to think that the northern cave may have contained a Palaeolithic burial, disturbed by hyenas, because there he had found several coprolites), thin flint 'knives', other less typical forms, also on flint and faunal remains of extinct species.

Romaní thought that the industry in the upper layer did not have a very definite character to determine its 'palaeoethnological level', but because a few Mousterian fossils directeurs had appeared in that layer (Romaní i Guerra 1917a:24), he thought it wise to keep its age close to the Mousterian level, to which layer 4 was attributed. Although he knew there were a few examples of bone-working tools, he did not consider that they were enough to "reduce" the age to that of a later Palaeolithic stage.

Because of the further inclusion of a chronological table including divisions in geological terms, Lartet's Ages and industrial terms in the same paper, where the

Upper Palaeolithic was divided as: Aurignacian, Solutrean and Magdalenian, it can be understood that Romaní decided to assign an Aurignacian character to level 2. The indirect and somewhat rhetorical style in which he did so could have been caused by the different opinion expressed by Vidal, earlier, and the fact that the latter was the expert and Romaní just an amateur. However, Romaní would have been aware of Cartailhac's suggestion, not only through Vidal's paper but also through direct correspondence, and Vidal's collaboration had long since finished, when this paper was published.

The remains on display at Vilanova were the following: three perforated *Cypraea* shells (only two were left in 2001) from level 2, six flint 'knives' also from level 2, between 18 and 80mm long and retouched (all present at the time of this study), 10 flint flakes from lower levels (unspecified, and not included here), and one fragment of petrified sediment, containing flints and bones from an unspecified stalagmitic layer, in contact with 'one of the lower layers'.

The aforementioned papers lack any kind of typological classification, beyond the enumeration and listing of the most characteristic types found, especially if they could be identified as *fossiles directeurs* and also faunal remains.

Another source of information is the excavation diary of A. Romaní, published in 1995 by Batrolí et al. The book contains a biography of Romaní framed inside the socio-political context of Spanish and Catalan history and the early developments of the study of archaeology as well as those of theoretical systematics. It must be borne in mind that the site was discovered when *la bataille de l'Aurignacien* was at its peak,

and this surely affected the chronocultural attributions that both Vidal and Romaní made, as explained above.

Other aspects of this publication include the discoveries and progress of Palaeolithic studies and excavations, mapped out chronologically, which is helpful to put the developments at Romaní in context, and Romaní's complete bibliography is included too.

Nevertheless, it is important to keep in mind that the writers belong to the team which is currently digging the site, and they not surprisingly show a certain bias, which is indeed acknowledged in some chapters (e.g. 'Analysis of Research, a valuation from 1995', etc.), but in fact extends rather further, as when they discuss the terminology and type names used by Romaní and Vidal, considering them inaccurate (against the information provided by the Logical Analytical System):

“... the frequently mentioned *endscrapers* seem to correspond to the unretouched positive bases (*sic*)...” (p.65)

The final part of the book is a reproduction of the excavation 'Atlas'. Approximately, 20% of it is dedicated to Romaní's work at Abric Romaní, and the rest includes information about other sites, in the Capelló cliff and beyond, geological and geographical studies and even notes on genealogy (Bartrolí *et al.* 1995). The most important pages for this research are those containing stratigraphic sections sketched at different moments of the works, yet unfortunately these do not date back to the precise moment when the work was being carried out, but were compiled later, from the notes that Romaní would have taken in the field, in another type of notepad, more handy and manageable. This means that we have a larger amount of pictures, coloured

illustrations and clearer notes, while as it is, small yet crucial spontaneous or minor details are lost to us, as they were not included in the final version.

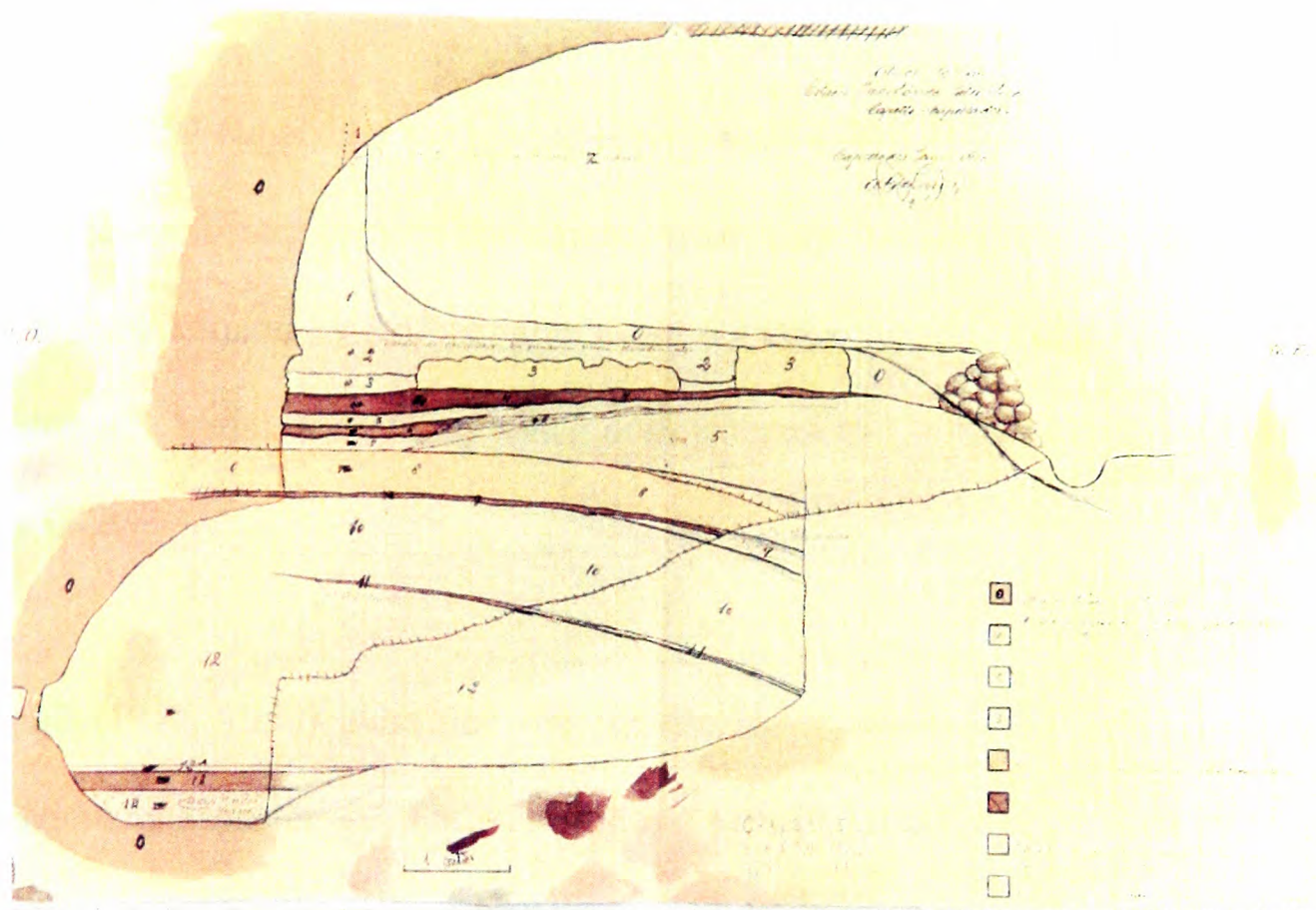


Figure 18: One example of the drawings included in A. Romani's diary (from Bartrolí *et al.* 1995)

4.3.1.2. Excavations by Ripoll and collaborators

Published information about the works of Ripoll and his associates from 1956 to 1962 comes from three main papers: Ripoll 1959, de Lumley and Ripoll 1962 and Ripoll and de Lumley 1965.²⁶

Ripoll and de Lumley (Ripoll and de Lumley 1965, de Lumley and Ripoll 1962) applied the classical Bordesian system to analyse material remains found at Abric Romani. Because layer 2 had been almost entirely excavated prior to the start of their research, they focused on the Mousterian layers, and work on the remnant sections

²⁶ Papers by Laplace will be discussed separately, because this author used a different typological system.

left by Romaní was only carried out in 1959, by Laplace, when one of them was excavated, and in fact proved to be sterile.

Ripoll's 1959 paper is a very brief notice regarding the early stages of the work he directed, the former uses of the shelter, prior to the discovery of the site and a list of the materials found by Romaní and Vidal. He takes for granted that the northern cave contained a burial, something which both Romaní and Vidal had only mentioned as a possibility.

Ripoll (1957, 1959) classified the Mousterian of Romaní (as a whole) as a 'final Denticulate Mousterian', because 'it has a very high percentage of denticulate pieces – endscrapers, blades and many flakes – with the typical abrupt Mousterian retouch'.

De Lumley and Ripoll's 1962 paper is a substantial work on Abric Romaní (accompanied by a note on Abric Agut), which was translated into Spanish and subsequently included in Ripoll and de Lumley's 1965 paper, which focused on the Palaeolithic archaeology of Catalunya in general, and described several sites and their assemblages in detail, Abric Romaní being one of them. These two papers contain the definitive stratigraphic sequence of the site, originally outlined by Vidal, and their illustration has been used by the rest of researchers who have worked on Abric Romaní in later years.

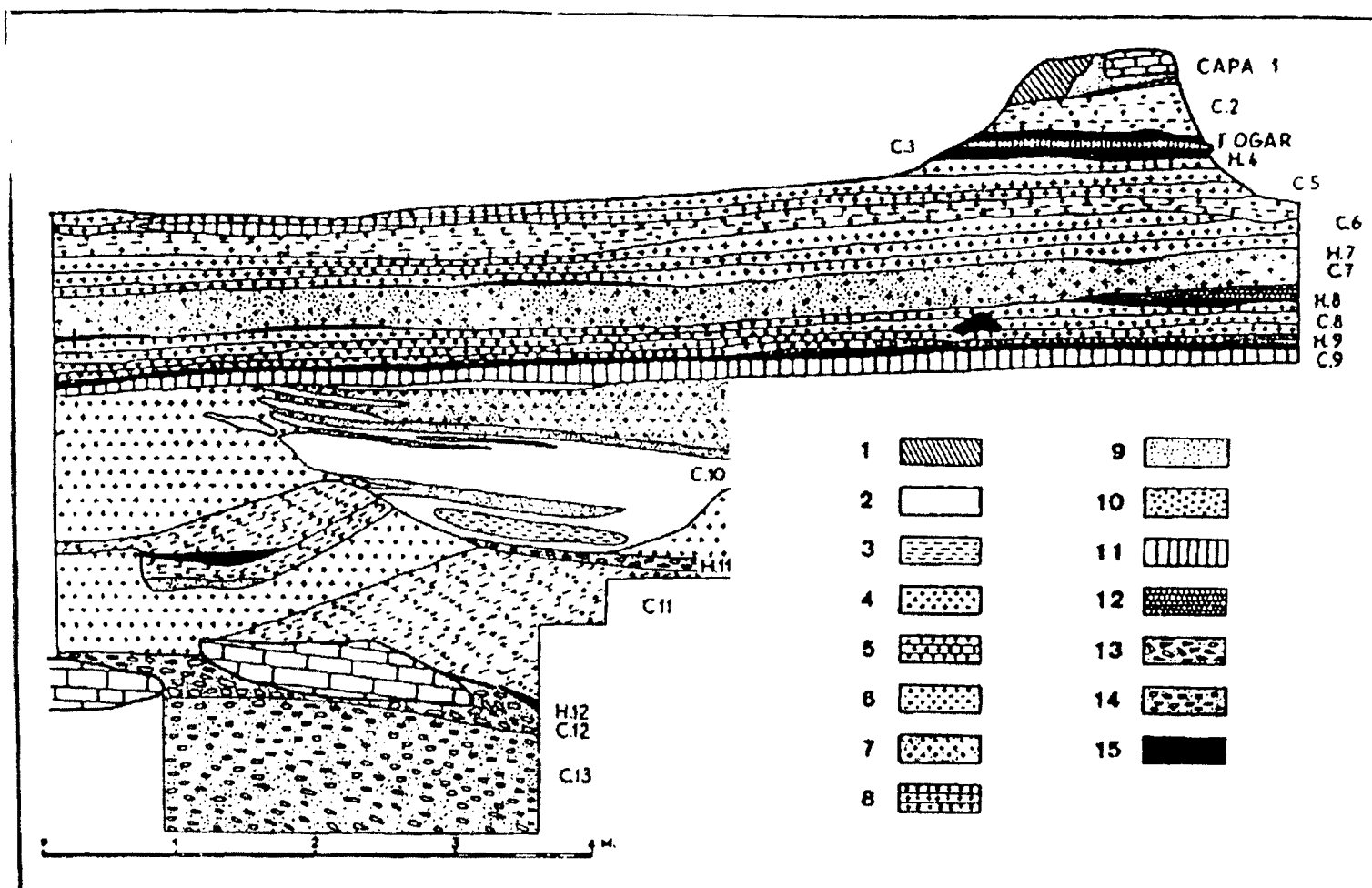


Figure 19: Abric Romani's stratigraphy (from Ripoll and de Lumley 1965)

Ripoll and de Lumley describe layer 2 as an early Aurignacian with Dufour bladelets, corresponding to a Perigordian II of Peyrony, which would have date from the first stages of the Würm III, and because of the lack of differences between the sediments of this layer and layer 4, they concluded that they were both formed during the same climatic stadial and thus were not very far apart, in time. It is important to remember that Vidal and Romani had noted that those layers had different types of sediments in terms of colour, and that a stalagmitic crust separated them.

According to Ripoll and de Lumley, only Abric Romani's level 9 had enough lithic materials to be studied as a separate unit, in the Mousterian sequence. The rest of layers of the site were grouped as follows:

- 2 (sic)27 to 8
- 10 to 13

Moreover, the materials collected by Ripoll were studied and indices calculated separately from those excavated by Romaní, because Ripoll thought that Romaní had selected the pieces preserved. We know that this is not correct, not only due to the aforementioned excavation diary, but also because among Romaní's pieces from layers 2 and 4 there are pieces less than 1cm long, and a large amount of debitage fragments, which do not correspond to any of his types of *fossile directeur*. Ripoll and de Lumley blame percentage and indices' differences on this supposedly selective preservation, and do not contemplate that subjectivity may play a role in the discordance.

Ripoll and de Lumley apply *la méthode Bordes* to all the Mousterian layers of the site (3-13) in groups for the cumulative graphs and indices, and as a whole assemblage in their written comments and conclude that: Abric Romaní's Mousterian is a Denticulate Mousterian, the dominant group being IV (Denticulates), non-levallois and non-faceted, thus falling inside Bordes' group IIIb 2b.

A sentence compiled by Canal and Carbonell (1989) in *Catalunya Paleolítica*, a volume dedicated to the state of Palaeolithic studies in Catalunya until 1990 should cause concern:

“... because of the absence of bifaces, rarity of knives, and lack of scalar retouch, Abric Romaní's Mousterian cannot be included in the Mousterian of Acheulian Tradition, nor in the Quina type Mousterian, therefore it is a non-Levallois Denticulate Mousterian” (p.368)

²⁷ Later in the paper this group is said to include layers 3 to 8 only.

as it reaches its typological classification as an attribution by defect, using the Denticulate Mousterian facies as a group that can integrate any kind of Mousterian that doesn't seem to fit anywhere else.

Similarities with Jabrud (level 9), Riparo Mochi (levels 30-48), Hortus Cave, Pech de l'Aze IIb (level 4b), La Chaise, Chadourne (levels A and A-B) are noted in terms of indices results and types' percentages (Ripoll and de Lumley 1965:60). A remark on the abundance of dihedral platforms concludes their 1965 paper.

The author had the opportunity to meet Professor Ripoll, as mentioned in chapter 3, during her research in 2001/2002, and to discuss with him his work at Romani. He explained to her the bad initial state in which the site was, when works began in 1956, and the decision to start sending boxes of material to Barcelona (more precisely to the MAB, where he worked), to keep materials safer, as clandestine excavators kept operating at the site between seasons and the collected tools were not in safe storage conditions, to his thinking. This was done rather unsystematically, just by transporting a certain number of randomly chosen boxes every time a trip to Barcelona was made by car. He did not remember if there were any excavation diaries from those years.

4.3.1.3. Laplace and Soler's studies of layer 2

Two researchers studied Abric Romani's level 2 remains using the Analytical Typology: G. Laplace - the creator of the method - in 1962, and N. Soler in 1986. Only Laplace did work at the site, in 1959, during Ripoll's excavation. This collaboration only lasted one season, possibly due to professional and methodological differences between the two researchers, already commented on above.

Laplace believed that layer 2 was formed towards the end of interstadial II-III or the beginning of the Würm III. Its materials, as identified by him were the following:

- 44 tools
- 104 blades and bladelets
- 71 flakes
- 1 crested blade
- 2 crested bladelets
- 2 cores

which he classified and described according to his groups and types, for example:

“Backed blades group: 9 pieces, all with marginal backing: LD1, marginally backed blade, one with direct partial retouch on blade (Bar²⁸); 6 with inverse retouch, Dufour type, on bladelets (5 in Cap, and 1 in Bar); 2 with alternate retouch, type Bos-del-Ser, on bladelets (Cap)” (Laplace 1962:38)

No graphs or indices calculations are included in this paper, and Laplace goes on to discuss the chronocultural attribution of the assemblage, after stating that he believes Romani’s work to have been very methodical and careful, another point on which he disagreed with Ripoll.

The presence of six typical Gravettian points made him consider two possible hypotheses: on one hand, layer 2’s assemblage could be a ‘pure’ industry, either an evolved Gravettian (comparable to that found at Reclau Viver), although the strong presence of nosed and carinated endscrapers and marginally backed blades and bladelets turned this into a very unlikely possibility; or a mixed industry, a transition between an Aurignacian with a very high percentage of marginally backed bladelets,

²⁸ Bar means Barcelona, for pieces studied at the MAB; Cap means Capellades, for pieces kept in Capellades’ Museum.

types Dufour and Bos-del-Ser, and the Gravettian, yet the evolved stage attributed to the Gravettian pointed also made this option highly speculative.

On the other hand, layer 2 could be a mixture of two archaeological layers, produced by natural phenomena, or else simply two separate levels not noticed by Romaní, and excavated as one. This seemed to be the most likely possibility for Laplace. He stressed the comments made by A.C. Blanc, during the INQUA excursion to Capellades in 1957, when he compared layer 2's materials to those found in level G at Riparo Mochi, classified as Perigordian II, though de Sonneville-Bordes had classified as typical Aurignacian, something with which Laplace strongly disagreed. Later on (Laplace 1966b:228), Laplace classified Abric Romaní's layer 2 as Proto-Aurignacian.

N. Soler included Abric Romaní's level 2 in his doctoral dissertation (Soler 1986), introducing his analysis of the material with a synthesis of the writings by previous workers, also insisting that Romaní's was a careful worker and focussing only on materials at Capellades. He reproduces Laplace's discussion on the cultural attribution of layer 2, and decides to keep it as a Perigordian II, which would be equivalent to an Archaic Aurignacian or Aurignacian 0, depending on the terminology one decides to follow. He agrees with Laplace that layer 2 is a mixture of Aurignacian and Gravettian assemblages, although he could not identify all the items listed by Laplace in 1962; this might have been due to Ripoll's removal of materials from Capellades. Soler knew that part of the collection was at the MAB, but he did not include any of those pieces in his study. His classification was:

- 44 tools (although 47 were counted by the present author in his list), for which he gives what he calls the formulae of 46 primary types (p.814-815))
- 42 blades
- 74 bladelets²⁹
- 71 flakes
- 1 crested blade
- 2 crested bladelets
- 1 prismatic core
- 1 pyramidal core

Similarities drawn by Laplace with the basal levels of Reclau Viver are noted and swiftly corrected, on the basis of his own research at the site, which belongs to the Reclau Caves system, a group of sites excavated by a team directed by Soler himself.

4.3.1.4. Vaquero's thesis and the 1996 paper of Carbonell *et al.*

The most recent kind of typological analysis applied to the Transitional layers of Abric Romani has been that of the Logical Analytical System. This has been done by Vaquero in 1992 and by Carbonell *et al.* in 1996. In both cases, the collection studied is that kept in Capellades only³⁰.

Layer 4's materials are counted by Vaquero (1992) as 846 items, divided in the following categories:

- Negative Bases of Production: 11 (1.3%)
- Positive Bases: 572 (68%)

²⁹ This supposes an increase of 22 pieces, for which Soler offers no explanation.

³⁰ Barcelona's material was said by him to have been lost (Vaquero 1992). Rather surprisingly, however, when contacted by the author to request permission to conduct research on Romani's materials, he himself indicated to her the location of 'the rest of the assemblage'.

- Fragmented Positive Bases: 80 (10%)
- Fragments of Positive Bases: 121 (14%)
- Negative Bases of Configuration: 62% (7.33%), which he classifies typologically as:
 - Sidescrapers: 16 (26%)
 - Denticulates: 44 (71%)
 - Foliates: 1 (1.5%)
 - Burins: 1 (1.5%)

Layer 2's assemblage is classified as follows:

- Negative Bases of Production: 0
- Positive Bases: 80 (52%)
- Fragmented Positive Bases: 11 (7%)
- Fragments of Positive Bases: 36 (24%)
- Negative Bases of Configuration: 27 (17%), which are classified as:
 - Sidescrapers: 5 (19%)
 - Denticulates: 8 (29%)
 - Endsrapers: 1 (4%)
 - Backed blades: 6 (22%)
 - Backed points: 6 (22%)
 - Burins: 1 (4%)

It is important to notice that there are less pieces here than in Soler and Laplace's analyses, yet we do not have any information about the removal of any material during this period.

The use of raw materials is very similar during both periods: flint predominates, with very slight differences: in layer 2 it accounts for 98% of the assemblage and in layer 4 for 92.7%. Other raw materials (quartz, quartzite, etc.) are also represented, but the percentage differences between the two layers are also negligible.

Vaquero mentions difficulties in the study of the production sequences, because he did not have access to the Negative Bases of Production of level 2, yet he does not mention the cause of this, or where these pieces were at the time when he did his research. He does say that he uses information from the literature, although no references are included. His study compares percentages of types, morphologies, extents of retouch, etc., following the lines of the Logical Analytical System and the Analytical Typology, as explained above.

Typologically, the differences are briefly described as:

- layer 2: 6 typological groups
- layer 4: 4 typological groups

because the number of primary types (see above) is higher in layer 4, Vaquero thinks that this indicates a major standardisation in layer 2, yet the parameters by which he measures such traits are only those from the general typological framework designed by Laplace. Denticulates are the type most represented in both layers, yet the differences in numbers are important: layer 2: 29% and layer 4:71%. The technological change between these levels is likely to be related to the introduction of indirect percussion techniques, according to Vaquero.

He also believes that the main problem of working with materials from old excavations is in terms of context and spatial distribution, but not in terms of morphology or aspects concerning the typological classification of the pieces. It is important to note that he mentions the presence of personal ornaments and fish and malacological remains in level 2 as indicating the Transition.³¹

Carbonell *et al.* (1996) state that Level 2 is one single archaeological level 'according to the dates obtained from the travertines', and that there is no Gravettian presence. The fact that 85% of the blades have convex longitudinal sections indicates to them that level 2 (which they call level A) is Aurignacian, yet they allow the possibility that there might have been pieces belonging to other technical traditions, which would have had a sporadic presence at the site.

They note that the main flint sources are only 15km away from the site, and these were already exploited during the Middle Palaeolithic, yet other flint varieties, more finely grained, come from further away (source unspecified) and are only present at the site during level A.

Technically, for them, the Transition is a break, because in level A, strategies aimed at producing blade supports have great significance, something which does not happen during level B (Romaní's level 4), as well as the fact that the number of blade blanks is 62% for level A in front of level B's 15%. Platform type percentages also vary.

³¹ This is also related to the presentation of the results obtained by Bischoff's first dating analysis, which will be discussed at length in chapter 5.

The dates obtained by Bischoff *et al.* (1988, 1994), which will be discussed in the following chapter, are used to support their claim of a rapid and abrupt Middle-Upper Palaeolithic Transition.

In between these two papers by Vaquero and Carbonell *et al.*, Martoto submitted his doctoral thesis on the Transition in Catalunya (1994). Although his research focused on the assemblages from some of the Reclau caves (mainly l'Arbreda) and those found at Ermitons (Sales de Llierca, Girona), he included a mention of Abric Romaní, but offered no new information other than his belief that 'the transition at Romaní would have occurred in a 1,000 to 4,000 year period' (Maroto 1994:334-335). In his research, he used the Analytical typology, but no direct work was carried out on Abric Romaní's assemblages by him.

In the following section, the author's own typological study is presented, along the lines described at the opening of this section. Comparisons with points made by studies discussed above are made, wherever relevant.

4.3.2. Present Research

From this review of the major writings about the Transitional layers at Abric Romaní, throughout last century, it is clear that they all have two points in common, whatever typologies the authors employed. First of all, all papers lack a self-examining part to single-out or even try to understand any shortcomings or biases, which the system in use may have, thus confirming the lack of concern with epistemological issues reported often by American authors (e.g. Clark 1992, 1994b, etc.).

Secondly, after thoroughly applying the typological system of their choice, none of the studies continues on to any further factors, such as seasonality, raw materials exploitation, site use, etc. beyond classification. It seems that once they have achieved the highest organisational level allowed by typology, their job is done, and they are satisfied with the results: no other aspects are worth studying. Typological classification became the ultimate goal for the abovementioned researchers.

The following two subsections focus on the typological analyses performed on the Transitional assemblages during the present research, as explained in the introduction of this section. This thesis' typological study was performed taking into account all the pieces – from all three museums' collections – something which not even Ripoll was able to do, since he does not seem to have been aware of the existence of the Vilanova collection. But the analysis was restricted to those items that could be attributed with a certain degree of security to layers 2 and 4, as narrated in chapter 3.

			Type of blank			Total
			Flakes	Blades	Bladelets	
Collection	Abric Romani C	Count	96	11	66	173
		% within Collection	55.5%	6.4%	38.2%	100.0%
	Abric Romani B	Count	30	12	113	155
		% within Collection	19.4%	7.7%	72.9%	100.0%
	Abric Romani V	Count		1	6	7
		% within Collection		14.3%	85.7%	100.0%
Total	Count	126	24	185	335	
	% within Collection	37.6%	7.2%	55.2%	100.0%	

Table 2: The three collections into which Abric Romani's layer 2 materials are divided, according to the types of blanks (C=Capellades, B=Barcelona and V=Vilanova).

The analyses have been carried out using concepts and calculations which are part of Bordesian systematics, and the factors that will be especially highlighted below are the following:

- total assemblage composition: total number of pieces, classifiable and unclassifiable material, and reasons for that, such as extent of breakage, etc.
- types of blanks (flakes/blades/bladelets) forming the assemblage, divided by collections (Capellades/Barcelona/Vilanova), to consider the differences between past partial studies and the present one.
- types of tools most represented (numbers and percentages). Discussions of possible meanings and attributions to classical industrial traditions in the Palaeolithic.
- expected characteristics according to past diagnostics, listed against the Abric Romani assemblages' characteristics, and long-needed evaluation of the results.
- calculation of indices and characteristic groups, followed by brief comparisons of outcomes with those obtained for certain classic French sequences and assemblages.

4.3.2.1. Layer 2

The total amount of pieces recovered belonging to layer 2 is 417, out of which 168 were classified into types defined by de Sonneville-Bordes and Perrot (1954b, 1955, 1956a, 1956b). The types identified were counted and their percentages plotted into a cumulative graph. Indices' calculations were also performed.

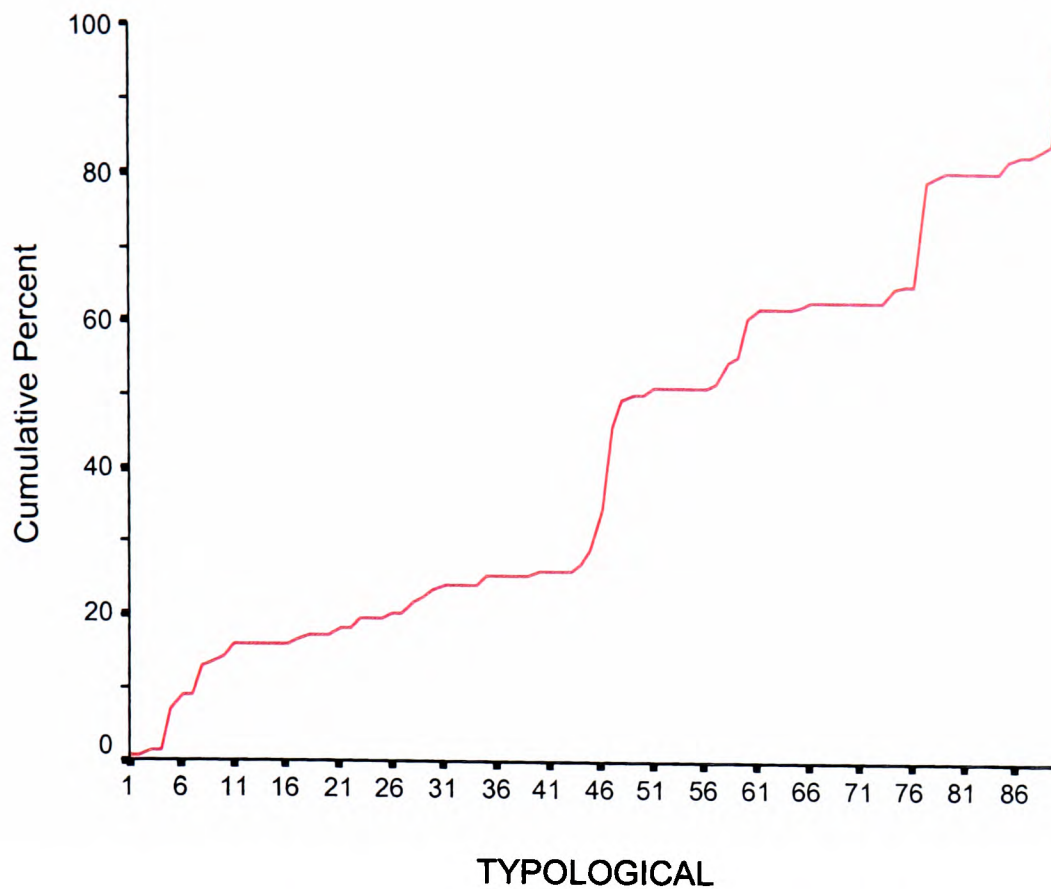


Figure 20: Cumulative graph for layer 2's assemblage.

In this assemblage, 245 pieces were considered unclassifiable; of those, 153 were complete but were not distinctive tool types (108 had signs of having been retouched, only 39 were unretouched and for 6 the author was unsure), and the rest, 91, over a third – 37.3% of the subtotal – were broken parts, of which 57 were classified as ‘too broken’, meaning that if they had represented one of the types, at the time of this study it was not possible to discern which type that was. There were 2 cores, and 1 burin spall.

Looking at the types of blanks from which tools were produced during the formation of layer 2, 335 of them could be classified into one of these categories: flake, blade and bladelet, as shown in table 2, and the rest, 82 blanks, were too broken to be categorised.

Capellades collection	Flakes = 96	Total = 173
	Blades = 11	
	Bladelets = 66	
Barcelona collection	Flakes = 30	Total = 155
	Blades = 12	
	Bladelets = 113	
Vilanova collection	Flakes = 0	Total = 7
	Blades = 1	
	Bladelets = 6	

Table 3: The Abric Romaní layer 2 collections showing the types of blanks that each of them contain, according to the three categories identified in the text, excluding pieces too badly broken for the blank type to be ascertained.

In layer 2's assemblage, the most represented type is number 90 (Dufour bladelets), with 25 pieces (14.8%), together with number 77 (sidescrapers), with a marginal difference, 24 pieces (14.2%). The next type in terms of quantity is number 47 (Atypical Chatelperron points) with 19 pieces (11.2%). It must be borne in mind that a total of 169 classifiable pieces is not a high quantity, but de Sonneville-Bordes considers groups of more than 100 pieces to be able to yield 'significant results' (1960:26).

In 1982, Soler published a paper on the Aurignacian in Catalunya, in which he described the characteristics of the assemblages that are attributed to this period as follows, and against which we have considered Abric Romaní's layer 2's pieces:

abundant carinated endscrapers	only three, representing a 1.8%
ogival endscrapers	absent
nosed endscrapers	absent
Aurignacian blades ³²	absent
strangulated blades	absent
Dufour blades are characteristic	most represented type: 25 pieces, 14.8%
burins are well represented (<i>fossile directeur</i>)	a total of 12, a 7.2% of the total

Table 4: Left hand column, Soler's characteristic types (1982). Right hand column, the actual representation of these in Abric Romaní (layer 2).

³² Soler (1982) mentions that this type and the following one are not always present because of the poor quality of raw materials used to manufacture tools during that period. It is important to know that they are indeed present at Can Crispins, a Catalan Aurignacian site where raw materials are of good quality (see chapter 5). At Abric Romaní, good quality flint outcrops were very close to the site and were being exploited.

It is evident, at a glance, that the assemblage from Abric Romaní's layer 2 does not present the characteristics that are expected from an Aurignacian collection, except for the one regarding the presence of Dufour bladelets, a trait that in a Mediterranean context is used to subclassify certain early Aurignacian assemblages as 'Protoaurignacian'.

Other traits from other papers (e.g. Kozłowski 1976, 1988, 1990, Otte 1987, 1990a etc.), referring to the Aurignacian in general add the traits below:

high number of retouched blades (65 & 66)	2 pieces
absence of backed blades (45-59)	48 in total
invasive retouch	8 pieces

Table 5: Other characteristics of the Aurignacian, tested against the assemblage characteristics of layer 2.

The indices' results are these, compared to the expectations of classifiers:

IG is high or very high (higher than IB)	IG = 15.97%
IB is very varied (lower than IG)	IB = 7.10%
IBd is higher than IBt	IBd = 4.14% and IBt = 1.77%

Table 6: Main indices and their expected characteristics for classic Aurignacian assemblages as quoted by compared to the results actually obtained for Abric Romaní layer 2.

The results of the other indices were the following:

- IGA = 1.77%
- IP = 1.77%
- IBdr = 58.33%
- IBtr = 16.66%
- IGA_r = 11.11%

-

The above indices were compared to those presented by de Sonneville-Bordes in 1960 for several French sites' assemblages, classified as different types of Aurignacian and Perigordian industries. The indices of endscrapers (IG) for the aforementioned Aurignacian layers range from 72.75% to 28.5%, and thus, Abri Romani's result could not be compared to any of them. Nevertheless, it was observed that 15.97% is much more likely to be a result from Middle to Upper Perigordian assemblages, and the closest case studied by de Sonneville-Bordes is that of La Ferrassie's level K, with 15.61%, a layer classified as a Perigordian V2. Moreover, the index of Aurignacian endscrapers (IGA) could only be compared to Perigordian examples, since the value obtained, 1.77%, falls out of the range of variation of the Aurignacian cases (35/7.1%). The closest value is that of Abri Labattut Upper Perigordian assemblage, with 1.12%.

Burin indices (IB) are highly variable both in the Aurignacian and the Perigordian – 40.59/2.91% and 53.5/6.1% respectively – and Abri Romani's 7.10% resembles that of La Ferrassie's level F, an Aurignacian I industry with an IB of 7.50%, and also the same type of assemblage at Abri de Patary, with 6.60%.

The IP (Piercers index) for layer 2 is 1.77%, and its closest parallels are Abri Castagnet's Aurignacian I assemblage, with 1.79%, and that of one of Abri Caminade's two Aurignacian I assemblages with 1.70%.

Specific burin indices were also compared: the variations within indices of dihedral burin (IBd) are very similar for both types of industries (23.1/1.14% for the Aurignacian and 24.05/1.90% during the Perigordian). The closest to Abric Romani's 4.14% is that of Abri Caminade coupe Ouest at 4.24%, classified as Aurignacian I. Regarding the index of burins on truncation (IBt) the variation is greater among the French Perigordian sites (35.94/1.56%) and comparisons with the figure obtained in this study, 1.77%, can be paralleled to the Aurignacian I layer of Abri Caminade coupe Ouest (1.72%), as well as that of early Perigordian (Perigordian I) of La Ferrassie's layer E assemblage (1.80%).

Out of six indices compared to classical examples, three would indicate affinities to those of Aurignacian I assemblages, while another one finds parallel values in both Aurignacian I and Perigordian I examples, yet that is likely to be due to the wide variation ranges of IBt indices. The indices of endscrapers, one of the fossiles directeurs of the early Aurignacian industries can only be compared to values corresponding to Upper Perigordian assemblages. In the case of La Ferrassie's layer K (Perigordian V2) the proportion against the IB is similar to that at Abric Romani's layer 2, with the IG being higher. In Abri Labattut's case, the number of burins is higher than that of endscrapers, in both the layers belonging to the Upper Palaeolithic, as it usually tends to be in assemblages of later stages during that period.

To summarise the above information, a crucial calculation is that which Bordes' system makes of the two characteristic groups, which synthesises in a single percentage figure the resemblance of layer's 2 industry to the classical Aurignacian assemblages:

- Characteristic Aurignacian Group (GA) = 3.55 %
- Characteristic Perigordian Group (GP) = 37.27 %

The striking difference between those percentages should at least make researchers wary of asserting that layer 2 is without a doubt an Aurignacian level. This has certainly not been the case in the past, as we have already seen. Abric Romani's Upper Palaeolithic was once considered to be Perigordian II – broadly equivalent to de Sonneville-Bordes' Aurignacian 0 – (Ripoll and de Lumley 1965), or the Aurignaco-Perigordian of Laplace, and his Protoaurignacian (Laplace 1962, 1966b).

A comparison of the cumulative graph obtained here and that of a classic Perigordian II layer, such as La Ferrassie level E (de Sonneville-Bordes 1960:160), shows hardly any resemblances in terms of percentages of types or differences between quantities of tools, observable as a sudden and steep inclination of the line.

The cumulative graph for Abric Romani's layer 2 (see above) shows a certain resemblance to the first part of the graph for the Perigordian III of Laugerie-Haute (de Sonneville-Bordes 1960), yet the second part is not comparable with it, the most important difference being that at Abric Romani, endscrapers are more numerous than burins (27 versus 12), a characteristic of early Upper Palaeolithic assemblages, together with the differences between dihedral burins and burins on truncation, as mentioned above.

It was impossible to find any closely similar graph among those included by de Sonneville-Bordes in her 1960 work, because it is not common to find that the most strongly represented types – in this case Dufour bladelets, denticulates and atypical

Chatelperron points – characterise very different and non-contemporaneous industries. While the Dufour bladelets would point at a Protoaurignacian type of assemblage, the denticulates imply Mousterian affinities, especially when they occur in such high concentrations, in comparison with those types considered to be representative of an Upper Palaeolithic assemblage. The atypical Chatelperron points are a *fossile directeur* for the Chatelperronian, a kind of industry where the denticulates would certainly fit in better than in a latter one. Albeit less in number, the six Gravettian points, already identified by Laplace in 1962, cannot be ignored, as typologically, they do not correspond to any of the industries mentioned in this paragraph, and would push the cultural attribution towards a much younger date.

In light of the above factors, and bearing in mind the disturbances that the top layers of Abric Romaní are known to have suffered throughout the 19th century, detailed in chapter 3, the decision of Carbonell et al. (1996) to rule out a mixture of several layers seems very unwise, yet it could be that their Logical Analytical system did not allow them a specific, clear and detailed morphological classification that would highlight an incongruence of this sort. They classify layer 2 as an Aurignacian layer, but it is difficult to agree with them after seeing the paucity of diagnostic Aurignacian elements, such as endscrapers and specific types of blades.

Having analysed typologically the most complete assemblage from layer 2, which could be gathered from the different collections, it is possible to consider that the mixture of materials firstly proposed by Laplace in 1962 may have involved not two, but three different components. According to the present study, it seems that in the lowest area of layer 2 there would have been a Chatelperronian assemblage, which would account for the high number of atypical Chatelperron points and the elevated

number of denticulates; this group would have been mixed with a 'Protoaurignacian' assemblage (sensu Kozłowski and Otte 2000a, Broglio 1996) where the Dufour bladelets belong. The uppermost zone inside layer 2 would have contained the remains of a small-scale Gravettian occupation, when the six Gravettian points were left at the site.

To give a chronological framework which could integrate these industries, the typological classification needs to be followed by a chronometric study, in which samples of the actual archaeological material can be dated, and that has been done, as far as was possible, for this study, as explained in chapter 3. The preliminary results of the dating project are discussed in detail in chapter 5.

4.3.2.2. Layer 4

This is the only layer which had actually been analysed by Bordesian systematics in the past, by Ripoll and de Lumley (1965). However, comparisons are pointless, as will be shown, because after considering that layer 4 and others did not contain enough pieces to be studied by this system, they grouped several layers together. The sole attempt to get any understanding about the processes that took place during the formation of any of those layers is thus rendered virtually useless. Except for noting the scarcity of materials, as a justification, Ripoll and de Lumley do not offer any further explanation or consideration about how lumping three different layers – formed during several thousands of years – together is going to affect the results and their interpretations, or if indeed the latter can mean anything at all. Looking at it some 40 years later, one gets the feeling that it was an attempt to apply the orthodoxy

of la méthode at any cost, even if it meant mixing three different strata, and that the basic strategy of the approach was not fully understood.

The present study considers layer 4 on its own, where there were 144 pieces (of a total of 249) that could be classified by Bordes' system. The extent of breakage in the 4 pieces out of the 95, which did not correspond to any of the types, was very high, and thus, they did not present enough characteristics for the author to be able to attribute them to any of the types. Another 2 were broken, but 89 were complete.

The types of blanks from which tools were manufactured, are classified into the same categories as those in layer 2, for comparison, as shown in table 6. Two blanks were too broken to be categorized.

Capellades collection	Flakes = 148	Total = 180
	Blades = 19	
	Bladelets = 13	
Barcelona collection	Flakes = 24	Total = 34
	Blades = 9	
	Bladelets = 1	
Vilanova collection	Flakes = 1	Total = 1
	Blades = 0	
	Bladelets = 0	

Table 7: Abric Romani's layer 4 collections showing the types of blanks that each of them contain, according to the three categories identified in the text, using the same classification specified above for layer 2.

The differences with the previous study could not be clearer. First of all, the cumulative graph (see figure 6) does not resemble in any trait a cumulative graph for a Denticulate Mousterian, but is closer to the Charentian type of La Ferrassie Mousterian found at the eponymous site of La Ferrassie, in its level C. It is possible that layers 6 and 8 do belong to a Denticulate variant, but in layer 4 there are only 11 pieces that can be considered denticulates, and that is a very low quantity of such

pieces, compared to traditional examples of assemblages classified as Denticulate Mousterian.

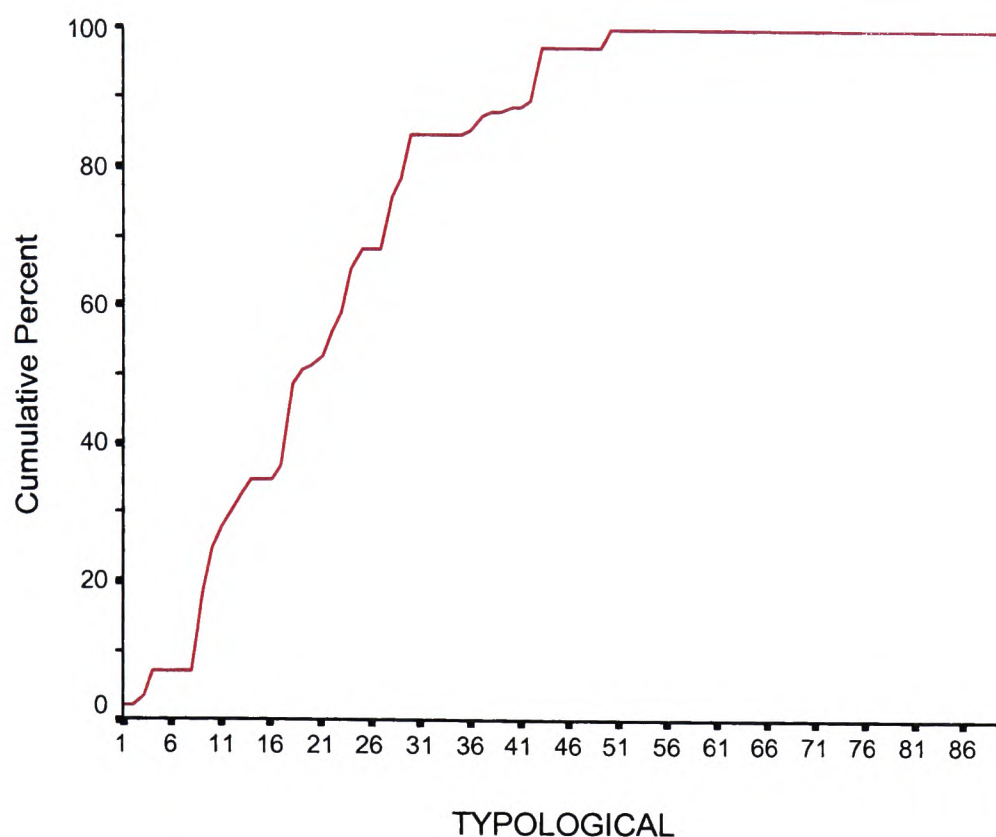


Figure 21: Cumulative graph for layer 4's assemblage.

The general characteristics set by Bordes (e.g. 1968b) for the Denticulate Mousterian and for the La Ferrassie subtype of the Charentian facies, already specified in 4.1. are listed in table 7, against the actual characteristics of Abric Romaní's latest Middle Palaeolithic level determined in this research. Abric Romaní's latest Mousterian has many more traits in common with the latter variant: the amount of denticulates, the high percentage of sidescrapers, and the presence of some endscrapers and of Levallois technique. The only common feature with the Denticulate variant is the absence of handaxes, which also applies to the La Ferrassie subfacies. The presence of points amounts to 4.9%; although it is not a high value, it needs to be considered as a contribution to the total number of types, which is in itself not a very elevated one, thus turning this trait into another attribute which does not correspond to a Denticulate Mousterian assemblage.

Denticulate Mousterian (Bordes' general summary)	Abric Romani's layer 4	La Ferrassie Mousterian (Bordes' general summary)
no handaxes	None	no handaxes
no backed knives	5 present (1 typical, 3 atypical and 1 naturally-backed), amounting to 3.5%	no backed knives
few or no points	7 present (types 3 and 4), a total of 4.9%	
25% maximum of sidescrapers	71.7% in total	50 to 80% sidescrapers
very high percentage of denticulates	11 pieces (7.6%)	few denticulates
	10 pieces (types 1, 3 and 4) a total of 7%	Levallois technique present
	9 present (6.3%)	some endscrapers (carinated and nosed)
	1 piece	numerous notches

Table 8: Abric Romani's layer 4 traits mapped against the expected characteristics for assemblages belonging to the Denticulate Mousterian facies (on the left) and the La Ferrassie Mousterian facies (on the right) as defined by Bordes (e.g. 1968).

The typological indices obtained for this assemblage are the following:

	Real Indices	Essential Indices
IL ^{ty}	6.94%	3.70%
IR	71.52%	76.29%
IA ^u	2.77%	2.96%
IB	0	0

Table 9: Real and essential indices results for the layer 4 assemblage.

The counts for the characteristic groups are:

- G I (IL^{ty}) = 6.94% (real) and 3.70% (essential)
- G II (Mousterian) = 41.2%
- G III (Upper Palaeolithic) = 5.2%
- G IV (Denticulates) = 4.4% (only 11 pieces present)

As aforementioned, the most striking value is that of group IV, as it would be expected to be much higher for a Denticulate Mousterian assemblage as classified by

Ripoll and de Lumley. Groups I and III's values also support this study's hypothesis that the diagnosis of those authors was not correct and that the assemblage shares many more traits with the classical La Ferrassie industries. The reason for their inaccuracy and oversight must be found in their grouping of three different Mousterian layers, which are likely to have had very different characteristics from each other. The existence of 14 bladelets is rather surprising, since authors tend to relate their origins to the beginning of the Upper Palaeolithic.

4.4. Conclusions

In the previous sections, a progressively more focused analysis of the application of typological systematics has been carried out. The starting point was an outline of the origins of Palaeolithic periodisation attempts and their evolution through the 19th and 20th centuries, as well as the different meanings that commonly used terms have had and still do have, depending on who uses them. This is something which is seldom made explicit and constitutes a source of great confusion, as Clark reports (2001), when attempting to understand and use the work produced by different workers.

Along the years, the different paradigms and the meanings of different words have gradually changed or have been used to define different things (e.g. the 'Aurignacian' according to de Mortillet, Breuil and Peyrony), but instead of these changes producing a new start, they have merely been piled one on top of the other, as Harrold (1991) explained.

Palaeolithic research in Iberia has been predominantly focused on typological studies, performed by using one or other of the typological frameworks defined in section 4.2.

Widespread and normally uncritical use of the different typological systems reviewed above has been, and still is, largely responsible for shaping the current state of knowledge about the Iberian Palaeolithic. The previous sections have shown that the lack of attention to the theoretical perspectives instinctively applied to the study of the Palaeolithic is an old tradition, which has had a crucial and rather unfortunate effect on the investigations that were actually attempting to cast more light on the phenomenon of the transition.

While the value of using typological systematics as an organisational aid is acknowledged, this research has shown that many workers have applied them carelessly and not just to organise materials, but also as a science for its own sake, turning their classifications into a major end product of research projects rather than one small aspect of interpretation. The persistent concentration on typological analysis is not taking research any further on or providing us with new kinds of information, because its uses are rather limited (lingua franca and organisational system) and it will never deliver answers to our questions on Palaeolithic life ways, etc.

A perfect example of the distorted use of typology that allows the comparison of the most widely used systems in Iberia is Abric Romaní, the only site to have been successively studied by each of those typologies. In every single case, research has ended once the partial assemblages have been organised into types. After nearly one hundred years of studies on Abric Romaní, we really know nothing about the processes that went on at the site, its use, who lived there, etc. although major hypotheses about how the Transition took place in Iberia have been put forward using

this site as an example of the Transition being an abrupt and rapid break between two periods and implying a replacement of one type of population (Neanderthals) by another (anatomically modern humans).

This chapter included a typological study of the assemblages of layers 2 and 4 of that site. It differed from previous analyses in the sense that its objective was purely to challenge past diagnostics which were perceived to have been inaccurate and erroneous. There was no intention to find out anything other than if what had been said about the site's industries belonging to certain facies or cultural traditions could be verified by applying the theoretical guidelines explained in section 4.2. and comparing the conclusions to the classical French sequences that were used to create the original definitions. The results suggest that classical views on the Transitional layers of Abric Romaní have been built on a series of mistaken ideas produced by the uncritical and erroneous application of theoretical frameworks which are in turn themselves biased, aggravated by the lack of research considering the complete assemblages due to their separation.

In order to rectify the past mistakes and avoid repeating them in the future, a major awareness of the importance of epistemological issues needs to be created, as well as a greater understanding of the scope and limitations of the different techniques and perspectives of the studies. Moreover, research needs to be developed on the basis of constant self-critical revision.

In chapter 5, the concept of the Transition will come into focus again, as the tenets outlined by Mellars (e.g. 1973, Mellars 1991, etc.) are tested against the record at

Abric Romaní and other N Iberian sites. The list of tenets quoted in chapter 3 is tested in each of the sites according to the information available. This comparative examination will serve as the base of the assessment that will be carried out in S Iberia in chapter 6 and at the European level in chapter 7.

5. The Transition in the North of Iberia

5.0. Introduction

5.1. Catalunya

5.1.1. The Capelló Area

5.1.1.1. Abric Romaní

5.1.2. The Reclau Caves

5.1.2.1. Reclau Viver

5.1.2.2. L'Arbreda

5.1.3. Other sites in Catalunya

5.2. Cantabria

5.2.1. The Classic Trio

5.2.1.1. El Castillo

5.2.1.2. El Pendo

5.2.1.3. Cueva Morín

5.2.2. Other sites in Cantabria

5.3. The Ebro Valley

5.3.1. Aragonese sites

5.3.2. Castilian sites

5.4. Galicia

5.5. Conclusions

5.0. Introduction

The present chapter focuses on those sites, located in the north of Iberia³³, which are thought to have undergone the process of the Transition around 40,000 years B.P. 'Northern Iberia' is to be understood as the regions above the so-called Ebro Line, a concept that will be analysed in the next chapter.

The fact that many of the sites which will be studied in the following sections were discovered and at least partially excavated in the late 19th and the early 20th centuries intrinsically links their analyses to the previous chapter, where the theoretical developments of the field and the different typological perspectives were described and reviewed in detail. Similarly, various aspects of what is covered in the present chapter require reference to concepts like typological categories and classifications (e.g. issues about standardisation and imposed form), in order to understand the analyses performed to study their presence or absence; those terms, together with their applications to the practical case study of Abric Romaní were thoroughly explained in chapter 4.

Due to the large amount of material collected by the author during her research, both while studying the museum collections and from literary sources, it is necessary to set very clear limits to the present unit. The main objective of chapter 5 is to review critically what has been said about the Mid-Upper Palaeolithic Transition as it occurred in Northern Iberia and test the selected traits outlined in chapter 2 according to the analyses described in chapter 3. Thus, this section of the thesis does not provide alternatives or innovative approaches to the study of the transition. The aim here is to

³³ Maps of sites and regions in this chapter have been included at the end, as appendices.

provide the most thorough review of the study of the actual transitional processes in the north of Iberia, to date.

The analyses of the sites selected for study, according to the early dates assigned to their transitional layers is complemented by the reviews of the regions in which they are located and of other sites found in the same areas as the key sites. Including the latter here should provide the best overview of the regions on which the chapter concentrates.

The following sections are divided regionally, and then into areas and sites. For each site, the tenets regarding the indices of flakes versus blades, the increases in complexity, variety, standardisation and imposed form and the appearance of sophisticated bone technology, naturalistic art and personal ornamentation are tested against all the available information. When the latter is negative, this is clearly stated, because absence of evidence is certainly of interest, and potentially significant, at sites which have a long history of research and a substantial record of publication.

5.1. Catalunya

“Le Paléolithique supérieur de la Catalogne est loin d’être aussi riche que celui de l’Espagne cantabrique”³⁴ (de Sonneville-Bordes 1973:61)

Thirty years have passed since Mme. Bordes wrote those words, and although Cantabria continues to have many more Middle and Upper Palaeolithic sites, the number of (Lower, Middle and Upper) Palaeolithic sites in discovered in Catalunya has risen spectacularly. The original quantitative difference might have been due to

³⁴ “The Upper Palaeolithic of Catalunya is far from being as rich as that of Cantabrian Spain”.

the fact that Palaeolithic research in Catalunya did not begin as early as it did in Cantabria and its development was not as steady either.

During the early 1970s, groups of amateurs began to participate in fieldwork seasons directed by established scholars (Pericot et al. 1952:19) and then to continue work on their own (see below section 5.1.3.3.). With the creation of more universities and Archaeology departments during the late 1970s and until the 1990s, these informal activities have been integrated into academic frameworks in the vast majority of cases; one advantage of this process has been the increase in the number of publications and academic research performed on these sites.

Geographically, the Catalan area is easier to define than Cantabria, because it comprises the modern autonomous region of Catalunya, which is divided into four provinces (Barcelona, Girona, Lleida and Tarragona). At the start of this research, this area was considered together with the Levantine littoral area, comprising all of the eastern Iberian regions bordering with the Mediterranean Sea. This perspective was abandoned when it was decided to focus on the 40,000 BP Crisis phenomenon, as sites with such early chronology have only been found in Catalunya. Thus, early radiometric results for the first Upper Palaeolithic strata are the basis for considering what has become the modern Catalan political entity as a separate region, rather than purely geographical characteristics, as will be the case with Cantabria.

The revamping of the Ebro line hypothesis (Zilhão 1993, 1997, 2000a) offered another reason why areas to the south of this supposed frontier should be analysed

separately from those to the north. That will be the focus of the following chapter, together with a thorough revision of the divisionary hypothesis.

The following two subsections focus on the main sites that include transitional layers, two of which the author was able to study in person. The third subsection concentrates on sites for which there is less published material, but radiometric dating and/or typological analyses have suggested that they may indeed be relevant to the topic of the Transition and how it is thought to have taken place in this area.

In 1982, Soler defined the Catalan Aurignacian as containing carinated endscrapers on flakes, nosed endscrapers, ogival endscrapers and strangulated blades. Aurignacian blades and double sided scrapers on blades are rare in this area because of the poor quality of raw materials, although there are some exceptions. Soler divides the Aurignacian into stages, according to the French method based on the artefacts made of bone (Aurignacian I = elongated flat split-based points, Aurignacian II = pointes lozangiques applatis sharpened at both ends, and so forth). These characteristics will be looked for as sites are studied separately as well as in inter-regional studies performed when the necessary information has been available.

5.1.1. The Capelló Area

This section centres on the karstic travertine cliff formed over the Anoia River and just below the hill on which the modern town of Capellades is located. It was described at length in chapters 3 and 4, to explain the reasons that made the Transition at Abric Romaní one of the key aspects of this research (sections 3.1.4. and 4.3.1.1.), and thus it needs no further introduction. Because of this, the following section

focuses directly on the results of the comparative study to ascertain if Abric Romani's transition resembles the generalised model.

It includes information on the dates that have been obtained for the transitional layers by different research teams in the past as well as the preliminary results of the author's own dating project undertaken in the course of this research (see chapter 3). A discussion of the results of the comparison will follow, as well as concluding remarks about the study of the Transition at this site.

5.1.1.1. Abric Romani

The author's typological analysis of Abric Romani's transitional assemblages concluded that layer 2, now usually referred to as 'Archaic Aurignacian,' could be the result of the mixing of assemblages from as many as three different layers. Either they have become mixed in one level or possibly three separate layers were wrongly excavated as a single one in the early 1910s. Layer 4, called 'Denticulate Mousterian', was shown in fact to be closer to a 'La Ferrassie' type.

Regarding layer 2: on the one hand – according to the rules of Bordesian systematics – it would not be an appropriate unit to test the tenets (if we believe that it is formed by 3 different typological layers), but on the other, there are the arguments that question the real usefulness of typological studies beyond the classification of the pieces that form what is thought to be an assemblage, as well as the fact that previous studies of the site have made it famous as the paradigm of an abrupt transitional event characterised by traits that are not exclusively related to typological results.

The author's belief is that typological systematics do play an important role in these studies, but they should not be the main method or indeed the final goal. Therefore, this section's aim is to see the outcome of the comparison of the data obtained from Abric Romani's transitional assemblages and assess whether the site's archaeological record really does portray the Transition as a generalised phenomenon or whether these collections indicate otherwise.

Before proceeding to the analysis, it is important to highlight that there have been several dating projects carried out for Abric Romani. The dates obtained for the transitional layers are included in the following table:

Layer	Samples' material	Dating method	Dates (in BP)
Travertine above A	travertine	Conventional ^{14}C	36000±1300
A (layer 2)	charcoal	^{14}C AMS	37290±990
A (layer 2)	charcoal	^{14}C AMS	35400±810
A (layer 2)	charcoal	^{14}C AMS	37900±1000
A (layer 2)	charcoal	^{14}C AMS	36590±640
A (layer 2)	charcoal	^{14}C AMS	28440±650
A (layer 2)	charcoal	^{14}C AMS	23160±490
A (layer 2) in CN	charcoal	^{14}C AMS	36740±920
Travertine below A	travertine	Conventional ^{14}C	35000±500
B (layer 4)	charcoal	^{14}C AMS	43500±1200

Table 10: Dates for the transitional layers (including travertine crusts above and between them) obtained by Bischoff *et al.* (1994). Laboratory reference numbers of the published dates have been omitted in order to simplify the tables. They can be found in the references inserted in the text.

Abric Romani: testing the tenets

1. Indices of flakes and blades

For this point, the assemblages of level 2 and level 4 were divided into blank groups in two ways. First of all, as regards the relative importance of flakes and blades generally, the results show that layer 2 contained nearly two thirds of blades, which is well above the 42 blade blanks found in layer 4, where they amount to one fifth of the total number of pieces.

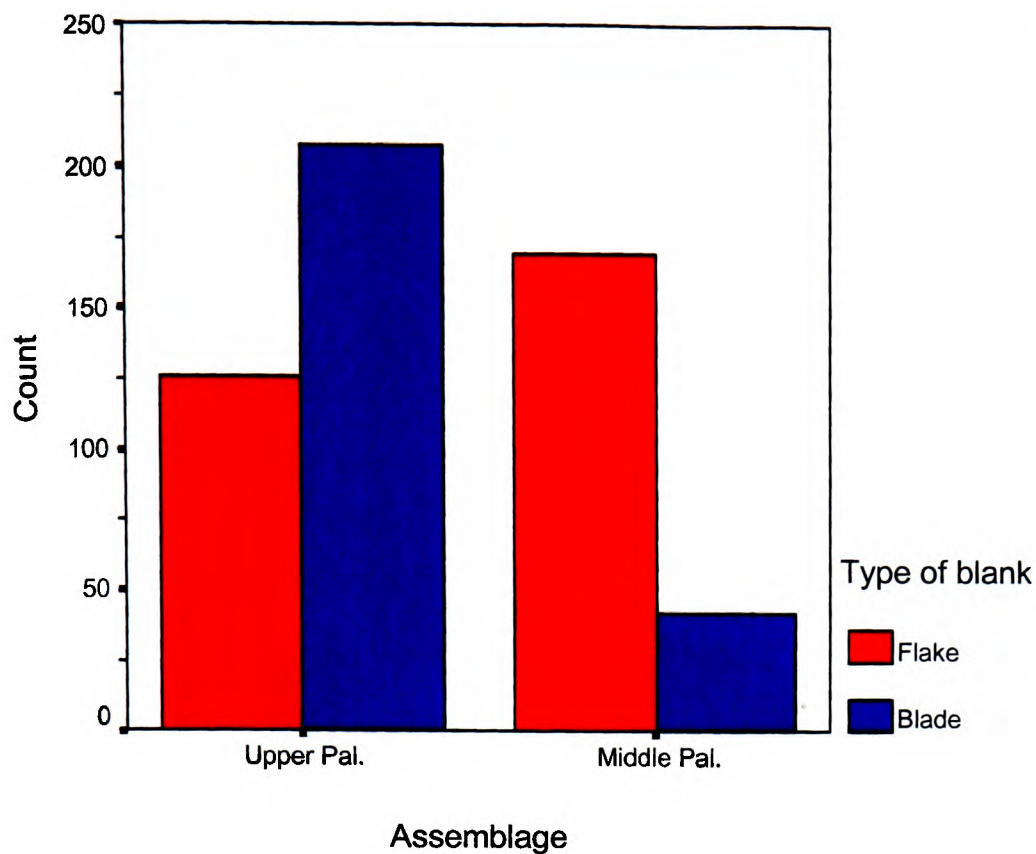


Figure 22: Number of flake and blade blanks in each assemblage (Upper Palaeolithic = layer 2 and Middle Palaeolithic = layer 4).

A second analysis was carried out by dividing the blanks from layers 2 and 4 into three categories: flakes, blades and bladelets. The purpose of this is to see to what extent bladelets represent an innovation in the early Upper Palaeolithic. Out of 208 blade blanks from layer 2, only 24 were blades and 184 were bladelets. A look at the results from level 4 indicates that bladelet blanks were also present there (14 in total). A significant increase in their proportion (from 6.6% in layer 4 to 55.1% in layer 2) would probably describe the scenario at Abric Romaní better than the aforementioned use of the term ‘innovation’. Interestingly, if we look at the blades group, excluding the bladelets, the proportion actually decreases: from 13.2% in layer 4 to 7.2% in layer 2.

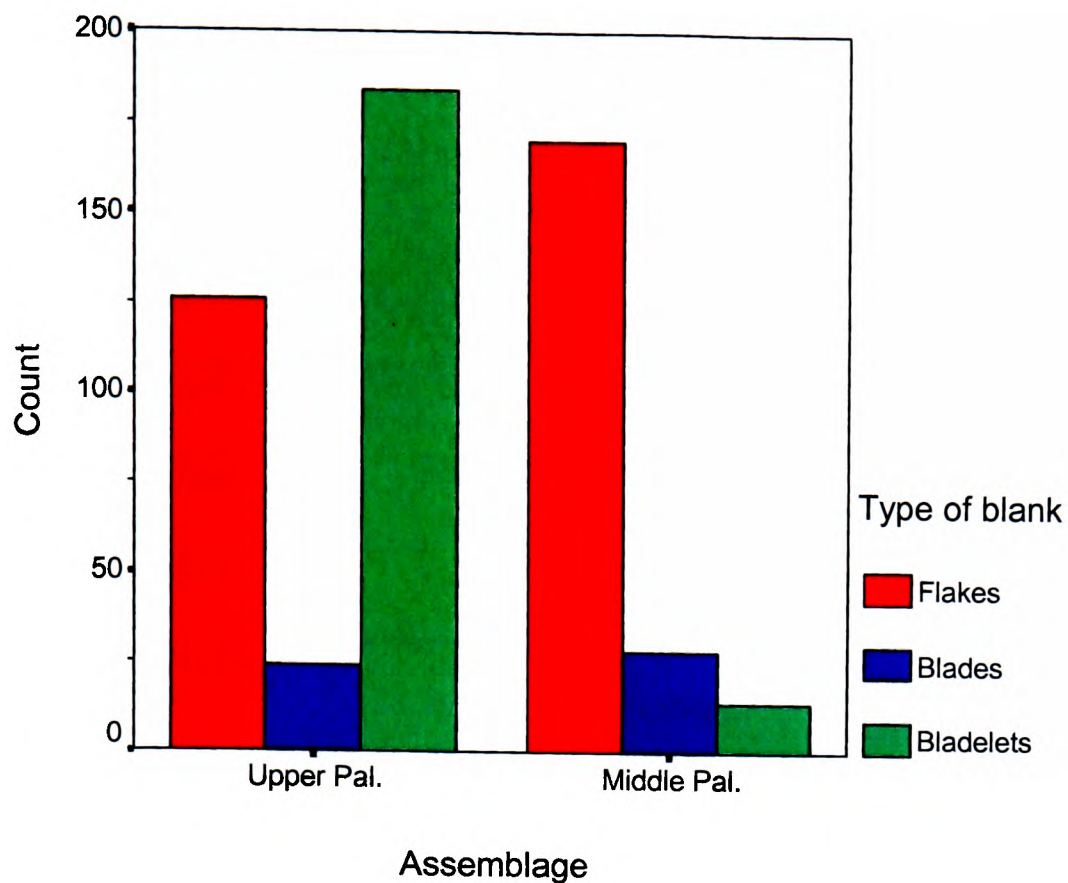


Figure 23: Blanks' analysis including different types of blades (blades and bladelets)

The consideration of specific and different types of blades (blades and bladelets) is therefore a crucial aspect that needs to be taken into account. In relation to this point, the proximity of the site to sources of flint (suitable for the manufacture of both blade and bladelet blanks) and the fact that raw materials percentages remain constant throughout the transition (89.3% and 94% for flint and 3.1% and 3.0% for quartzite for layer 2 and layer 4 respectively) are points to consider in relation to the results of this study of blank percentages and when comparing this site with Reclau Viver (see section 5.1.2.1.)

			Assemblage	
			Upper Pal.	Middle Pal.
Type of raw material	Flint	Count	315	200
		% within Assemblage	94.0%	89.3%
	Quartz	Count	6	2
		% within Assemblage	1.8%	.9%
	Quartzite	Count	10	7
		% within Assemblage	3.0%	3.1%
	River pebble	Count	1	
		% within Assemblage	.3%	
	Chert	Count	2	8
		% within Assemblage	.6%	3.6%
	"Cornuvianita" *	Count	1	4
		% within Assemblage	.3%	1.8%
	Granite	Count		2
		% within Assemblage		.9%
Rhyolite	Count		1	
	% within Assemblage		.4%	
Total	Count	335	224	
	% within Assemblage	100.0%	100.0%	

Table 11: Count and percentages of types of raw materials used in layer 2 (Upper Palaeolithic column) and layer 4 (Middle Palaeolithic). * The author has left untranslated words for which she is not satisfied that there are precise English equivalents.

2. *Greater degree of standardisation and imposed form*

At the level of blanks, by plotting the width and length of the pieces graphically, divided by assemblages, the most important concentration of apparently preferred blanks is found in layer 2, between $x = 1$ to 1.5 cm and $y = 2$ to 2.5 cm, because of the amount of bladelet blanks.

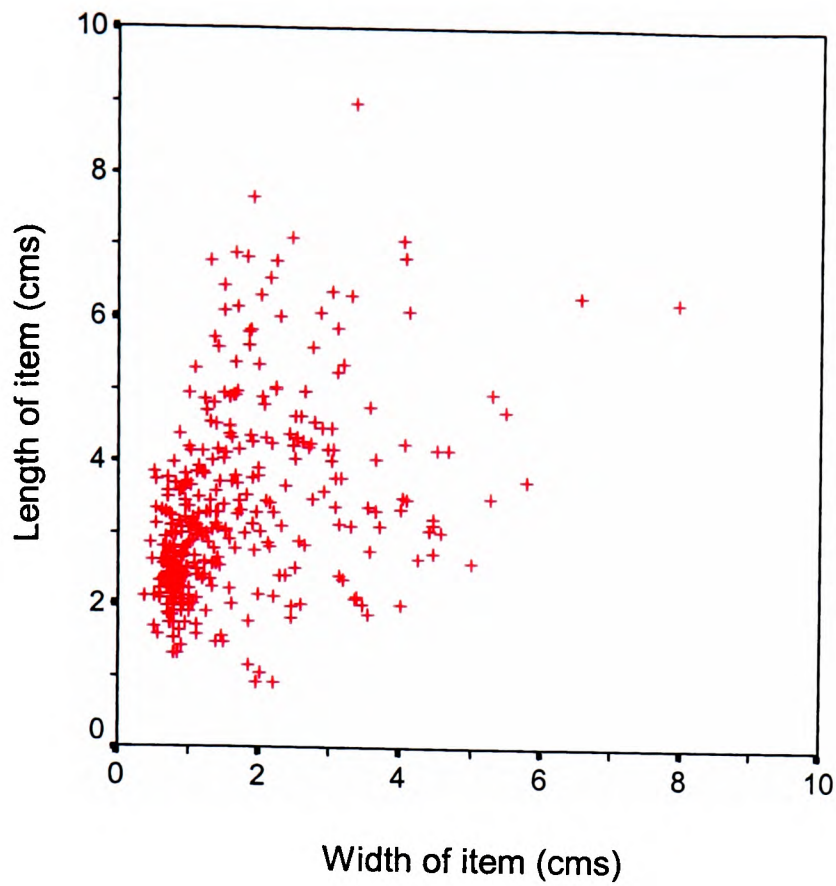


Figure 24: Scatterplot displaying a concentration of blanks with similar measurements in layer 2.

The same type of graph for layer 4 does not display any similar clusters at any point, which would lead us to conclude that blanks displayed a greater variation in size and shape during the latest Mousterian, which might indicate lack of preference or lack of control in manufacture.

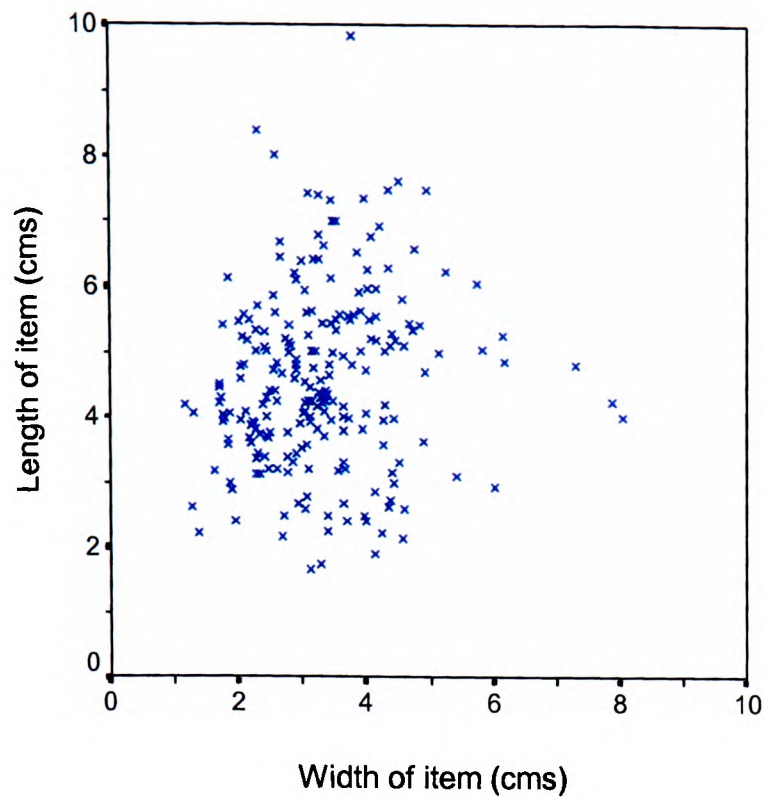


Figure 25: Lengths and widths of blanks in layer 4 graphically represented.

The appearance of a cluster for layer 2 can also be studied from a typological perspective. In order to do this, the classes most represented in layer 2 (5, 46, 47, 77 and 90) were plotted together, and the result was a concentration of pieces within the typical measurements for bladelets (and blades to a lesser extent), classified as Dufour bladelets and atypical and typical Chatelperronian points. Shapes of endscrapers on retouched blades and sidescrapers (numbers 5 and 77) show a higher degree of variation, especially in the case of the latter.

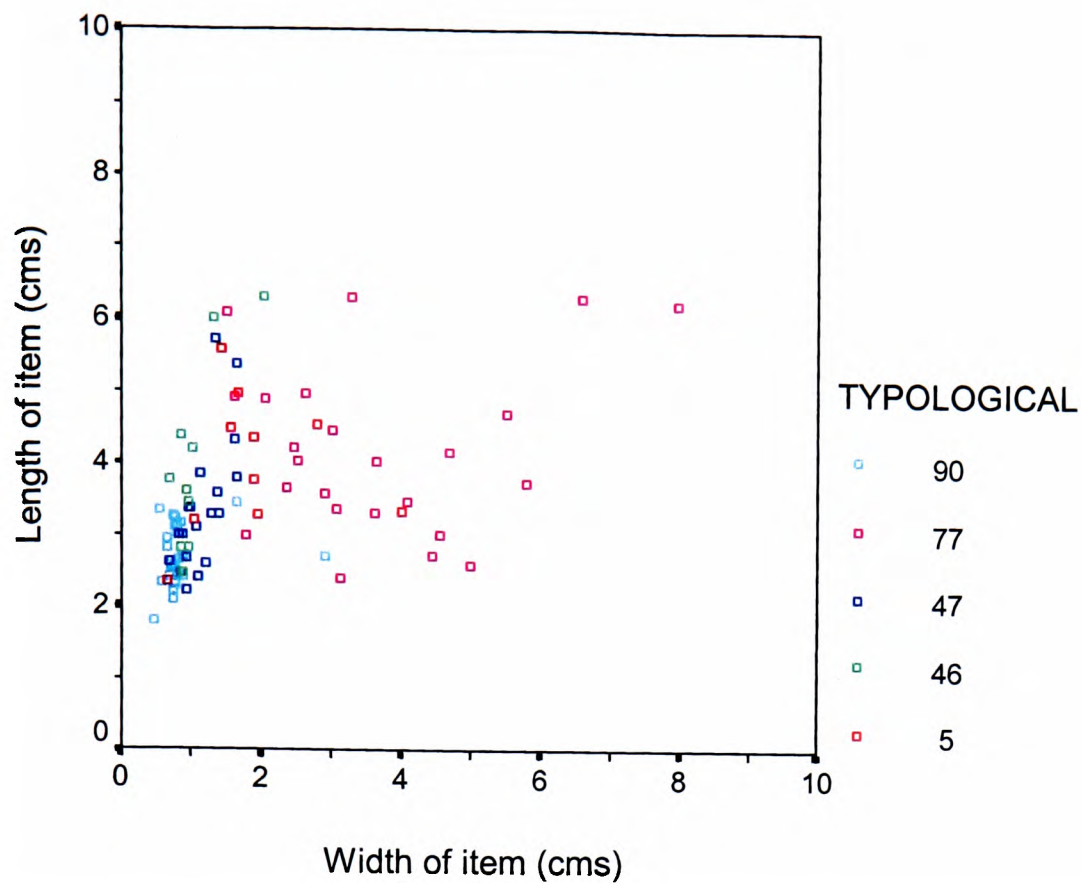


Figure 26: The most represented types in layer 2 graphically represented, by measurements.

3. Increase of 'geographical' variation

This thesis addresses the subject of variation that might be attributed to geographical factors by comparing the assemblages of Abric Romaní's layer 2 and Reclau Viver's Aurignacian. This is done in section 5.1.2.1., after the latter site has been studied. However, several caveats will have to be born in mind: the complexity of the Aurignacian layer/s of Reclau Viver and its lack of Mousterian levels, and the already discussed problem concerning the comparison of assemblages analysed by two different typological systems to observe the supposed 'increase', in this case layers 2 and 4 at Abric Romaní. In these circumstances, the author conducted an analysis to see how much variation was to be found when the earliest Aurignacian at these two sites was compared, and just what the differences were. It would have been good if the immediate final Mousterian background could have been similarly studied, but obviously, this was not possible.

4. *Appearance of complex bone/antler/ivory technology*

Abric Romani's Vidal Collection, at the MAC, contained a few bone pieces, but no bone or antler or ivory artefacts or fragments were present in any of the other collections.

The worked bone remains seen at Barcelona were in a very fragmentary state – as can be appreciated from picture 27 - and thus it was not possible to discern if they had belonged to any particular type of implement. Samples were taken from three of the pieces in order to date them, but this was unsuccessful, as explained in chapter 3.

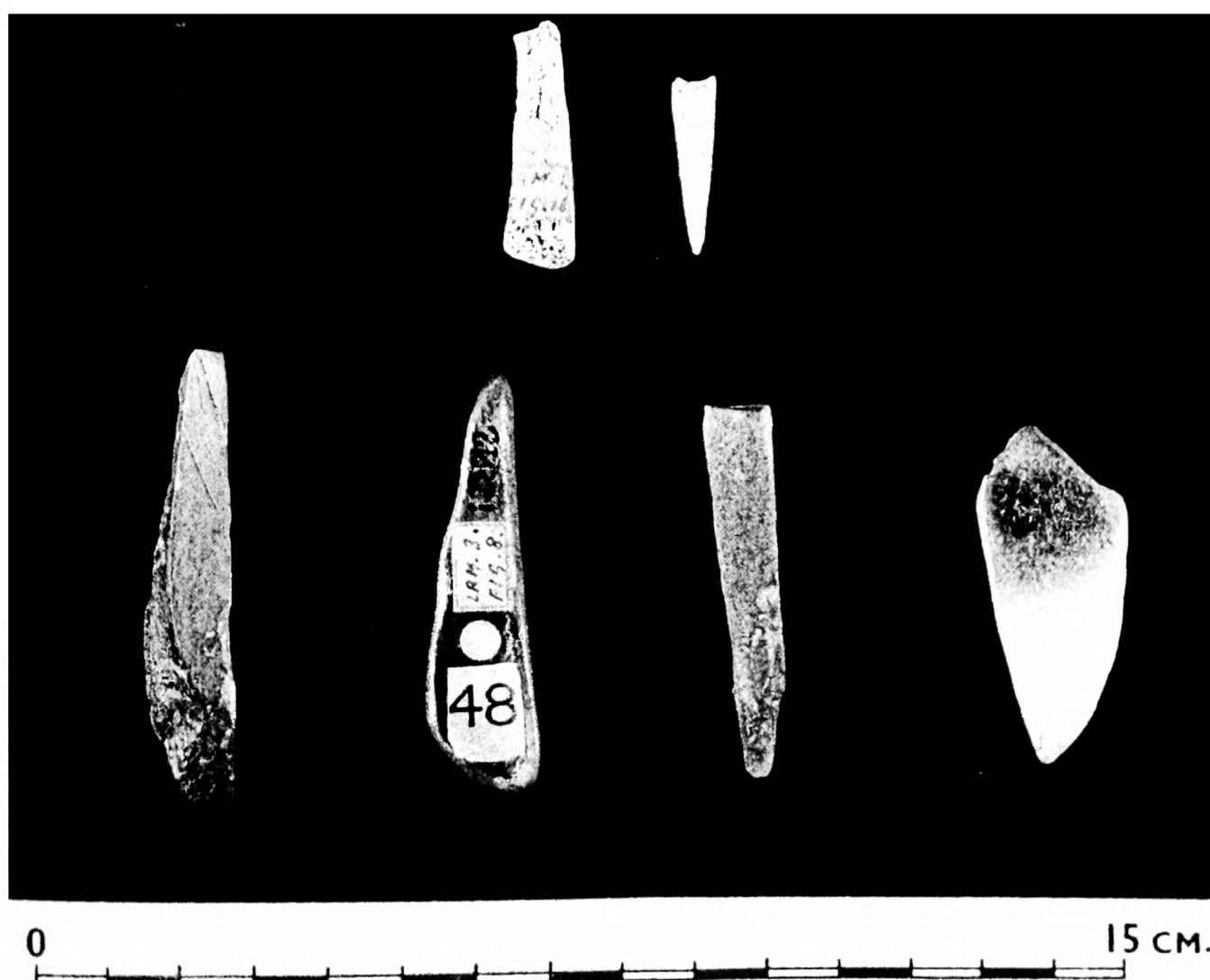


Figure 27: Bone pieces from the Vidal Collection at the MAC.

It is difficult to appreciate exactly what techniques were used to work these pieces, due to their poor preservation. Only in one case (pict.7) it seems clear

that some sort of polishing work was performed on the implement, which also shows traces of having been burnt.



Figure 28: Bone point fragment (tip).

5. *Appearance of sophisticated/naturalistic art*

No traces of art of any kind were recovered from layer 2 at Abric Romaní.

6. *Appearance of personal ornamentation*

Maroto et al. (1996:244) write that “At layer 2 we find elements of personal ornamentation: fish vertebrae and perforated sea shells. ... Neither is present in layer 4”. Carbonell et al. (1996:427) add that “the [Transition to the?] Upper Palaeolithic in Abric Romaní is characterised by a clear technological break with the Middle Palaeolithic... cultural elements appear that were unknown up to that time in the site, such as perforated shells and fish vertebrae which were used for personal ornaments... The chronological framework within which this transformation is produced suggests an early appearance of the Upper Palaeolithic in the north of the Iberian Peninsula”.

From the above comments it is clear that the perforated shells and fish vertebrae excavated by A. Romaní during 1909 and 1910 (see chapter 3) from

level 2, inside the 'Coveta Nord' are considered by these authors to be material proof that this characteristic, regarded as one of the hallmarks of the Transition, does apply to this site.

Because dates obtained by Bischoff, which came from organic remains (charcoal/bone fragments) taken from the remnant sections attached to the wall of the site, preserved by Romaní and Ripoll, gave readings of *c.* 40,000 BP, these objects, which had been modified by people who had lived at the site, and had been excavated inside the layer's matrix, were assumed to be a clear signal that the Transition had taken place at around that time.

Despite the fact that some researchers (Laplace 1962, Soler 1986) had hinted at the possible existence of two different strata inside layer 2 and although these materials –exhibited at the MAC – were never directly dated, the latter were always considered to belong among the remains of the earliest Aurignacian occupations, the only ones that took place, according to Carbonell et al. (1996:425).

The preliminary results of the dating project performed as part of this research contradict the widely known assumptions outlined above. In the paragraphs below, the author describes in detail the shells from which the samples dated were obtained and she presents the dates obtained at the Oxford Research Laboratory for Archaeology and History of Art (RLAHA), after a brief explanation concerning all the shells housed in the MAC.

The marine shells from the Vidal Collection are classified and counted as follows: 22 *Cypraea pyrum*, 12 *Cyclote neritea*, 1 *Turritella sp*, and 9 *Nassa reticulata*. There is one *Cypraea pyrum* at the MAN in Madrid and two more in Vilanova; it is not known if the Capellades collection contains any shells. According to Vidal (1911), all of them were found together inside the 'Coveta Nord'.

An important factor considered at the time of drilling the pieces was to perform the sampling in an area where it would cause the least damage or change to the item, and would be not very visible, in case the objects would be studied or exhibited in the future. Most samples were obtained in the area near the lip of the shells and pictures of the pieces were taken before and after the operation; these show that the operation was carefully carried out and the morphology of the shells was not affected.

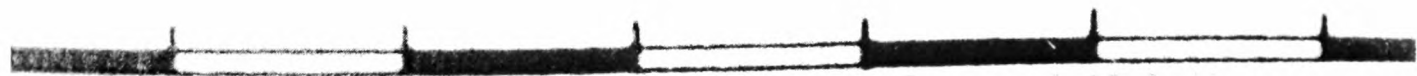


Figure 29: One of the shells sampled, before being drilled.

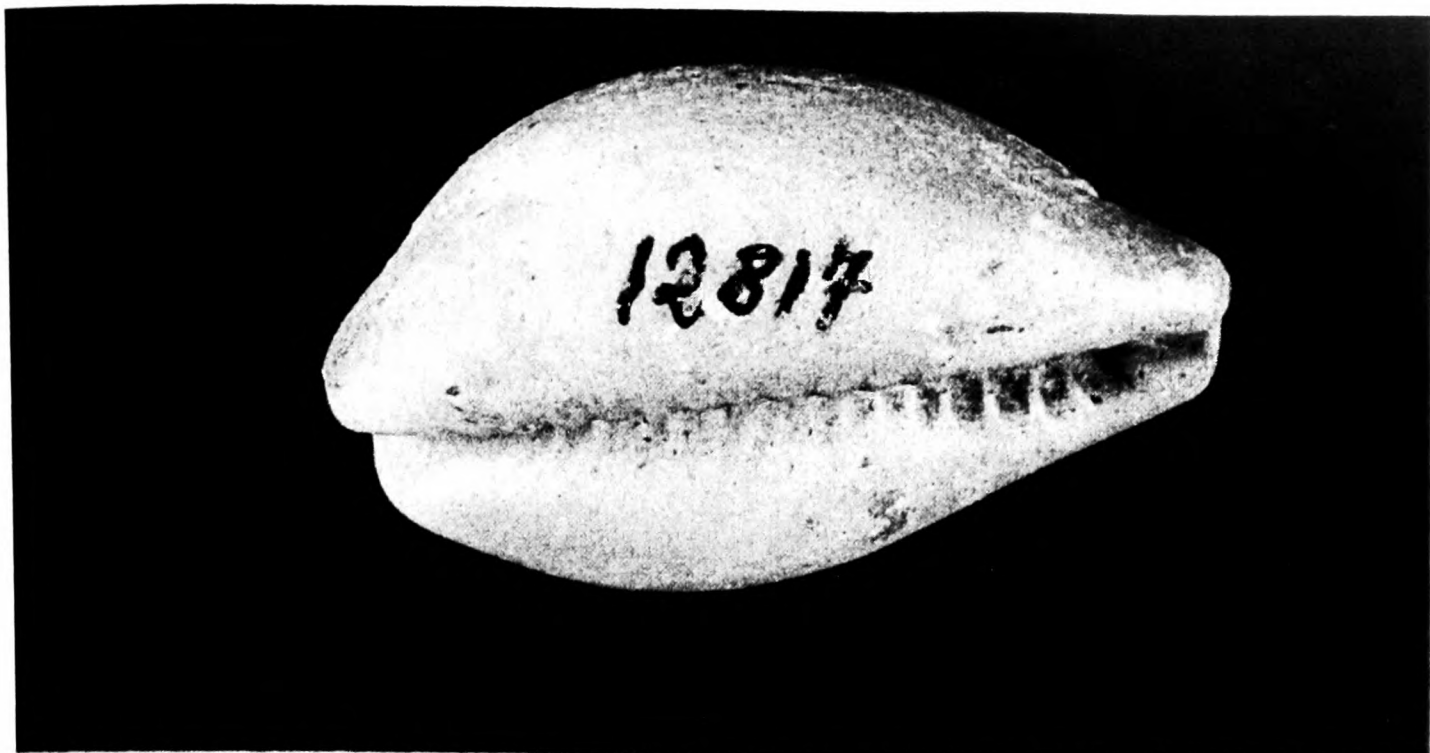


Figure 30: The piece of the previous picture, after having been drilled.

The museum's photographer also took pictures of the molluscs and close ups of the perforations, especially those of the *Cypraeas*. These are located on the dorsal side (in the case of this species and most others, this is usually the one opposite the side where the siphonal canal is located³⁵, the usual position for this species according to Taborin, (1993:180).

All the *Cypraeas* were perforated by a method that can loosely be described as sawing – Taborin's B4 type of technique – which implied the repeated rubbing of a pointed object in the small area where the hole is now located, moving the instrument back and forth. This produced a characteristically narrow perforation surrounded by scratch marks.

³⁵ Taborin (1993:169) warns about the difficulties of defining and describing these pieces and the perforations, which are caused by the high diversity of shells' shapes.

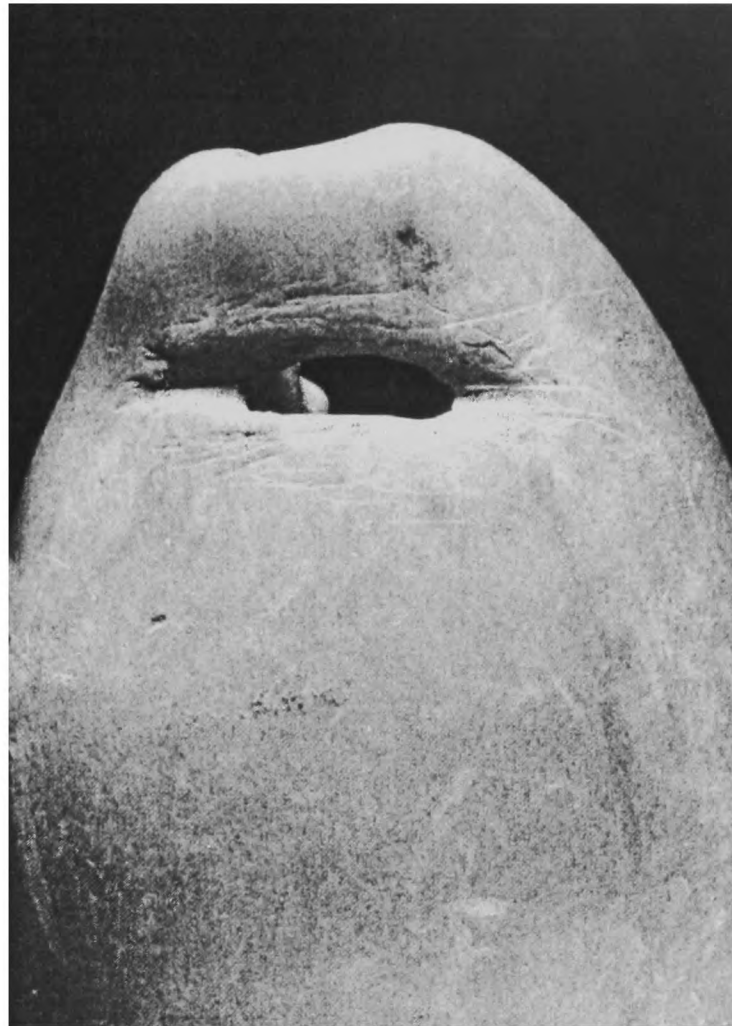


Figure 31: Close-up showing clear traces of sawing, around the perforation.

The *Turritella sp* was worked differently: a close-up of the orifice reveals traces of some piercing, possibly by pressure following a preparation of the area of the perforation by abrasion. This produced a more opened and circular perforation, with irregular edges, but traces around it are minimal. Taborin (1993:252) quotes sawing as a common technique to perforate *Turritella sp*, but this is clearly not the case for the one found at Abric Romani.

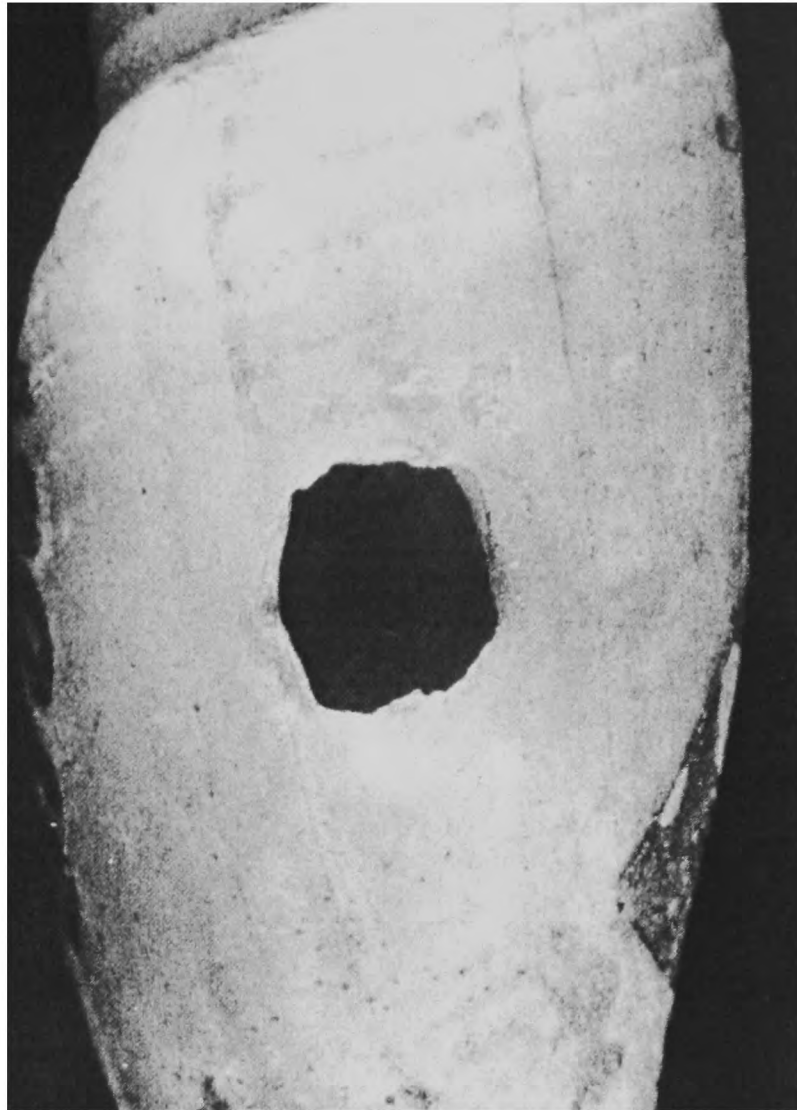


Figure 32: The perforation made on the *Turritella sp* shows signs of piercing.

The same procedure seems to have been applied to other shells, such as the *Nassa reticulata* examples, but in these cases the shells were not very thick and the results were bigger and more irregular perforations and, in some cases, parts of the shells were lost.

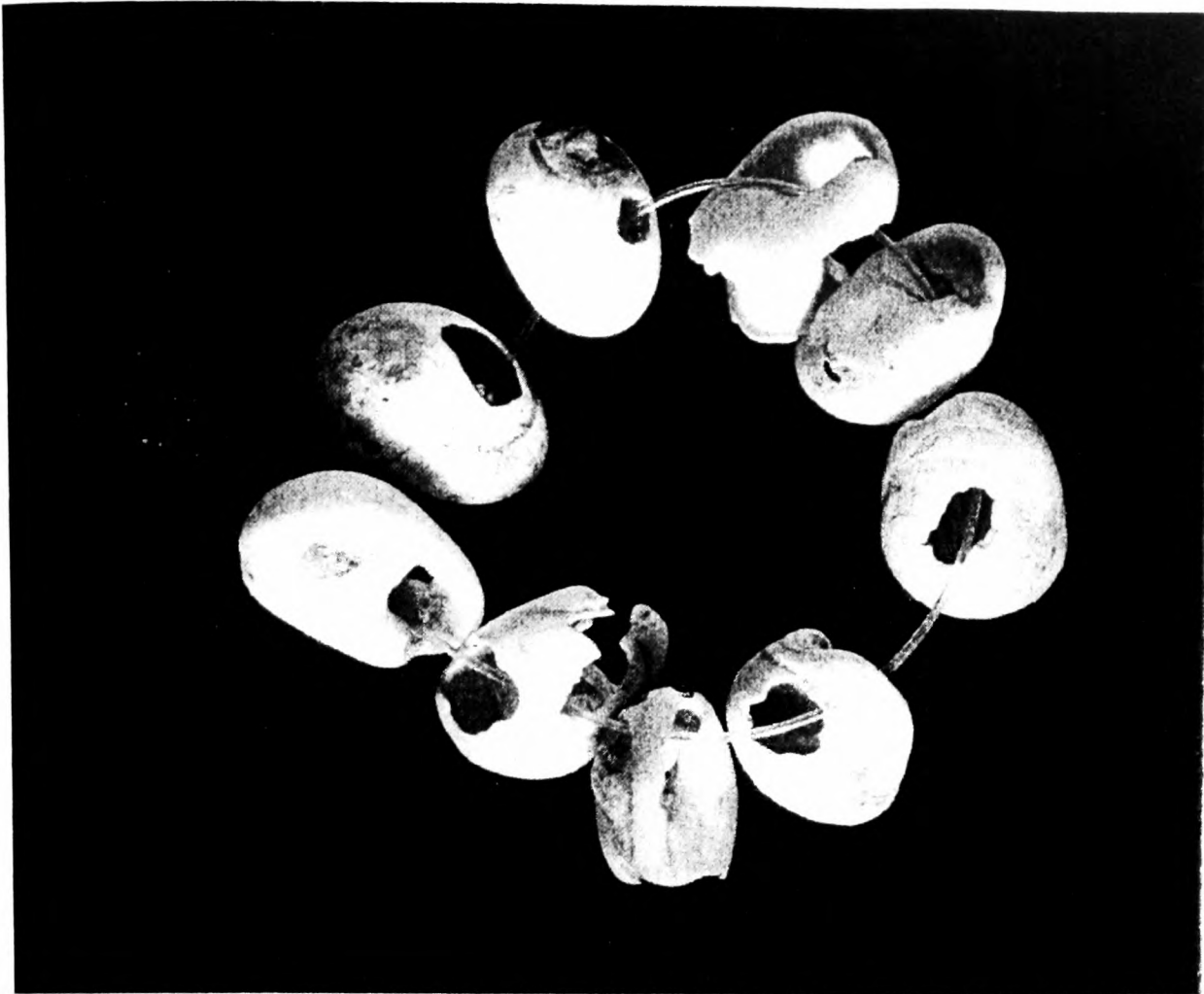


Figure 33: Irregular perforations on the *Nassa reticulata* specimens.

The shell species found at Abric Romani are not diagnostic of any of the periods into which we divide the Upper Palaeolithic, and most of them appear in the French sites studied by Taborin throughout it. However, it is important to highlight that the most numerous species at Romani, the *Cypraeas pyrum*, does not seem to have been found in any French Aurignacian layer, but it is common during the Solutrean, although other types of *Cypraeas* do appear during the Aurignacian (e.g. *Cypraea columbaria* and *Cypraea burdigalensis*).

An analysis of the dated specimens, including the AMS date obtained for each of them follows:

- OxA-11922 (ARMAC 12817(p))³⁶

This particular example presents a smooth dorsal surface towards the top, which becomes more rugged on the lower area. There seem to be traces of colouring on one side, which were not visible during the visual morphological study of the piece.



Figure 34: Possible colouring traces on the right side are still visible nowadays.

The perforation is narrow and scratches around and specially below the slit are clear.

³⁶ OxA numbers are the RLHA's reference numbers and those starting with ARMAC are the author's fieldwork references.



Figure 35: Close-up of the perforation made on the ARMAC 1281(p) shell.

This shell was dated to 20190 ± 75 BP.

- OxA-11923 (ARMAC 12819)

The only specimen of *Turritella sp* discovered in layer 2 was drilled right on the siphonal canal, for the reasons outlined above.

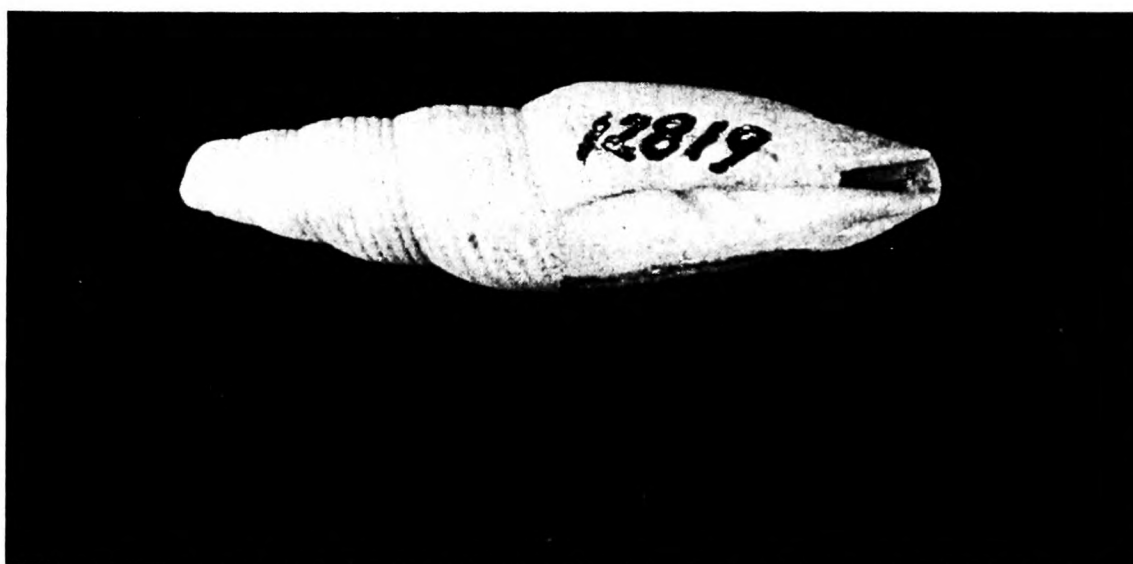


Figure 36: The drilled area is the lower edge of the siphonal canal.

As already mentioned, the perforation is round with irregular edges and located on the dorsal surface. The area around it appears to have been smoothed by polishing, as the characteristic horizontal ridges that cover the whole of the shell's surface have disappeared in that zone.



Figure 37: View of the perforated side of the *Turritella sp.*

It produced a date of 21155 ± 80 BP.

- OxA-11924 (ARMAC 23146(ex))

This is the only *Cypraea pyrum* that presented two clear holes. Its dorsal surface was smooth and extremely shiny.



Figure 38: View of the location of the two perforations.

The traditional elongated and narrow perforation does not present any type of abnormality.

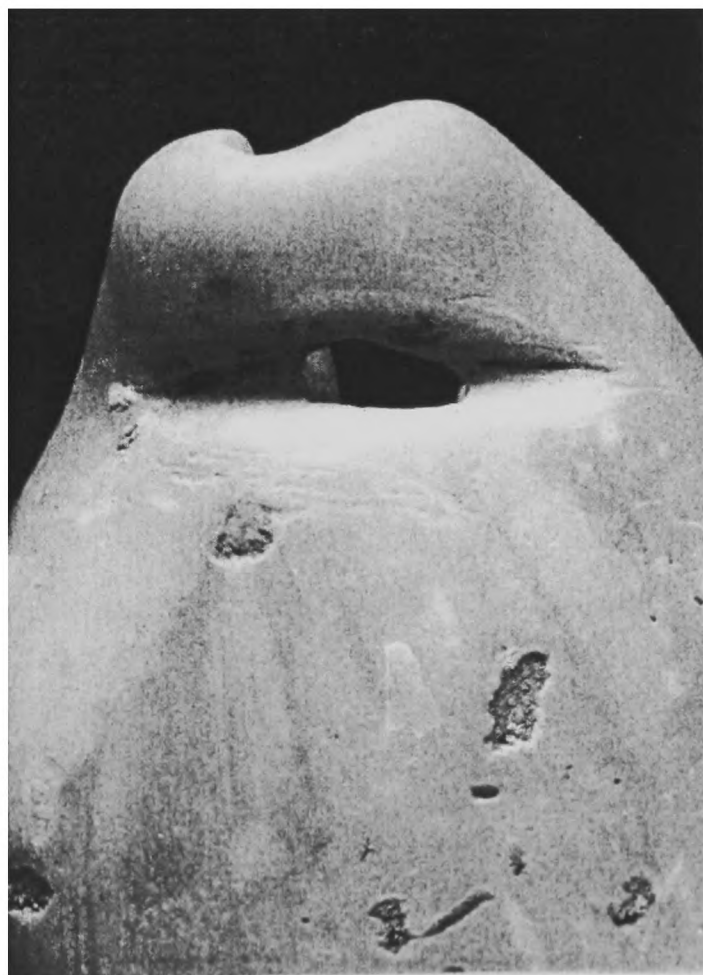


Figure 39: Close-up view of the top perforation.

Another hole was made on the right side towards the middle proximal half of the piece. The technique to create this orifice was different from the one used to make the aforementioned upper slit characteristic in this species. A close-up picture shows that it was probably made by direct pressure, as the calcium carbonate layers around the opening cracked unevenly. Taborin (1993:172) classified this type of perforation as 01a.



Figure 40: Close-up of the lower perforation, clearly showing the edge damage caused by direct pressure.

This piece was dated to 20295 ± 75 BP.

- OxA-11573 (ARMAC 12817)

The last piece was another *Cypraea pyrum*, which presents a very narrow and horizontal perforation on top of the dorsal surface, which is placed in the centre of the shell but in this case it is elongated towards the right side.

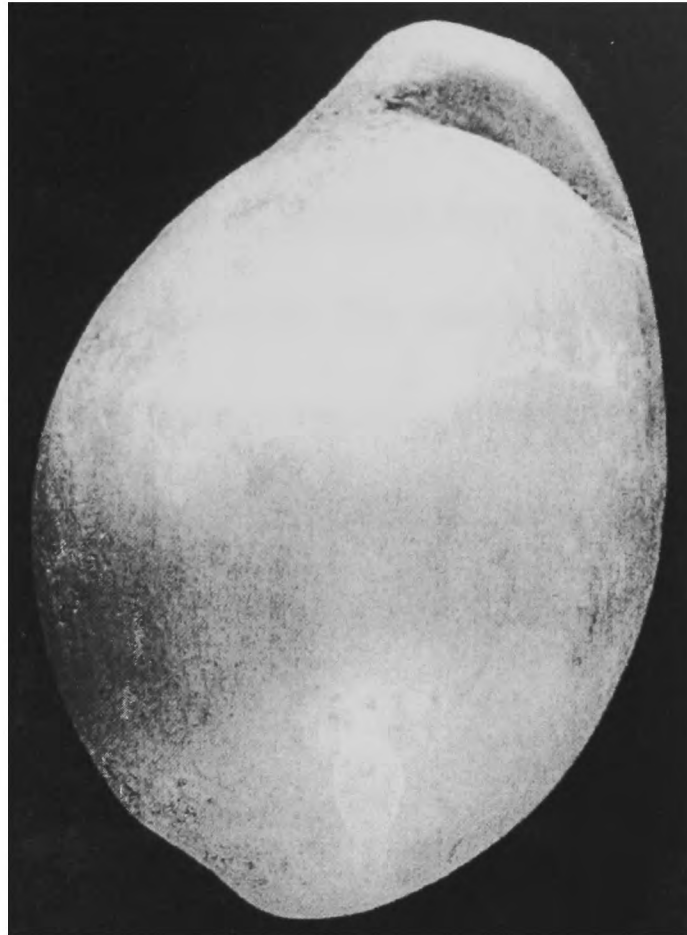


Figure 41: Piece ARMAC 12817. General view.

Its smooth surface shows no traces of colour or pecking, but there are some concretions on the left of the perforation, which are also commonly found on the lithic implements from this site.



Figure 42: Close-up of the perforation.

Its date is 20680±110 BP.

Table 3 presents a summary of the dates obtained from the shells sampled, together with the data relevant to the dating results. The new readings clearly have little in common with the dates that had been previously obtained for this layer and they accordingly support the idea – already presented in chapter 4 from the typological perspective – that layer 2 of Abric Romani is very likely to contain elements from very different ages.

Lab's ref #	Sample identification	Sample material	$\delta^{13}\text{C}$	Results (in BP)
OxA-11922	ARMAC-12817(p)	<i>Cyprea pyrum</i> (shell)	1.0	20190±75
OxA-11923	ARMAC-12819	<i>Turritella sp</i> (shell)	1.6	21155±80
OxA-11924	ARMAC-23146(ex)	<i>Cyprea pyrum</i> (shell)	1.5	20295±75
OxA-11573	ARMAC-12817	<i>Cyprea pyrum</i> (shell)	2.7	20680±110

Table 12: AMS radiocarbon determinations of shell carbonates from perforated shells excavated at the site of Abric Romani (layer 2).

A second application to extend the dating project was successfully prepared in order to date two samples procured on a previous occasion by one of the members of the staff of the Oxford dating laboratory. These had been extracted from the remnant sections of the wall of the rock shelter at levels which were believed to correspond precisely with layers 2 and 4, and the results obtained are shown below:

Lab's ref #	Sample ID	Material type	C:N Ratio	$\delta^{15}\text{N}$	$\delta^{13}\text{C}$	Results (in BP)
OxA-11967	AR98/level A	<i>Equus</i> ' tooth	3.3	5.98	-20.3	35,900±600
OxA-12025	AR102/level B	charcoal	-	-	-24.5	39,060±350

Table 13: AMS radiocarbon determinations of tooth dentine and charcoal from the Abric Romani site (the references use the stratigraphic designations of the recent excavations, but are equivalent to layers 2 and 4 respectively). A C:N ratio is used as a measure of bone preservation. Modern values mean at 3.2, but at ORAU a range of 2.9-3.6 is used. Values outside this are suspicious and may evidence the addition of carbon from a contaminating source.

These two dates did not come from humanly modified objects but were much closer to the ones obtained by the previous dating projects. It is important to remember that the remnant sections yielded few if any lithic or bone implements (Laplace 1962), and thus it is not possible to complement these radiometric results with further information from associated industry.

Another important issue is the fact that layer 4 (currently designated level B) produced a date which is rather young, and closer to those obtained by previous projects for level 2 (currently referred to as level A). Looking at Beck et al. (2001) graph, a date of 39 ka would convert into a calendar age of 42-44 years ago, not too different from the calendar date of Level A. This is because the amount of radiocarbon is rising and falling dramatically during this period. The only previous date obtained for level B is 43500 ± 1200 BP. More dates from this layer are needed in order to be able to securely ascertain its chronology.

It is very difficult to establish whether the dated organic material did really belong to the Transitional layers, or to strata placed at higher or lower, which have nothing to do with the area from which the shell samples came. Even if that could be resolved, nothing excludes the possibility of other areas of layer 2 containing objects from different chronological periods due to secondary deposition processes or old excavation techniques.

To conclude this section, we can certainly say that there is in fact no evidence for the appearance of personal ornamentation during the Aurignacian at Abric Romaní. The

earliest dates obtained for objects of this type locate their first presence somewhere in the late Gravettian³⁷.

In conclusion, the generalised transitional scenario does not apply for the site of Abric Romani as a block package, as earlier accounts suggest. While tenets number one and two can be observed from the analyses performed, the evidence for complex bone/antler/ivory technology is very poor, and the pieces cannot be dated, which is a crucial issue, due to layer 2's complex and probable multiple composition. Regarding the issue of the appearance of sophisticated art, there is a complete lack of evidence, and a thorough study of the personal ornamentation objects, assumed to be a clear proof that the last tenet was applicable for this site, has shown that we have no evidence that personal ornaments were manufactured or worn at the site during the earliest Upper Palaeolithic. The ones discovered in layer 2 were made and left there much later on.

5.1.2. The Reclau Caves

The Reclau Caves were created by the formation of cascading travertine terraces which developed from the outflow of ground waters moving across the Pleistocene limestones of the Usall plain. They are located some 4 km away from the town of Banyoles, 15 m above the Serinyadell river. Their present day elevation above sea level is around 200 m (Bischoff et al. 1989, Soler and Maroto 1987a).

³⁷ *Cyclote neritea* is a species which was also found at the Gravettian layer at Isturitz, and *Turritella sp* have been discovered in French sites with Upper Perigordian remains, according to Taborin's study (1993).

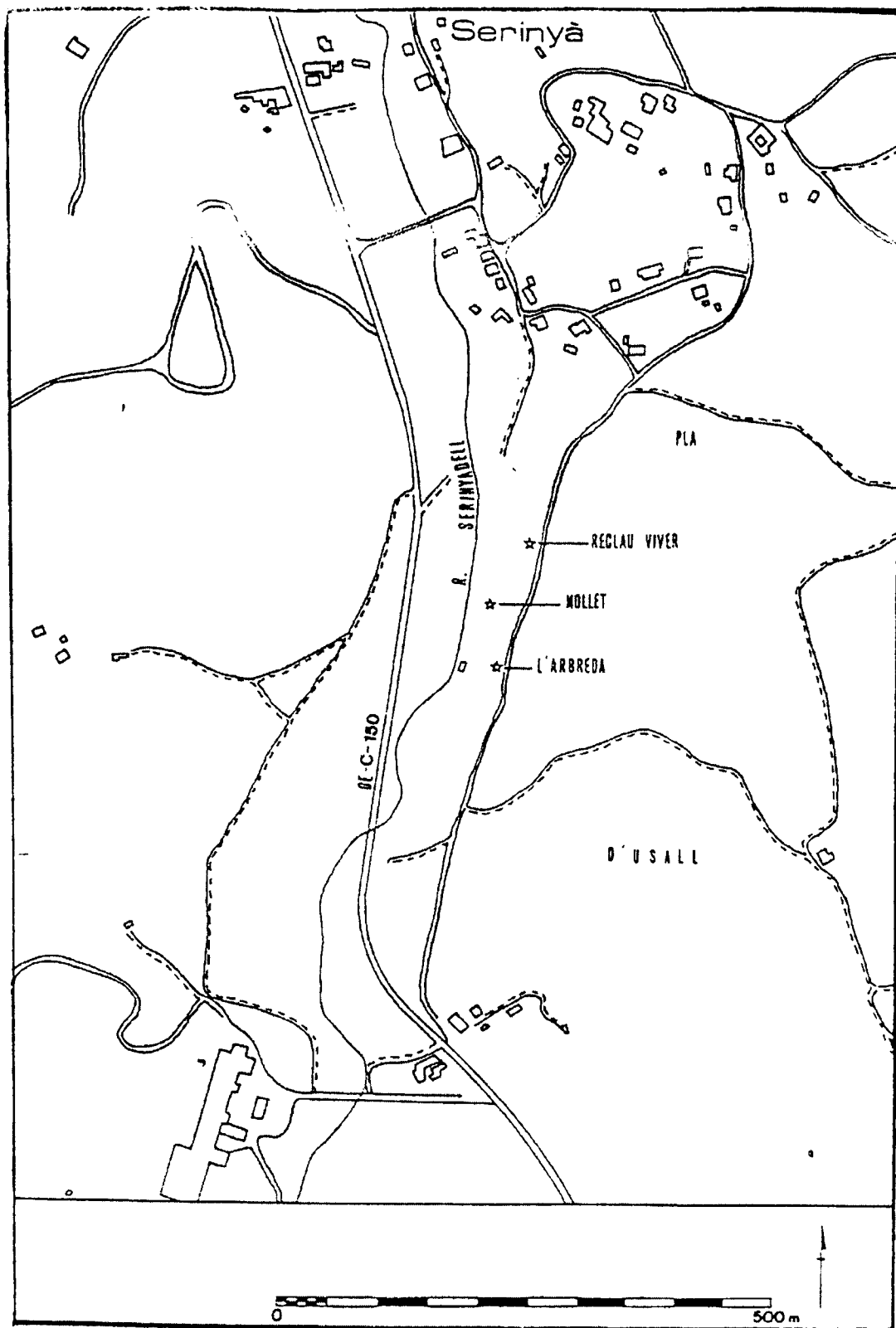


Figure 43: Map of the region of the Reclau caves

The first reference to these caves is that of P. Alsius (1896) and L. Pericot (1952) reports that the first prospection works were carried out by Barba and Camps in 1934-1935, though these were only superficial.

J. M^a. Corominas, a doctor from the region, was the first one to carry out systematic archaeological research in the area, from 1943, when he performed a thorough prospection of the different caves, onwards. He began excavating Reclau Viver in

1944 and l'Arbreda in 1972. In 1975, N. Soler assumed the direction of the works until 1982. From 1983 to 1987 and from 1996 onwards, they have been carried out yearly, under Soler's and J. Maroto's supervision.

This section focuses on the two most famous caves of the group, Reclau Viver and l'Arbreda. The author studied the Corominas collection from Reclau Viver, which had not been analysed before and is kept at the Banyoles Museum. The data obtained in this study are complemented by the other studies of this site's materials, mainly by Soler.

Access to the l'Arbreda material during the author's research period was restricted due to the fact that a student at the University of Girona (Mr D. Ortega) was working on his dissertation, which is based on that collection. Nevertheless, l'Arbreda is a crucial site for the study of the 40,000 BP Crisis phenomenon, and therefore it is included in this thesis, by using information found in the literature.

5.1.2.1. Reclau Viver

In 1943, the Centre of Regional Studies of Banyoles set up a project to explore all the Serinyà caves. All of them produced archaeological remains. The following year, Corominas began to excavate Reclau Viver, the first cave from the south from the village of Serinyà. He worked at Reclau Viver until 1947 (Corominas 1946, 1949, 1952, Soler 1981, 1986, Maroto 1994).

Reclau Viver cave can be divided into two main areas:

- The 'hall': roofed area where the stratigraphical layers are severely mixed due to many episodes of post-Palaeolithic burials³⁸.
- The 'corridor': elongated passage (3 m long, 1.60-1.90 m wide) the roof of which collapsed after the Solutrean occupations, thus preserving the original stratigraphy of earlier Palaeolithic levels.

The several problems encountered by scholars when studying this cave are attributed by Soler (1981) to disagreements between them on typological matters, complicated by the scarcity of remains. The present author thinks that the methods of excavation - artificial 20 cm deep levels in irregular trenches and the use of gunpowder explosions to remove big blocks (probably from the collapsed roof) – may have played an important role in complicating matters at this site.

Since Corominas' work, several other researchers have revised his interpretations and have attempted the reclassification of the pieces he found. This has been possible thanks to the careful inventory and preservation of the remains and to the fact that he kept a meticulous excavation diary. The most complete study of Reclau Viver's Palaeolithic levels is that of Soler (1981, 1986). He focused on the lowest two levels, which have always been attributed to the earliest Upper Palaeolithic, and because of stratigraphical problems in the hall area, he concentrated on the corridor zone.

Below the Solutrean and Gravettian levels, the stratigraphical sequence is the following (Corominas 1946):

³⁸ Corominas (1952:25) mentions that shards of one single pottery vase were found in all levels of this area.

4.40-4.60 m	Almost sterile
4.60-5 m	Level B (according to Corominas (1952) Aurignacian, for Soler (1981) Aurignacian I and for Laplace (1966c) Protoaurignacian)
5-5.40 m	Level A (according to Corominas (1952) Aurignacian, for Soler (1981) Aurignacian 0, for Estévez (1976) and Laplace (1966c) Protoaurignacian, and for de Sonneville-Bordes (1973) Chatelperronian)

Table 14: Stratigraphy of the Lowest Levels of Reclau Viver.

Both level A and level B had a very scarce number of tools; while A contained seven big Dufour bladelets (e.g. 35x6x2 mm and 47x9x2 mm) and a Chatelperronian point (out of 68 tools), level B yielded 33 tools in total: eight endscrapers (six of them nosed), five backed bladelets, nine sidescrapers (two carinated ones), six denticulates and five burins (Soler 1981:25,27, 1986). 20 more tools, attributed to an uncertain level, were typologically classified by Soler according to the Analytical Typology method.

Both levels seemed to Soler to be older than l'Abreda's Aurignacian. The radiocarbon dates obtained in the 1970s in Michigan did not support his hypothesis:

(Unspecified) Aurignacian level)	18,700 ± 800 BP
	16,560 ± 600 BP
	16,200 ± 500 BP

Table 15: The three first dates obtained for Reclau Viver's Aurignacian levels according to Soler (1981) and Maroto (1994).

Already in 1981, Soler considered them to be too young, and assumed they must have been contaminated. New dates were obtained from bone samples by AMS at Oxford, and were provided by Maroto (1994):

Level B	30,190 ± 500 BP
Level A	40,000 ± 1,400 BP

Table 16: Latest radiocarbon dates for Reclau Viver's Aurignacian levels.

These new results clearly influenced the re-interpretation of the site's typological attributions, and Maroto et al. (1996) consider level A to be parallel to Arbreda's earliest Upper Palaeolithic; the distance between the two caves is barely 100 m, so in principle, this does not seem a far-fetched possibility. Nevertheless, Reclau Viver's bone technology is more abundant and varied than that of l'Arbreda.

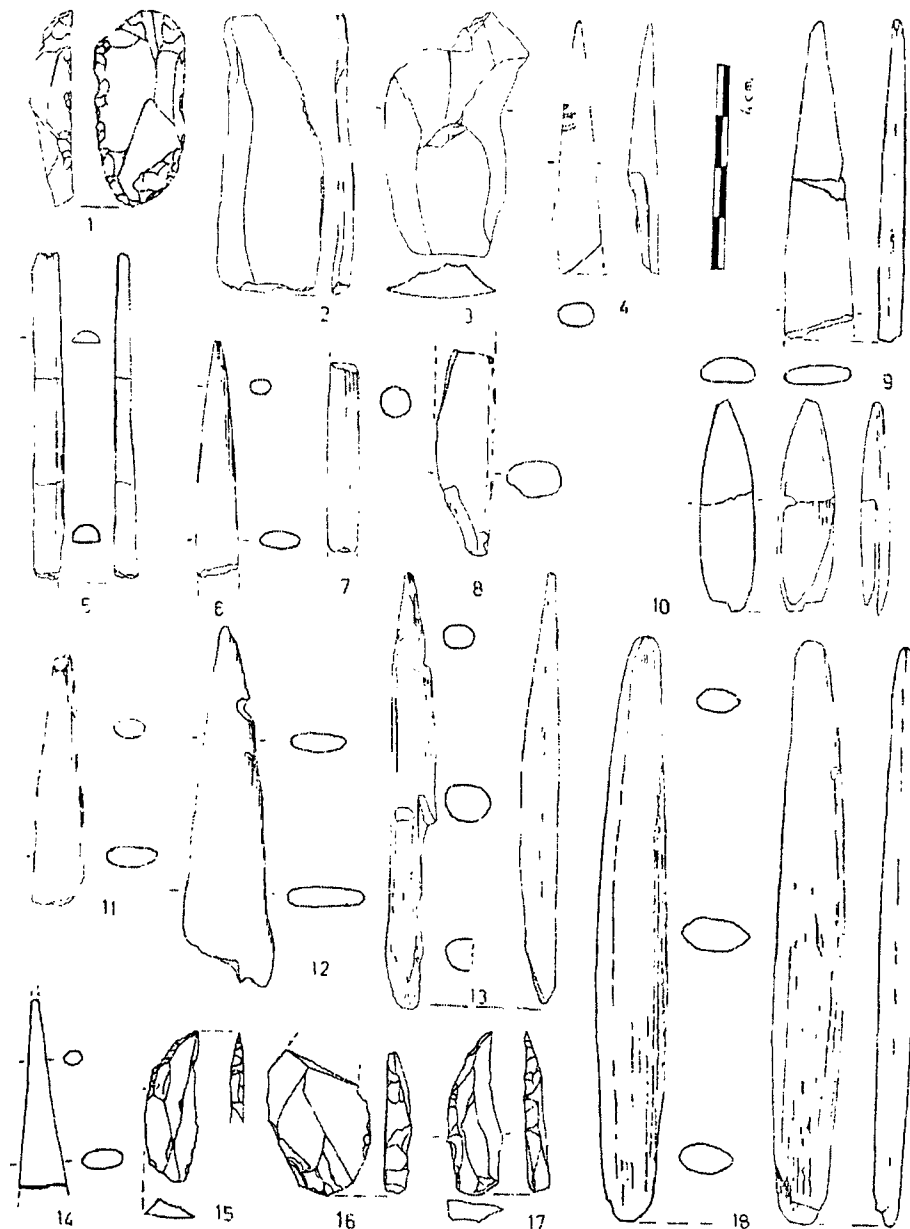


Figure 44: Some examples of lithic and bone technology from Reclau Viver (from Soler 1981).

During her fieldwork, the author spent around three weeks in Banyoles, studying a part of the Reclau Viver Corominas' collection, which – according to the Director of the Museum – had not been previously studied. Although she did not have access to the rest of the Reclau Viver' collections or the excavation diaries, she studied 349 unsorted pieces from the corridor area, an amount considered representative and this

study is complemented by information from Corominas and Soler's publications mainly³⁹.

The author examined materials the original location of which can be mapped as follows:

Trench II	Trench III	Trench IV	Trench V	Out of Trenches
4.00-4.20	4.00-4.20	4.00-4.40		4.00-4.20
4.20-4.40	4.20-4.40	4.30-	4.30-	4.20-4.40
4.40-4.60	4.40-4.60	-4.50	4.50	-4.50
4.60-4.80	4.60-4.80	4.50-4.70	4.50-4.70	4.50-4.70
4.80-5.00	4.80-5.00		4.70-	-4.80
	5.00-5.20		4.90	4.80-5.00
	5.20-5.4			

Table 17: Stratigraphic layers of Reclau Viver where the materials studied by the author were found (the figures are depths in metres: see Table 5 for the relationship to the two archaeological levels). The diagonal lines shown at three points (in the centre and right hand columns) indicate that there is unexplained variability in the measurements of layer depth used by Corominas at these points.

Regrettably, studies of Reclau Viver's Palaeolithic lithic and bone remains have usually been performed considering both the archaeological layers together, as the inventory included them in one single category. This study also deals with them in that manner, in the absence of the necessary information to separate them.

³⁹ It is important to note that Reclau Viver's materials were moved to different locations, especially during the early years of the collection, but details of these events are unknown. Only Soler and Laplace seem to have had access to what Soler (1981) considers "the whole collection".

As shown in table 9, the most frequent type was the sidescraper, with 30.3 %, followed by carinated endscrapers and endscrapers on retouched blade (11.2% and 10.1% respectively). Other types with a substantial representation, although less prominent, were atypical Chatelperronian points (6.2%) and Dufour bladelets (5.6%). A total of 178 pieces (out of 349) were classified following Bordesian systematics; 14 cores were also identified.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1	5	2.8	2.8	2.8
2	5	2.8	2.8	5.6
3	2	1.1	1.1	6.7
5	18	10.1	10.1	16.9
6	1	.6	.6	17.4
7	6	3.4	3.4	20.8
8	2	1.1	1.1	21.9
10	5	2.8	2.8	24.7
11	20	11.2	11.2	36.0
12	2	1.1	1.1	37.1
13	3	1.7	1.7	38.8
14	4	2.2	2.2	41.0
23	1	.6	.6	41.6
24	1	.6	.6	42.1
45	5	2.8	2.8	44.9
46	3	1.7	1.7	46.6
47	11	6.2	6.2	52.8
51	1	.6	.6	53.4
52	1	.6	.6	53.9
60	5	2.8	2.8	56.7
61	1	.6	.6	57.3
64	2	1.1	1.1	58.4
67	2	1.1	1.1	59.6
68	2	1.1	1.1	60.7
74	2	1.1	1.1	61.8
75	4	2.2	2.2	64.0
77	54	30.3	30.3	94.4
90	10	5.6	5.6	100.0
Total	178	100.0	100.0	

Table 18: Typological classification of the Corominas' collection for Reclau Viver's Aurignacian layers.

The percentages of raw materials for the Initial Aurignacian (undivided) at Reclau Viver are the following:

Layer	Classification	Types of RM	%
A/B	Initial Aurignacian	Flint	79.8
		Quartz	19.3
		Quartzite	0.9

Table 19: Lithic Raw Materials from Reclau Viver.

Regarding the worked bone remains from this site, Soler (1981) listed the following, out of a total of 26 items:

- 2 split base points
- 6 triangular points
- 5 *lissoirs*
- 2 sticks/rods of different configurations
- 6 piercers of different configurations

The author found the following in the collections she saw:

- 4 fragments of points (rounded or sharp)
- 3 fragments of spatulas
- 2 fragments of sticks
- 14 unidentifiable fragments
- 1 *lissoir* fragment

Soler's papers from his thorough study of Reclau Viver's earliest Palaeolithic and Corominas' publications provide important information about lithic and bone technology remains found by the latter in the two Aurignacian levels, and some of it can be used to form an opinion on whether the characteristics of the Transition outlined in chapter three are applicable to this site.

Nevertheless, no study consulted by the author produced counts of the numbers of flakes and blades, and the index for this has to be based solely on data from the author's research. At the same time, incremental changes in complexity, standardisation, innovation and imposed form cannot be assessed due to the lack of a Mousterian assemblage with which to compare levels A and B. The biggest difficulty in using the published information to assert whether the tenets apply or not is caused by the tendency of all the studies reviewed to analyse the tools exclusively from a typological perspective.

The short distance between Reclau Viver and l'Arbreda and the fact that workers now consider the earliest Aurignacian level (A) from the former to be contemporaneous with the latter could be used to analyse aspects of interassemblage variability, but the mixing of lithic and bone materials from Reclau Viver's levels A and level B renders any such comparison of little use. In the case of bone implements, Soler (1982) attributes the findings to both levels, but apart from considering split base points as the *fossile directeur* to determine layer B's type of Aurignacian, he is not precise about which pieces belong to which level. Regarding stone tools, he clearly states that they have been studied as a single assemblage (Soler 1981:16).

Reclau Viver: testing the tenets

1. Indices of flakes and blades

The Aurignacian layers of Reclau Viver do not present a higher component of blade rather than flake blanks, as opposed to the case of Abric Romaní and against the first characteristic of the change according to Mellars. Flakes represent 70.9% of the blanks and blades only 29.1%.

	Type of blank		Totals
	Flakes	Blades	
Count	212	87	299
Percentage	70.9%	29.1%	100%

Table 20: Count and percentages of types of blanks (flakes and blades) for the Initial Aurignacian layers at Reclau Viver. This is based on the material studied by the author personally.

Within the blades group though, bladelets outnumber blades by far (75 and 12 respectively). This is likely to indicate the small size of cores from which these types of blanks can be manufactured, a trait that relates to the distance between this site and the sources of flint as well as to curated use of such valued raw material.

	Type of blank			Totals
	Flakes	Blades	Bladelets	
Count	212	12	75	299
Percentage	70.9%	4%	25.1%	100%

Table 21: Count and percentages of blanks, including bladelets from Reclau Viver's Aurignacian (Corominas' collection).

2. *Greater degree of standardisation and imposed form*

The most frequent types in the collection studied by the author were types numbers 5,11,47,77 and 90. In this case, no clusters can be detected in the scatterplot (figure 24), indicating that variability of sizes and shapes is greater here than at Abric Romani.

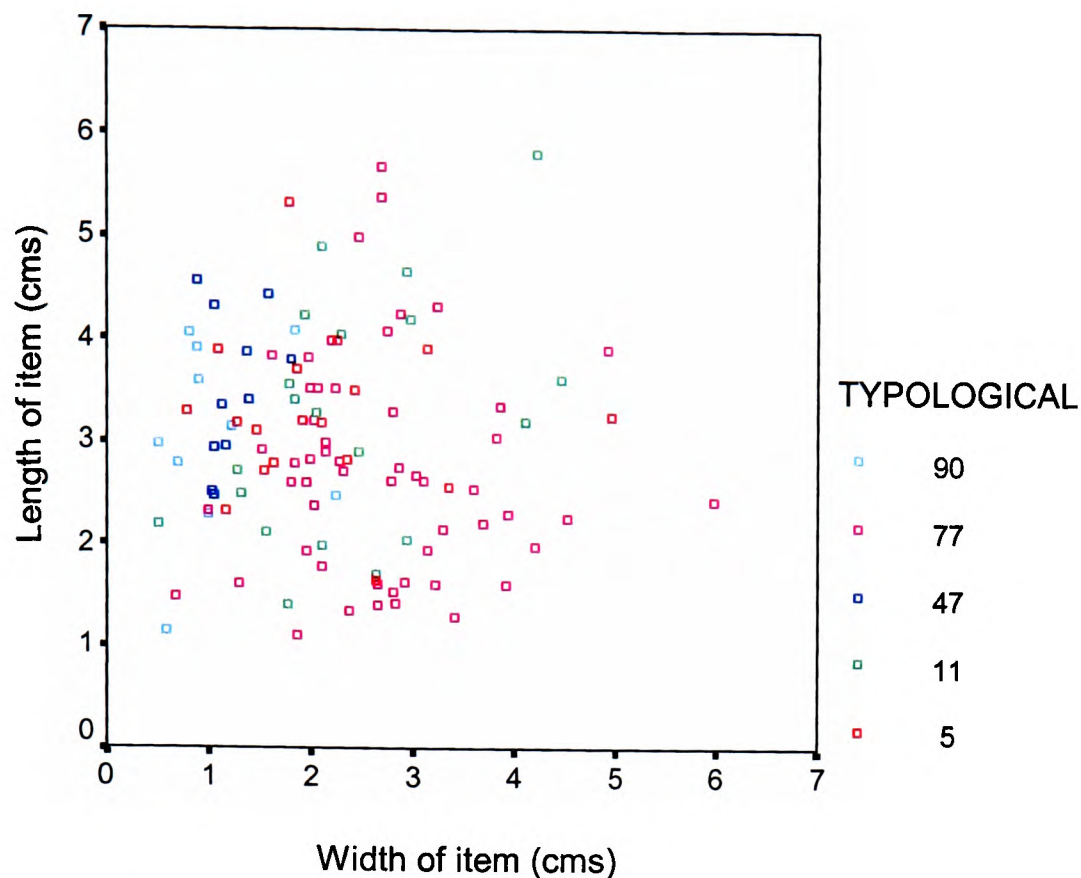


Figure 45: Scatterplot displaying dimensions of the most frequent types in the Reclau Viver Aurignacian (Corominas' collection data only).

A look at the individual types clearly shows that the variability is relatively smaller for sidescrapers, and thus in this case at least, standardisation would not be related to any new type of tool or any specific type of blank as could be argued for Abric Romaní. Another characteristic of these pieces is that the vast majority of them are relatively small, and the biggest concentration occurs around y values of 2.80 to 3.50 cm and x values of *c.* 3 cm.

3. *Increase of 'geographical' variability*

Several observations can be made by comparing information recorded by the author during her study of the Corominas collection from Reclau Viver and the analysis of the Aurignacian assemblage from Abric Romaní level 2, which can shed light on the issue of a possible geographical variety of the early Aurignacian assemblages at the inter-regional level.

The most striking difference is observed on the bar chart which depicts the count of blanks (flakes and blades) of the two layers (Figure 46), as Reclau Viver's Aurignacian collection contains well over double the proportion of flake to blade blanks (70.9% and 29.1% respectively), as opposed to Abric Romani's level 2, where blades outnumber flakes by nearly the same proportion (62.3% and 37.7%).

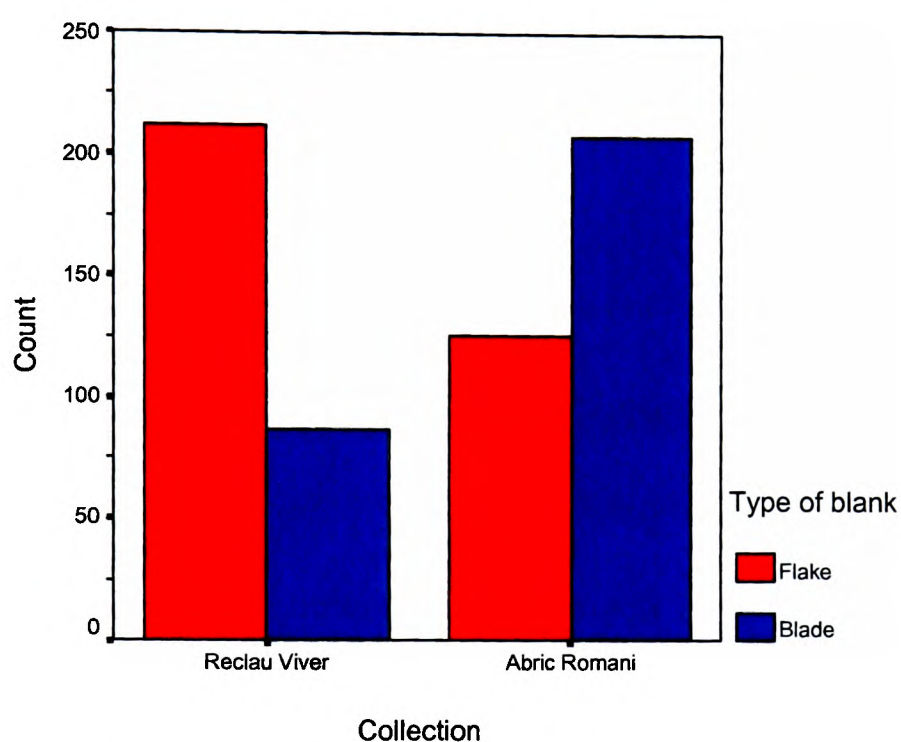


Figure 46: The counts of flake and blade blanks from the Aurignacian layers of Abric Romani and Reclau Viver compared.

By dividing blade blanks between blades and bladelets we can observe that – within the parameters outlined above – the greater differences are to be found in the bladelet group. While the blade percentage is nearly double at Abric Romani's layer 2 (7.2% against 4% at Reclau Viver), the bladelets constitute 55.1% of Abric Romani's assemblage, while they are only 25.1% of Reclau Viver's. Obviously, these differences affect the percentages of flakes on each side.

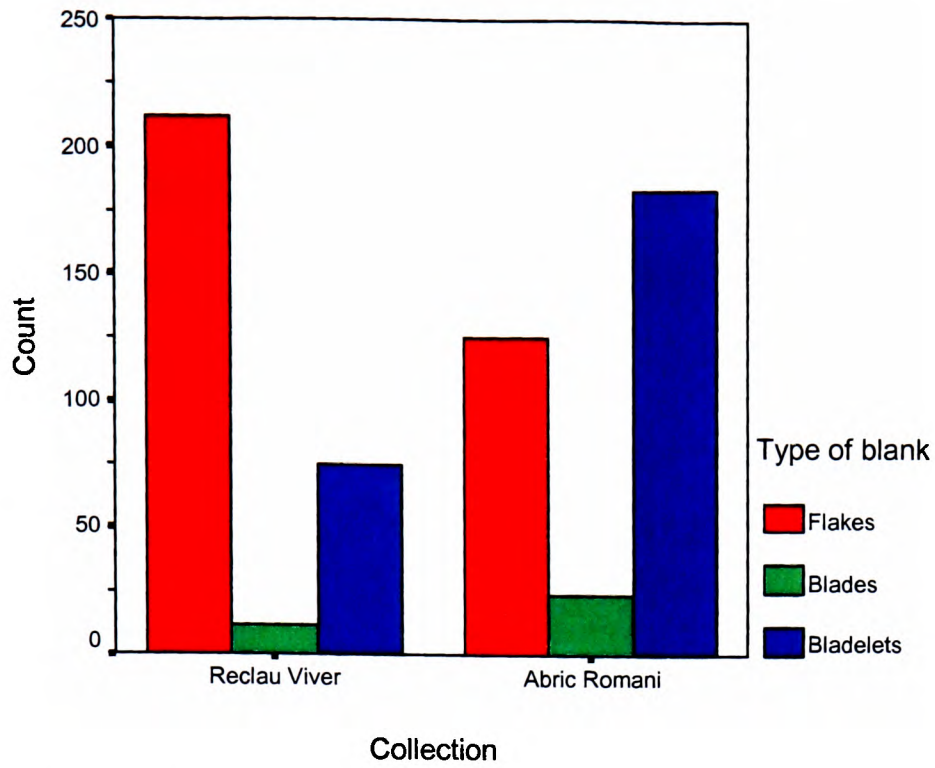


Figure 47: Counts of blanks separating flakes, blades and bladelets, for both assemblages.

As noted above, these two sites are very different in terms of their proximity to raw material sources, especially flint. This amounts to 94% of the materials used at layer 2 of Abric Romani, but not much more than half (55.5%) at Reclau Viver, where quartz constitutes 29.8% of the lithic raw material used, amongst a greater spectrum of materials. Nevertheless, the latter and the rest of the other raw materials are far from appropriate for the manufacture of bladelets, due to their physical properties (e.g. grain size, etc.).

			Collection	
			Reclau Viver	Abric Romani
Type of raw material	Flint	Count	166	315
		% within Collection	55.5%	94.0%
	Quartz	Count	89	6
		% within Collection	29.8%	1.8%
	Quartzite	Count	17	10
		% within Collection	5.7%	3.0%
	River pebble	Count		1
		% within Collection		.3%
	Chert	Count		2
		% within Collection		.6%
	"Cornuvianita"	Count		1
		% within Collection		.3%
	Granite	Count	1	
		% within Collection	.3%	
Sandstone	Count	4		
	% within Collection	1.3%		
"Calcareo"	Count	16		
	% within Collection	5.4%		
"Radiolarita"	Count	5		
	% within Collection	1.7%		
"Lidita"	Count	1		
	% within Collection	.3%		
Total	Count	299	335	
	% within Collection	100.0%	100.0%	

Table 22: Counts and percentages of raw materials used in each of the two Aurignacian assemblages.

Another difference is that the proportion of quartz and quartzite is inverse at Abric Romani (1.8% and 3%), although in both cases the amounts of pieces manufactured in these materials are very small, most likely due to the fact that flint sources are near by the site.

The scatterplot of Reclau Viver's assemblage does not display any cluster similar to the one in Abric Romani's layer 2 graph. Sizes of blanks are more consistent and exceptions are less than for layer 2, but the parameters for the vast majority are distributed over a wider area than those of Abric Romani, more precisely x values between 1 and 3.5 cm and y values between 1.5 and 4 cm.

Geographical variability can also be studied from a typological perspective, by comparing the type lists that resulted from applying the typological system devised by de Sonneville-Bordes and Perrot (1954a). From this perspective, it is worth mentioning that four out of the five most frequent tools at each site are the same for both assemblages; this would point towards little inter-regional variability, but the similarities end here.

As observed in chapter 4, in Abric Romaní layer 2 the most frequent types are 90 and 77, with 14.8% and 14.2% respectively. The latter, sidescrapers, is the most frequent type at Reclau Viver, with 30.3%, while number 90, Dufour bladelets, amounts to 5.6% only. The differences in numbers for this type may also be related to the differences in raw materials and the lack of flint in the areas adjacent to Reclau Viver.

On the one hand, Reclau Viver's Aurignacian contains types considered as characteristic of this industry such as carinated endscrapers and endscrapers on blades, in higher proportions than they appear at Abric Romaní: 11.2% and 10.1% respectively, compared with 1.8% and 5.9% at the latter site.

On the other hand, types 46 and 47, characteristic of Chatelperronian toolkits, albeit present, are not as abundant at Reclau Viver as they are at Abric Romaní: at Reclau Viver, Chatelperronian points are 1.7% and atypical Chatelperronian points are 6.2% of the total assemblage, while at Abric Romaní, they are 5.9% and 11.2%. This would support the possibility of the

existence of Chatelperronian occupations being responsible for the formation of part of level 2 at Abric Romani.

A comparative analysis of the most frequent types' measurements (length and width) was carried out in order to see the similarities of the two assemblages in terms of individual types.

Studying the presence of standardisation independently for each site in previous sections, it was noted that while standardisation of types made on bladelet/blade blanks can be observed for Abric Romani layer 2, the only traces of this trait at Reclau Viver are restricted to sidescrapers of small size.

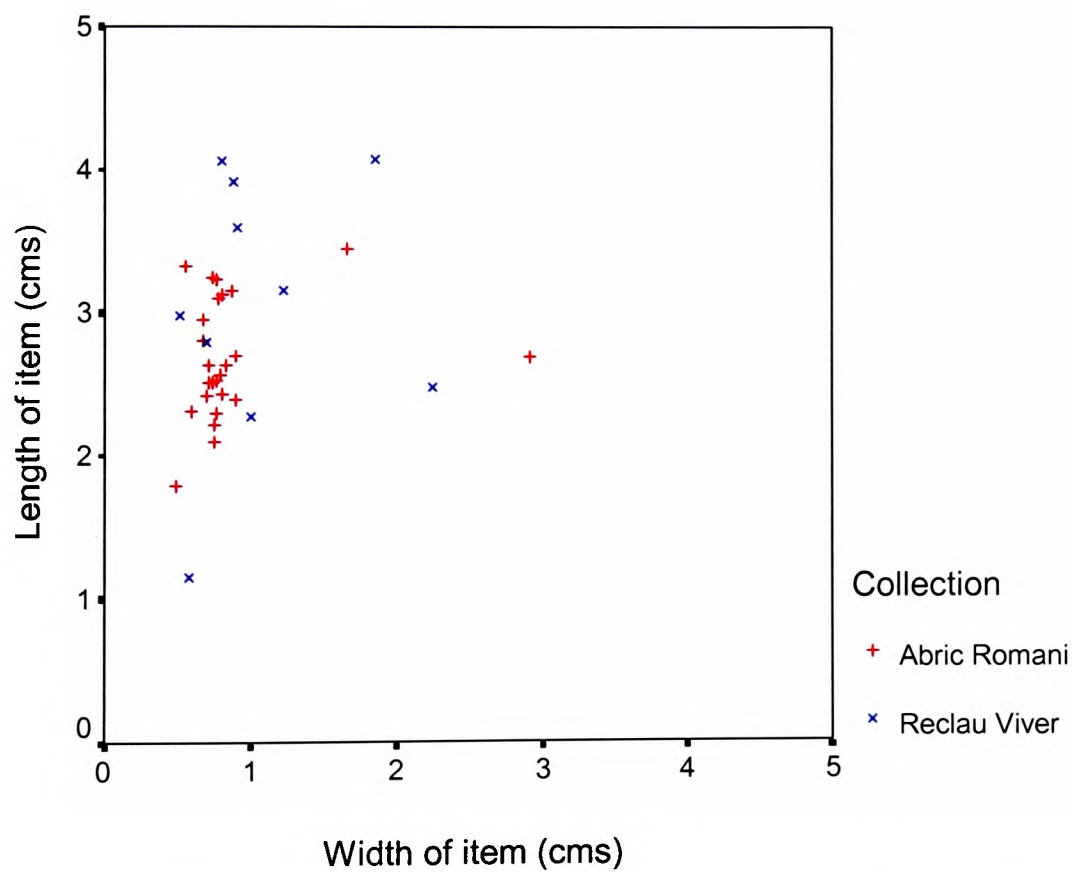


Figure 48: Scatterplot mapping the dimensions of Dufour bladelets from each of the two assemblages.

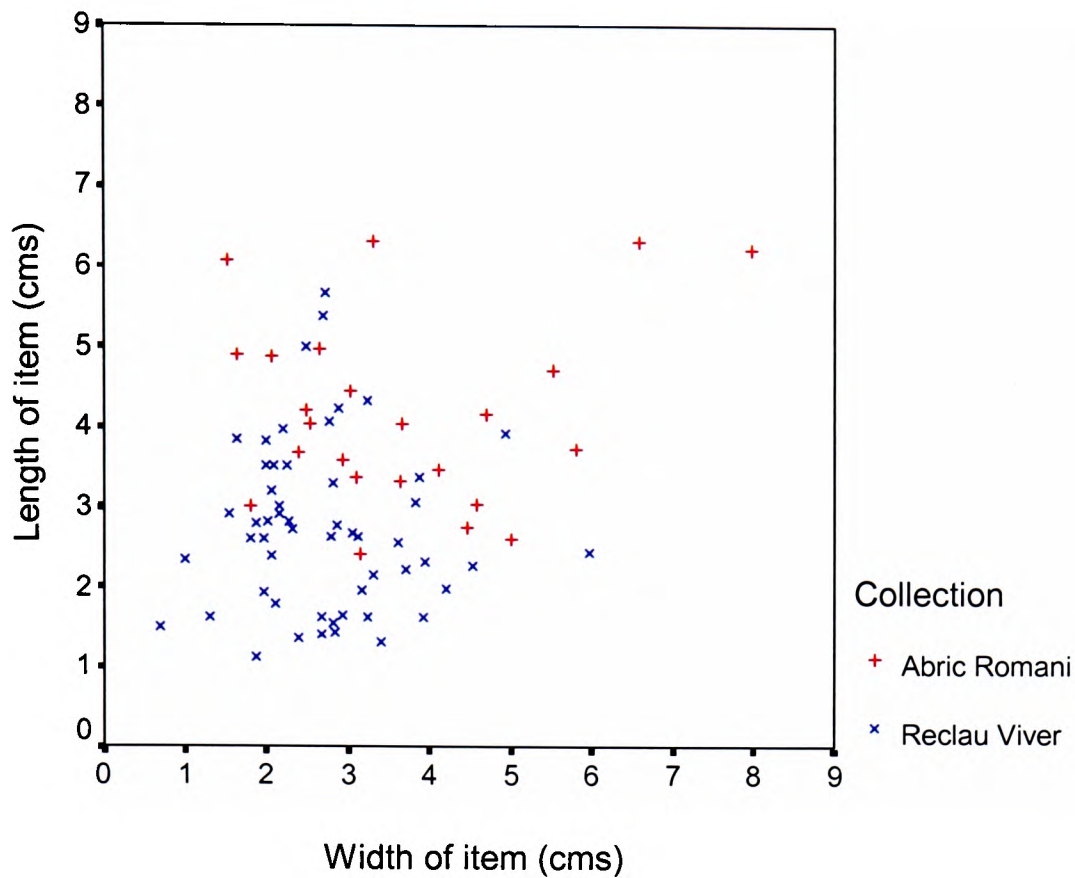


Figure 49: Scatterplot mapping the dimensions of sidescrapers from Abric Romani's layer 2 and Reclau Viver's Aurignacian assemblages.

Comparing measures by types, Reclau Viver's standardisation (*grosso modo*) remains confined to sidescrapers, as mentioned above, but the graphs show that layer 2's standardisation is much greater for types made on bladelet blanks, and that is strictly for type 90 (Dufour bladelets).

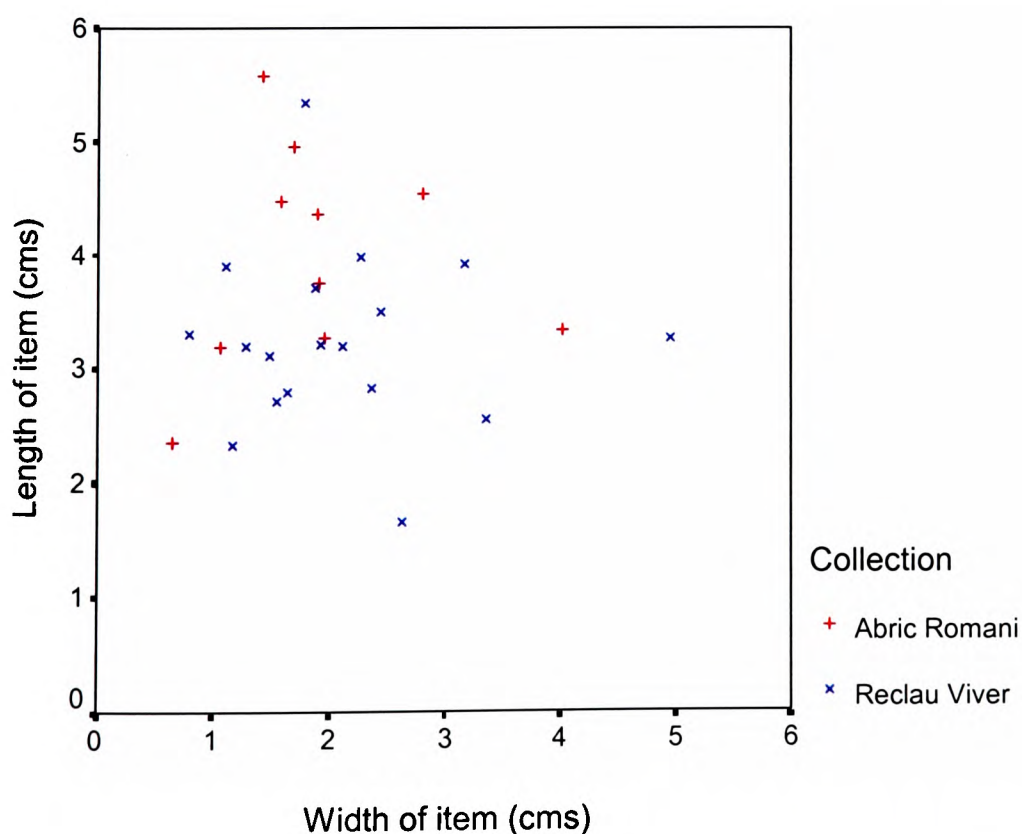


Figure 50: Endscrapers on blade belonging to each assemblage, mapped by length and width.

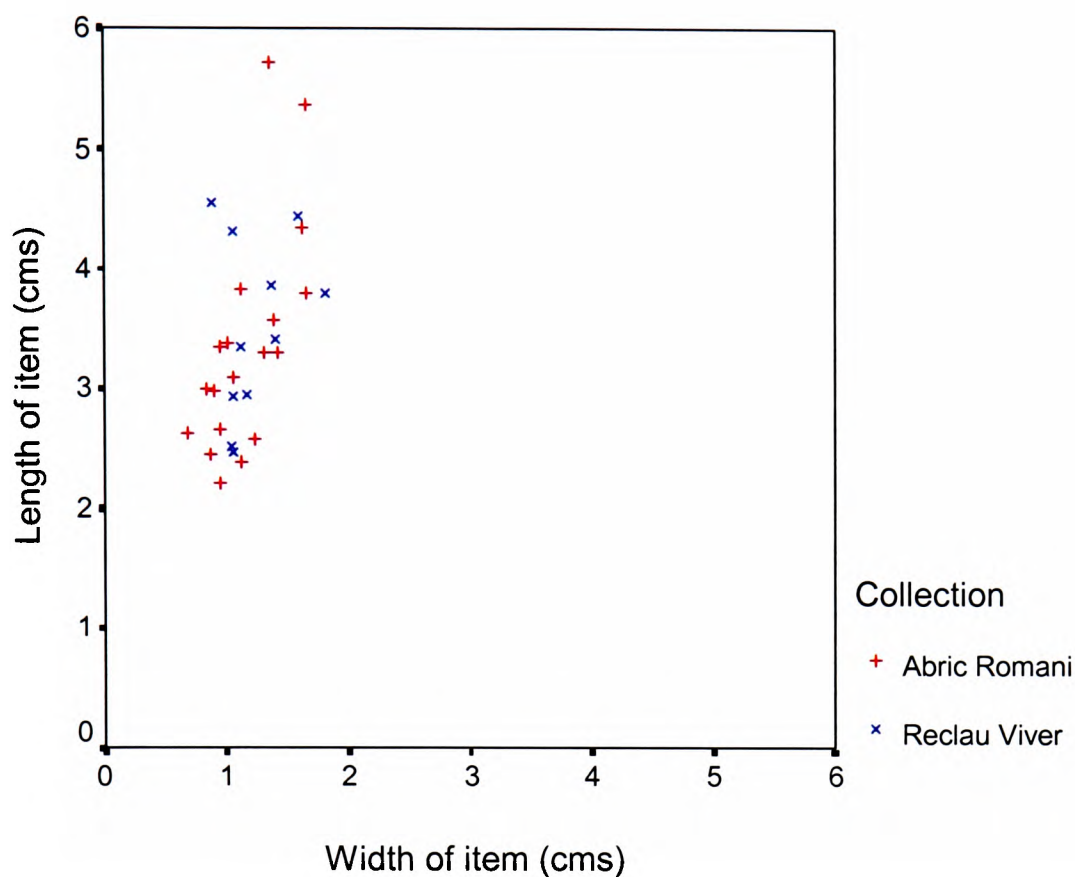


Figure 51: Atypical Chatelperronian points from each assemblage, compared by measurements of length and width.

On the basis of the above information, it seems clear that these sites display two quite different types of so-called Aurignacian assemblages, not only typologically but also in terms of blank types and range of raw material.

4. *Appearance of complex bone/antler/ivory technology*

The bone technology remains studied by the author were produced using techniques such as sawing, polishing and abrasion, and the same can be observed from those inventoried by Soler (1981:29). Thus, well-worked bone implements were present in the earliest Palaeolithic levels of the site.

5. *Appearance of sophisticated/naturalistic art*

Corominas (1952:46) considers [the search for?] Palaeolithic art as an absolute failure, from which is understood that no traces of such were found.

6. *Appearance of personal ornamentation*

During the 1946's excavation works, he recorded finding elements that could represent personal ornaments: there was an unspecified quantity of perforated canines at a depth of 4.40 to 5.40, and thus perhaps classifiable as Aurignacian, but it is impossible to attribute them to either of the two levels with certainty. Soler classified 4 as deer canines and one as unspecified, but he did not attribute them to a particular layer either.

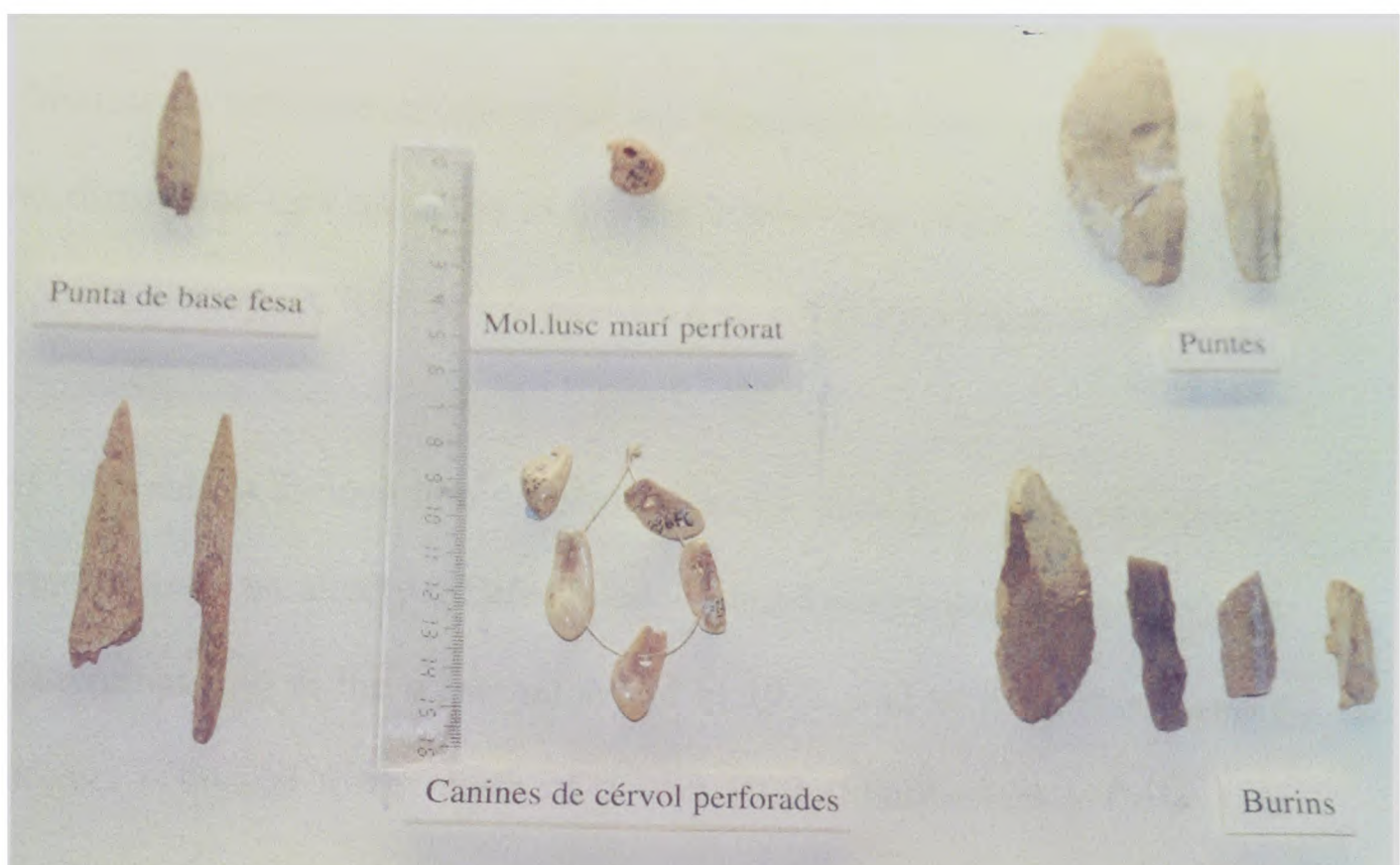


Figure 52: Deer canines from Reclau Viver as exhibited at the Banyoles Museum.

The impossibility of separating the assemblages from levels A and B, and the fact that researchers have usually considered them to be different types of Aurignacian (but have still analysed them as a single assemblage) translate into two major difficulties when attempting to study the beginning of the early Palaeolithic at this site and if the tenets are applicable as a signal of the earliest moments of that period. Nevertheless, the above paragraphs clearly present Reclau Viver as a complex mixture of characters: while complex bone working technology and personal ornamentation seem to be present, there is no art, no clear presence of standardisation and the

number of flakes is very much higher than that of blades and bladelets. Therefore, this site does not seem to fit the generalised idea of the transitional phenomenon in more than two of the defining characteristics.

5.1.2.2. L'Arbreda

L'Arbreda is another of the Reclau caves. Its exact location is 42° 9' 38" N and 2° 44' 49" E. The entrance to the cave was located on the east hillside, overlooking the Serinyadell stream (Bischoff *et al.* 1989), but the original morphology of this cavity is unknown, because its structure collapsed and was completely filled up with sediments when it was discovered by Corominas in the late 1960s/early 1970s⁴⁰. In 1972-1973, he excavated two sections of 6 m² to a depth of 8.8 m, but did not reach the bedrock.

The area of l'Arbreda is divided into different sectors – with different stratigraphical sections, which should be clearly differentiated – named with letters from the Greek alphabet. Corominas dug in the α (alpha) sector in 1972, and in the β (beta) and γ (gamma) sectors – located to the north of α – in 1973 (Maroto 1994). Corominas excavated in his customary way, by layers of 20 cm, and that is how the remains are currently organised in boxes at the Banyoles Museum.

Although Bischoff *et al.* (1989) mention that Soler – Corominas' successor at l'Arbreda – focused his excavation in the southern sector (α), from 1972 onwards, Maroto (1994) clearly states that the work was carried out in β from 1975 to 1987, and from 1990, both in β and in γ . Yet, the most thorough stratigraphical section is that of α , which may indicate that this area is where most of the work has been

⁴⁰ Prior to this, Corominas had performed two short prospections: one in 1947 and the other in 1950.

performed. The sequence of layers according to Soler (1986), and Estévez (1976, 1980, 1980-1984, 1987) are shown in Table 14 .

N. Soler		J. Estévez	
Sterile	2.40-2.80	2.40-3.20	Solutrean
Solutrean	2.80-3.20		
Gravettian	3.20-5.00	3.20-3.40	Transition ?
		3.40-4.40	Gravettian
		4.40-5.60	Aurignacian
Aurignacian	5.00-5.60		
Mousterian	5.60-8.80	5.60-6.00	Transition
		6.00-8.80	Mousterian

Table 23: Two different interpretations of the lower part of the stratigraphical section of l'Arbreda's α sector.

Soler and Estévez interpretations differ from Corominas' original stratigraphy regarding the layers under study here, which is shown in Table 15.

5.60-5.80	Aurignacian	Level 29
5.80-6.00	Aurignacian/Mousterian	Level 30
6.00-6.20	Mousterian	Level 31

Table 24: Corominas' original stratigraphical interpretation of α .

The discrepancies noted above are most likely due to the fact that the stratigraphy of the transitional layers, at least in that sector, is quite problematic, because the basal Aurignacian level is in contact with the preceding Mousterian, inside a homogeneous unit, with no visible lithologic changes, something stressed by Estévez only. However, this site's transitional layers have been repeatedly dated, and the readings obtained by Bischoff et al. (1989) are considered to be reliable, despite the complications just mentioned⁴¹.

⁴¹ An added problem in the study of l'Arbreda is that the information about numbers of remains, stratigraphical cuts etc. varies greatly from paper to paper. In view of this and considering that work has been in process during the research leading to this thesis, the author has considered all of the literature and when differences were noted, she has trusted the latest version, unless otherwise stated.

Layer H⁴² (Aurignacian)

L'Arbreda's basal Aurignacian layer has an average thickness of 20 to 45 cm and is in contact with the layers above and below itself. Despite being a relatively thin layer, Soler and Maroto (e.g. Soler 1982, Soler and Maroto 1987a, etc.) have always differentiated two types of Aurignacian within it, due to the supposed lack of bone tools in the lower part of the level: one evolved type at the top of the layer and a previous and rather poor one at its base, which they call Archaic and see as parallel to Reclau Viver's level A. This division is not mentioned in Maroto et al. (1996:230), where layer H is described as a 'well-defined initial or early Aurignacian'.

Layer H's lithic industry is described as laminar and 'Upper Palaeolithic-like'. The largest part of the retouched tools (228 pieces classified out of a total of 1514 items larger than 1 cm) is made on imported flint, the source of which would be at least 90 km away from the site. After flint, which reached an overall percentage of 67.4%, the second most used raw material is quartz with 23.5%. In the case of the latter the blanks produced were not 'proper' blades but laminar flakes.

Dufour bladelets are the best represented type; there are 180 of them, which makes 40.4% of the total assemblage. They are followed by the group of what Maroto et al. (1996:228) call "Retouched bladelets" with 11%, (unspecified) burins make 9.6% and endscrapers, again in general, amount to 7%. Grouping the latter two categories together in very broad terms is likely to be related to the difficulties that two of the authors reported in previous papers, when attempting to classify such tools into more specific groups, despite the three of them basing their work – including doctoral

⁴² This is Corominas' level 29.

theses – almost exclusively on typological systematics (e.g. Fullola 1979, Maroto 1994, Soler 1986). This trait differentiates l'Arbreda from its neighbouring site, Reclau Viver, and makes it resemble Abric Romani's layer 2.

Layer H also contained eight bone implements, three of which have been used as a *fossile directeur* by Soler and Maroto (1987a, 1987b, 1990, Maroto and Soler 1990) to classify the layer as Archaic Aurignacian. Maroto et al. (1996) also mention the presence of worked elephant ivory, but do not describe the items in question. From one of the illustrations (p.231), a tip of a point with longitudinal marks on both sides can be seen, but it is uncertain if this is the only piece made on ivory or there are more. Bone and ivory pieces, as illustrated in that paper, show traces of having been sawn as well as filed and polished. Broadly comparable artefacts (bone only) were also present at Reclau Viver.

Up to eight marine shells were found in this level: three *Dentalium vulgare*, one *Pecten jacobus*, one *Gourmya rupestris*, one *Homalopoma sanguinea*, one *Trivia pulex* and one indeterminate fragment. Only the second last specimen is clearly reported as perforated (Maroto 1994), but all are considered to have been personal ornaments.

45 pieces of ochre (36 "oligist"⁴³, two limonite and seven manganese) are also counted among the remains from this layer. These are thought to be "a clear indication of the appearance of art" (Soler and Maroto 1990:12).

⁴³ Deliberately left untranslated; the author could not be sure that the possible translations would be exact equivalents of the particular rock facies and did not wish to introduce inaccuracies.

Layer H has been dated in several occasions. The results are displayed in a table (Table 25) for greater clarity:

Source	Sampled material	Results (in BP)	Cultural attribution	Observations
Delibrias <i>et al.</i> (1987)	unknown	22,590±290	Evolved Aurignacian	Supporting existence of two different types of Aurignacian (Soler 1986)
	unknown	25,830±400	Archaic Aurignacian	
Bischoff <i>et al.</i> (1989)	Charcoal (AMS)	37,750±1000	Archaic Aurignacian Average: 38,500±1000	
		37,750±1000		
		39,900±1200		39.9±1.3 (in Maroto and Soler 1990, Maroto <i>et al.</i> 1996)
		38,700±1200		
(Soler and Maroto 1993)	Charcoal (¹⁴ C)	>33,500	Archaic Aurignacian	
		37,340±1000		Used for new average: 38,300±500
		35,480±820		

Table 25: All the radiometric dates obtained for l'Arbreda's level H.

At present the dates obtained in 1987 are considered to have been 'grossly contaminated' (Bischoff *et al.* 1989:572), and thus are excluded from arguments that conclude that the Transition at the site was a chronologically abrupt phenomenon. The fact that the dates obtained for the underlying level I (uppermost Mousterian, see below) are actually younger supports this.

Comparisons are drawn with the earliest Upper Palaeolithic of Grotte Tournal (Bize-Minervois, Aude in France), which will be mentioned in chapter 7. Similarities with Reclau Viver can be noted in terms of bone technology and the presence of perforated items interpreted as personal ornaments, but not in terms of lithic technology. Further comments on this aspect cannot be made at the moment because of the impossibility to access and study the collections of l'Arbreda.

Layer I (Mousterian)

The last Middle Palaeolithic level at l'Arbreda is in current terminology designated layer I, though formerly known as level 30 (Soler 1986, Maroto et al. 1996). Its average thickness is 60 cm and it is in contact with layer H, immediately above.

This level is described as 'rich in lithic industry' (Bischoff et al. 1989:569), and the number of retouched pieces is very high (retouched flakes = 89.2%). The raw materials used were all local, and because of this, flint percentages are low (4.4%) (Maroto 1994). Although the type of flint used in this level is very patinated, which complicates its identification, Bracco (1997) believes its source to be located c.20 km away from the site. This scholar thinks this type of material to be different from the flint used in the Upper Palaeolithic layers of the site⁴⁴.

Quartz is the most used raw material (75.9%) (Maroto 1994), and two types have been identified: the largest quantity comes from river pebbles and the other type is 'hyalin quartz', deemed scarce by comparison. Bracco (1997) located three sources of quartz in a radius of 3 km from the site.

Other types of raw materials are quartzite (6.1%), recrystallised sandstone, lydite, etc. Maroto (1994) highlighted the bad quality of the local resources in relation to the use of the recurrent centripetal Levallois technique as a method of tool manufacture; despite its poor quality, almost any flake seems to have been retouched and used as a blank to produce a tool.

⁴⁴ Flint used in layer H is thought to have been obtained some 90 km away from the cave.

Maroto (1994) classified the layer as a Typical Mousterian with a low Levallois index (9.8%, probably due to the use of quartz), a low index of Upper Palaeolithic tools, a moderate proportion of notches and a high number of sidescrapers (45.2%) and denticulates (25.8%). Maroto found an unspecified quantity of pieces difficult to classify, as also occurred during the study of layer H (see above). In this case, he decided to divide this group in two and add half of it to the percentage of sidescrapers and the other to that of the denticulates group. Original percentages of these two categories before these additions are not specified.

This assemblage also included four Chatelperronian points: two made on imported flint, one on hypabyssal⁴⁵ rock and one in quartzite. Maroto (1994) considers the question of their origin a problem, but categorically rules out a possible origin out of layer I, and any relationship with layer H. There were also seven perçoirs and two 'abrupt' (unspecified) tools. Despite these controversial components, Maroto et al. (1996) do not consider the possibility of this level being actually a Chatelperronian one, or at least having been partially formed by Chatelperronian and Mousterian occupations. This reasoning is in line with Soler's belief that the Chatelperronian is a final Mousterian variant caused by the acculturation of Neanderthals and his complete denial of a possible presence of this type of industry in the Catalan area (Soler 1997). It is important to mention here that Maroto (1994) identified an episode of bioturbation in the west area of this layer. The existence of the problem seems to have been overlooked by Bischoff et al. (1989), as well as by himself and Soler previously (Maroto and Soler 1990), as they believe that the nearest site with Chatelperronian industries is the Grotte Belvis (Aude, French Pyrenees).

⁴⁵ See note n.43.

Other remains included 21 ochre fragments, for which Maroto (1994) is ready to consider a possible Aurignacian origin, that is layer H. Why these items but not the implements mentioned above could have moved into layer I from layer H is not explained.

There are several dates for level I, and they are provided below (Table 26) in the same manner as those for layer H were given in the previous section.

Source	Sampled material	Results (in BP)	Cultural attribution	Observations
<i>Bischoff et al.</i> (1989)	Charcoal (AMS)	39,400±1400	Final Mousterian Average: 40,400±1400	
		41,400±1600		
		34,100±750		Maroto (1994) rejects it for 'being too young' and it is not counted towards the average date.
<i>Maroto et al.</i> (1996)	Bone (AMS)	44.560±2400	Mousterian Average (with above): 39.900±600	

Table 26: Radiometric dates obtained for l'Arbreda level I.

The fact that these dates are very close to those obtained for layer H brings Maroto and Soler (1990) to advocate a 'rapid replacement' phenomenon type of Transition, and Bischoff et al. (1989) consider it as 'chronologically abrupt'.

L'Arbreda: testing the tenets

The study of the Transition to the Upper Palaeolithic at l'Arbreda became the subject of frequent conference papers and a source of debate after the publication of the dates obtained at the University of Arizona by Bischoff *et al.* in 1989. They became public

at the same time as those for El Castillo cave (Cantabria), which will be analysed in the second part of the chapter.

Before these events took place, only Estévez (1980-1984, 1987) had considered the possibility of the Transition being visible at level 5.60-6.00 m, the industry of which he considered 'difficult to classify' as reported by Soler and Maroto. These authors considered at that time that 'the sediments of the transitional period were absent or mixed' (Soler and Maroto 1987a:57). This paper, which describes the earliest works at the site, also details the complications of studying the stratigraphy of the same: the collapse of the cave's structure, the erosion episode that took place at level 6.00-6.60 m, and the pedologic and hydraulic processes which affected the Mousterian sediments between 7.20 and 8.60 m. Only Maroto (1994) mentions that bioturbation affected the western area of level I; it is significant that Bischoff et al. omitted that information, after highlighting that bioturbation is one of the most important processes that 'may produce erroneous ages' (Bischoff et al. 1989:571).

Zilhão and d'Errico (1999) have opted for excluding l'Arbreda from any analyses to investigate the Transition because of these problems and the fact that layers H and I are in contact. The appraisal of the factors highlighted by the site excavators (Soler and Maroto 1990, Maroto and Soler 1990) to support their claims for an abrupt Transition backs those that remain sceptical about the role this site might have played in the process. For Soler and Maroto the cultural change is clear because of the following points:

- (trapezoidal) blade production
- diversification of tools
- generalisation of the importation of raw materials

- appearance of the well-worked bone technology
- appearance of personal ornamentation
- appearance of art

No explanation – or indeed, analysis – is provided about what ‘the diversification of tools’ means or the extent to which it can be detected in those layers. Soler and Maroto just mention different tools being produced during the two stages. Attention is drawn to the fact that typological classification tables are presented, but the system used to carry out the classification is not mentioned. In the two tables given by Maroto *et al.* (1996:224,228) there are 12 types for the Mousterian and 13 for the Aurignacian, and in both cases scrapers, denticulates and notches figure among the most frequent types.

Typological studies of these assemblages are affected by the crude and (one might almost feel) irresponsible way in which these workers decided to resolve their doubts about pieces such as denticulates and sidescrapers, described in the preceding section. Their classifications, if perhaps no more useful than they are now, would be more trustworthy if pieces about which they had doubts had been excluded from the count, instead of assigning them to a particular type without knowing if they do really belong to it or not. A further complication is added by the constant refusal of these researchers to consider a possible Chatelperronian element in the formation of l’Arbreda’s record.

Soler’s typological attribution of l’Arbreda’s earliest Upper Palaeolithic to an Archaic Aurignacian seems based most solidly on the presence of split-base bone points (described at length in Maroto 1994), which are used as fossiles directeurs. The presence of worked ivory (Maroto *et al.* 1996) strengthens de case for the

consideration of a possible presence of a Chatelperronian component, which has not been properly addressed yet, as already mentioned.

The claim for the appearance of personal ornamentation is supported only by a single case of a perforated marine shell, which has not been directly dated or even published, to allow a more careful study of its nature.

The appearance of art is merely assumed from the finding of 45 pieces of ochre in layer H. There are no explanations regarding why the 21 ochre pieces from layer I could not have meant the presence of art already in the latest Mousterian.

Although blade production does increase across the layers studied here, this is a subject which should be researched in connection with the important change in raw materials use and with proper account taken of the fact that the production of laminar flakes was already present during the last Mousterian layer. The most striking change in l'Arbreda's record during the formation of layers H and I is found in the raw material procurement strategies, which developed from mostly locally based collection and manufacture to an approach involving the importation of large quantities of flint from far away areas, which would most likely favour the production of blade blanks, not an invention at that moment in time, but a strategy that would allow a technological production system that exploited cores to a larger extent than previous prevalent knapping methods, such as the Levallois technique.

Changes in raw material economy are not specifically contemplated by any of the traditional tenets, but could be related to the appearance of extended networks which

could have played a role in the procurement of flint from far away sources, yet this cannot be ascertained through the information obtained from published sources.

The dates that Maroto and Soler (1990, and also Soler and Maroto 1993) produce in support of a 'rapid replacement' episode need to be re-examined taking into account the stratigraphical complications highlighted in 1987 and 1994.

In light of the factors just discussed, it would be wiser to treat the transition at l'Arbreda with caution rather than include this site as a proof of a 40,000 BP Crisis taking place in Iberia, until the doubts highlighted above have been thoroughly investigated. At the moment, the lack of thorough information on issues like the exact quantities of pieces and types in each assemblage renders a thorough test of the applicability of most of the transitional tenets for this site impossible, although there are a few of them for which the answer (presence or absence) is known: there is complex bone technology, there is one example of personal ornamentation (in need of further and more detailed study) and as usual, there are no examples of naturalistic art.

5.1.3. Other sites in Catalunya

The present section highlights the existence of more Catalan sites with assemblages that have been radiometrically dated or typologically assigned to the period of the Transition. An unfortunate characteristic that is common to the sites in the following subsections is the scarcity of published information about them, despite (or perhaps because of) the fact that at least two of them seem to contradict the version of events during the Transition as interpreted at the three main sites studied in the previous sections.

The dates (see below) obtained for Ermitons and La Roca dels Bous could be seen as important, if one sought to question hypotheses that advocate for a generalised Transitional process, not in terms of specific characteristics of assemblage composition, but specially regarding the timing of the event: the Ebro line to name only one.

The typological characteristics of the open-air sites near Llagostera constitute an important reminder of the existence of sites of this kind, which are absent in Cantabria, as we will see below, and are all too often overlooked in many regions where they do exist.

Further work must be carried out at La Roca dels Bous and the scope of the studies of the open-air sites mentioned in section 5.1.3.3. needs to reach beyond the typological framework which has clearly constituted the main objective of studies carried out until the present, if we are ever to know more about their meaning in the regional context. At the moment, and with the amount of published material that exists about them, the only thing that can be done here is to mention their existence.

5.1.3.1. Ermitons cave

This site, located in Sales de Llierca (La Garrotxa, Girona), is thought to have been an ibex hunting station, because of its location in an abrupt and isolated area. It yielded three strata with Palaeolithic remains, most likely all Mousterian. Two dates were obtained (Maroto 1994):

(unspecified level)	¹⁴ C	36,430±1800 BP
Layer IV	Bone (AMS)	33,190±660 BP

Table 27: Available dates for Ermitons cave.

It is not possible to separate remains from different layers in this site, and thus lithics from strata IV, V and VI were analysed as one single assemblage, according to Maroto et al. (1996), who blame the problems on the results of an 'old excavation'. Yet the site was excavated in 1970-1971 by Professors A. M^a Muñoz and M^a L. Pericot, two scholars of high reputation.

The author studied the papers originating from the excavation reports as well as further revisions of those. The researchers highlighted the scarcity of remains from strata IV and VI, opposed to the abundance of materials from level V in thorough and descriptive articles (Muñoz and Pericot 1975, Pericot and Fullola 1975) that included a typological classification of the industry by levels and zones, according to the Analytical Typology system.

It is not possible to analyse the remains beyond the typological level, as performed in the mid 1970s; however, the location of this site and the persistence of Mousterian assemblages until such recent dates challenge interpretations that advocate a uniform 'replacement' phenomenon to explain the Transition to the Upper Palaeolithic.

5.1.3.2. La Roca dels Bous

This site is a rock shelter on a cliff 30 m above the Segre River, in Camarassa (Lleida). Excavations began in 1973, directed by E. Sunyer, but all published and excavated materials (*c.*2000 lithics) are said to have been lost (Martínez et al. 1994).

Current work has been in progress since 1987, carried out by members of the Universitat Autònoma de Barcelona, who think that archaeological deposits at the site could reach a depth of 20 m. So far, 11 different occupation episodes have been studied, and two dates have been obtained for the following units at the University of Arizona:

(unspecified material) by AMS	S1	>46,900 BP
	R3	38,800±1,200 BP

Table 28: Dates obtained for samples from Roca dels Bous.

Published information on this site is extremely scarce, to say the least, but it is important to highlight its existence because the above dates have been obtained for a period typologically classified as Middle Palaeolithic, which would go hand in hand with the results from Els Ermitons.

Most information available refers to the results of applying the Logical Analytical system to classify lithic artefacts typologically, together with a few technological observations which lack any type of precision regarding the layer to which they refer, and thus have not been included here.

5.1.3.3. Sites around Llagostera (Gironès)

Several amateurs have been working (prospecting/excavating) in many different sites in the region around Llagostera, near Girona. Soler (1982, 1986) has listed and briefly described them and Canal and Carbonell (1989) included some of them in their reference volume *Catalunya Paleolítica*, mostly following observations made by Soler in previous papers.

They are all open air sites, typologically classified by that researcher as Aurignacian, yet none of them seems to have been chronometrically dated so far. Most of them (Can Crispins, Cal Coix, Tranquinell, etc.) present mixed industries from several periods.

Can Crispins and Can Font i Can Guardiola are two examples of sites said to have yielded Archaic Aurignacian material. The paucity of published information about them, however, makes it impossible to analyse any aspects of them in detail. A map is included so that their location can be taken into account.

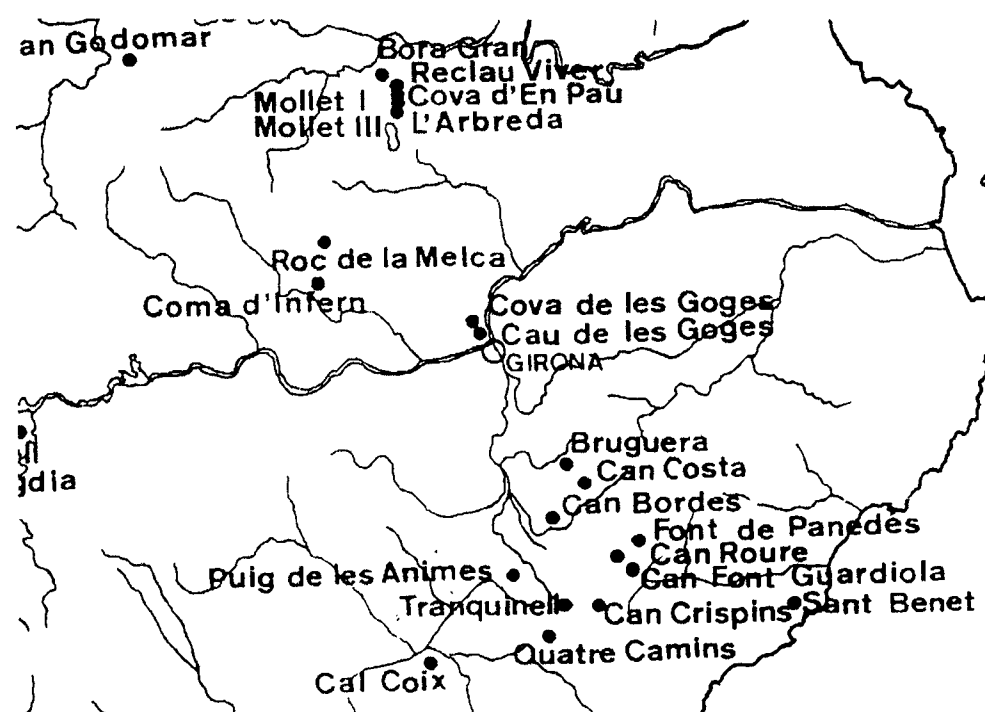


Figure 53: Location of the sites near Llagostera in relation to the Reclau caves (from Soler 1982)

5.2. Cantabria

Cantabria is the area of the littoral strip between the Cantabrian sea (Gulf of Viscay) to the north and the Cantabrian mountain range to the south. Its width varies but does not exceed 50 km. On the east it is linked to south-western France by the Bayonne-San Sebastian coastal fringe, but separated from it by the Pyrenees; a granitic 'shield' (Straus 1985:501) on the west separates this zone from Galicia. Thus, when using the term 'Cantabria', researchers refer to a 400 km long area comprising current day

provinces of Guipuzkoa, Bizkaya, Cantabria and Asturias. The predominant landscape is formed by steep sided small valleys where karstic activity has formed thousands of cavities. Virtually all archaeological sites from this region are to be found in caves, as open air sites have been eroded or deeply buried under the steeply sloping valley sides (Cabrera Valdés and Bernaldo de Quirós 1995).

Research in this region began during the 1870s, with discoveries such as Altamira's paintings, and has been more or less constant ever since. This, combined with the fact that several excavated caves contained long archaeological sequences, has turned the area into a leading key zone for Palaeolithic studies, especially from the Middle Palaeolithic period onwards.



Figure 54: Map of Iberia marking the location and extension of the Catabrian area (from Bernaldo de Quirós 1976)

Cantabria is also a clear example of a region where research has been carried out by several foreign workers, particularly from the United States, as pointed out in chapter two. Related to the works on which the following section will focus, we have

examples such as the excavations of L.G. Freeman (e.g. 1983a, 1993, etc.) from the University of Chicago and L.G. Straus (e.g. 1983, 1990, etc.), from the University of New Mexico. The earlier is credited with having established the application of Bordesian systematics in Iberia (González Echegaray 2000), as well as giving Cantabria a vital role in defining the applicability and the real concept of Bordes' Mousterian facies (Freeman 1994).

Another aspect of the influence of *la méthode* Bordes in the area directly relates to the study of the Transition: in the early 1960s, when in France the Chatelperronian was defined as an industrial entity and arguments about whether the nature of the Transition was an evolutionary phenomenon (Bordes 1968a) or a rupture of some sort, Bordes' evolutionary theory was adopted in Cantabria, substituting the Chatelperronian – not yet identified in this area – by the Aurignaco-Mousterian, also called Protoaurignacian⁴⁶.

González Echegaray and Freeman (see González Echegaray *et al.* 1971, 1973) proved that the Aurignaco-Mousterian did not exist, since it was based on El Conde's mixed early Upper Palaeolithic and Mousterian layer and one level at Cueva Morin which was badly excavated. Nevertheless, the perception of the evolutionary character of the Transition in this area still prevails, with the Chatelperronian seen as the product of the Mousterian of Acheulian Tradition Type B's evolution and the Aurignacian as the evolutionary successor of La Quina Mousterian (Bernaldo de Quirós *et al.* 2001).

According to Cabrera Valdés *et al.* (1993), there are two types of Cantabrian Aurignacian:

⁴⁶ See Gatzarria cave in chapter 7.

- Archaic Aurignacian: (a local transitional industry evolving from La Quina type Mousterian) with many sidescrapers (simple lateral with semi-Quina retouch), some endscrapers and burins and without Dufour bladelets.
- Early Aurignacian: (the origin of the Classic early Aurignacian and Aurignacian 0) where Dufour bladelets would be present, endscrapers and burins would be well-represented and sidescrapers are less frequent than above.

These researchers advocate Neanderthals as the manufacturers of the earliest Upper Palaeolithic industries and quote the case of Vindija cave in Croatia, where Neanderthals' remains have been found related to Aurignacian remains and dated to 29,080±400 and 28,020±360 BP (Smith *et al.* 1999).

The Cantabrian Mousterian has been characterised by Freeman (1994) as having a very low representation of Levallois tools and technique (because of the particularities of the raw materials most frequently used, which are of poor quality) and being unusually rich in denticulates.

5.2.1. The Classic Trio of sites

The deepest stratigraphic sequences containing transitional layers are those of El Castillo cave, El Pendo cave and Cueva Morín (Cabrera Valdés and Bernaldo de Quirós 1992). All three of these have long research histories, being some of the earliest sites in Iberia to be excavated and studied; the analysis of their transitional sequences constitutes the focus of the present section.

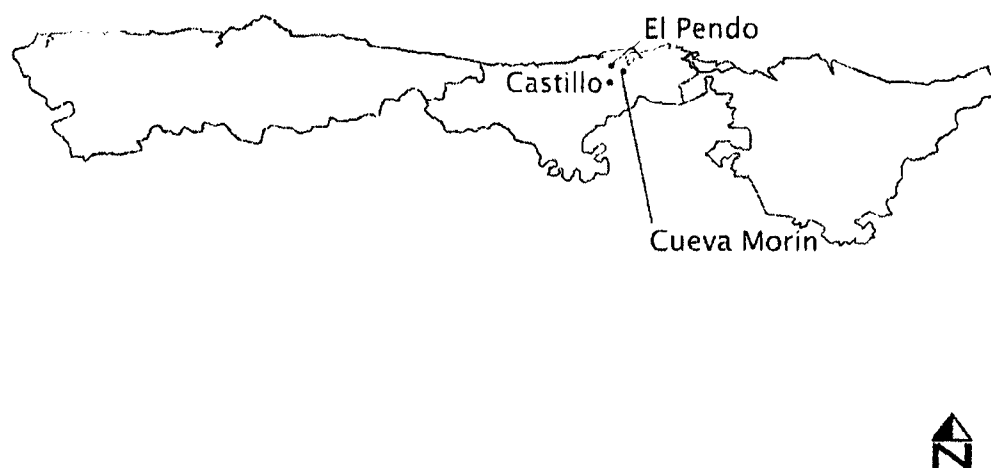


Figure 55: Location of the three caves in the region of Cantabria as divided in autonomous communities (Digital Chart of the World, Pennsylvania State University).

The main reason for choosing these among all the Cantabrian Palaeolithic sites is the amount of published or available information about them, which is relevant to the list of tenets. Having said this, it is important to stress that Palaeolithic research in Cantabria has mainly focused on typological classification of assemblages and on the study of raw materials, as we shall see below.

5.2.1.1. El Castillo

El Castillo cave (Puente Viesgo, Santander) is located on a hill bearing the same name, in which there are several other Palaeolithic and post-Palaeolithic caves, such as La Flecha, La Pasiega, Chimenea, Monedas, etc.). Its coordinates are $0^{\circ} 16' 40''$ W and $43^{\circ} 17' 25''$ N. It is 190 m above sea level and 175 m above the valley of the Pas river. Nowadays, the distance to the sea coast is about 18 km (Altuna 1992).

The cave opens to the NE, and was discovered by H. Alcalde del Río in November 1903, who then excavated seven levels, and in 1906 undertook further work funded by Prince Albert of Monaco. Systematic excavations started only in 1910, directed by H. Obermaier in collaboration with H. Breuil – who had worked there in 1908 – and

P. Wernet joined in 1911. The Aurignacian and Mousterian layers were excavated during 1912 and 1913. Work continued until 1914, when World War I broke out. Research at this stage was still being funded by Prince Albert of Monaco, and remains were shipped to the *Institut de Paleontologie Humaine* (IPH) in Paris.

	Flake tools (Mousterian β)	Flake tools (Mousterian α)
Oviedo's Museum	53	0
IPH (Paris)	796	876
MAN (Madrid)	46	27
Santander's Museum	2493	2004
Total (from the above)	3388	2907
American Museum of Natural History (NY) ⁴⁷	7	6

Table 29: Distribution of pieces from El Castillo's Mousterian upper layers according to Freeman (1994), at the time when he studied them.

In 1932, Obermaier brought back the 'most significant' pieces (Cabrera Valdés 1984) and deposited them in Santander's Museum. Breuil also gave some remains to the MAN in Madrid and another group was kept in Oviedo, in the house of Count of la Vega del Sella. In 1957, after Obermaier's death, which occurred on November 12, 1946, González Echegaray brought another lot of pieces from the IPH back to Spain, but the exact original location of these remains is not made clear by Cabrera Valdés (1984).

In 1973, Almagro requested the rest of the Paris collection to be sent back to Spain, supposedly to the MAN, since it was there where Almagro worked, at the same time that Obermaier's excavation notes were received by that institution as P. Wernet's legacy⁴⁸ (Cabrera Valdés 1984, Altuna 1992). Current excavation works began in 1980 under Cabrera Valdés' direction.

⁴⁷ These are 'non-descript pieces'.

⁴⁸ P. Wernet died in Friburg in 1973.

The transitional sequence at El Castillo is the following:

- Level 18: Aurignacian 'Delta': with an average thickness of 70 cm⁴⁹, thinning down towards the opening. It has been subdivided into several sublevels by Cabrera Valdés and her team during the 1980s and 1990s.
- Level 19: sterile stalagmitic crust 15-40 cm thick.
- Level 20: Mousterian 'Alpha'; about 65 cm deep, thinning down towards the inside.

The major publication on El Castillo's Palaeolithic remains is that of Cabrera Valdés' doctoral thesis (Cabrera Valdés 1984), but there have been other studies of the remains, and information about them is crucial in order to put her work into perspective. Obermaier and Breuil (Obermaier 1916) studied a total of 3,439 pieces from level 20 (previously called Mousterian Alpha), and around 2,900 from level 18, supposedly before the dispersal of the collections (Cabrera Valdés 1984). Freeman studied 4382 artefacts from the same level, of which 2530 were 'essential flake tools', and 334 were bifaces (including 303 cleaver flakes).

Cabrera Valdés (1984) explained that her research had focused on the materials from the MAN, those in Oviedo and a few from Santander; regarding particularly the Transition levels, this is quantified as follows:

- Level 18: a total of 1,101 pieces out of which 882 were tools, according to de Sonneville-Bordes and Perrot's typology.
- Level 20: out of 1,264 pieces, 681 were tools and 100 were bifaces, classified by Bordes' system.

⁴⁹ According to Bernaldo de Quirós *et al.* (2001), that layer is only 10-15 cm thick.

According to Freeman (1994), Cabrera Valdés only worked on the MAN's collection and a tiny fraction of Santander's pieces, having learnt in 1979 that much of Santander's collection had lost its provenience data while stored during the centre's refurbishment works.

It is important to stress that all of the studies mentioned above were carried out from strict typological perspectives, mainly. On the basis of her first study and no doubt with additions from current works, Cabrera Valdés and her team have also published data on faunal remains and more abundantly on the raw materials percentages (e.g. Cabrera Valdés *et al.* 1997, Cabrera Valdés *et al.* 2000, Bernaldo de Quirós *et al.* 2001, etc.)

The author was granted permission by the Santander Museum's director to study El Castillo's transitional materials, and was provided with a detailed inventory of boxes with pieces from levels 18 and 20. Most unfortunately, however, financial constraints prevented her from making a proper analysis of these assemblages, and the following information is therefore taken from the literature already referred to.

Layer 18 (Aurignacian)

This is considered to be a very rich level, including lithic and bone tools and the remains of three hearths. Cabrera Valdés used de Sonneville-Bordes and Perrot's typological method to classify the assemblage and Laplace's 'description method' (Cabrera Valdés 1984).

The most frequently represented type is the sidescraper – 212 in total (24.03%) – followed by carinated sidescrapers (8.73%) and atypical carinated endscrapers (7.82%)⁵⁰. Layer 18's indices are grouped in the following table:

IR = 34.84%	IRA = 20.88%
IB = 10.32%	IBrest = 59.93%
IBd = 7.03%	IBdrest = 68.13%
IBt = 2.04%	IBtrest = 19.78%
IP = 3.04%	GA = 29.85%
	GP = 2.15%

Table 30: Typological indices for El Castillo's level 18 according to Cabrera Valdés (1984).

The raw materials used to manufacture the stone tools found in this level came from rounded cobbles from the bed of the Pas River, in their vast majority; their distribution is as follows:

Flint	18.2%	Black Limestone	15.1%
Quartzite (fine grained)	33.1%	Ophite	7.1%
Quartzite (coarse grained)	15%	Limonite	1.9%
Quartz	3.4%	Others	6.2%

Table 31: Raw materials' distribution for the assemblage from El Castillo's level 18 (Cabrera Valdés 1984).

Regarding worked bone implements, Breuil and Obermaier described ten split-base points. Cabrera Valdés studied three split-base points, five fragments (2 basal and 3 medial), and one complete point, apart from six more with a flat section and two *lisseurs* on ribs (Cabrera Valdés 1984). There were also 37 pieces of colourants.

Cabrera Valdés divided layer 18 into three sublayers (a, b and c) which were subsequently split into two (e.g. 18b1 and 18b2). Dates obtained for this layer have been published according to this distribution (e.g. Cabrera Valdés and Bernaldo de Quirós 1996):

⁵⁰ In her 1984 publication, Cabrera Valdés provided typological lists which included columns to distribute tool types according to the raw materials used to make them, but the total count of the different columns, by types, does not correspond to the total number of pieces classified into those categories.

18b1	38,500±1800 BP
18b2	37,100±2200 BP
	37,700±1800 BP
	38,500±1300 BP
	40,700±1500 BP
18c	39,800±1400 BP
	40,000±2100 BP
	40,700±1500 BP
	41,100±1700 BP
	42,200±2100 BP

Table 32: Published dates for El Castillo's level 18, according to the subdivisions made by Cabrera Valdés.

This level is at the heart of the debate on Neanderthal acculturation; Zilhão and d'Errico (1999) believe that level 18b should be classified as Chatelperronian and 18c as Mousterian. The Spanish workers' arguments against this proposal are based on the finding of a sagaie (point) and one engraved fragment found in 18b⁵¹. It must also be borne in mind that Zilhão and d'Errico, for whom El Castillo is a key site in their discussion of the Transition (Zilhão and d'Errico 1999), published their observations without having studied the pieces or the stratigraphy of El Castillo in person.

Bernaldo de Quirós and Cabrera Valdés (see Bernaldo de Quirós *et al.* 2001, etc.) view Zilhão and d'Errico's interpretations as being driven by their need to demonstrate that the Aurignacian always postdates the Chatelperronian, so as to strengthen their own Out of Africa model, as well as their hypothesis against the Chatelperronian as a product of Neanderthal acculturation.

The author considers that the impossibility of knowing which artefacts from the old excavations belong to each of the sublevels is a serious obstacle against the credibility of Zilhão and d'Errico's proposal (quite apart from their lack of thorough and first

⁵¹ Nevertheless, see the discussion of the presence of worked bone implements in Mousterian layers at El Castillo, in the section below.

hand research work on the issue). It must also be taken into account when appraising the use of detailed subdivisions by the present excavators of the site: although this may be useful for the current works, it cannot be applied to materials from the early 1910s, when a considerable amount of pieces were recovered.

Another problem in the study of El Castillo cave is the constant comparisons and assumptions that the current excavators have been making with regard to the site of El Pendo cave. As we shall see below, doubts about the reliability of the latter were first made public by important scholars in the early 1980s (Hoyos and Laville 1983), and have been confirmed by later studies (Saguino and Morcillo 2001). Despite these papers being widely available in Spain, Cabrera Valdés and her team seem unaware of them, as they do not even mention the concerns that these papers raised about El Pendo's stratigraphy.

Layer 20 (Mousterian)

A simple comparison between Breuil's and Cabrera Valdés' counts of tool types can depict the limited and partial scope of the latter's study, a problem which must be borne in mind when using it to study the assemblages excavated by the first workers who excavated at El Castillo. Breuil counted 729 sidescrapers from level 20, while Cabrera Valdés was only able to study 345 of them. The same happened with denticulates: Breuil identified 257, but the 1984 publication only reports 134 for this layer.

Differences must be considered taking into account personal biases affecting typological classifications, but the fact that the old collections are scattered around different museums, as seen in the introduction to this site, must also be kept in mind.

Bordes and Freeman (Freeman 1994) coincided in classifying this layer as a Mousterian of La Quina type. Cabrera Valdés *et al.* (1997) call it ‘evolved Charentian [Mousterian]’ in agreement with the opinion of Bordes. Typologically, the denticulates predominate, amounting to 19.67%, followed by the simple convex sidescrapers (a total of 109, 16%). The indices obtained by applying Bordesian systematics follow:

I. Lev. Ty.	6.60%
I. R.	50.66% (es. 54.50%)
I. Ch.	26.08%
I. A.	1.02% (es. 1.10%)
I. B.	12,80% (es. 13.64%)

Table 33: Typological indices for the assemblage studied by Cabrera Valdés from El Castillo’s level 20 (Cabrera Valdés 1984).

I. Lev.	8.07%
I. F.	22.76%
I. F. (es.)	5.30%
I. Lam.	14.72%

Table 34: Technical indices for layer 20, according to Cabrera Valdés (1984).

Group I = 6.60%	Group III = 6.02% (es. 6.47%)
Group II = 56.68% (es. 60.97%)	Group IV = 19.67% (es 21.16%)

Table 35: Typological groups (real and essential) for layer 20 (Cabrera Valdés 1984).

This level already includes some worked bone technology (according to Cabrera Valdés and her team, manufactured by means including polishing techniques⁵²), antler working and the presence of ochre pieces. It has been dated on various occasions, and results are rather dissimilar: 48,000 BP (Cabrera Valdés and Bernaldo de Quirós 1996), 39,300±1900 BP and 43,300±2900 BP (Cabrera Valdés *et al.* 1996).

⁵² However, the author did not find any pictures or illustrations of these remains, in any of the publications about El Castillo cave, that could be used to compare these with layer 18’s worked bone pieces.

El Castillo: testing the tenets

1. Indices of flakes and blades

It is not possible to say much about the flakes and blades indices, due to the lack of information published on this point, except for the fact that layer 18's most frequent type is the sidescraper (24.03%), which gives this assemblage a very archaic and Mousterian-like resemblance. Layer 20's commonest type is the Denticulate, but the second largest is the simple complex sidescraper (19.67% and 16% respectively), thus accentuating the feeling of continuity. Moreover, layer 20 has a rather important index of blades (14.72%), but this cannot be compared to the Aurignacian one, because the latter is not published anywhere.

2. Appearance of complex bone/antler/ivory technology

Bone worked by polishing techniques, and thus considered to be of complex manufacture, is present in level 20, the latest Mousterian, and thus its presence in level 18 cannot be considered as an innovation subsequent to the Mousterian period.

3. Appearance of sophisticated/naturalistic art

The earliest Aurignacian at El Castillo does not seem to have included any form of art. The first signs of naturalistic art (according to Cabrera Valdés et al. 1993) appear during the Upper Perigordian.

4. Appearance of personal ornamentation

According to Straus (1992), mobile and ornamental objects are more the exception than the rule for the Upper Palaeolithic in Cantabria, and cannot be used to diagnose the beginning of the Aurignacian. This seems to apply to El

Castillo, where so far there has not been any discovery of this type of items related to the earliest Upper Palaeolithic.

The remaining tenets cannot be tested at this site. Regarding the ones on which comments can be made, there seems to be little or no change in the sphere of lithic industry concerning typological parameters. The presence of complex bone technology in the latest Mousterian means that its presence in the earliest Aurignacian is not anything new. The lack of artistic representations is the only trait in common with the sites mentioned as representing the Transitional scenario in Catalunya, but this negative point is about the only similarity, as El Castillo's earliest Aurignacian has not yielded any type of personal ornamentation, unlike the Reclau sites studied above.

As a concluding remark for the analysis of the transition at El Castillo, it should be noted that there are several important problems associated with this study. First, there is the typological focus that drives most of the research centred on this cave and the traditional and influential comparisons made with sites like El Pendo and Morín and the complications that make it necessary to assume traits rather than record them, as will be discussed in the following section. Then there is the lack of complete studies of the assemblages, coupled with the fact that for over 20 years many projects have been based on the assumption that our knowledge of El Castillo is the foundation stone upon which further research can rest. This point is especially worrying, as in El Castillo's case the whereabouts of most of the tools have always been known. There are also problems in connection with correlations between modern findings and research carried out by the first scholars who worked at the site, especially in terms of

stratigraphical details and differences in these between the areas outside and inside the cave.

5.2.1.2. El Pendo

El Pendo is a cave located on the 'Alto del Churi', near the town of Escobedo (Camargo, Cantabria), and belongs to a karstic formation of the mountain range of 'El Alto del Peñajorao'.

The cave is an elongated cavity, created by a stream that drains an uvala⁵³. It opens to the south, and it is *c.*25 m wide. Right at the entrance it descends about 50 m along a 150 m slope. Present elevation is *c.*88 m above sea level (Butzer 1981).

Research has been carried in the site for more than 120 years, both by famous national scholars, like M. Sanz de Sautuola, J. Carballo, J. Martínez Santaolalla, J. González Echegaray, I. Barandiarán, etc. as well as international researchers like A. Cheynier, H. Breuil, J. Chavallion, A. Leroi-Gourhan, Arl. Leroi-Gourhan, L. Freeman and H. Laville, to name but a few.

The first to visit El Pendo was M. Saez de Sautuola, in 1878, but the first excavations at the site did not take place until two years later, and they were directed by Sanz de Sautola and Vilanova y Piera. In 1907, Alcalde del Río performed an exploration, and a year later, researchers like Carballo, Breuil and Obermaier visited the cave. It is

⁵³ An uvala is a complex closed depression formed by the coalescence of several lesser or smaller depressions or dolines (including sinkholes) within its rim, according to the Caving Canada's glossary of karstic related terms (<http://www.cancaver.ca>).

worth noting that the latter thought that El Pendo was 'useless' because peasants from the area had extracted soil from inside the cave to use it as manure.

Carballo began to work systematically at El Pendo in 1924, and in 1926 a decorated *baton* was found there. New works, with some collaboration from foreign workers, started in 1930. He further worked at the site in 1932, 1934 and 1940. Thereafter, the site was not excavated until 1953, when St. Olalla and Cheynier started to do so again, until 1957.

The monograph of this site (González Echegaray 1980) is not based on the writer's own work at the site, but the remains from materials excavated in the 1950s (although he participated in the digs), which were moved in boxes to different locations and were stored for many years in very poor conditions; Saguino and Morcillo (2001) note that at least twice they were kept in basements that got flooded periodically.

El Pendo's place in the current debate about the origins of modern humans and the Transition to the Upper Palaeolithic in Iberia is side by side with the French sites of Roc-de-Combe (Bordes and Labrot 1967), and Le Piage (Champagne and Espitalié 1967, 1981), in the French region of Lot. These three sites are quoted by advocates of the population dispersal hypothesis, in favour of Neanderthal acculturation, as the explanation for the appearance of industries like the Chatelperronian (as explained at length in chapter 2), due to acculturation processes, and are considered as the 'unmistakable evidence of significant chronological overlap [of Aurignacian and Chatelperronian industries]' (Mellars 2000:36), because in all three sequences, Aurignacian layers appear both below and above the Chatelperronian levels.

Rigaud (2000, 2001) already discussed the problematic interpretations of the French sites' stratigraphies, as mentioned in chapter 2, in relation to the Neanderthal acculturation phenomenon. The following paragraphs analyse the case of El Pendo's cave.

The stratigraphy of El Pendo was first studied by K. Butzer in 1968 and 1969, in the framework of the significance of the different Mousterian facies dispute between Bordes and Binford (Bordes 1953, Binford and Binford 1966, Binford 1973). The results of his sedimentological analyses of this and other Cantabrian sites, like Cueva Morín, El Castillo, La Flecha, Hornos de la Peña and Covalejos remained unpublished until more than 10 years later (Butzer 1980, 1981).

In 1982, M. Hoyos and H. Laville wrote a paper questioning Butzer's results, as the conclusions of his two articles were quite different and there was no explanation for any of the discrepancies (Hoyos and Laville 1982). They noted that he had given the same number to two different layers, and had overlooked that some levels were in contact with others and that there had been several episodes of flooding affecting the transitional sediments among others.

Already in 1982, Hoyos and Laville declared El Pendo's stratigraphy to be highly problematic and warned against its use as a reference point for study of the Cantabrian Palaeolithic. Why some authors chose completely to ignore their conclusions is beyond one's understanding.

The team that undertook work at El Pendo from 1994 to 2000 revised the work of Butzer and Hoyos and Laville (Saguino and Morcillo 2001). A product of their analysis is the revised stratigraphy, which is included here together with the previous interpretations, as a comparative table⁵⁴.

Types of industries	González Echegaray 1980	Butzer 1980	Butzer 1981	Hoyos and Laville 1982	Saguino and Morcillo 2001
Aurignacian I	VII	VII	15	VII	14
Evolved Chatelperronian	VIII	VIII	14	VIII	15
Archaic Aurignacian	VIIIa	VIIIa		VIIIa	16
	VIIIb	VIIIb	13	VIIIb	17
	VIIIc	VIIIc	12b	VIIIc VIIIc' VIIIc''	18a 18b 18c
Mousterian	VIII d	VIII d	12a		

Table 36: A comparative study of the different proposed stratigraphies for El Pendo's Transitional section with the types of industries traditionally associated to the layers.

Their conclusions are in line with those of the latter, as they identified three main phenomena which substantially affected the site's stratigraphy:

- El Pendo contains a large accumulation cone which starts outside the cave's entrance and right next to which the trenches containing the Palaeolithic layers were dug by the first excavators. Saguino and Morcillo (2001) believe that human occupations took place near the entrance of the cave and that the main deposits were created by slope-related processes as materials rolled down because of gravity, and sedimentary differences are related to the weight of the remains and the progressively decreasing inclination of the slope as layers began to accumulate. This view had been previously discarded by Butzer, who thought that the uvala located in front of the entrance of the cave would have prevented phenomena like aeolian transport episodes, etc.

⁵⁴ These researchers revised the whole stratigraphic sequence, and designed a comparative table (Saguino and Morcillo 2001:79). Only the section relating to the transitional layers is reproduced here.

- There is a stream – dry at present – which ran through the cave, somewhat below the Upper-Middle Palaeolithic layers. Butzer was aware of its existence, but decided that it had not played any role in their deposition and sedimentation (1981:159). Both Hoyos and Laville and Saguino and Morcillo identified severe flooding episodes related to periods of possible obstruction of the exit way of the water as well as others reflecting high levels of rainfall.
- Both teams mention the presence of large clasts fallen from the roof of the cave – Butzer distinguished five different episodes - which made the stratigraphy even more complex to interpret. At the same time, it can be appreciated, from the pictures of the outside of the cave, that the entrance is just below a vertical karstic wall, from which fragments could have been detached by gelifraction, as happened inside, and which would have ended inside the cave after rolling down the slope of the cone mentioned in the first point.

Moreover, ESR dates support the claim that despite El Pendo being a spectacular site, containing Palaeolithic rock paintings (from later periods than the ones this thesis deals with), and later prehistoric settlements, its Palaeolithic sequence does not allow a definitive chronostratigraphic and palaeoenvironmental study.

Regarding the study of the Transition in Cantabria from the regional perspective, the vast majority of authors omit any references to any of the problems mentioned in this section, as we have seen was also the case with El Castillo cave, and continue to relate information about faunal remains, lithic assemblages and palaeoenvironmental factors from El Pendo to other sites, mainly El Castillo and Cueva Morín; these correlations have been avoided by the present author.

The above paragraphs give the reasons why El Pendo cave is regretfully but necessarily excluded from this research, why all previous works, including data from this site should be thoroughly questioned and why researchers must be wary of interpretations based on this sequence.

5.2.1.3. Cueva Morín

This site is a cave on the hill of Mazo-Moril, on the eastern side of the Peña Cabarga mountain range; it is also known as Cueva del Rey and Cueva de Villanueva (Obermaier 1916), after the nearby village of the same name (in Santander province). Its coordinates are 0° 10' 10" W and 43° 21' 43" N. It is about 10 m long and 1 to 2 m wide, getting larger towards the back and being some 2 m high.

Cueva Morín was discovered by Obermaier and Wernet in 1910. J. Carballo carried out prospection work in 1912 and 1915, and began systematic excavations in 1917, which lasted until 1919. The Count of la Vega del Sella excavated there the following two years and Carballo published the results of his own work in 1923 (González Echegaray *et al.* 1971).

J. González Echegaray *et al.* (1971) locate the materials of the first excavations in the MAN and the American Museum of Natural History of New York. No further work was performed until 1955, when González Echegaray was put in charge of the research. In 1966 and 1969 he and L. Freeman worked at the site. They reported 22 archaeological layers, of which the following are of interest to this study:

Level 9	Aurignacian 0
Level 10	Chatelperronian
Level 11	Denticulate Mousterian

Table 37: The transitional layers at Cueva Morín.

The study carried out by González Echegaray and Freeman, albeit having a very strong typological component, is quite different from the other monographic publications mentioned until now. Not only are stratigraphical problems taken into account (*e.g.* geological alterations caused by cryogenesis were detected in levels 19-22, although the transition layers, located above the latter, were not affected), but materials which were considered as problematic, or researchers were unsure of how to classify them, were discarded for the purpose of typological counts (González Echegaray *et al.* 1971, 1973).

Level 9: Aurignacian 0

The earliest Upper Palaeolithic in Cueva Morín is located in level 9. This is a relatively thin level (10 cm thick according to González Echegaray *et al.* (1971)) but rich in remains: it yielded 3070 pieces, out of which 206 were tools. 197 cores were also recovered. Flakes make up 87.5% and blades amount to 8.6% of the blanks count of these assemblage.

This assemblage was classified as Archaic Aurignacian, or Perigordian II in Peyrony's system. According to Laplace, it was ProtoAurignacian, due to the large quantities of Dufour bladelets. According to González Echegaray *et al.* (1971), these amount to 13, a mere 6.3% of the total. Laplace's opinion does not seem to take into account the fact that this type is far from the most frequent, number 65 (convex truncation) amounting to 13.6%, closely followed by sidescrapers (12.6%) and denticulates (11.7%), which are two types likely to have been manufactured on flakes

and thus giving the assemblage a very archaic and Mousterian-like appearance. This is acknowledged by the authors of the 1971 publication.

The total number of endscrapers is larger than that of burins (52 versus 19), but the latter is considerably lower than that of type 65, the most strongly represented one, with 28 pieces. The proportions of endscrapers and burins would point to an early Upper Palaeolithic typological stage, but comparisons between this layer's cumulative graph (González Echegaray *et al.* 1971:196) and those in de Sonneville-Bordes (1960) suggest that Morín's level 9 is closest to that of the Evolved Aurignacian layer at the site of Chanlat in Corrèze, considering the percentages not only of endscrapers and burins, but also those for types located to the right of the cumulative graph.

González Echegaray *et al.* do mention that their classification of this layer was influenced by comparisons with the Aurignacian levels of Roc-de-Combe and Le Piage. Serious problems with these two sites have already been mentioned in the previous section and will be further detailed in chapter 7.

IG	25.3%	IGA	9.3%
IB	9.3%	IBdr	63.2%
IBd	5.8%	Ibtr	5.3%
Ibt	0.5%	IGAr	36.5%

Table 38: Typological indices of Cueva Morín's Aurignacian layer, in double column, from González Echegaray *et al.* (1971:197)

This layer's Aurignacian group is 6%, and the Perigordian one is 7.5%.

In terms of raw materials, flint predominates with 82.3% of the total number of pieces being manufactured on that type of rock. Flint is followed by Quartzite (11%), Ophite (4%) and Quartz (2.7%). Sarabia Rogina (1999) has located sources of flint in the area near the site.

Layer	Classification	Types of RM	%
9	<i>Initial Aurignacian</i>	Flint	82.3
		Quartzite	11
		Ophite	4
		Quartz	2.7

Table 39: Percentages of raw materials used in Morín's level 9.

No signs of bone worked pieces, presence of art or personal ornaments are mentioned in the monograph. The absence of these, apart from the first, is in line with the characteristics of the El Castillo Cave transitional record.

Level 10: Chatelperronian

This level yielded 520 tools (out of 2964 pieces), and it was typologically studied following de Sonneville-Bordes and Perrot's (1953) system.

Endscrapers and burins had similar percentages (IG = 13.3%, IB = 12.6%), although these were much lower than the percentage of denticulates (10.4%) and sidescrapers (14.4%). The latter is the most frequent type, closely followed by types 65 and 74, which are two kinds of truncated pieces (both with 13.3%).

According to González Echegaray *et al.* (1973) the 10 Chatelperronian points found in this level were classified as 'Cottés style', which would assign an evolved Chatelperronian typological status to the layer; nevertheless, they found the most important similarities were between this level and level I of Trou de la Chèvre and Grotte du Renne X, IX and VIII. Comparisons are made with the sites of Roc-de-Combe and Le Piage too, but do not seem to have affected the original typological classification of the assemblage.

In this layer, flake blanks (95.6%) overwhelmingly outnumber those of blades (2.6%) as also happens in layer 9, but the difference is slightly greater in this layer. No traces of bone technology, art or personal ornaments were found here either, in line too with the situation in layer 9.

Layer	Classification	Types of RM	%	Observations
10	Evolved Chatelperronian	Flint	78.2	Very poor quality
		Quartzite	13.4	
		Quartz	0.6	
		Ophite	7.9	

Table 40: Raw materials used in the assemblage yielded by Morín's level 10.

Flint is the most used raw material during this period (78.2%) according to Gonzalez Echegaray *et al.* (González Echegaray *et al.* 1973), although its quality is rather poor. This factor does not seem to have made the manufacturers of tools look for another type of raw material, as the second most used material was quartzite with a much lower percentage (13.4%).

This level was excavated during several seasons (1966-1969), and information about it can be found in the two monographic volumes (González Echegaray *et al.* 1971, 1973); nevertheless, details are rather scarce, especially regarding the points which are being studied here. It has been dated to 36960±6500 BP by conventional radiocarbon.

Level 11: Mousterian

This layer was at the centre of Freeman's doctoral research on the Mousterian facies as defined by Bordes and the applicability of his scheme to areas outside southwestern France.

Despite the above, it was only excavated in two squares (VA and VB), although the material recovered was very abundant and frequently burnt (González Echegaray *et al.* 1971, 1973). This allowed its classification as a Denticulate Mousterian subtype D (i.e. non-Levallois and non-faceted), with no bifaces.

In total, the pieces were 1429, out of which 226 were typologically classified according to Bordesian systematics. Denticulates represented 34.5% of the assemblage, and were largely manufactured in flint, the most common type of raw material (138 artefacts were made on flint). Quartzite, ophite and quartz are also represented.

There is a large quantity of flake blanks (358 in total) overwhelming the very reduced presence of blade blanks (5), all of which are made on flint except one, which was made on ophite.

Cueva Morín: testing the tenets

The information obtained about the transitional layers of this site only allowed a partial study of these characteristics.

1. Indices of flakes and blades

This indices display a clear predominance of the former at all three levels, although the percentages of blades increase slightly and progressively. This increase cannot however be considered as enough to count among the characteristics of the Transition at the site, as the overall count keeps flake blanks well above those of blades even in level 9.

2. *Increase of geographical variability*

The findings at this site, throughout the transitional layers, seem to run in parallel with those at El Castillo cave, and there is no more difference between the Aurignacian layers of these two sites than there is between the Mousterian levels of the same.

3. *Appearance of complex bone/antler/ivory technology*

There are no traces of bone technology in any of the three layers at Cueva Morín. It must be noted that Freeman has written extensively about the presence of worked bone in layer 17 (Mousterian of Acheulean Tradition and non-transitional) (e.g. González Echegaray *et al.* 1973, Freeman 1983b). While it may be true that those items were modified and used as tools, they do not seem to have been worked by any of the techniques which are usually understood to give the complexity which is claimed as an innovation for the period of the early Upper Palaeolithic and is visible in pieces from El Castillo or Reclau Viver. The presence of non-complex worked bone is not an innovation.

4. *Appearance of sophisticated/naturalistic art*

No artistic remains were recorded.

5. *Appearance of personal ornamentation*

No items of personal ornamentation were found at this site.

Once again, a transitional sequence of the Cantabrian region does not follow the pattern thought to have characterised the Transition throughout Europe. The evolution of the transitional sequence in Morín displays a continuity pattern that is parallel to

that of El Castillo, with the only difference being that at Morín there is a Chatelperronian layer preceding the Aurignacian.

5.2.2. Other sites in Cantabria

The sites studied in the previous section are not by any means the only ones which have yielded layers containing transitional remains (however unconventional the transition they display may be), but they are those for which there is published information about those layers.

Publications detailing thorough studies of other sites, such as La Viña (Manzaneda, Oviedo), El Conde (Asturias), Amalda (Zestoa, Guipúzkoa), Ekain (Deba, Guipúzkoa), Labeko Koba (Arrasate, Guipúzkoa), Lezetxiki (Arrasate, Guipúzkoa), and many more are either non-existent or virtually impossible to get hold of, even in Spanish libraries. These and other sites tend to be either included on maps or mentioned without comment in a list when there is the need to enumerate several sites of one region (e.g. Arrizabalaga 1997), and are never accompanied by sufficient details to be able to test the tenets of the transition.

This is the reason why the applicability of the tenets cannot be further studied in this region. With the available information we can at least say that the tenets here tested show little sign of being applicable to the transitional process as observed in the Cantabrian record.

5.3. The Ebro Valley

The previous sections centred on the two regions of Iberia where research has been carried out for the longest time, and in a more or less consistent manner; these two factors have produced an amount of literature, which – if not as thorough and multidisciplinary as would be desirable – is much more abundant than the one about the sites that will be analysed in the following sections.

In the present one, sites with transitional layers located along the Ebro Valley will be the focus. Although this river has lately been receiving a lot of attention, for reasons that will be discussed in the following chapter, the actual sites of the regions through which it flows have remained unmentioned all along.

It is true that the lack of widely distributed published material on these sites makes their study difficult, and this will inevitably help generalisations, such as the one about the Transition in northern Iberia being a very early phenomenon, appear plausible.

Despite the scarce information available about these sites, any survey of the Mid-Upper Palaeolithic Transition in the north of Iberia would be incomplete without mentioning them.

5.3.1. Sites in Aragón and La Rioja

The most important sites in these regions are Peña Miel (La Rioja) and Gabasa (Huesca, Aragón). They are very often written about together, but this is largely due to the fact that the excavation team working on them is the same for both (based at the University of Zaragoza).

These researchers acknowledge that this region's findings are seldom discussed in international meetings and symposia, and this contributes to keeping important information from researchers from other regions and countries (Utrilla and Montes 1993).

The cave of Peña Miel (Nieva de Cameros, La Rioja), opens towards the Iregua river, at 840 m above sea level. It was first excavated by E. and L. Lartet in 1865, at the time when the classic French sites were also being dug, and it is mentioned by E. Cartailhac (Cartailhac 1886), but remained forgotten for a century, until P. Utrilla began the modern excavations, carried out between 1980 and 1984.

The transitional sequence in this cave alternates archaeological levels with sterile ones, some of which have been dated.

Layers	Industry type	¹⁴ C dates (in BP)
b	Sterile	
c	Aurignacian/Mousterian	37700±1300 39900±10500
d	Sterile	
e	La Quina Mousterian	40300±1600 45500+1400/-1200

Table 41: Transitional sequence at Peña Miel, according to Montes *et al.* (2001).

Differences have been observed in this cave's record across the Transition, for raw material procurement strategies: while in the Middle Palaeolithic, the tools were manufactured in local stone nodules, following an opportunistic model of collection and use, in the Upper Palaeolithic, the lithic industry is produced on materials coming from sources at least 20 km away from the site.

This strategy change produces a variation in the amount of quartzite used, which lessens (71.8% down to 41%), as well as the introduction of limestone; this material is the most used in the early Upper Palaeolithic (51.5%), although this percentage is lower than that of quartzite in the Middle Palaeolithic, indicating that manufacture is more evenly distributed in terms of other – less used – raw materials, the percentages of some (lydite, for example) remaining constant throughout the sequence.

It is difficult to assess how the Transition is represented here, as the researchers do not seem to have a clear or definitive interpretation and cultural attribution for layer c, as yet. Not much can be added by the present author either, in the absence of any useful published information published on the archaeological contents of layer c.

Near the town of Gabasa (Huesca, Aragón), in the Pre-Pyrenees Mountain range, there is a complex of five caves, the lowest of which is the focus of the following paragraphs. The Cueva de los Moros (sometimes the name is written as Cueva de los Moros I) opens in front of the Sosa stream, at an altitude of 780 m above sea level, and it was discovered by M. Badía in 1982. P. Utrilla and her team have worked there from 1983 and until the mid 1990s.

The study of this cave is apparently complicated, due to the homogeneity of the sedimentological matrix reported by the excavators (Montes *et al.* 2001), which makes it difficult to differentiate the archaeological levels.

However, it is known that its levels contain Mousterian industries, rich in sidescrapers and classified as Typical Mousterian, an attribution which changes to Mousterian of

Acheulean Tradition type B for the uppermost strata, due to the elevated index of Upper Palaeolithic tools found in them.

The following table contains the top of the stratigraphical sequence of this site and the information on radiometric dates obtained for the different layers.

Layer	Industry type	¹⁴ C dates (in BP)
a	Mousterian of Acheulean Tradition type B	>39900
a/c		>45900

Table 42: Uppermost Mousterian layers at Cueva de los Moros (Gabasa).

It is currently clearly impossible to test the Transitional tenets at these locations. Nevertheless, Utrilla and Montes (1993) consider that while Peña Miel's chronological pattern follows that of the Catalan and Cantabrian sites, Cueva de los Moros' model of the latest Mousterian is closer to that recorded at La Roca dels Bous, a rockshelter studied above, the location of which is relatively close to the site analysed here.

The author agrees with Utrilla and Montes' interpretation of Cueva de los Moros uppermost levels, but does not share their opinion regarding Peña Miel, and their comparisons with the northern Iberian sites studied above. Further research is required to ascertain the typological attribution of Peña Miel's level c industry. The aforementioned scholars are not very clear about the Catalan/Cantabrian sites they are referring to, and at the moment, their claim seems highly influenced by the radiocarbon dates obtained for that level. Moreover, although l'Arbreda presented problems of contact between the earliest Aurignacian and the latest Mousterian layers, all the sites in those regions contain clearly typologically-determined layers.

One can at least hope that further research in this region in the future will produce new information relating to the Transition, to an extent where useful comparisons with the rest of Iberia can be made.

5.3.2. Castilian sites

In the province of Burgos (Castilla-León), there are two important Mousterian sites, known as Cueva Millán and Cueva de la Ermita.

The first one has three levels, all classified as La Quina Mousterian. They have high percentages of sidescrapers, low denticulate indices, no bifaces or Levallois technique and very few Upper Palaeolithic tools (Moure Romanillo and García Soto 1983).

Bone fragments of the uppermost level (1a) have been dated to 37600 ± 700 BP and the following sublevel (1b) has yielded a date of 37450 ± 600 BP⁵⁵; the faunal associations made with the Cueva de la Ermita site, where there is a very similar industry, have related that layer to the interstadial Würm II-III.

The Transition in this region cannot be studied further because of the lack of Aurignacian levels that could be dated, and we do not know whether the dates above indicate final Mousterian occupations or simply that those must have taken place somewhere else. It is clear, though, that this region has not received the same amount of research in the past as nearby Cantabria, which is a factor that may be biasing our vision of the phenomenon in this zone. Current research on these and other Palaeolithic sites is being done and the outcome should be awaited with great interest.

⁵⁵ Both dates were obtained by the conventional 14C method.

5.4. Galicia

Research in this area has increased tremendously in the 1980s and 1990s, with the resulting discovery of several sites, most of them open-air ones, at present under study. The only cave site, A Valiña (Castroverde, Lugo), is so far the only one that appears to offer an approximation towards the transitional process in this area.

A Valiña is a limestone cave on the Da Croa hill, at 620 m above sea level. Its coordinates are 43°02'46" N and 03°39'10" W. It was discovered in 1987, when the nearby area was being exploited as a quarry, and the frequent dynamite explosions began to unearth Palaeolithic tools. Soon, an early Upper Palaeolithic occupation area was identified; it was also determined that at least 15 m of deposit had been affected and seriously damaged because of the aforementioned explosions (Villar Quinteiro and Llana Rodríguez 2001).

The early Upper Palaeolithic occupation was classified as Perigordian (Chatelperronian), although the lithic industry is not abundant: 52 tools were identified, among them, one Chatelperronian point. Denticulates are the most common type, and burins are more numerous than sidescrapers (13% and 9.6% respectively). The latter are characteristically atypical and of poor technical quality.

According to Villar Quinteiro and Llana Rodríguez (2001), the tools are manufactured on quartz, schists, calcareous rock and flint, but the authors do not provide readers with any percentages of the latter materials. The blades index is 16%, rather low, and

this means that flake blanks are predominant in this level. The latter has been dated to 34800+1900/-1500 BP, 31730+2880/-2110 BP and 31600±250 BP by conventional ¹⁴C on bone, which are very early dates, and further research and new radiometric dates are needed to support them.

The above researchers, though, are convinced that these dates actually indicate that the transition in northern Iberia is an early phenomenon, and compare them to other (later dated) Chatelperronian layers such as Morín level 10 (dated to 36960±6500 BP by conventional radiocarbon). More worryingly, they also compare the site's stratigraphy to "perhaps El Pendo" (Villar Quinteiro and Llana Rodríguez 2001:138).

5.6. Conclusions

The previous sections have presented in detail the northern Iberian sites which have been found to contain (at least part of) the stratigraphical sequence of the Mid/Upper Palaeolithic Transition. This has been done by geographical regions; inside these, each site's record has, whenever possible, been compared to the transitional tenets generalised by Mellars (e.g. 1991). This was done using information obtained by the author through analyses of lithic assemblages, bone tools and personal ornaments' collections and a detailed study of the published materials about the sites she was unable to study herself.

The result is a thorough review of the transitional scenario, which differs a great deal from the general and pan-European phenomenon that has been proposed by scholars who have not even studied for themselves the main evidence from these sites.

Regionally, the Transition is here seen not as a uniform event, which took place in the same way, at the same time, everywhere, but more as a mosaic incident, which affected the several regions rather differently and at different times.

The uneven amount of information which exists on this phenomenon, and its unreliability, has wrongly pushed many researchers to understand the Transition as a rather early event and, depending on the areas, abrupt or slow and evolutionary, to suit their personal preferences regarding the several hypothesis on the origins of modern humans. That has happened inspite of the fact that there is actually much more (and much wider distributed) information about the sites that are most relevant to the discussion.

Simultaneously, smaller sites presenting aberrant interpretations have received less attention and have not been so openly represented at international events, with the predictable outcome that they have now come to be completely overlooked, not only by foreign scholars, but by Iberian researchers from other teams.

The most widely publicised data relate to radiometric dates obtained at the biggest Catalan and Cantabrian sites; these have usually been taken at face value and hardly ever questioned, even when the location of the sampling ought at least to provoke doubts regarding their authenticity. The limited dating project carried out in this research has produced very different results, the first obtained on objects directly modified by hominids, and it is hoped that they will entice scholars to revise previous

hypothesis on how the Transition took place, and to approach more cautiously the task of interpreting the data they manage.

The direct comparison of the individual sites' data against the aforementioned tenets also allows us to see clearly that only some of them apply to some of the cases, and there is simply no case where they do so as a whole: *there is no northern Iberian site which presents evidence of their overall validity as characteristics of its earliest Upper Palaeolithic level.* Careful review of the cases in which their occurrence has been claimed in the past (e.g. at l'Arbreda cave) has shown that the presence of many of them was based on essentially unsupported assumptions, which are easy to question.

This chapter has also mentioned cases of sites where the study of the Transition is fraught with problems or is very difficult to observe. Although, in some cases, there are scientific reports discussing the reasons why locations like El Pendo should not be used to make interpretations of the event and even less to compare their record with that of other sites, most researchers have decided to ignore them, and continue using the controversial sites as international examples which back their personal hypotheses and beliefs.

The strong and almost exclusive typological focus under which most of the studies have been performed has not helped to improve the situation of this field of research. If that can be attributed to the research traditions that governed Palaeolithic archaeology in the past, and to some extent understood in the context of the period

when that research was performed, the same should not continue to be done, employing the dubious practices and quick-fix solutions that have been too frequently noted in the above survey of the Transition in northern Spain.

The organisation of this chapter will be repeated in the next one, which will be devoted to study the Transition has been interpreted in the southern Iberia.

6. The Ebro Line and the Transition in Southern Iberia

6.0. Introduction

6.1. The Ebro Line

6.2. The Portuguese Sites

6.2.1. Late Middle Palaeolithic Sites

6.2.1.1. Foz do Enxarrique

6.2.1.2. Gruta da Figueira Brava

6.2.1.3. Other sites

6.2.2. Possible Transitional Sites

6.2.2.1. Gruta Nova da Columbeira

6.2.2.2. Caldeirão

6.2.2.3. Gruta de Salemas

6.2.2.4. Pego do Diabo

6.2.2.5. Other sites

6.2.3. Aurignacian Sites

6.3. Southern Mediterranean Sites

6.3.1. Cova Negra

6.3.2. Cova Beneito

6.3.3. Perneras

6.3.4. Mallaetes

6.4. Sites in Andalucía and Gibraltar

6.4.1. Boquete de Zafarraya

6.4.2. Bajondillo

6.4.3. Carihuela

6.4.4. Gorham's Cave

6.5. Sites in the Meseta

6.6. Conclusions

6.0. Introduction

This chapter's aim is to set the 40,000 BP Crisis event – as it was interpreted in the previous chapter – in the peninsular context, by examining southern Iberia, as defined by the Ebro Line hypothesis (ELH).

This analysis has two parts: first of all, a thorough revision of the divide proposed by the aforementioned hypothesis, which is supposed to be supported by several types of evidence, according to its strongest advocate, J. Zilhão, but has never been fully explained. Secondly, the chapter will focus on the Mid/Upper Palaeolithic Transition in southern Iberia, how can it be studied in that area and the evidence for it.

The structure of the chapter is the same as chapter 5's: individual sites, regionally grouped, will be studied in relation to the transitional event, focusing on their transitional layers. An exception to this rule will be the Portuguese sites; these are divided chronologically as Late Middle Palaeolithic, Transitional and Aurignacian sites, mainly because they are all located in one single region, central Portugal. All the information used to study the sites in this chapter comes from published sources.

The study of the ELH as a single entity is justified by several factors. Although it remains just that, a hypothesis, since its public formulation in Madrid in 1991 (Zilhão 1993), it seems to have gained by default the status of a proven theory, as something which apparently fits so well into the explanations of how the Transition took place in Iberia, that although its advocates have never produced all the facts which in their view prove its existence, many have already incorporated it into their own reconstructions and interpretations.

At this thesis' level, a review of this concept can be conducted independently of the regional division, in the sense that its acceptance or refusal does not affect the division of Iberia in two main areas, as organised in chapters 5 and 6, but its inclusion also allows a brief consideration of environmental factors, and their role in the framework of the Transition and its development, while the main focus of the study, the existence of material remains through which the change can be studied and their interpretations, is maintained.

The review of the dividing line, sometimes called "Ebro Frontier" (e.g. Zilhão 1993, 1997, 2000a), will be conducted by using published information as well as information personally provided by Zilhão, with whom the author of the thesis has been fortunate enough to have the opportunity to discuss this topic on several occasions, during international meetings and debates. She is grateful to him for these discussions.

A crucial aspect that must be borne in mind in relation to the analysis of the Iberian regions included in this chapter is that none of them has an old and stable Palaeolithic research tradition like those observed in chapter 5 for Catalunya and Cantabria. While it is true that some sites were discovered or partially excavated during the early 20th century, this situation is not universal and such work certainly did not continue. In cases such as that of the Meseta area, research on the topic of the Transition has made hardly any headway at all. In relation to this issue, it is important to highlight once again the great paucity of extant archaeological material and its difficult access, which

has already been mentioned for certain areas (e.g. 5.3.1.); in this zone, it is more the rule than the exception.

Maps marking the locations of the sites mentioned in this chapter have been included in the appendices' section.

6.1. The Ebro Line

The Ebro Line hypothesis was first defined by Zilhão (e.g. 2000a:111) as:

“a stable biocultural frontier located along the Cantabro-Pyrenean mountains, more exactly along the Ebro River basin, which for at least 5000 years would have separated the Mousterian Neanderthals from [southern] Iberia from the Aurignacian Moderns of Cantabria, Aquitaine and northern ‘Catalonya’”

Such a frontier would fit perfectly well in the theory of the 40,000 BP Crisis in the North of Iberia, as it would explain the differences between the two sides of the divide – fast and early transition in the North, along the lines of the ‘Out of Africa’ theory – and a much later replacement in the south, where Neanderthals survived much longer, until or even beyond 30,000 BP, the time when the Transition is thought to have taken place in the South. If true, this hypothesis would be very important, so its basis needs careful consideration.

According to Zilhão (2000a:111), the ELH has received ‘considerable support from many lines of evidence’, but it seems clear to the present writer, having scrutinised all the publications that mention the phenomenon to date (Zilhão 1993, 1997, 1998b, a, 2000a, Zilhão and d’Errico 1999, 2000), that only a limited amount of archaeological evidence – carefully chosen – has been provided to date to support the existence of the division.

For Zilhão, it is an unassailable fact that Neanderthals survived in southern Iberia until *c.*30-28000 BP, making Mousterian tools as has been argued by several researchers (Hublin *et al.* 1995, Raposo 1995, Vega Toscano 1990, Villaverde and Fumanal 1990, Zilhão 1993), while in the north, the traditional vision of the transitional phenomenon as expounded in chapter 5 stands (Zilhão 2000a:111). He contributes evidence from the Portuguese area, by listing sites ‘with acceptable dates’ (Zilhão 2000a:112); these are: Foz do Enxarrique, Furos, Caldeirão, Gruta da Oliveira, Almonda, Pedreira de Salemas and Figueira Brava. In fact, of this list, Caldeirão and Gruta da Oliveira are the only ones which provide assemblages numerically strong enough to allow study avoiding errors caused by scarcity of pieces, are not possible redeposition scenarios and have yielded dates certainly linked to human presence at the sites.

On the other hand, according to Zilhão (1996a), several unspecified early Upper Palaeolithic sites, which gave dates around 40,000 years BP cannot be accepted, for example, Gato Preto’s dates were not correct ‘for some yet unspecified reason’. In 2000, the low content of collagen and/or Uranium of the samples led to the setting aside of all readings ‘post-28 ka’, because they were ‘incompatible with the cultural

stratigraphy of the last glacial' (Zilhão 2000a:111). Thus, Gato Preto and Columbeira's results were rejected.

Advocates of the existence of this frontier believe that AMH did not proceed to cross the Ebro River earlier than they did for environmental reasons. According to them, at *c.*40,000 BP, south of the Ebro there were temperate woodlands, which were different from the tundra/steppe/boreal forest environments to which AMH had adapted to (Zilhão 2000b:342).

The author of this thesis looked for further information that would document these environmental conditions in, among other sources, papers authored by M.F. Sánchez Goñi, recommended by Zilhão (personal communication 2001). She found that information in those papers is far from backing the ELH, although they provide a useful overall picture of the environmental conditions thought to have existed in Iberia during OIS-3 (*c.*60-25000 BP), as well as making clear the difficulties of correlating palynological and microfaunal information with that from marine core sediments among others (Sánchez Goñi 1994a:174).

According to Sánchez Goñi (1994b:239), the environmental record, is not well known yet, because there were lots of short fluctuations and many palynological studies have found that the percentages of arboreal pollen were insufficient. These difficulties are only worsened when the problems of the ¹⁴C dating method are added to the picture (van Andel and Tzedakis 1998). A clear example of the problems of data obtained by palynological research is that such sequences do not record the episodes of climatic improvement known to have taken place – via other methods – between 25000 and

15000 BP. However, and despite the advice of Sánchez Goñi, who clearly states that chronostratigraphies based on palynological analyses must be abandoned, pollen profiles are used by Zilhão to support the validity of Caldeirão's sequence as site documenting the late survival of Neanderthals in the area (Zilhão 2000a:112).

From their study of the marine core MD95-2042, drilled at 37°48"N-10°10"W, Sánchez Goñi *et al.* (2000) wrote that although the continent's response to high frequency climatic oscillations is still poorly known, but it is certain that vegetational changes would have been significant at a regional scale. From 50000 to 30000 BP, these were caused by a succession of temperate and cold environments. At least in two loosely defined moments (*c.*52-46000 BP and *c.*37-34000 BP) and in general during OIS 4, 3 and 2, temperate/deciduous forests could not colonise Iberia, even during the warm peaks known as Dansgaard-Oeschger events (Dansgaard *et al.* 1971).

Other scholars (e.g. van Andel and Tzedakis 1998) do think that Iberia was colonised by deciduous woodland at times such as the Hengelo interstadial, a warm phase during OIS 3, but they do not note any kind of separation or difference in terms of environmental or vegetational conditions between northern and southern Iberia, and they indicate that this type of vegetation extends throughout all southern Europe and the northern fringes of west Africa. When conditions changed, during colder episodes, southern Europe's vegetation is represented as grass steppe, but this again does not imply any kind of divisions in Iberia.

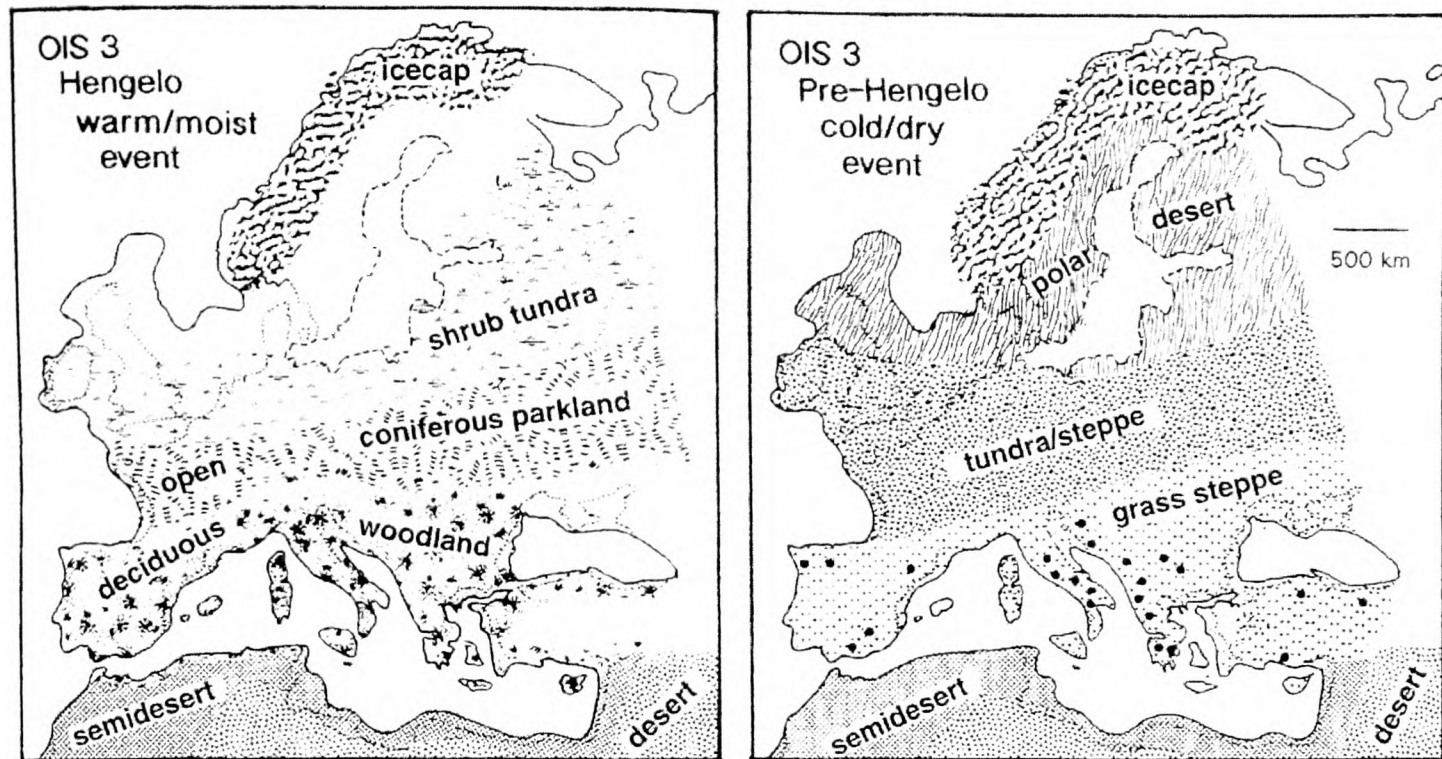


Figure 57: European vegetation variations during two different environmental episodes (from van Andel and Tzedakis 1998).

It is not argued here that Iberia's quaternary environments were identical throughout the peninsula, but data are clearly still too scarce to allow any type of assertions on the exact conditions and differences between particular adjacent regions.

Another important issue that ELH supporters seem to ignore, is that archaeobotanical data for the environmental reconstruction of Iberian scenarios at the time of the Transition are not only scarce, but very unevenly distributed; 19 out of the most reliable 21 palynological analyses currently used belong to sites in littoral areas, and only those of La Ermita and Cueva de los Moros can provide us with information for inland landscapes (Iriarte and Arrizabalaga 1997).

Raposo (2000:105) clearly rejects the existence of any geographic boundary at the Ebro line because of the lack of ecological evidence to support the idea. He notes that if there were any kind of differences, these would have been very similar to the ones which exist today between northern and central Iberia's colder climate and the milder

one of the southern coastlines, which are not separated by any clear dividing lines anywhere.

It seems clear, then, that since the ELH was formulated in 1991 (Zilhão 1993), several issues have clashed against the basic points on which it relies. Because of the participation of Zilhão himself in the research teams working on those topics, he has perhaps been forced to look for plausible explanations to reconcile new evidence with the existence of the frontier, as the following examples may show.

First of all, it must be borne in mind that Zilhão is one of the strongest advocates of the Indigenist hypothesis, which was explained at length in chapter 2, and rejects the idea that Neanderthals were acculturated by incoming modern humans and thus started to produce Chatelperronian assemblages. Zilhão and d'Errico (1999) rejected the evidence for that view from all those sites in Iberia with Aurignacian dates earlier than 36500 BP. For them, those dates were 'dubious results' and they accepted as reliable only that of La Viña, where the earliest Aurignacian appears at *c.*36500 BP. Examples such as El Castillo, and others, some of which have already been commented on in the previous chapter, are abundant and all of them were criticised at length and finally rejected, in clear contrast to the more than 30 sites that according to them prove their hypothesis right: none of those was studied for possible problems of the same nature. Moreover, there is no mention whatsoever about sites like Roca dels Bous, Els Ermitons and Gabasa.

Even if the earliest Aurignacian had been detected only at 36500 BP, the Ebro line could still stand, though for 5000 years instead of 10000. But what is more difficult to

explain, if the Ebro line did exist, is the fact that Chatelperronian appeared only above the frontier, where Neanderthals would have had contact with AMH (without, in Zilhão's view, acculturation playing any role), while there are no traces of it in southern Iberia, where such contact was not a risk to their cultural purity. Zilhão fails to address this question satisfactorily (e.g. 2000a).

Secondly, the discovery of a supposed hybrid specimen of Neanderthals and Modern Humans, the Lagar Velho child (Duarte *et al.* 1999) struck a heavy blow at the assumption that these were two biologically incompatible populations.

In 1999, Zilhão and Duarte excavated the burial of a four-year old child found under a limestone cliff near Leira (39°45'25"N and 8°43'58"W), which was dated to c.24500 BP. Although the burial pattern is distinctively Gravettian (Duarte *et al.* 1999:7609), they believe that the skeleton morphology is a mosaic of Neanderthal and early AMH features. Such a combination of traits at the time would 'only indicate that the child was a descendant of extensively admixed populations, and not just a one-off case (Duarte *et al.* 1999:7608). The researchers conclude that this discovery rejects the Out of Africa hypothesis. Ever since it was made public, this find has been highly controversial. Tattersall and Schwartz (1999:7115), for example, believe it is no more than a typically Gravettian burial of a 'chunky Gravettian child', a descendant of the AMH who had entered Iberia from the north.

So, if the 'hybrid' interpretation of the child skeleton is true, as Duarte *et al.* (1999) – which includes Zilhão – published, where does the Ebro frontier stand? Was it there at all? The author put these questions to Zilhão and Duarte in 2001, during a conference

held in Murcia (Spain), and she was told to refer to the environmental information discussed above.

There are other problems that remain unanswered by the ELH advocates, for example, the fact that the two only graphic representations showing the location of the frontier (see Figures 58 and 59) actually place the division in two different places. The dissimilarity is greatest in the Catalan region, where they do not map sites like Abric Romani, perhaps due to their doubts about that site's Aurignacian layer, but they also omit, whether by design or accident, those which have very late Mousterian dates, mentioned in chapter 5.

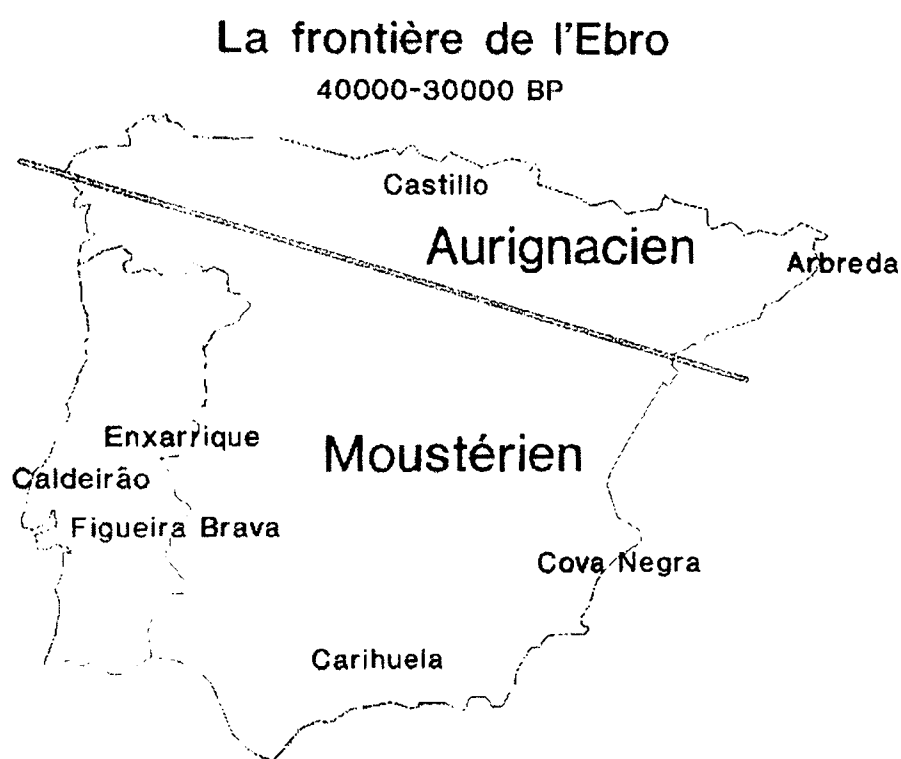


Figure 58: The Ebro Line in 1991 (from Zilhão 1993)

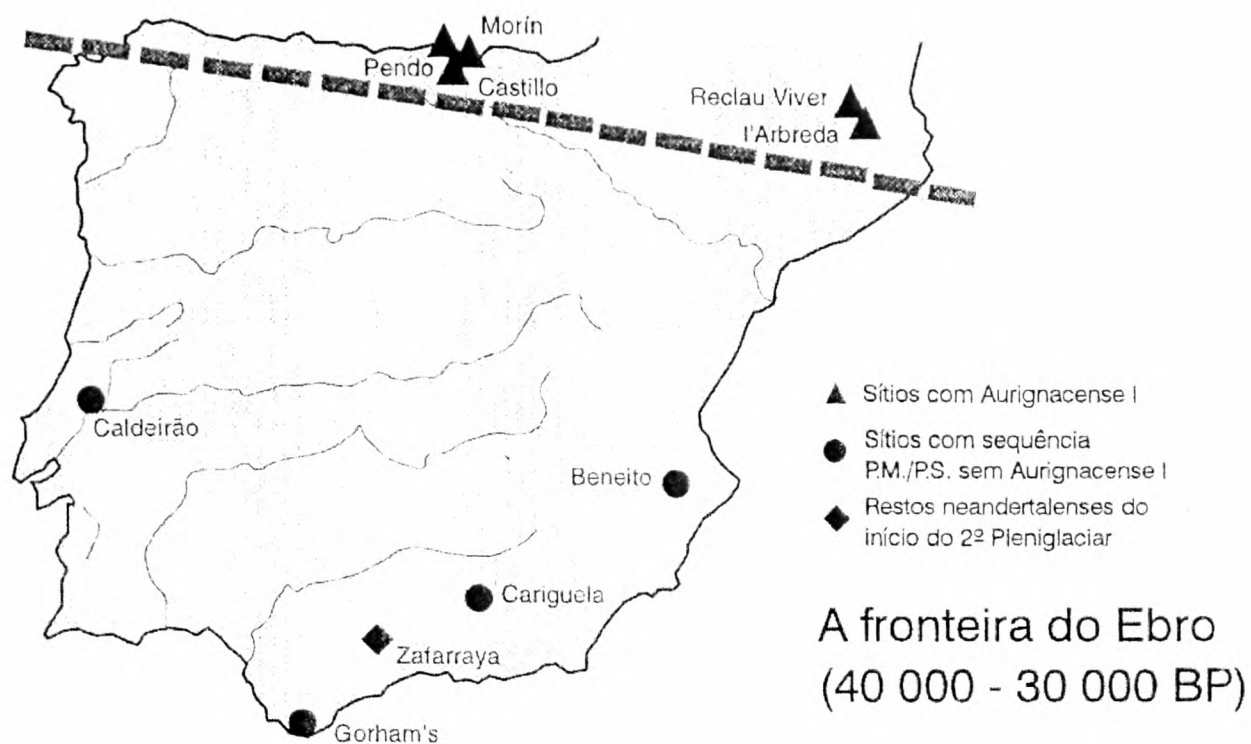


Figure 59: The Ebro Line in 1997 (from Zilhão 1997)

There are Iberian sites (such as El Castillo, etc.) where excavators support an *in situ* evolution from Neanderthals to AMH, but they fall irremediably over the line (in Cantabria). If true, this view would conflict with Zilhão's personal interpretation of the Neanderthal/AMH relationship; in fact, most if not all human remains found in Cantabrian sites in old excavations appear to have been lost (Garralda 1997), so there is no direct evidence with which the Lagar Velho skeleton could be compared.

For all the reasons indicated above, the author of this thesis does not find the ELH either plausible or well supported by the actual evidence. The ELH is perhaps not as new as a lot of people have thought, and it quite closely resembles the hypotheses proposed by Fortea and Jordá (1976) for the development of the southern Spanish Solutrean and the appearance of the Magdalenian in the region⁵⁶, which in the end were abandoned and forgotten about.

⁵⁶ In the 1950s-1970s, F. Jordá discussed the long survival of the Solutrean culture in sites like Les Mallaetes and El Parpalló, which were contemporaneous with the French Magdalenian, and the final, though strongly regionalized adoption of the latter in these and other southern sites, like Cueva Ambrosio, by presenting two possible hypotheses of how this change could have taken place (For a summary see Fortea and Jordá 1976:150-155).

Much of the information mentioned in the above paragraphs was already mentioned or fully discussed in chapter 5, especially that on the issues related to the northern side of the divide. The traits referring to the south will be the focus of attention in the following sections. The generalisations that the ELH implies must be added to those mentioned in previous chapters.

6.2. The Portuguese Sites

The research on the Transition to the Upper Palaeolithic in Portugal combines the usual focus on typological issues, with a strong interest in faunal remains and their use as environmental indicators, as well as relative chronology markers.

Sadly, one of the most important traits of this region is the lack of modern research until the mid 1980s – the pioneers having been Breuil and Zbyszewski (1942-1945, 1943) – and the subsequent paucity of publications on the Palaeolithic in relation to the area. Several projects are being carried out at the moment, but many of them are having problems because of the disagreement between absolute dates and typology. As it will be shown below, many dates have been considered ‘not satisfactory’ because the industry associated with them does not seem to display the expected traits. It should be taken into account that for the Mousterian layers, the Portuguese assemblages do not seem to contain the traditional [French?] ‘type fossils’ (Raposo 2000).

To add insult to injury, many assemblages are extremely small; notwithstanding the primary rules of typological systematics outlined in chapter 4, the presence of actual

human groups associated with specific industries (mainly Aurignacian) has been inferred from the presence of less than 10 pieces in some locations.

Against Zilhão's (1993) thinking, both Marks (2000) and Raposo (2000) consider that the presence of true Aurignacian remains in Portugal (and southern Iberia in general) is questionable, something which Zilhão ended up endorsing (Zilhão 1997), another blow to his ELH.

Marks thinks that if Aurignacian people did in fact arrive in the area, at around 28000 BP, they were ephemeral visitors, in very small numbers. Raposo notes important differences between Middle Palaeolithic sites and Upper Palaeolithic sites in location (river basins *versus* secondary valleys), territoriality (no clusters *versus* clusters) and lithic raw material collection strategies (local opportunistic *versus* clear preference for siliceous rocks and systematic flint use). At the same time, he associates early Upper Palaeolithic sites with a more abundant Gravettian presence.

The sites in the sections below are mainly located in the central region of Portugal. P. Thacker (2001) stresses this point, in clear contrast to the widespread settlement patterns of earlier (Middle Palaeolithic) and later (Gravettian) periods. For this reason, the analysis of the sites is organised in a chronological manner, as opposed to the regional pattern followed in chapter 5 and in the rest of this chapter.

6.2.1. Late Middle Palaeolithic Sites

Two sites are highlighted in this section, the biggest difference between them being that Foz do Enxarrique is an open air site and Figueira Brava is a cave, with the particularities that the study of such different records entails.

After their independent analyses, a final subsection will deal with other Late Middle Palaeolithic sites for which there is regrettably little information in the publications consulted.

6.2.1.1. Foz do Enxarrique

This site, located on the banks of the Tagus River, near Vila Velha de Ródão, was discovered in 1982, and research is being carried out there at present. It seems likely to prove the most important open air site of the period in Iberia.

Although the industry has not been thoroughly studied yet, it is known that tools were knapped *in situ* and the recurrent Levallois technique predominates (Raposo 2000). The most abundant types are sidescrapers, notches, and denticulates, all manufactured on quartzite river pebbles. According to Zilhão (1993), flint and quartz are very scarce. He qualifies the assemblage as 'big enough' [to allow a proper analysis of the Mousterian occupation]; no Upper Palaeolithic traits can be discerned, although it has been dated by U-series on two horse teeth and one auroch tooth to an average of 33600 ± 500 ; that is equivalent to 30000 BP in radiocarbon terms (Raposo 1995), according to Bard *et al.* (1990).

6.2.1.2. Gruta da Figueira Brava

This rockshelter is located in the Council District of Sesimbra, and it yielded a Neanderthal molar, apart from abundant faunal and malacological remains (a *Patella* sp dated to 30930±700 bp (Vega Toscano *et al.* 1999)).

Zilhão (1993) noted the predominance of quartz in the raw materials used to fashion an assemblage which does not show any Upper Palaeolithic tendencies. According to Raposo (2000), these Upper Palaeolithic traits exist, but are residual, and the classification of the assemblage is Typical Mousterian. It is rich in denticulates and the Levallois technique is absent.

Nevertheless, this Mousterian occupation, which Zilhão (1993) dates ‘until 31000 BP’, although another date obtained read 30050±550 bp (Vega Toscano *et al.* 1999), has a serious problem. The shelter used to be a cave, and the Middle Palaeolithic occupation is thought to have taken place in the inner chamber of the cave. The materials studied come from the outer area, but are likely to have been redeposited there from inside, or else the context could have been locally disturbed (Raposo 2000). Only layer 3 is known to contain undisturbed Mousterian materials, yet the dates mentioned above relate to unspecified levels.

6.2.1.3. Other sites

Raposo (2000) highlights three main sites: the open air site of Conceição was discovered in 1996 and subjected to a rescue excavation because it was located on the site of the new Vasco da Gama bridge (Alcochete). Two layers were observed, both with abundant lithic remains and were dated as follows: 27200±250 BP (top layer)

and 64500+11600/-10400 BP (lower layer). Although retouched tools were scarce, there is a predominance of denticulates and notches.

Another site is located in the same region as Gruta de Salemas (see below, 6.2.2.3) and it is a karstic feature with Middle Palaeolithic industries, although these are so scarce, that is difficult to classify them typologically. This site is called Pedreira de Salemas, and three layers were identified in it: above the one containing the aforementioned tools (layer 4), there were layer 3 (sterile) and layer 2, dated to *c.*29000 BP.

Lastly, there is Lapa dos Furos, dated to *c.*30-34000 BP, which only yielded seven artefacts: three flint flakes, two notches, one denticulate and a flint core, which have been attributed to the Middle Palaeolithic (Raposo 2000).

6.2.2. Possible Transitional Sites

The four main sites containing both late Mousterian layers and early Upper Palaeolithic assemblages are described in the following subsections.

6.2.2.1. Gruta Nova da Columbeira

This cavity was discovered in 1962, and it is located in Bombarral, 10 km away from the present-day Atlantic coast, in a valley where there are other caves of similar age. It contains 2.5 m of Mousterian sequence.

The main paper about this site was written by Raposo and Cardoso (1998), but other authors have included specific details about it in other publications (e.g. Vega Toscano *et al.* 1999).

According to Zilhão (1993), the Mousterian levels contain similar proportions of flint, quartz and quartzite, and the industry was classified as Denticulate Mousterian, with Levallois technique and a high percentage of sidescrapers (Raposo 1995, 2000). The top Mousterian layer (16/7 depending on the old/new stratigraphy) provided a ^{14}C date of 26400 ± 750 BP. Together with the date for layer 20/8, 28900 ± 950 BP, it was considered to be too young and they are both assumed to be contaminated.

The upper layers are considered to be contemporaneous with the early Upper Palaeolithic, but those do not contain any human occupation. Despite this, the site is counted among the transitional ones by Portuguese scholars, and this author accordingly included it in this section, though one can hardly say it solves any problems relating to the Transition.

6.2.2.2. Caldeirão

This site was discovered in 1979, and was excavated by Zilhão, who provides extensive information about it in his doctoral dissertation (Zilhão 1997).

According to Vega Toscano *et al.* (1999), the stratigraphy of this cave contains levels ranging from the Middle Palaeolithic up to the Middle Ages. The layers containing Mousterian industries are L to Q. Raposo (1995, 2000) counts that among all of them they only yielded 48 Mousterian lithic artefacts in total. These were manufactured by

using the Levallois technique and although some are made on flint, the vast majority are on quartz and quartzite.

Layer K contains a mixture of Mousterian and early Upper Palaeolithic artefacts, the latter comprising a retouched flint blade and two perforated marine shells, which prompted Zilhão to classify the layer as Gravettian. Moreover, this layer is in contact with the overlying Jb. Raposo has difficulties classifying the quartz endscrapers found in K as Mousterian (Raposo 2000). This layer was dated to 27600 ± 600 BP and this reading, considered to be consistent, is statistically identical to that in Pego do Diabo 2, *c.*28000 BP, the earliest Upper Palaeolithic occupation in cave in the Portuguese area (see below, 6.2.2.4).

6.2.2.3. Gruta de Salemas

Discovered in the late 1950s, this cavity is about 30 m long and 1 m wide. The Middle Palaeolithic assemblage is located in layer 4/8 (depending on the old/new stratigraphy) and considered exceptionally large, although exact numbers are not provided in any paper.

Layer 3/7 contained three bone *sagaies* and about 100 tools, including prismatic cores and bladelets; it was originally classified as “Gravettian or Perigordian” (Raposo 2000), but Zilhão proposes to separate three Dufour bladelets and one fragment of what he thinks was a bone point and thus include an Aurignacian phase (Zilhão 1997:475-486).

There are two dates available; for layer 3: 20250±320 BP and for layer 4: 24820±500 BP, which would be comparable to the one for Pego do Diabo 3, if they were not considered “unreliable due to inadequate sample control” (Raposo 2000).

The author believes that Zilhão’s Aurignacian claim is rather risky, as three Dufour bladelets are a very small piece of evidence, and this type in itself is not considered sufficiently diagnostic *‘per se’*. Inverse retouch, a feature of the Dufour bladelets is not, after all, unknown in the Gravettian: *cf.* the *fléchettes*, which were regarded by de Sonneville-Bordes and others as a ‘type-fossil’ of the Perigordian IV.

6.2.2.4. Pego do Diabo

The transitional sequence at this site comprises layers 2 and 3. Layer 2 has only 31 artefacts, among which there are six Dufour bladelets and one *sagaie*. This layer is broadly similar to, and thought likely to be contemporary with, layer 3/7 of Gruta de Salemas, as previously mentioned, and regarding its dates (bottom section only) comparable to Caldeirão and Gato Preto, despite controversies about the latter’s dates, which will be mentioned in the next section. The top section of Layer 2 at Pego do Diabo was dated to 23080±490 BP and was classified as Gravettian. Its bottom area was dated to 28120+860/-780 BP, and typologically attributed to the Aurignacian by Zilhão, because of six Dufour bladelets of Dufour subtype b (Zilhão 1993, 1997, Raposo 2000).

The only thing known about layer 3 is that it is classified as Middle Palaeolithic and dated to 18630±640 BP, a date that does not make sense in the context as it is younger

than those for the layer just above it. Its assemblage is very small, which constitutes the main obstacle for the study of this sequence.

6.2.2.5. Other sites

Zilhão (1993) mentions two transitional sites for which there is not much information, but they seem well worth mentioning as they appear to contain all the transitional sequence.

In the first instance, Gruta da Oliveira, on the Almonda karstic system, contains La Ferrassie Mousterian below a layer considered to be Upper Palaeolithic. Redepositional phenomena have affected the stratigraphic record of this site, where an unspecified layer has been dated by U/Th to 70000 years.

In the second, Gruta do Escoural, containing a large Middle Palaeolithic assemblage made on quartz with no Upper Palaeolithic traits, is thought also to have had a possible Aurignacian occupation, inferred by Zilhão's classification of three microlithic points noted within the collections dug out in the 1960s, very similar – typologically – to the Dufour type b bladelets found at Pego do Diabo, mentioned above. There are other Upper Palaeolithic layers on top of this one, but none has a clear typological classification.

6.2.3. Aurignacian Sites

Zilhão (1996b) quotes in relation to blade production (flint prismatic cores) of the Portuguese Aurignacian the following as distinctive technological traits: blades longer than 2 cm, extracted from systematically prepared platforms, usually by abrasion and

often by preparatory faceting or both; bladelets shorter than 0.8 cm, obtained by following a different chaîne opératoire from that of blades.

There are several sites that are said to display evidence of possible Aurignacian occupations. None of them has been published in detail, and thus the information below is rather patchy, yet the author considered important to mention them, especially since the existence of this industrial tradition is highly questioned by Portuguese workers, as explained above.

Gato Preto is the most controversial site of this period in Portugal; it was excavated by A. Marks as an emergency operation because of roadworks in the area nearby, which had begun to unearth a flake industry on quartz with a large quantity of nosed scrapers, which could be related to the Upper Palaeolithic tools found in Pego do Diabo.

The controversy lies in the fact that this industry was classified by Zilhão (1997) as Gravettian or Protosolutrean, but when dates by TL were obtained, the resulting reading was 38100 ± 3900 , which is equivalent to 30-46000 BP and thus not compatible with that researcher's ELH, which only allows Upper Palaeolithic sites in that area from *c.*28-30000 BP onwards. Therefore the date was rejected because it did not suit the techno-typological attribution of the assemblage (Raposo 2000). Should the date be correct, then the typological possibility of it being an Aurignacian occupation would probably be considered more accurate than Zilhão's original classification, although a full study of the pieces would be required to confirm this

issue. Nosed scrapers, after all, are a classic Aurignacian tool type (*grattoirs à museau*).

Vale do Porcos⁵⁷ was dug during the 1930s and the collections from the site are kept at the National Archaeological Museum in Lisbon. They contain a blade industry made on flint, where several types of burins predominate and Dufour bladelets and Aurignacian blades are absent. Zilhão (1993) attributes it to a possible late Aurignacian comparing it to classical French records, yet no absolute dates for this site have been produced, and his classification rests on purely typological grounds.

6.3. Southern Mediterranean Sites

This section's aim is to provide a clear picture of how the Spanish Levantine sites south of Catalunya, in the regions of València and Murcia portray the Transition. Although, as will be shown below, there have been excavation works from the late 1880s (e.g. Siret 1893, 1930, 1931), the first large scale investigation's results only appeared in 1942, when Ll. Pericot published his work at Parpalló (Pericot 1942).

During the 1940s and 1950s, systematic excavation works directed by scholars like Corominas, Fletcher, Jordá, Pericot and Pla took place, and archaeological research in the area has followed a steady evolution since then. In the 1970s, several re-analyses of materials collected during the 1950s to the 1970s intensified the pace of studies, which focused on typological classifications and on environmental conditions as observed from sedimentological and geological studies mainly.

⁵⁷ This site is not mentioned on the map, because no publication consulted provided details of its exact location in the context of a map of the central Portuguese area. Zilhão (1997:66, 77) does locate Vale do Porcos I and II in two different maps, but these are local, and their position respect to the map of the whole country is not given.

Several generalisations, especially those regarding the prolonged Mousterian presence and the questions concerning the typological classification of the earliest Upper Palaeolithic industries, in relation to the existence or absence of an Aurignacian period in the area, associate this area with the southernmost region of Iberia, Andalucía, which will be studied in the last section of the chapter. At the same time, these traits are the same that separate it from the Catalan region, where the Aurignacian has been detected substantially earlier and without too much controversy in the most famous sites. These generalisations support *grosso modo* Zilhão's division theory.

The most complex site is Cova Negra (Xàtiva), which also contains one of the longest Mousterian stratigraphical sequences topped up by one Upper Palaeolithic level; unlike Abric Romaní, where the transitional layers are separated by stalagmitic crusts, Cova Negra's upper levels have suffered a series of redeposition episodes and direct contacts between layers make its study difficult. Some of these problems are also perceived in the study of other sites of this area, like Cova Beneito (Muro), and although they have been suspected or fully known for several years, it seems to this writer that they have not been addressed or even investigated. Meanwhile, 'reconstructions of the Transition' have been built, ignoring these facts.

6.3.1. Cova Negra

This cave is located 3 km away from the town of Xàtiva (València) and is a 25 m deep cavity on the left bank of the Albaida River, some 100 m above sea level and 17 m above the river's present channel. It can be divided in two parts, the hall and the

inner chamber, both covered, but none of the studies of the materials makes any distinctions referring to pieces found in one or the other.

The first mention of Cova Negra in the literature was made by Vilanova i Piera (1872), and Cartailhac also mentioned it a decade later (Cartailhac 1886). In 1928, Viñes began the first excavation work which lasted until 1933. According to Villaverde (1984), the cave was excavated in the 1950s too, specifically in 1951, 1953, 1956 and 1957 by different scholars among whom were Pericot, Jordá, Alcàcer, etc. After this period, Cova Negra was excavated again from 1981 to 1989. Villaverde's monograph re-studies the materials from the previous digs and includes his findings during 1981 and 1982.

This site has 15 stratigraphic units, which have been classified as Mousterian, except the last one, which belongs to the Upper Palaeolithic. One of the difficulties in studying this site is the several changes in the nomenclature of the layers: the 1984 monograph quotes level I and II (both described as Mousterian and analysed by Bordes' system), plus a superficial layer "R-82", described as Upper Palaeolithic. Villaverde mentions that the pieces lack any sort of stratigraphical reference, but 'some [unspecified] circumstances allow him to determine their position regarding the Iberian facies of the Upper Palaeolithic'. Later papers (e.g. Villaverde and Fumanal 1990, Villaverde *et al.* 1996) refer to layers A and B and also I and II as the transitional ones. In this analysis, the nomenclature used is the latter, that is to say the sense used by the latest papers on the site:

- Level I: 10-20 cm thick, its uppermost part is partially removed, and contained numerous roots. There are some separate sediments near it, thought to be the ones

originally deposited on top of the level. After reading Villaverde's dissertation, the author of this thesis associates them with what Villaverde calls "superficial level R" (1984:177), which has been thought of as a separate unit since its discovery in 1982, and analysed as such.

- Level II: 8-9 cm thick, in contact with level III, just below, and "difficult to separate from it" (Villaverde 1984:172).

The uppermost Mousterian levels are described by Villaverde (1984, Fortea 1985) as *Paracharentian*. This new facies was coined by Bourgon, while studying the Mousterian in the Perigord (Bourgon 1957), and here is associated with the belief that the prolonged Mousterian survival is a regional phenomenon, specific to the area under study. It is defined as presenting a decrease of Levallois technique, and percentages scrapers, especially transversal types, and slight increase of denticulates and notches, respect to the La Quina variant, thought to have had the same origin as this variant, and no tendencies or traits resembling those of the Upper Palaeolithic⁵⁸.

The following table compares the characteristics of the Paracharentian and La Quina facies:

PARACHARENTIAN	TRAITS	LA QUINA CHARENTIAN
>10%	Technical Levallois index	Usually <10%
Moderately low	Faceting index	Very low
Low	Blade index	Very low or low
High, between 65 and 80%	Sidescraper index	Moderately high, 55-65%
Very high, >40%	Charentian index	High/mod. High, 22-38%
>6 and <10%	La Quina index	12-20%
Between 2 and 9 %	Denticulates index	9-20%
Not many, 0-6%	Number of notches	Abundant, 6-13%

Table 43: Specifications of the Paracharentian facies, according to Villaverde (1984:210), compared to La Quina Mousterian facies.

⁵⁸ Fortea (1985) quotes that de Lumley has classified several sites of the Würm II in southeastern France as Paracharentian (*sensu* Bourgon).

The artefacts which have been attributed to Layer R (and therefore presumably any from the layer that has been called I and perhaps also II), thought to be Upper Palaeolithic, were actually collected from the surface area, and lack any proper stratigraphic context. They are described as a coherent group, very likely to belong to a single industrial moment (Villaverde 1984:213). According to that author, it was first called Solutreo-Gravettian, because of two strangulated points (*sic*) and several backed bladelets. Endscrapers predominate, abruptly retouched pieces are well represented and the bone industry includes two points, a *sagaie* and a fragment of another one, which warrant a more precise ascription to the Solutrean-Gravettian II, *sensu* Fortea and Jordá (1976).

Another complication in the analysis of this sequence is that the monograph groups assemblages from different levels in 'industrial units' and – as observed for Abric Romani – such units are then studied as individual assemblages. In the case of the levels formed during the transitional period, they are grouped in the unit I-IV or Sup I-II (*sic*). Only the typological lists for the old excavations' materials are provided and R – considered Upper Palaeolithic – seems nevertheless to be analysed by means of the Bordes typology for the Lower and Middle Palaeolithic.

Chronometric dating has been attempted, but it has proved unsuccessful so far, which leads the author to wonder whether the late character of the Mousterian assemblages mentioned above may simply have been inferred by means of typological analyses matched with environmental data obtained from those levels.

In 1990, Villaverde and Fumanal classified level II as a Charentian Mousterian and level I as an evolved Solutrean or Solutreo-Gravettian, stressing the clear break and lack of continuation across the Transition at the cave. The 'evolved Solutrean' classification was subsequently argued against by Villaverde *et al.* (1998), while attempting to analyse the Aurignacian phenomenon in the Iberian Levant as a whole (including the Catalan area, now understood as displaying a very different type of Transition).

In light of the complications that Cova Negra's transitional stratigraphy and attempted chronometric dating present, the process of the Transition cannot be studied at the site. The analysis of the Upper Palaeolithic material is especially problematic, due to the lack of stratigraphical information, acknowledged by scholars from the start, although as seen above, it does not look as if that issue has stopped them from classifying it, in the framework of the original typological study (Villaverde 1984).

6.3.2. Cova Beneito

This cave is located on the southern slope of the Benicadell mountain range in Alicante, an abrupt and narrow valley area. It is an 8 m deep and 6 m wide cavity inside the municipal boundary of Muro. Its coordinates are 38°48'03"N and 3°12'00"E.

The transitional layers, according to Iturbe *et al.* (1993, Iturbe and Cortell 1987), are the following:

- Level IX: 30 cm thick, in contact with level X, formed by two different units:
 - C4: Aurignacian 0

- C5: 'Discontinuity' dated to 33900±1100 BP
- Level X: 20-40 cm thick, classified as Final Mousterian, dated to 30160±1900 BP. Villaverde *et al* (1998) consider it to be 'transitional', because of the following characteristics:
 - Enrichment of Group IV (notches and denticulates)
 - Abundant naturally backed knives
 - Increased frequencies of Group III
 - Laminar index of 19%
 - Frequent endscrapers, burins and borers
 - One pendant made on a lynx canine perforated by typically Aurignacian techniques at the site.

The above traits certainly appear to give it a transitional character both typologically and technologically. Nevertheless, the same authors acknowledge that the relief pattern on the inside area of the site contains a slope going down towards the inside zone, so that this level's materials could have rolled down after being left on top of it in later periods, thus creating an episode of redeposition which would have created a palimpsest. This alternative interpretation is taken for granted by some (e.g. Zilhão 1996a) and ignored by others (e.g. Fortea 1985).

The factors that contributed to the formation of these layers, especially layer X, would need to be carefully re-studied, before considering Cova Beneito in the framework of the Transition. Unfortunately this has not been done to date, and therefore the transitional phenomenon cannot yet be studied at the site, important though it might prove to be.

6.3.3. Perneras

This rockshelter in Lorca (Murcia) is one of the best examples of what was reported in chapter 2 as one of the major problems in the study of the transitional process in Iberia: the widespread lack of knowledge about sites like this one, usually because of their excavators' work not being published at all, or not reaching beyond national meetings on general or regional topics in Archaeology, or at the most not beyond national journals.

Perneras was initially excavated by L. Siret and J. Cuadrado, the pioneers of Palaeolithic research in Murcia. The collections excavated by them are kept in the MAN (Montes 1984). In 1970, the site was located and new excavations began under the direction of R. Montes.

Geographically, the site, sometimes called a small cave, opens to the south and on to the Ramonete – nowadays dry – stream, 105 m above sea level. The present distance to the coast is some 3.5 km, but it has been calculated as *c.* 10 km at the time when the site was occupied.

It contains 15 strata, nine of which have been classified as Middle Palaeolithic and six as Upper Palaeolithic. The transitional layers are nos. 5 (Aurignacian) and 6 (Mousterian).

Layer 5 was classified by Villaverde (1984) as Typical or Classical Aurignacian, and contained nosed scrapers, dihedral burins and burins on truncation, backed bladelets and denticulates.

Layer 6 is said to be a 'Laquinoide' (i.e. La Quina-like) Mousterian, containing sidescrapers, one Levallois point and few denticulates.

Sources of quartz, the predominant raw material used at Perneras, are found 50 m away, and the flint comes from near the source of the Guadalete River, accessible via the Ramonete stream; although at most sites flint is the material most used to manufacture lithic tools, here it accounts for only 7% of the total lithic remains. The cave had two natural water springs inside (Montes 1985).

Colorants [pieces of ochre?] were found in all Upper Palaeolithic levels and one unspecified Mousterian layer, but no traces of art were unearthed. Bone remains are scarce and it is not known if any pieces were worked. Molluscs are found from the Middle Palaeolithic onwards, but are said to be only related to dietary patterns and subsistence models. Although the only one which appears in Montes' 1985 paper seems to show a double perforation, no personal ornamentation is claimed from any of the layers mentioned above.

No dates are available for Perneras. In view of the results from Cova Negra and Cova Beneito's presented above, which cast little light at present on the question of the Transition, the dating of layers 5 and 6 could represent a major advance for this field of research in the area. However, it must again be noted that some sources claim that disturbance phenomena have affected the Aurignacian layer and also the 'Siret' layer (an unspecified Upper Palaeolithic layer) (Vega Toscano 1988).

6.3.4. Mallaetes

Also known as 'Cova de les Malladetes this site is located on the Mondúver mountain range, near Barx, La Safor (València).

From 1946 to 1949, it was excavated by Pericot and Jordá, and the first analyses showed several discordances with the record studied at Parpalló, as interpreted by Pericot (1942). In 1947, the first Aurignacian remains at the site were discovered and they lacked the typical elements. This cave – like Parpalló – has been mostly studied in regard to the Solutrean levels they both contain, as can be seen in the major papers and other publications about them (e.g. Pericot 1942, Fortea and Jordá 1976, etc.)

In 1970, Jordá and Fortea started the new excavations at Mallaetes and stratum XII (the third from the bottom, covering two more levels, which very poor and apparently not attributed to any particular type of industry or dated), was dated to 29,690±560 BP (Fortea and Jordá 1976). Because of the industrial traits, both from bone and lithic tools, and the date obtained for the layer, the Aurignacian of Mallaetes (only one level) was compared to that of Abri Pataud I and II, Caneda (Caminade), Morín in Cantabria and Gorham's cave in Gibraltar. It was also compared to that of Cueva Ambrosio, originally identified by Siret, but now thought not to have existed (Paniagua 1997), and just to have been the product of that scholar's mistaken classification.

Layer XII contained about 50 lithic pieces (Fortea 1985), about which particular information is extremely scarce, to say the least, but a bone industry – equally poorly known – is said to have been found in large quantities.

According to Villaverde (1984:315), there are just 22 lithic artefacts: some endscrapers, burins and notches, one denticulate, two sidescrapers and predominant continuously retouched pieces. In regard to the bone tools, he mentions a triangular-section point and two lozenge-shaped *sagaies*, one of them *c.*22 cm long.

The traits above point towards an Aurignacian which was already developed beyond its initial stage when it reached this area. Villaverde and Fumanal (1990) classified it as Aurignacian II.

Strata XIII and XIV have yielded too few tools to allow their typological classification; those found, are described as of 'uncertain type', although Fortea and Jordá (1976:134) note the absence of blunted edges in them.

The importance of this site is mainly the existence of the dated Aurignacian level, although the industry is described as advanced. Mallaetes cave is usually included in the studies of the early Upper Palaeolithic of this area, and serves as one of the references for new studies in this region.

6.4. Sites in Andalucía and Gibraltar

The region on which this section focuses follows the pattern of a late transition observed in the previous parts. The sites studied here are located not only on the coastal plains of the region, close to the sea, like Bajondillo and Gorham's cave, but also in mountain environments at a quite high altitude (*c.*1000 m), like Carihuela and Zafarraya, both located on the mountain ranges (Baetic systems) that border the coast

from the Gulf of Cádiz as far as central València. This makes it necessary to remember environmental conditions and surroundings, as well as the fact that activities developed by the particular groups that used these caves would have been rather different.

The sites of this area have very different archaeological histories. While Zafarraya and Bajondillo have become foci of study more or less recently, Carihuela and Gorham's cave have long lists of researchers and years of excavations attached to their names.

The literature shows that modern excavation work at these sites takes into account earlier actions and achievements, and not only attempts to find out more about them (e.g. correlations looked for at Gorham's cave, see below), but it also has allowed scholars to include these sites within a pattern of regional research or make them the base to develop stratigraphical correspondences with other sites in the region (e.g. Carihuela). This constitutes a remarkable departure from the usual adoption of imported evolutionary frameworks devised in and for southwestern France, and seems likely to have been caused by the peculiar feature of the long Mousterian persistence in the area and the late arrival of the Upper Palaeolithic, which just does not fit at all with the traditional and expected model.

Experts do not yet agree on the specific character of the earliest (or initial) Upper Palaeolithic in this region. While traditionally (e.g. Cacho 1980, Fortea 1985) scholars have acknowledged the presence of typical Aurignacian pieces, usually in problematic series, they have still refused to characterise the earliest Upper Palaeolithic as

Aurignacian. This is at present strongly being argued against by younger workers who are studying new sequences, where they claim there is a clear Aurignacian presence, which inaugurates the local Upper Palaeolithic sequence (e.g. Cortés Sánchez 2000).

The need for further more detailed analyses of this region in the future is absolutely clear, not only to find more sites, but also to allow the continuation of the refreshingly innovative studies which have already been able to combine typological analyses – here really used as a method, not as an objective of research – within a wider research framework that includes many other different kinds of study.

6.4.1. Boquete de Zafarraya

This small cavity is located within the municipal boundary of Alcaucín, in Axarquía (Málaga), but it is only 450 m away from the Granadine village of Ventas de Zafarraya. Its name comes from the mountain pass 400 m NW from the cave. This site, 0.5-2.5 m wide and 20 m deep, is located below a limestone cliff, 1022 m above the sea level. It opens to the south and it is surrounded by the mountain ranges of Tejeda to the East and Alhama to the West.

It has been excavated since 1981 by C. Barroso and his team, although until the summer of 2003 there have only been preliminary publications about the work. The first monograph about this site appeared on July 31st, 2003 (Barroso 2003).

Vega *et al.* (1999) describe the site's stratigraphy as homogeneous, with Holocene layers at the top and Mousterian deposits, with many Levallois flakes and [famous] Neanderthal remains at the bottom. These are accompanied by faunal remains that

allow correlations with units V and VI from Carihuela (see below), supposedly belonging to the Interpleniglacial or the Upper Würm Pleniglacial. Villaverde *et al.* (1998) attribute the Neanderthal remains to the Hengelo interstadial or the beginning of the Würm III. Radiocarbon and U/Th dates have provided readings of 28-30000 BP.

Barroso and Hublin (1994) have identified 47 levels of either human or carnivore occupation of the cave, the site would have been used only as a hunting station or for sporadic occupation by human groups. All the Mousterian at the site has been classified as Typical Mousterian, displaying an extreme use of Levallois debitage: 41% of the flakes were produced by that technique.

Flint was the raw material used for artefact manufacture. Tools, mainly on flakes, constitute only 4.2% of the lithic series, and consist almost exclusively of sidescrapers, endscrapers, Mousterian points and flakes. Although there are flint outcrops close to the site, provenance studies have located the original sources for the specific flint used (of a higher quality than that of the cave surroundings) near Alcolea (Periana) and Alfarnate, 7 to 12 km away. The bulk of the assemblage was brought already finished to the site, where knapping activity is thought to have been minimal (Medina Lara *et al.* 1986). This is in accordance with the suggested use of the cave.

It is important to highlight the appearance of two retouched bladelets, typically Upper Palaeolithic, that were found less than 10 cm from the top of the stratified Mousterian levels. Intrusion is one of the possibilities being considered (Barroso and Hublin 1994:65), but there are also one Chatelperronian point and one core specifically for

blade manufacture coming from the bottom of the stratigraphy at the entrance of the cave, clearly non-Mousterian in appearance, for which intrusion cannot be argued. No information is given about the presence or absence of an Upper Palaeolithic layer above the Mousterian levels described here.

The faunal remains excavated seem to confirm the interpretation of the site as a hunting station: ibex constitutes 85% of them, with two thirds of the prey being between three and six months old specimens; this has allowed researchers to attribute to the human occupations a seasonality aspect, and they are thought to have ranged from the end of June to November. Other herbivores are horse, deer, wild boar, etc. and among the carnivores, there are remains of bear, lynx, wild cat and hyaena.

The site has attracted international attention due to the finding in 1983 of a very well preserved Neanderthal mandible and a broken Neanderthal femur (Barroso and Hublin 1994). Both are reported to show traces of cannibalistic activities.

It is hoped that the publication of the monograph will provide much more specific data, not only about the skeletal remains, but also about other aspects of the Mousterian occupations at the site. Once again, there is no clear transitional event here in the sense of a late Middle Palaeolithic passing into an early Upper Palaeolithic, but the apparent late survival of Mousterian is important, as is the absence of and clear Aurignacian or other initial Upper Palaeolithic.

6.4.2. Bajondillo

This site is located on the western side of the Bay of Málaga, in the town of Torremolinos (Málaga, Andalucía), and was the objective of a rescue excavation in 1989, after being partially destroyed and exposed by building works.

It has 5 m of deposits (Cortés Sánchez 2000), which can be divided into 17 layers. The Upper part of the sequence (3.85 m) has yielded remains classified as Aurignacian, Gravettian (probably contemporaneous with that of Mallaetes) and Solutrean; the lower layers (0.8 m) contain Mousterian artefacts. This sequence makes Bajondillo an ideal site to study the Transition in this area. The layers involved in the process are:

- 11/12: Aurignacian
- 13: still under study
- 14: Mousterian

According to Cortés Sánchez (2000) and himself and Simón Vallejo (2001), layer 14 is different from the layers that occur above and below it. Flint constitutes 92.2% of the raw materials used at that time, with a very low presence of quartzite and quartz (7.5% and 0.4% respectively). The technology is clearly Levallois recurrent centripetal, although there are some discoidal cores. Typologically, Group II amounts to 17% - considered a low percentage – and group III to 13.8% - inside a rising trend of this group throughout the successive layers – with denticulates constituting 14.9 % of the tools.

Cortés Sánchez and Simón Vallejo (2001) link these characteristics to Carihuela's level V1 (Vega Toscano 1990:171) and possibly Cova Beneito in València (see above), placing this layer inside the Würm pleniglacial or the Hengelo interstadial.

No information is provided about layer 13, which in the late 1990s and early 2000s was in the process of being studied. It may prove crucial to interpretation of the whole succession.

Layers 11 and 12 are thought to be facies of one single layer and to represent a radical shift from the previous stratigraphical divisions. The index of endscrapers, including carinated and nosed examples is higher than that of burins. There are also bladelets thought to be younger forms than Dufour ones. These characteristics together with the clear presence of Aurignacian retouch on some of the types, point to an Advanced [Late] Aurignacian.

Regarding the use of raw materials, the percentage of flint rises to 95.3% and that of quartzite decreases to 4.7%. This level has been dated to c.30-28000 BP.

As in Perneras, molluscs are fairly common after the Mousterian, which is not surprising, given the proximity of this site to the sea, but faunal remains are very fragmentary and this limits their study in a research framework which is at present in its very early stages. There is no indication that decorative items were being made.

According to Cortés Sánchez and Simón Vallejo (2001): together with Cova Beneito, Bajondillo proves that there is Aurignacian south of the Ebro. More information about

layers 14 and 11/12, and news about the results from the study of layer 13, are needed in order to provide enough information about the existence or absence of the traditional transitional tenets.

6.4.3. Carihuela

The site was discovered by Obermaier , early in the 20th century, and has been excavated by J. Ch. Spahni, M. Pellicer, H.T. Irwin and, since 1980, by G. Vega Toscano. The details of the works of the first three scholars have never been published in detail (Vega Toscano *et al.* 1999), and thus their achievements remain largely unknown.

Carihuela has yielded a stratigraphy with more than 100 levels: over 62 of them are thought to be Mousterian, but work is still ongoing at this cave. It is located on the mountain of Castillo de Píñar, in the Harana mountain range, 600 m S-SE from the village of Píñar (Granada). According to Vega Toscano (1990), the cave has a strategic position at an altitude of 900-1300 m, over the depressions of the Guadix and Granada.

The transitional sequence comprises units IV and V. Unit V contained Neanderthal remains and seems likely to constitute the top of the Mousterian sequence, dates for which span from 145000 to 29000 BP and the main characteristic of which is its homogeneity, its use of flint and a ‘classical Mousterian character’.

Layer IV was once (Almagro *et al.* 1970) said to contain AMH remains in association with Mousterian industries, but this claim was withdrawn later on, and the error

blamed on the redeposition of Mousterian lithics derived from an older deposit located at the cave's entrance which would have rolled down and fallen into a level containing human remains which had been introduced into the site later on.

The major stratigraphical problems (in this case contamination) are quoted as a possibility by Otte (1996:245) when mentioning the possibility of Carihuela's upper levels showing a tendency towards Aurignacian traits.

Vega Toscano *et al.* (1999) consider that the presence of Neanderthal and AMH remains may be due to the actions of predators and not linked to any kind of ritual or burial practice, as opposed to what Barroso is claiming for Zafarraya's remains.

Palynological analyses (Carrión 1992) attribute level V to the Upper Pleniglacial of the Würm III. Villaverde *et al.* (1998) have placed both units (IV and V) at the beginning of that period.

More information on the exact contents of these two deposits is needed in order to see if this site can offer a clear picture of the transitional process. It is disappointing to the present author that meanwhile nothing can be safely said about it, though it may well prove that some form of already developed Upper Palaeolithic replaced a late Mousterian, after a time interval that remains to be established and might be brief or long.

6.4.4. Gorham's Cave

This site was discovered by Captain A. Gorham in 1907, but its systematic study did not begin until some 40 years later, when J. d'A. Waechter, former student of D. Garrod, who had worked at other sites nearby, conducted the first large excavation (1948-1954). Many aspects of Waechter's work were not published or even recorded, and a lot of the material is said to have been lost (Barton 1999, Stringer *et al.* 1999).

A new campaign of modern excavation began in 1995, and one of the aims is to attempt to correlate the current findings with those made by Waechter (Fernández-Jalvo and Andrews 2000). In 2001, the present author was able to begin studying a part of Waechter's collection, which remains in Gibraltar, but that study is not included here as it is unfinished. Abundant information about the current research by the 'Gibraltar Caves Project' has been made public during two conferences held in Gibraltar (1998 and 2001), in which the Transition to the Upper Palaeolithic in Iberia was the key aspect (Gamble 1999, Stringer *et al.* 2000).

Geographically, Gorham's is one of the four caves of a complex located on the East side of Gibraltar's rock (from North to South: Boat Hoist, Vanguard, Gorham's and Bennet's). At present, they are right on the modern seashore, but it is thought that the coastline at the time when the Transition took place was between 2.5 and 4.5 km away (Finlayson and Giles Pacheco 2000), as during OIS-3, the sea level would have been some 70 to 85 m lower than nowadays.

Waechter described a 16 m deep stratigraphy (Finlayson *et al.* 2001), though some authors report that the deposits are only 10 m thick (Barton 1999). The Transition

took place during the deposition of contexts 16 and 17, which are distorted by slumping or bioturbation and that has led to findings of pieces characteristic of the Middle Palaeolithic (e.g. a flake from a discoidal core) in association with a platform of rejuvenation from a prismatic core, a clear indication of Upper Palaeolithic technology. Extreme caution is required when considering these units, as Macphail *et al.* (2000) have stressed the importance of the phenomena which have disturbed the sediments embedded in this and adjacent units, in relation to the interpretations that may be based upon the remains unearthed and their original positions in the record.

The Mousterian layers are not very rich, but have been classified as a Typical Mousterian (Barton 1999, Stringer *et al.* 1999). Level G, the most recent of them according to Vega Toscano *et al.* (1999), has been dated to 47700±1800 bp and 49200±3200 bp, c.50-40000 BP according to Pettitt and Bailey (2000), who analysed charcoal lumps found in association with diagnostic stone artefacts inside that layer. Barton (2000) identifies context 16 as containing the uppermost Mousterian tools. A hearth within 16 (individualised as context 24) has been dated by AMS on charcoal to 32280±420 BP.

The first Upper Palaeolithic level is D, attributed to the Aurignacian by Pettitt and Bailey (2000), which has been dated by ¹⁴C to 27860±300 bp and 28700±200 bp (Vega Toscano *et al.* 1999).

No specific details of the assemblages unearthed in these contexts seem to be available yet, possibly due to the research's early stage and the concentration of the work on only three stratigraphic units at the back of the cave (Finlayson *et al.* 2001),

but it is known that tools were manufactured on local raw materials and that a specific type of chert (honey-coloured) originates from a source 17 km away from the site, NW of the Rock.

The publication of the proceedings of the international meeting held in the summer of 2001, summarised by Stringer and Davies (2001), is eagerly awaited, as it will report further progress on many aspects of the investigation.

6.5. Sites in the Meseta

The central area of the Iberian Peninsula is dominated by high plateaux (elevations between 600 and 800 m) and it is known as La Meseta. It extends from South of the Pyrenees to the North and northwestern area of the Baetic system, but it is separated from these mountain ranges by the Ebro and the Guadalquivir River valleys.

This is the area of which least is known, in relation to the Transition. Several researchers (Gamble 1999) have noted the paucity of Upper Palaeolithic sites in this area and felt that this is likely to be caused by a research bias rather than a possible abandonment of the region during that period of time. Straus *et al.* (2000:554) noted that 'Knowledge of the interior (with the exception of some ill-defined finds in sandpits now under Madrid) was virtually nil until recent years)

However, the late 1980s and 1990s have seen the development of a few projects in the Guadalajara area, which certainly helps to correct the aforementioned bias, indicating that early Upper Palaeolithic sites are indeed there, but they still have not been found. Publications are also extremely rare and mostly of only regional distribution.

According to Adán *et al.* (1995), work on the upper Jarama valley began in 1983, after Jordá discovered the Upper Palaeolithic site now called Jarama II. Since then, several other sites (e.g. Jarama I, Jarama VI, etc.) have been discovered and excavated. A small team works in the area and its progress depends largely on government funds, which are requested along with the necessary permits to excavate, but not always are granted.

Jarama I and II are known to have Magdalenian remains; Jarama I was supposed to be studied further in view of a possible Mousterian presence, but economic restrictions prevented the University of Salamanca's team from carrying out that work.

Jarama VI's lithic series have been attributed to the Middle Palaeolithic. The site was partially destroyed by clandestine diggers, yet several layers were left intact and it is to be hoped that they can in due course be excavated and studied.

The site was discovered by García Valero and Pérez in 1988; it is a cave on the left bank of the Jarama River, near the village of Valdesotos, in the northwestern region of the province of Guadalajara. At 840 m above the sea level, it opens to the NW, 15 m away from the river and 25 m above the present-day basin. The cavity is 15 m long 1-9 m wide and 1-5 m high, divided into three areas: hall, cavity and gallery. Five seasons of work were carried out from 1989 to 1993, and five levels were unearthed, although only 14 m², out of the total area of 90 m² were excavated.

Level 2 was dated by ^{14}C on charcoal producing the following results: 29500±2700 BP, 32600±1860 BP and 23380±500 BP, showing that central Iberia's Middle Palaeolithic occupation follows the model of so many southern Mediterranean and Andalusian sites, i.e. characterised by a long persistence of this type of industrial tradition in the area. It is also similar to the cases of Cueva de los Moros and Roca dels Bous, mentioned in chapter 5.

All tools from layers 1, 2 and 3 were studied together, amounting to 6144 pieces in total and were attributed to the Middle Palaeolithic (in general) due to the presence of predominant flake tools, such as sidescrapers, points, denticulates, notches, endscrapers, burins, backed knives (manufactured on quartz mainly, although there is also some flint and quartzite) and the high presence of the Levallois technique, together with the clear absence of blade blanks and abrupt retouch (García 1996). Studies of the lithic materials are being conducted following the Laplace method.

Apart from these sites, the Archaeological Survey of Guadalajara (de Balbín and Valiente 1995) provides information on other Middle Palaeolithic and Upper Palaeolithic [unspecified subperiods] sites; de Balbín and Valiente mention seven Middle Palaeolithic and one Upper Palaeolithic occupations, but only provide two site names, without attributing them to any specific period: La Bragadera (Atienza) and Garganta del Sorbe (Muriel).

More research in this area is clearly and urgently needed to help the work, which is currently in progress, develop into a larger regional initiative that allows a broader knowledge of the later Periods (Middle and Upper) of the Palaeolithic of central

Iberia, as there are regions in that zone that have not even been prospected yet. This would provide this research field with the answers to questions such as whether the scarcity of information is due to the fact that there are indeed so few sites from that time period – in which case we could look for the causes of that, and even propose frontiers - or whether it is simply misinformation due to plain and simple research bias, and what is needed is a larger number of projects centred in parts of the Meseta.

6.6. Conclusions

There are several points which can be highlighted from this study of the evidence of the Mid-Upper Palaeolithic Transition in southern Iberia. First of all, the information found in the literature is simply not yet sufficient in order to test the traditional tenets, and it is no use pretending otherwise. This seems due to two facts: to begin with, in most cases, there is not as much categoric information on individual sites and assemblages as there is for the main sites of chapter 5, but it is also clear that, in general, researchers working at the sites studied in this chapter have not geared their research objectives to match those tenets, as has happened in cases like l'Arbreda, where conclusions reached in any papers published tend to be based on the formula 'the basal Upper Palaeolithic has the following features: more blades than flakes...' and so on, right down to the presence of representational art as the last item on the list (even, it has to be added, when there are no genuine traces of such art).

Secondly, regarding the Ebro Frontier, it seems to the present author that Zilhão has tended to discard and ignore data presented by other research teams which do not go well with that hypothesis. When his own team is the one that finds 'inconvenient'

remains⁵⁹, these are made to fit into the ELH, and the original idea has already had to undergo several modifications. This does not mean that through these adjustments the idea now makes sense, and although it has been said to have received support from several lines of evidence, these have been studied in this chapter and it is the author's view that they clearly show otherwise.

The Transition in this area seems to have happened at *c.*30000 BP in the majority of cases. The internal debate is more focused on the character of the earliest Upper Palaeolithic industries, and whether they can be really called Aurignacian or whether the latter culture was present only minimally, if at all. Traditional views rejecting the idea of the Aurignacian as the opening stage of the southern Iberian Upper Palaeolithic are losing ground at present due to the reports coming up from sites like Bajondillo; however, proper information on level 13 at that site and revisions of Cova Beneito and Pernerias are essential to cast definitive light on this issue. Portuguese Aurignacian claims, when based only on a handful of stone artefacts, should be ignored, as they fail one of the basic rules of the systematics by which the term 'Aurignacian' is defined.

The problematic relation between typological analyses and chronometric dates shown to exist in the Portuguese region is another factor that should also be addressed sooner rather than later, if research in this field is to progress in the future. Once the problems of methods like radiocarbon for this time range are acknowledged, researchers will be properly aware of them and can seek solutions to any faults that may occur. Typology

⁵⁹ The 'inconvenience' is more the interpretation of that material, not the remains themselves: for example, many scholars clearly reject Zilhão and Duarte's views on the Lagar Velho child.

should never be the excuse to question the validity of the dates, for the reasons mentioned in chapter 4.

Unless dates are falsified on statistical grounds or over clear evidence of sampling or chemical composition problems, discarding them just because they do not suit somebody's hypotheses is totally unjustifiable. Several cases mentioned above have shown also the extent to which specific researchers in this area may group different assemblages and then typologically classify sites according to the results of this analysis.

Finally, these regions present a common need for further research, which at present can be seen to be going ahead best in the southern area. New studies should encourage further fieldwork as well as the refinement of analytical techniques, now known to have important flaws (e.g. pollen analyses or microfaunal studies which have failed to register the short spells of climatic improvement during OIS-3). Until these issues are addressed, ideas on the amount of acculturation suffered by each human group, or suggestions about boundaries separating areas occupied by different groups, are mere castles in the air.

7. The Transition to the Upper Palaeolithic in Europe

7.0. Introduction

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7.1.1.1. Mediterranean West

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7.2. Theoretical approaches to the Transition in Europe

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7.3. Conclusions

7.0. Introduction

The previous two chapters have analysed the Mid/Upper Palaeolithic Transition in Iberia by first looking into the so called '40,000 BP Crisis' in the North – focusing not only on the sites that support the abrupt rupture (crisis) hypothesis, but also on those that seem to have been forgotten by scholars building generalising theories. Secondly, in chapter 6, the focus was on the Transitional process as observed in Central and Southern Iberia, highlighting all the difficulties that lack of research and (sometimes technical inaccuracy) have caused in studies of these regions.

The aim of the present chapter is to set the Iberian processes into the European context, so far as time and space allow. The intention is not to drown the evidence studied in chapters 5 and 6 in a sea of careless generalisations but, by looking at the transitional process in the rest of European areas, both regionally and marking specific sites, on the 'practical' side, and by analysing some of the specific theories that have been proposed, to explain how the Transition took place at the continental scale.

The following pages accordingly do not pretend to be an exhaustive and detailed analysis of continental transition evidence, but just an overview based on initial reading that takes into account the particularities and differences of the several regions into which Europe has been divided. The model for dividing Europe followed is that of Gamble (1990), because it constitutes a widely known and used scheme (e.g. Davies 2001, etc.). It is of course ridiculous to attempt any definitive contextual overview on the basis of reading merely a section of such literature as was readily available written mainly in English, and without seeing the actual archaeological

material, but in the context of this thesis the exercise seems both necessary and worthwhile.

A crucial aspect to take into account is that the amount of research has been anything but homogeneous, with the vast majority of studies focussing on Western Europe and many of them on areas of France, since this field's early days. Nevertheless, the author has consulted numerous published sources (including web pages) dealing with information on areas outside France.

To keep Iberia as the centre of attention – and to avoid any similarities with any wave-effect spread of populations – the continental analysis will set off from the Pyrenees north and eastwards.

As previously done in Iberia, the analysis will centre on latest Mousterian, Transitional and Earliest Upper Palaeolithic assemblages, and special attention will be paid to sites in which assemblages are dated.

7.1. The Continental Record

This section is subdivided in three, according to the longitudinal position of the main three zones in which Gamble (1990) split the continent (western, central and eastern Europe). Each of these areas will be dealt with according to the 'provinces' into which these zones are organised. Wherever possible, the environmental conditions of the area are noted, and then a selection of relevant sites are mentioned, together with their stratigraphical sequence for the transitional phenomenon and the assemblages they contained.

7.1.1. Western Europe

7.1.1.1. Mediterranean West

This area comprises most of Iberia (except Cantabria and the northern part of Galicia) and the French Mediterranean coast. Iberia has already been dealt with, but the area is included here to make special reference to two sites in particular.

Firstly, Grotte Tournal, with which l'Arbreda has been compared by Soler, in chapter 5. This cave is located in the Cesse Valley, 1.5 km away from the town of Bize-Minervois in the Aude region. It was discovered and first excavated by P. Tournal in 1826, and then followed many other workers, among which were E. Genson, J.S. Albaille, P. Helena, etc. These researchers did not publish their research and the first substantial published results come from H. de Lumley's study of the Albaille and Helena collections (de Lumley and Issetti 1965).

Its deposits are divided into three main units from top to bottom: I, II and III. The transitional layers occur within in the middle unit (II), whose thickness varies from 0.5 to 2 m, and it is found in all dug sections so far by Tavano (1987b). Inside it, assemblage IIB2/D2 is the uppermost Mousterian, where denticulates are predominant (39.2%), followed by notches (28.3%), made on quartzite (95%) collected from the alluvial deposits left by the Cesse River. The Levallois technique is present (IL = 27%), and according to Tavano (1987a). the main characteristics are technical and typological stability, and the lack of relation with the overlying level, from which is

separated, although sedimentary analyses estimate that the chronological gap was very brief; the Upper Palaeolithic tools amount to 6.8% only.

The earliest Upper Palaeolithic assemblage is called IIC1/E, and has been classified as Archaic Aurignacian, presenting endscrapers, retouched blades, strangulated blades and Dufour bladelets. The raw material used is almost exclusively flint, although the exact quantity is not given (Tavoso 1987b:31). Although radiocarbon dates have been obtained at the site, none of them is relevant to the layers discussed here.

Parallels can be drawn with l'Arbreda in terms of the latest Mousterian/earliest (Archaic) Aurignacian separation, as well as regarding the drastic variation in raw materials procurement; this is probably the main similarity with l'Arbreda, the radical change of raw materials that took place across the Transition, and the presence of Levallois technique in the Mousterian. Mousterian types are similar, yet their percentages are not. Aurignacian types are also comparable, but no specific information about Tournal's percentages is provided, which makes more detailed comparison impossible.

The second site is on the southwestern French coast, more precisely in Bouches-du Rhône, near Marseille: Grotte Cosquer, now partly submerged (Clottes and Courtin 1996). Its impressive paintings are the reason to include this brief reference to it, as they have been radiocarbon dated and the oldest readings are the following (Chauvet *et al.* 1996):

Oval sign	28370±440 BP
Hand stencil n.19	27740±410 BP
Bison n.2	27350±430 BP and 26250±350 BP
Hand stencil (unspecified)	27110±390 BP and 27110±350 BP
Black hand stencil n.12	24840±340 BP
Horse n.5	24730±300 BP

Table 44: A selection of the oldest dates obtained after dating some of the Cosquer paintings directly by radiocarbon.

Both Chauvet (see below) and Cosquer caves are included in this review because of the early dates obtained for their paintings. So far, they are the only examples known, and that type of art (naturalistic, representational [rock paintings]) is one of the characteristics usually linked with the Transition by scholars.

7.1.1.2. South West

This area spreads from northern Iberia (omitting here the Pyrenees section by the Mediterranean Sea, included in the previous section), to the north of the Charente region, and the Rhône Valley in the East.

The already mentioned huge amount of research carried out in the Périgord, and more specifically in the Dordogne region dominates the information for this section and increases the number of sites that can be analysed in relation to the phenomenon of the Transition. Two of these sites, La Ferrassie and Abri Pataud have yielded what are certainly amongst the most complete early Upper Palaeolithic sequences in Europe and they accordingly serve as a reference for the rest of Western European sites of this period. Both of them are in the Vézère Valley (more precisely, La Ferrassie is located in the valley of one of the affluents – nowadays dry - of that river) and their dates for the earliest Aurignacian are almost identical. La Ferrassie also contains Chatelperronian and Mousterian layers, thus yielding a complete transitional sequence. Only some of the levels are dated, though:

La Ferrassie (excavations by Delporte)		Abri Pataud	
Aurignacian I K6	33220±570 BP	Aurignacian I (14)	34250±675 BP
			33300±760 BP
			33300±410 BP
Aurignacian I K7			
Chatelperronian L3			
Chatelperronian M1			
Mousterian (La Ferrassie type) M2			

Table 45: Parallel stratigraphical sequences for the Transition at La Ferrassie and Abri Pataud.

The possible development of the Chatelperronian industries from the Mousterian of Acheulean Tradition type B could be studied through the sequence of the latter site (La Ferrassie level E, Lower Perigordian/Chatelperronian) and other similar ones, yet it has been deemed difficult if not impossible because of generalised erosion episodes that seem to have affected the interstadial period's sediments (Laville *et al.* 1980, Rigaud 1976).

There are two sites which deserve special mention for their proximity to the Cantabrian region, studied in section 5.2., and into which they were not included because they are in the Atlantic zone of the French Pyrenees, on the French side of Euskadi.

Isturitz is a cave system composed by three tunnels, located between the *communes* of Isturitz and San Martin de Arberoura. It was excavated by E. Passemard in 1913-1922, R. and S. de Saint Périer between 1928 and 1959 and by G. Laplace in 1959.

It was originally believed that a Chatelperronian layer was underlying the Aurignacian, although this attribution has never been confirmed, and most researchers prefer to write about a 'Pre-Aurignacian' assemblage; still, a few (e.g. Esparza

Sanjuan 1993) defend its 'clear' Aurignacian character, against all odds and possible criticisms.

In 1959, Laplace identified a Protoaurignacian level, just outside the cave. Esparza (1993) highlights the clear predominance of sidescrapers in all layers. Isturitz contains the standard sequence of the early Upper Palaeolithic in western Europe, according to Gamble (1990): Chatelperronian – Aurignacian – Gravettian.

Gatzarria, a small cave on the Arbailles mountain range, is located in Ossas-Suhare and was excavated by Laplace from 1961 to 1976 (Laplace 1966a). It contains a full transitional sequence, including a Chatelperronian and two Protoaurignacian layers. It was one of the bases for the development of Laplace's industrial evolutionary sequence of leptolithic complexes (Laplace 1966c):

Aurignacian I (cbf)	Archaic Aurignacian with split-base points
Aurignacian 0 (cj1)	Protoaurignacian + carinated endscrapers
Aurignacian 0 (cj2)	Protoaurignacian with backed pieces
Chatelperronian (cj3)	Chatelperronian
Mousterian	

Table 46: Transitional sequence at Gatzarria. On the right, Laplace's cultural attributions.

Another pair of sites must be mentioned, as noted in chapter 5, both located in the Lot region. Roc-de-Combe was discovered by J. Labrot in 1950, and was excavated by himself in 1959 and in collaboration with the University of Bordeaux, where Bordes was based, in 1966.

The stratigraphical sequence of the transitional layers was analysed by Bordes and Labrot in 1967, and it was found that the Mousterian influence on the

Chatelperronian, the latter being deemed not primitive, was very limited, unlike at the sites of Arcy-sur-Cure and La Ferrassie.

Level 7	Aurignacian I
Level 8	Lower Perigordian (Chatelperronian)
Level 9	Aurignacian
Level 10	Lower Perigordian (Chatelperronian)
Level 11	Mousterian

Table 47: Stratigraphy of the Transition at Roc-de-Combe, according to Pelegrin (1995a).

The interstratification of the Aurignacian and Chatelperronian layers was interpreted by the aforementioned authors as the mark of a possible frontier zone, between territories occupied by Neanderthals and those where the AMH were living. Nevertheless, erosional episodes, which had disturbed the stratigraphy of that period, were acknowledged by them (Bordes and Labrot 1967).

A modern critical revision of the stratigraphical problems of Roc-de-Combe has been provided by Rigaud (2000, 2001), in publications that also include the re-analysis of the sequence at the site of Le Piage. The latter is located below a cliff in Fajoles, 7 km from Gourdon.

Work was undertaken there by Champagne and Espitalié in 1958, and continued for nine seasons, during which 80 m² of the 2.40 m deep deposits were excavated, yielding some 4200 tools and many unretouched pieces.

Level F	Aurignacian
Level F1	Lower Perigordian
Level G	Aurignacian
Level H	sterile
Level I	Aurignacian
Level J	Aurignacian
Level K	Aurignacian

Table 48: Aurignacian and Lower Perigordian interstratified levels at Le Piage, according to Champagne and Espitalié (1981).

Contamination episodes at this site were first documented by Demars (1990) and Pelegrin (1995b). Recently, J.G. Bordes has also studied these two sites for his PhD thesis. His taphonomic analyses, which included refitting and technological studies have confirmed the sedimentological problems and postdepositional events, which have caused the present stratigraphical record. Nevertheless, his research has also revealed that there are areas of both these sites which are well preserved and unaffected by the aforementioned redepositional processes, which have yielded remains providing crucial information about the Transition in the Lot region (Bordes 2002).

On one hand, Roc-de-Combe contains the classical sequence of southwestern France: Mousterian-Chatelperronian-Early Aurignacian with split-base points, which is followed by a late Aurignacian with twisted Dufour bladelets and then Gravettian layers.

On the other, Le Piage contains an Aurignacian of a kind unknown until now in the northern Aquitaine basin, but present in the Mediterranean area, just below the early Aurignacian layer. It contains long and straight Dufour bladelets resembling Chatelperronian points, produced on prismatic cores for producing flakes, a technique that resembles Neanderthals' production of Chatelperronian points. Bordes proposes that Chatelperronian Neanderthals might have influenced the very earliest Aurignacian AMH, something that the Indigenists have noted and – of course – applauded (d'Errico *et al.* 1998).

Another important site to mention is the rockshelter of Saint Césaire, excavated by Lévêque between 1976 and 1987; it yielded a full transitional sequence, famous for the association of a Chatelperronian assemblage with Neanderthal remains, also seen in the Grotte du Renne at Arcy-sur-Cure, located in Gamble's North West province. The Neanderthal remains have been dated to some 34000 years ago while TL dates on burnt flints found in the Chatelperronian layer have yielded results of c. 36300 years.

In the region of l'Ardèche, there is the Chauvet cave, where several of the rock paintings were dated to periods even older than those mentioned for Cosquer in the previous section (Chauvet *et al.* 1996):

Right-hand confronted rhino	32410±720 BP and 30790±600 BP
Left-hand confronted rhino	30940±610 BP
Bison	30340±570 BP

Table 49: Dates available for the paintings at Chauvet cave (directly dated by radiocarbon).

This province has also provided two early Upper Palaeolithic burials, those of Combe-Capelle and CroMagnon, yet these are relatively old excavations and the exact chronology could not be determined by absolute methods.

7.1.1.3. North West

This area is adjacent to the north of the South West zone and spans from the Atlantic coast from where the South West region ends, in the Charente, and as far as the south of Denmark. To the east, its border links the mouth of the Elbe River with the source of the Rhône, this crossing the rivers Rhine and Meuse at different latitudes. It includes the British Islands, which were united to the continent at the time.

A key site to mention in this province is clearly that of Arcy-sur-Cure, is a group of several caves (Grottes de l'Hyène, du Renne, du Bisson, des Fées, Trilobite, de l'Ours, du Cheval and Le Loup). The cave complex is near Yonne, by the river Cure, on the Morvan mountain range.

It was first explored towards the end of the 19th century by the Marquis of Vibraye and excavated by the Abbé Parat. Later on, Breuil studied Parat's collection from Trilobite, and Leroi-Gourhan continued Parat's work from 1946 to 1968 at Grotte du Renne, without a doubt the most famous cavity of the group, because of its impressive Chatelperronian assemblages, one of which is associated with Neanderthal remains (as it is also the case at Trilobite), for which absolute dates of c.33300-30400 BP have been obtained (Djindjian *et al.* 1999).

Aurignacian , level VII	31800±1240 BP
Chatelperronian, level VIII	33000±1400 BP
	33500±400 BP
	33860±250 BP
Chatelperronian , level Xb	33820±720 BP

Table 50: Dated Transitional layers at Grotte du Renne.

Amongst other archaeological evidence, the large number of personal ornaments and bone implements has put this site at the centre of the Neanderthals' acculturation debate, and constitutes the basis for the Indigenists' arguments against the idea that Neanderthals would have been acculturated by mentally superior AMH.

Other sites worth mentioning in the area of northern France are Seclin (Revillon 1988) and Rocourt (Otte 1990a), which have yielded Middle Palaeolithic industries (not related to any Transitional sequence) manufactured on blades, thus showing that blade manufacture is not solely a feature of Upper Palaeolithic industries, as discussed

in chapter 3 (Bar-Yosef and Kuhn 1999). Otte (1990a, 1990b) has proposed the existence of a Mousterian regional facies based on this distinctive trait.

In England, the early Upper Palaeolithic site of Kent's Cavern yielded an assemblage with foliate points, apparently unrelated to those of central/southeastern Europe (Gamble 1990). A number of other British sites have yielded similar pieces. In the Gower Peninsula, Wales, an Aurignacian II assemblage dating to the Arcy interstadial was unearthed at Paviland cave, famous for a Gravettian burial (Aldhouse-Green 2000). The Aurignacian assemblage is dated to 29600 ± 1900 BP and 28000 ± 1700 BP. England's youngest Early Upper Palaeolithic settlements appear to be at c.27000 bp (Gamble 1990).

7.1.2. Central Europe

In this section, there are only two provinces, as there is no evidence that can be studied for this period from the Alpine region, which it is believed not to have been occupied during the earliest Upper Palaeolithic (Gamble 1990).

7.1.2.1. Mediterranean Central

The equivalent of the Chatelperronian of western areas – in terms of 'transitional industries – in Italy is called Uluzzian, after the Uluzzo Bay in southern Italy, where this industry was first identified.

According to Milliken (2001), two clusters can be differentiated for this type of industries, characterised by a type of knife in the shape of a crescent or lunate and by splintered pieces: first of all, in the southern regions of Puglia, Calabria and Campania

where there are the sites of Grotta-riparo Uluzzo, Grotta del Cavallo, and Grotta de Castelcivita and Grotta de la Cala, among others. Secondly, another cluster has been identified in the Toscana region, including the sites like Grotta la Fabbrica, San Romano (an open air site in the Arno Valley), etc. the Uluzzian is virtually unknown outside these two areas. Apart from the crescent-like knives, these assemblages usually contain a good number of endscrapers (predominant according to Gamble (1990)) and denticulates, and unlike other transitional industries, the Uluzzian is not manufactured on blades, although these may be present. The cores are uni/bi-directional or discoidal, and the bone industry, which is rather poor, is only present at La Fabbrica and El Cavallo, which also contains perforated shells.

The authorship of the Uluzzian is a rather controversial issue, but it is generally attributed to the Neanderthal groups; at Grotta del Cavallo two teeth were found, but they have not been attributed to either Neanderthals or AMH with any certainty. Matters are complicated further because only there are six dates for the three Uluzzian sites: Castelcivita, Grotta del Cavallo and Grotta de la Calla, and there are suspicions that the only site containing remains in primary position is that of Grotta La Fabbrica (Milliken 2001). This information is simply insufficient to test hypotheses on possible Neanderthal acculturation processes, proposed after the contemporaneity (and even longer existence) of the southern Uluzzian with respect to the earliest Aurignacian.

The Castelcivita cave, near the village of Cortone in the region of Campania, is a 4 km cavity on the lower part of the Alburni Hill, known since 1920. According to Gambassini (1997), the Palaeolithic occupations took place just in front of the cave rather than inside it. That researcher excavated the 3.40 m of deposits from 1975 to

1988. The transitional sequence is provided below; it constitutes the cultural sequence model for southern Tyrrhenian Italy.

Aurignacian, level 9	32930±720 BP
Uluzzian, levels 10-11	32470±650 BP

Table 51: Transitional layers at Grotta de Castelcivita.

The earliest Aurignacian assemblages in Italy are to be found in sites on the northern region of the Peninsula. Here, two of the most important sites are described. Grotta Fumane is a cave 350 m above sea level in the valley of Fumane, in the Lessini Hills, up in the Alps of the region of Venice. This mountainous location is not surprising, and one should take into account that it is during this period that the first sites on the Appenine mountain appear. Gamble (1990) believes that they belonged to human groups which generally resided in the south, which were following deer herds.

Grotta Fumane was discovered in 1964 by G. Solinas and first explored by F. Mezzena. A. Broglio has worked there since 1988. Bartolomei *et al.* (1993) published its stratigraphy, the transitional section of which follows:

Aurignacian A2 (0/I)	32100±500 BP
	36500±600 BP
	32800±400 BP
Aurignacian A3 (0/I)	
(unspecified early Upper Palaeolithic) A4	
Mousterian A5-A13	

Table 52: Transitional sequence at Grotta Fumane, with dates available.

One of the rockshelters in the cave complex previously known as Grimaldi caves, presently called Balzi Rossi, in Liguria, is that of Riparo Mochi. From 1938 to 1962, several caves were excavated by A. Blanc and L. Cardini, although there had been previous works, beginning during the late 19th century, and further excavation works are still on going.

According to Djindjian *et al.* (1999), A. Segre (unknown reference) published Mochi's stratigraphic sequence, which they reproduce, and the transitional part looks as follows:

Level F	Aurignacian I
Level G	Mediterranean Aurignacian 0
Mousterian levels	

Table 53: Transitional sequence at Riparo Mochi.

The earliest Upper Palaeolithic level's attribution has been a cause for argument between several researchers: Blanc (1953) called it Lower Perigordian, but changed it after de Sonneville-Bordes published her 1960 book, and called it early Aurignacian; Laplace (1977) believed that it was actually a Protoaurignacian with marginally retouched bladelets. It contains carved fragments of ground and polished implements on bone and antler, but their state is too poor to allow a proper typological identification. It also contains perforated shells.

Moreover, level G is very similar to Fumane's A2. Both assemblages are dominated by small bladelets which would have formed part of composite tools (Djindjian *et al.* 1999); these are followed by sidescrapers and notches and denticulates which are far more common than blades (a characteristic of Italian assemblages in general).

Aurignacian and Mousterian assemblages in this region have some important differences among which the following can be highlighted: Mousterian assemblages are produced by means of discoidal/centripetal techniques, while the Aurignacian ones are made on simple uni/bi-directional cores of fine grained flints, which are

absent during the Middle Palaeolithic, when the most used raw materials are quartzite and silicified limestone.

The absence of naturalistic art is a striking difference between this region and that of Central Northern Europe, which follows below.

7.1.2.2. North Central

One geographical trait that characterises this zone and the Northern East part is the existence of large mountain ranges extending in an E-W direction dividing the landscape in two separate areas: in the north there are the plains in the lowlands of northeastern Europe and in the south, the Danube River basin. According to Weniger and Orschiedt (2000), episodes of population expansion and retreat take place across these zones, on a N-S axis according to climate changes.

Intrinsically, the Northern Central Province extends from the eastern border of the North Western area to the Vistula River in present day Poland. In the south it borders with the Alpine and the South East provinces, along much of the Danube River, which together with the northern edge of the Carpathian mountain range, is included in this Province.

The industries of this region during the Transition to the Upper Palaeolithic can be divided into two groups: one would group the foliate points traditions, thought to have developed from the local Middle Palaeolithic as perhaps in particular its Micoquian substrate, present at sites like Jankovich (NC Hungary) and Szeleta (northeastern Hungary) from which the names Jankovician and Szeletian have developed (Allsworth-Jones 1986, 1990). Valoch (1957) defined these as Middle Palaeolithic

flake industries on flint where Middle Palaeolithic types, such as sidescrapers predominate, although there are also Aurignacian endscrapers (both carinated and nosed) and a few bone points. Szeletian industries are at least broadly similar to the Bohunician assemblages in TransDanubian sites in Hungary and river valleys in Moravia and the Czech Republic, and are contemporaneous with the Aurignacian industries of sites like Istállöskö (see below). The Bohunician, Middle Palaeolithic assemblages from Moravia, are characterised by endscrapers, sidescrapers and some bifacial foliates (Valoch 1967). The leaf point industries are a vast and complex topic (see Allsworth-Jones 1986, 1990, etc.) and no attempt to address it properly can be made here.

The second group would bracket together the Aurignacian industries, generally small assemblages, characterised by endscrapers on blades and thick flakes, and blades displaying a flat continuous retouch. The sites containing the biggest assemblages are Breirenbach (open air site in E Germany), Vogelherd (on the Danube shore of W Germany), Geißenklösterle (near to Vogelherd) and the open site in the loess of Krems Hundsteig (on the Danube basin in northern Austria), some of which are described below.

According to Gamble (1990), bone artefacts are present in assemblages from caves but not in the open air sites. He has also observed that in Moravia and the Czech Republic the Aurignacian sites form a ring in the high limestone plateaux around the valleys of the Váh and Nitra rivers, while the Szeletian assemblages tend to occur at in the sites along the valleys of these rivers. The most northern sites are those of Lommersum and Breirenbach, two open air sites in Germany.

The site of Szeleta in the Bukk Mountains by the Szinva River near Miskolc and Borsod, in northeastern Hungary, was excavated since 1906 by O. Kadic and from 1966 by L. Vértés. The basal Szeletian layer overlies the uppermost Middle Palaeolithic, which had very few artefacts. The Szeletian is considered to be the earliest Upper Palaeolithic layer, and it includes laurel leaves and points as well as sidescrapers; it is dated to 43000±1100 BP, though the reliability of this reading seems rather uncertain.

East of Brno, Moravia (Czech Republic), there are the rockshelters of Stranska Skala, embedded in a calcareous cliff with many cavities, excavated by K. Valoch and J. Svoboda. Two of them are highlighted here: IIIa and IIIb, because of their transitional sequences, which include Bohunician and Aurignacian layers that have been dated (Svoboda 1993).

	Stranska Skala IIIa	Stranska Skala IIIb
Bohunician 4	41300±3100 BP	
Bohunician 5	38200±1100 BP	38500+1400/-1200 BP

Table 54: Dates for the Transitional industries at the sites of Stranska Skala IIIa and IIIb.

Willendorf II is a site with assemblages buried in loess deposits in northeastern Austria, by the Danube River. Discovered by H. Brun in 1889, it was excavated by J. Szombathy, J. Bayer (1913, 1926-1927), H. Obermaier, F. Felgenhauer and M. Otte and J. Haesarts in various campaigns from 1908 to the early 1980s. Its stratigraphical sequence is considered to be exceptional (Djindjian *et al.* 1999), and the transitional segment is the following:

Level 3	Aurignacian 0	34100+1200/-1000 BP
Level 2	(unspecified early Upper P.)	41700±3100 BP
Level 1	(unspecified early Upper P.)	30530±250 BP

Table 55: Transitional layers at Willendorf II. The dates obtained are quite problematic.

Geißenklösterle (Blauberen-Weiler, Bade-Württemberg) was discovered in 1957 and was excavated by J. Hahn from 1975 to 1983. It is only 60 m away from the Danube River, and its stratigraphy includes Aurignacian, Gravettian and Magdalenian layers. The earliest Aurignacian (Aurignacian 0) is characterised by carinated tools and thought to have been deposited during interstadial conditions (Djindjian *et al.* 1999); it yielded an anthropomorphic figurine. Several dates are available:

Aurignacian 0	IIIa	40200±1600 BP
		33500±640 BP
		33100±680 BP
		37800±1050 BP

Table 56: Dates for the earliest Aurignacian at Geißenklösterle.

Very close to that site is Vogelherd, in the same valley of the Swabian Jura; discovered and fully excavated by Rick in 1931. There seem to be problems with the dates obtained for it. The earliest Aurignacian is rich in bone industry (split base points) and is famous for its ivory figurines. Its lithic industry includes burins, blades and carinated pieces (Bahn 2001). The transitional sequence only includes two levels:

Level V	Aurignacian	27110±280 BP
		30650±560 BP
Level VII	Micoquian (very poor)	

Table 57: Transitional sequence at Vogelherd, with dates available.

Conard and Bolus (2003) stress that the Transition in this area represents an abrupt and clear break with the Middle Palaeolithic with which the earliest Aurignacian has no relation whatsoever.

Istállóskö is one of the oldest Aurignacian occupations in the area. This site is located in Szilvarad (northeastern Hungary) in the Bukk Mountains, and was excavated by J.

Hildebrand, between 1912 and 1925 and by Vértés from 1947 to 1951. It has two Aurignacian levels the dates of which are in the table below:

Aurignacian, level 2	31140±600 BP
	30900±600 BP
	29120±312 BP
Aurignacian, level 1	44300±190 BP
	39700±900 BP
	31540±600 BP

Table 58: Dates for Istállöskő's Aurignacian levels. The oldest dates are considered to be 'problematic' by Djindjian *et al.* (1999).

7.1.3. Eastern Europe

Information seems to be extremely scarce for both the Mediterranean and the North Eastern regions, an aspect which is stressed when comparing them to the South Eastern Province, which includes famous sites like Bacho Kiro, Temnata, etc.) famous for having the earliest Upper Palaeolithic dates of the whole continent.

7.1.3.1. Mediterranean East

This region is integrated by the Greek Peninsula, and islands, and the Dalmatian coastal fringe along the Adriatic strip. To the north and the west, the Carpathians and the Dinaric Alps separate it from the South Eastern Province.

Unlike the other two Mediterranean regions, little is known about the transition in this area. Although there are Middle and Upper Palaeolithic sites (e.g. Francthi cave), dates are often controversial and their relation with the transitional process is unknown. Raposo and Cardoso stress that this area becomes unoccupied during the earliest Upper Palaeolithic (Raposo and Cardoso 1998, Raposo 2000).

It is important to bear in mind that a great deal of the Palaeolithic coastal plains by the Adriatic sea are currently underwater, which could account for the loss of some sites in the northern side of this region.

7.1.3.2. South East

This Province borders with the Mediterranean East to the south and the North Central and Eastern to the north. Gamble (1990) locates the dividing line between the latter and this area between the Prutt and the Dniester rivers, the former's course being crossed by this imaginary frontier around central Moldova.

This region's sites, like Bacho Kiro and Temnata, are at the centre of many writings about the origins of the Aurignacian and the earliest Upper Palaeolithic. These are issues that will be discussed in the second part of this chapter, and thus will be omitted here.

The amount of attention that this region has received, certainly as regards overviews, cannot be compared to that paid to the South Western region, but it must be remembered that works have taken place since Garrod's excavations in the 1930s or even before.

Clearly, a major site in the debates about the Transition and the roles of the human species involved is that of Vindija, near Zagreb in northwestern Croatia. This site, excavated by Karavanic and Smith (Karavanic 2000, Karavanic and Smith 2000, Smith *et al.* 1999), has been dismissed by many because of the evidence of cryoturbation phenomena partially affecting the transitional layers. The researchers

working at the site acknowledge the existence of these problems, but clarify that the area from which the dates have been taken, where they have made their findings, is not affected. The transitional sequence at this site involves a very late Mousterian, with Neanderthal remains dated to 29080 ± 400 BP, 28020 ± 360 BP and 33000 ± 400 BP, and the earliest Aurignacian was manufactured sometime during the mid Pleniglacial.

The late Mousterian dates for the Neanderthal remains are highly relevant in relation with those obtained at Velika Pečina for AMH remains (33850 ± 520 BP), as on one hand they reject the idea that the Peninsular areas like Iberia and Crimea were the sole *refugia* for Neanderthals and on the other they confirm the temporal overlap and coexistence of both species in eastern Europe, certainly likely to be a place of constant population movement if the origins of the Upper Palaeolithic industries and human species are to be found to the east of this region.

Bacho Kiro, in the valley of the Drianovska Reka, near Drianovo (CW Bulgaria) in the Balkan Mountains was excavated by Garrod in the 1930s and in the 1970s by J. K. Kozłowski and B. Ginter (Kozłowski 1982). Its stratigraphic sequence reveals levels from the Middle to the Upper Palaeolithic, along 3 m of sediments. These two periods are separated by a hiatus, which would sever all the connections between the two phases, and more directly between the latest Mousterian and the earliest Upper Palaeolithic industry, called Bachokirian, which is dated to the Würm II, interstadial of Heraklista, above 43000 BP. The earliest Aurignacian (level 11a), classified as Aurignacian 0, has been dated to 33750 ± 850 BP.

Further details about these industries are provided in section 7.2.1., where they are used to illustrate arguments and hypotheses proposed to explain the processes studied here.

Temnata cave, near Karlukovo in the valley of Iskar (southern Bulgaria) was also excavated by Garrod before the II World War and from 1984 to 1994 by Kozłowski, Laville and Sirakov (Kozłowski *et al.* 1994).

In this case, layer VI (TD-II) yielded an (undetermined) transitional industry, with a high Levallois technique index and indicating a transformation towards laminar techniques and Upper Palaeolithic tools that has nevertheless been denied any connection with the Upper Palaeolithic industries deposited above. A late Middle Palaeolithic industry was excavated just outside the cave. It contained bifacial foliates, but dates are not provided for this assemblage (Djindjian *et al.* 1999).

Dates for the Upper Palaeolithic are problematic, as by TL the readings are *c.*45000, but by ¹⁴C AMS they only reach *c.*39-36000 BP.

7.1.3.3. North East

According to Gamble (1990), the oldest early Upper Palaeolithic industries of this region are in Moldova V, the layer above them was dated to *c.* 28-29000 bp, Kostenki XVII, dated to 32200 bp and Kostenki XII (Ia), dated to 32700 bp, although the latest is above Kostenki XVII and therefore, dates might be erroneous.

Information is scarce, but one of the stations of Kostenki-Borchevo near Voronej (Russia) seems to provide the transitional sequence. Kostenki is a group of open air sites on the right bank of the Don River, excavated since 1868 by S.G. Gemelin, etc. and from 1917 onwards by the Institute of St. Petersburg. A volcanic layer which is present at several of the sites allows their correlation (Bahn 2001).

At Kostenki I (Poliakov) the stratigraphical sequence of the Transition follows the pattern shown below:

Aurignacian	III	32600±400 BP
		32600±1100 BP
(unspecified industry, poor)	IV	
Streletzian (transitional industry)	V	32300±220 BP
		34900±350 BP

Table 59: The Transition at Konstenki I, with available dates.

It perhaps needs still to be established how closely 'Aurignacian' as diagnosed here would correspond to Aurignacian as recognised further West, or to what particular version of the central or west European industry.

7.2. Theoretical approaches to the Transition in Europe

Having looked at the European scenario for the Transition in the previous section, it seems appropriate rest to summarise how researchers have chosen to interpret the data obtained from that record.

This thesis has examined only one theoretical approach (which will not be included in this section), and its applicability to the record according to the information available about the Iberian transitional sites. It is beyond the scope of this work to test the extent to which it might apply to any of the sites mentioned in this chapter, as the information gathered about them is too general to allow such analysis.

The aim of this section is to present the other main alternatives, according to which the data like those in 7.1. has been analysed and interpreted. Each of the two broad perspectives in which this section has been organised groups various interpretations by individual scholars who – for particular reasons of their own – think that is the way to reach an understanding of the Transition and not the other. For reasons of space, only the most representative are referred to in here, and in quite general terms.

Looking at the possible ways in which the Transition can be interpreted, it is easy to see that Archaeology and Palaeoanthropology walk hand in hand and are inextricable at the theoretical level: those who support the ‘Out of Africa’ hypothesis believe that AMH and the Aurignacian industries spread all over Europe through migratory processes of some kind, and Neanderthals died out somehow (thus there was a rupture); the supporters of the Multiregional hypothesis do not believe in those migrations and advocate for a progressive change from Neanderthals and Mousterian into AMH and Aurignacian. According to them, there would not be a rupture, but an evolutionary process.

7.2.1. Population Dispersal

In this section, six different perspectives will be mentioned; all of them have in common the fact that their authors believe the Aurignacian to be a foreign industry, which somehow spread into Europe, thus causing the Transition, and giving it the characteristics of a crisis or rupture, which was more or less abrupt depending on the area and the time frame between the last Mousterian industries’ dates and the earliest ones for the basal Aurignacian.

The first model to explore is that originally presented by Raposo and Cardoso (1998, Raposo 2000), and illustrated by figure 1. These authors divide the transition into three stages:

1. 40000 years ago (or before): The Aurignacian industries only occupy a narrow horizontal strip as a front, originating in the east (Bacho Kiro 11), running along the Danube Valley (Istállöskö level 9, Willendorf II, Geißenklösterle IIIa) and the Alpine arch (Fumane) spreading to reach Catalunya (l'Arbreda) and Cantabria (El Castillo 18c). Outside this front, there were only foliate points industries, which had developed from the local Mousterian substrate, before the Aurignacian appeared.
2. 35000 years ago: Transitional industries are abundant, especially around the margins of the previous Aurignacian front. Acculturation phenomena would explain their sudden and synchronic appearance. In Italy and the Balkans, industries of this type are called by these authors 'Mousterio-Aurignacian' industries. Iberia witnesses a persistence of the Mousterian.
3. 30000 years ago: The Upper Palaeolithic industries (Aurignacian) spread all over Europe, and Transitional industries disappear. The scenario in the peninsulæ is the following: Italy and the Balkans become deserted and in Iberia the Mousterian persists until 27000 years ago.

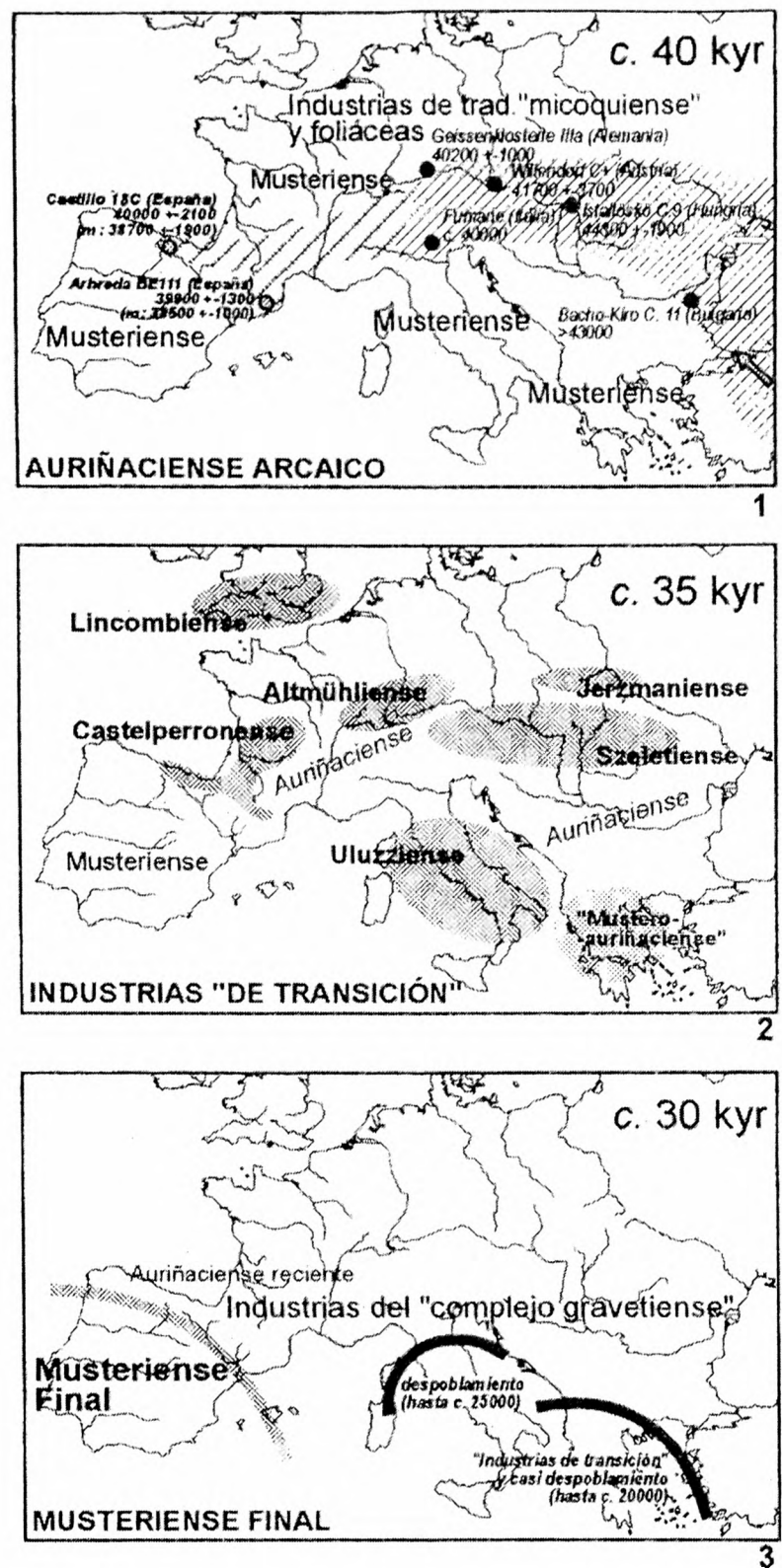


Figure 60: The transitional process according to Raposo (2000).

The presence of Aurignacian in the Danube Valley, during the first phase of this model has been further worked on by Conard (e.g. 2002, Conard and Bolus 2003), who believes that the remains of AMH found at Vogelherd are a proof of the process of introduction of the Aurignacian into Europe, the character of which was rather fast; other sites documenting it are those located in Austria, Bavaria and the Swabian region. This has been called the 'Danube Corridor Hypothesis', and establishes this

river as a main route for migratory processes as well as for transport of raw materials, etc.

Bocquet-Appel and Demars (2000) produced another – more detailed – model, after statistically working with a collection of absolute dates for the last Mousterian industries and the earliest Aurignacian found around the European continent.

1. Before 40000 BP: Neanderthals are present everywhere and AMH are absent.
2. From 40000 to 37500 BP: Neanderthals are absent from Britain, an East European band of some 500 to 600 km in width, northern Italy and along the coast of north western Spain, while AMH are present south of the Carpathian Mountain and in one point above the Danube, after coming into Europe through the great Northern Plain area. During the initial phases of the colonisation, there is coexistence in the northernmost and the southernmost areas of Europe.
3. From 37500 to 35000 BP: The extinction process of Neanderthals is accelerated during this phase, and they become absent from a vast zone of W Europe. In Iberia their occupation becomes reduced to the Atlantic zone. AMH are largely present in east Europe (from 13° to 24° E) and also 51° to 41° N and 5° to 3° W.
4. From 35000 to 32500 BP: Neanderthals are only present in the lower half of France, where they coexist with AMH (this continues until 27500 BP), reaching the Pyrenees in the west and a third of the Atlantic Western area of Iberia. The expansion of AMH accelerates during this period, and can be divided into two sub-phases: from 35000 to 33750 BP, when they reach the western part of the continent, where their expansion is slow, once their

presence is documented on both sides of the Alps, and from 33750 to 32500 BP, when all the colonised areas are connected with one another.

5. From 32500 to 30000 BP: Neanderthal presence is strongly contracted and AMH are only absent from southwestern Iberia. In that region there is coexistence once AMH arrive, until 27000 BP.
6. From 30000 to 27500 BP: Neanderthals disappear completely and AMH colonise all of Europe.

This model is complemented with a couple of mentions about climate change, and it puts the origins of the Aurignacian tentatively in the Middle East, though noting that at present that dates there are younger than those in Europe.

Kozłowski's Multi-Aspectual approach, analyses different parameters: technology, typology, bone implements, subsistence patterns, raw materials' economy, dwelling structures, art and symbolism and settlement patterns, concluding that different innovations appear at different times, and that two opposed adaptation strategies took place (Kozłowski 1990):

1. From a Mousterian base: development of the industries with leaf points which will be the base for the Gravettian.
2. The Aurignacian: it is entirely distinct from the first one and probably intrusive.

Regarding the second point, Kozłowski and Otte (2000a, 2000b) have traced the origins of the Aurignacian to the Zagros Mountains, and the Baradostian, an early Upper Palaeolithic industry which is rich on flakes and in blades and bladelets, apparently related to the Mousterian of the zone, believed to be present from 40000 to 21000 BP. There are no signs of rupture between these two industries, favouring the

hypothesis that the Aurignacian possibly originated from the Baradostian, as there is no sign of a rupture between different types of industries.

Davies (1999, 2001) has proposed that the Aurignacian spread around Europe could have taken place by means of two types of groups, and as a two-phase phenomenon, the basis of which is to be found in typological variation. A comparison of the two different groups follows:

PIONEER	DEVELOPED
Simple/small assemblages (n<700), without many tool-types	Complex/larger assemblages (n≥300), with a wider variety of activities apparent
Aurignacian 0 or I	Aurignacian I to IV
Scattered occupations, mainly river valleys	Denser site distribution related to worsening climatic conditions
Little effect on Neanderthal groups	Disrupt Neanderthal activities, driving them into extinction
Local raw materials	Exotic materials increase in quantities
Limited evidence of residentiality	Residentiality more apparent
Little/no symbolic activity apparent	Frequent evidence of symbolic activity

Table 60: Characteristics of Pioneer and Developed groups' assemblages (Davies 1999).

Davies acknowledges that it is difficult to assign certain assemblages (if not most of them) into one of the two groups, quoting as examples Fumane and Istállöskö. The author of this thesis suspects that more difficulties may lie in the overlaps between the characteristics of the two first traits and in the fact that Davies has used as other examples El Pendo (as a Pioneer between 45000 and 37000 BP) and Roc-de-Combe and Le Piage (as Developed between 37000 and 27000 BP). Many assumptions underlie this model (Aurignacian equates with AMH, the short chronology (c.36500 to 27000 BP) is untenable, etc.), and they should be kept in mind when considering its validity .

There are also researchers who have opted to integrate different processes into their own explanations. A clear example of this type of interpretations is that of M. Otte (e.g. 1990a, 1990b); his belief appears to be that the Aurignacian is a homogeneous behavioural assemblage constructed outside Europe (Kozłowski and Otte 2000a, b), which spread into the Continent and all throughout Europe by diffusion. The Chatelperronian would be the product of Neanderthals who had been acculturated by AMH manufacturing Aurignacian industries. Yet, foliate industries in Northern Europe would progress to a stage where they were technologically Upper Palaeolithic (with blade tools) but without bone tools; he sees these industries as a completely autonomous development which would have taken place before the arrival of the Aurignacian in the zone.

7.2.2. Multiregional Evolution

At the level of lithic assemblages, links between the Mousterian and the Aurignacian industries have been claimed on the basis of perceived similarity between La Quina and Aurignacian retouch, and typologically, the resemblances between both industries' carinated endscrapers and *limaces*; but the Multiregional hypothesis has many other implications.

According to this hypothesis, Neanderthals evolved into AMH wherever they were living in Europe and, as mentioned above, Mousterian industries evolved into Aurignacian. This is the reconstruction advocated by teams like those referred to when studying the Cantabrian sites, and by several American scholars.

Straus (1995) believes that the Upper Palaeolithic characteristics gradually developed over 30000 years, and that the major changes took place at c.20000 BP, not at 40000

as advocated by the former perspective. The author of this thesis thinks that any biological changes that may have occurred at around 40000 BP would have had a 'magnet effect' and, with time, all the changes implied by the list of tenets, were grouped around the all-important species' changes.

Straus considers that gene flow came into Europe as glacial barriers melted during the Würm interstadial, but Clark (1994a) has argued against heavy reliance on the concept of migration; he sees it as an idea derived from History, and thus inapplicable when doing Palaeolithic research.

Authors (e.g. Clark and Lindly 1989a, etc.) who do not believe in the explanations which present the Transition as a break tend to highlight the fact that the generalisations created by supporters of the crisis scenario mask a great amount of variability, showing any similarities between the Middle and Upper Palaeolithic periods. Typological systematics and the differences between typologies are blamed in part for the chaos they create when two or more are used to study different periods' assemblages which are subsequently compared; the 'pattern searching' attitude of most of the crisis interpretation supporters and their lack of concern for crucial epistemological concepts is also criticised. These issues were already dealt with in greater detail in chapter 2. The most extreme variant of this approach is the one that denies that a Transition – as defined by Mellars and others (see chapter 2) – ever existed (Clark 1997a).

7.3. Conclusions

This chapter has addressed in a somewhat preliminary (and therefore inevitably superficial) way the task of describing the continental context to the Transition to the Upper Palaeolithic in Iberia. It has attempted to avoid, as far as possible, the frequent generalisations that so often mask the multivariate character of the process of the Transition, when approached as something that affected a vast area.

In the first part, major transitional sites in Europe were noted within the major areas into which the continent has been divided. This unveiled an enormous and complex scenario, especially when it comes to the so called Transitional industries. In Iberia, only the role of the Chatelperronian and its possible implications were discussed, when it was present in a site or its appearance had been denied despite possible details indicating its presence; in Europe as a whole, the Transitional industries are of many different kinds and with quite different characteristics, which should prevent researchers from putting them into one single bag.

Perhaps the chief lesson to learn is precisely this complexity of the situation. Every area of Europe really needs to be studied in at least as detailed a fashion as has been attempted for Iberia in this thesis and considering no generalising theory; moreover, many other elements (faunal assemblages, regional settlement patterns, seasonality, etc.) need to be taken into account. Only after that can comparisons perhaps be made and patterns discerned; this is specially true with issues like that of acculturation (whatever this concept really means to each of the scholars who have recently used it). It is not really the case that meanwhile we are all guessing, and doing so in the ways each of us favours when we confront the great outstanding problems of the

Palaeolithic period? At present, speaking of the Transition as a pan-European phenomenon is completely unwarranted.

In the second part of the chapter the focus has been in the variety of ways in which scholars have opted to interpret the transitional phenomenon, and how those possibilities are deeply related to the Palaeoanthropological questions that still need resolving.

Although the review of these questions, both practical and theoretical, has had to be relatively general, for the sake of the limited space available here, the chapter that now ends has aimed to stress the immense complexity and plurality of this field of research. These are two characteristics that the generalisations criticised in this work often manage to hide, but their crucial role and importance means that they can never be buried very deep, and they always and ultimately manage to come out, and remind scholars that they need to be carefully considered.

In the next chapter, the general conclusions of this thesis will be outlined, together with the future research avenues that this work has been able to uncover, both in terms of the study of the actual transitional phenomenon, as well as regarding the ways in which this has been investigated and how it should be approached in the future.

8. Conclusions

8.0. Introduction

8.1. Summary of concluding observations

8.2. Final remarks

8.0. Introduction

In this chapter I wish briefly to synthesise what the main findings of each section have been. Although each of the chapters has its own conclusions section, I think it is important to include the following summary, which will show how all the parts relate to one another.

8.1. Summary of concluding observations

In chapter 2, I included a global analysis of how the debate on the Transition has developed from 1973 until 2001 at the published level, mainly in Western Europe and the United States. The study of the Transition in Iberia was then approached taking into account the historic precedents and the foreign influences from which it has borrowed many concepts and upon which it has evolved and progressed to its present state.

Probably, the most important point regarding the way in which research for this thesis was carried out is that I had to develop a methodology not only to analyse the components of the collections I worked with, but also to test whether the generalised notions of the Transition as a pan-European phenomenon were applicable to the Iberian record. Despite the large amount of literature that exists for some of the sites, as reviewed in chapter 2, this had never done before in that region, and my research showed that in fact, many of the classic tenets, relating to the Transition generally, lacked a clear definition, by which all researchers could apply the terms, or discard them, depending on the sites concerned and what they have yielded.

I also aimed to include an overview of the theoretical aspects that are intrinsically related to this field of research, by addressing several subjects such as the origin of the terminology as used by specific scholars who set the path for the rest of researchers, as well as the systematics of typologies most frequently used in Palaeolithic research in Iberia. Sadly, the lack of concern with epistemological matters which chapter 4 portrays (which I have tried to avoid in my research) is all too clearly visible in many of the studies that I worked on for chapters 5 and 6.

The study of northern Iberian sites with a transitional record shows that the generalisations proclaimed to depict the Transition in Europe are not applicable to that area. It emerges that we cannot properly refer to a '40,000 BP Crisis', since the transitional traits are very much mosaic-like and vary from site to site and between different regions. Moreover, research is far from having reached a level that might allow us to make this type of claim; thus, its present state invalidates assertions with such wide-ranging implications.

There is much less information about southern Iberia than for the northern area, possibly caused by the smaller amount of research carried out in the south, and that prevented me from being able to test the tenets against that part of the record. Chapter 6 clearly shows the lack of interest (and, sadly, knowledge in some cases) in theoretical and methodological matters, which need to be urgently addressed if progress is to be made in the future. The concept of the Ebro Line was also revisited, and it was found to be lacking any solid basis as well as any actual support in the archaeological/environmental record.

Chapter 7's main aim was to stress (in and admittedly superficial survey) the great complexity of the transitional process as a continental event. The plurality displayed by the record is so immense, we cannot speak of one Transitional phenomenon, either chronologically or culturally. This truth has for too long been hidden by broad statements and careless reconstructions that have masked crucial details; it has been perceived by very few, who have been ignored by the vast majority. In order to progress, thorough revisions must be carried out at the micro (site) and middle (regional) level, before we can venture to speak about Europe as a whole, if indeed that proves to be appropriate when that task has been completed. Moreover, it is not enough to recognise the problem and revise previous studies: the complexity of the matter needs to be fully and adequately understood.

8.2. Final remarks

Looking back on this thesis, I feel very different from when I set out to study the Transition from the Middle to the Upper Palaeolithic for the first time, a couple of years before I began to work for the actual doctoral degree.

I count that I have written many times – for more than I had hoped would be the case – that there is not enough information on some of the aspects I had planned to look at, or that research has not been done in one issue or the other. This only emphasises more strongly, even more than I can do with this chapter, how much is still to be done in this field. The work of the past four years seems a very tiny grain of sand, but I think that even the biggest beaches are ultimately formed by this kind of unit, so I am satisfied that it is a start, and that I have done my best to further our knowledge on the Transition.

This thesis was in essence about the Transition in Iberia. My own view is that something did actually happen, but it is far from homogeneous and cannot be categorised as a specific type of process of change. The Iberian Peninsula can indeed be divided into parts, but only on the criteria of the amount of research that has been carried out in specific areas. Daringly, I would say that the most uniform part, according to how the archaeological record appears at the moment, is the southern half, where a break between the Middle and Upper Palaeolithic periods seems clear, yet that is an area in urgent need of study; on the other side of this imaginary 'research-bias boundary', at the moment we cannot speak of a clear single process. Some of the best sites are those of Abric Romaní and Reclau Viver, but even there the picture is far from clear.

I believe it is very important to emphasise one thing, which all archaeologists should always bear in mind: our account of any major event, in this case the Mid/Upper Palaeolithic Transition, will always be the product of a very complex mixture of factors which will develop in the following way: during the framework of time during which the Transition is thought to have taken place, several events occurred (i.e. something DID happen). By certain means, traces of those events became embedded in what we call the archaeological record. Those material remains then underwent several processes that modified them, some of which we are able to identify, while some others we simply may not be able to see by using the techniques so far available to us. Then, out of those altered vestiges of the original events, we have only found a portion, and there is no way to know if there is more to be found, or how much is still waiting to be discovered. When findings do take place, biases of the finders inevitably

tend to select a part of the whole since inherited research traditions, personal interests and specific methodologies will all come into play. Only then do we come up with what we think originally took place. Mousterians, Aurignacians, toolkits, acculturation processes, climatic factors, hybrids, landscape models, bottleneck episodes etc. all come into being only after the research has gone through and been shaped by, such a complex process. In order to have a clear idea of what we are talking about, and possibly even to establish what ultimately did happen, we need to acknowledge that this process takes place and we need clearly to understand how and why it happens like it does.

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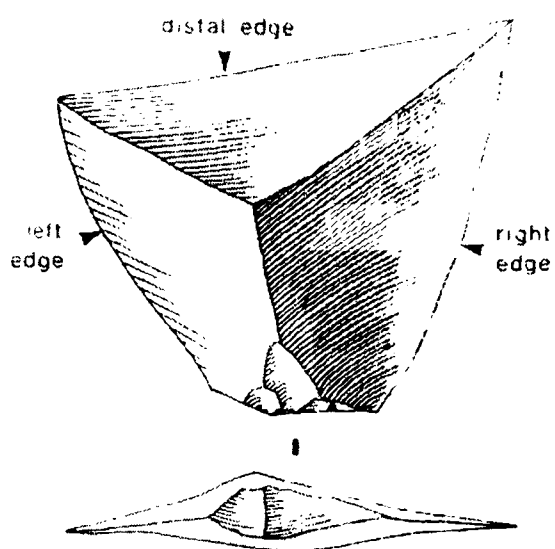
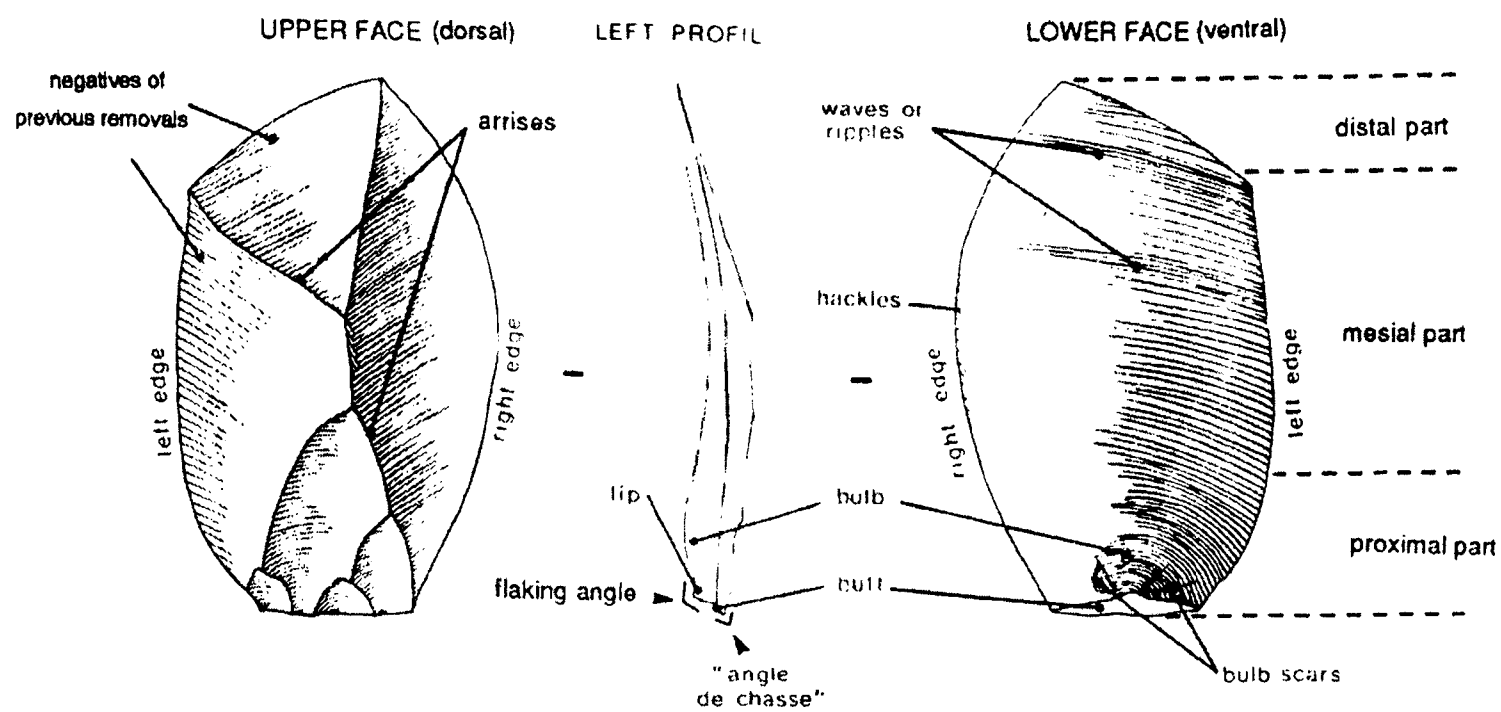
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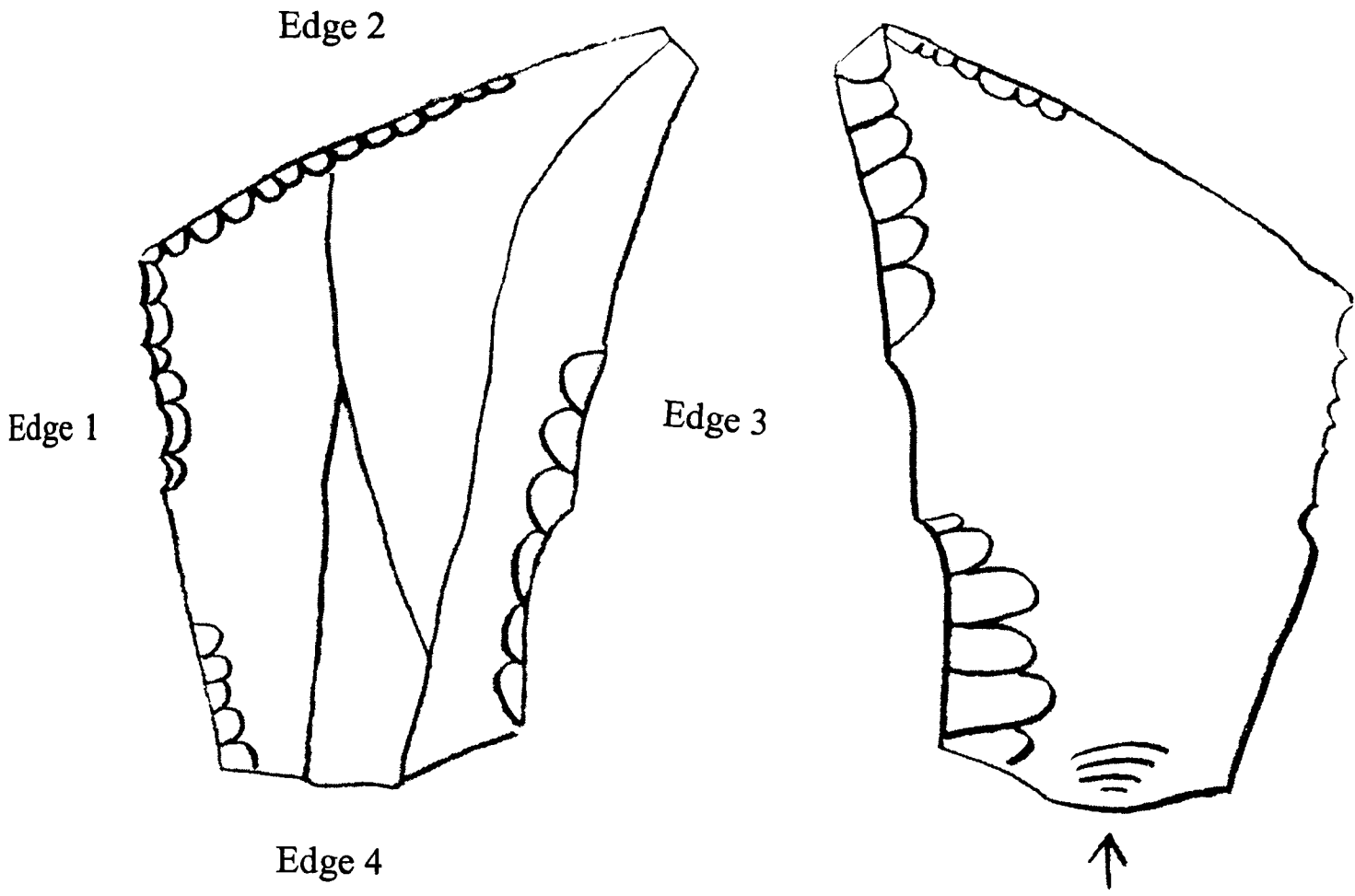
Explanatory Note for the Appendices

The appendices are organised in the following way: They are all numbered with two digits, *e.g.* 4.1., 4.2., etc. The first digit the one of to the chapter to which the appendix information belongs. The second one is just to give the different parts a certain order.

Appendix 3.1. Lithic industries' terminology



(from Inizan *et al.* 1999)



Appendix 3.2.

LITHIC RECORD FORM**General Information**

- Date:
- Museum:
- Collection:
- Box number:
- Excavation Date:
- Directed by:
- Site:
- Layer:
- Picture number:
- Prof. Picture:

Classification: **MOUSTERIAN / CHATELPERRONIAN / AURIGNACIAN / GRAVETTIAN / OTHER:**

- Piece number:
- Own number:

Typological system: **BORDES / SONNEVILLE-BORDES & PERROT / LAPLACE / L.A.S.**

- Typological classification:

Piece Morphology

- Length:
- Width:
- Thickness:
- Cortex: 0% / 5% / 25% / 50% / 75% / 100%
- Raw Material Type:
- Raw Material Colour:

Platform Morphology:

Cortical / plain / dihedral / faceted / chapeau-gendarme / winged / pecked / spur / linear / punctiform

Piece Condition:

- Broken: Yes / No
- Part Present: **Distal / Proximal / Central / All**
- Patina: Yes / No

Retouch: Retouched / Unretouched

LOCATION AND EXTENSION

- **Edge 1:** 0% - 5% - 25% - 50% - 75% - 100%
- **Edge 2:** 0% - 5% - 25% - 50% - 75% - 100%
- **Edge 3:** 0% - 5% - 25% - 50% - 75% - 100%
- **Edge 4:** 0% - 5% - 25% - 50% - 75% - 100%

Analysis of Edges**Edge 1:**

Type of Edge:

Length:

Position of retouch:

Direct / Inverse / Alternate / Bifacial / Crossed

Distribution of retouch:

Continuous / Discontinuous / Partial

Delineation of retouch:

Rectilinear / CX / CV / Denticulate / Serrated / Cran / shoulder / nose / tongue / tang / irreg. / reg.

Angle of removals:

Abrupt / Crossed Abrupt / Semi-abrupt / Low

Morphology of retouch: Parallel / subparallel / scaled / stepped

Extent of retouch: Invasive / Short / Covering

Edge 2:

Type of Edge:

Length:

Position of retouch:

Direct / Inverse / Alternate / Bifacial / Crossed

Distribution of retouch:

Continuous / Discontinuous / Partial

Delineation of retouch:

Rectilinear / CX / CV / Denticulate / Serrated / Cran / shoulder / nose / tongue / tang / irreg. / reg.

Angle of removals:

Abrupt / Crossed Abrupt / Semi-abrupt / Low

Morphology of retouch: Parallel / subparallel / scaled / stepped

Extent of retouch: Invasive / Short / Covering

Edge 3:

Type of Edge:

Length:

Position of retouch:

Direct / Inverse / Alternate / Bifacial / Crossed

Distribution of retouch:

Continuous / Discontinuous / Partial

Delineation of retouch:

Rectilinear / CX / CV / Denticulate / Serrated / Cran / shoulder / nose / tongue / tang / irreg. / reg.

Angle of removals:

Abrupt / Crossed Abrupt / Semi-abrupt / Low

Morphology of retouch: Parallel / subparallel / scaled / stepped

Extent of retouch: Invasive / Short / Covering

Edge 4:

Type of Edge:

Length:

Position of retouch:

Direct / Inverse / Alternate / Bifacial / Crossed

Distribution of retouch:

Continuous / Discontinuous / Partial

Delineation of retouch:

Rectilinear / CX / CV / Denticulate / Serrated / Cran / shoulder / nose / tongue / tang / irreg. / reg.

Angle of removals:

Abrupt / Crossed Abrupt / Semi-abrupt / Low

Morphology of retouch: Parallel / subparallel / scaled / stepped

Extent of retouch: Invasive / Short / Covering

Appendix 4.1. Abric Romani's layer 2 Typological List

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1	1	.6	.6	.6
3	1	.6	.6	1.2
5	10	5.9	5.9	7.1
6	3	1.8	1.8	8.9
8	7	4.1	4.1	13.0
9	1	.6	.6	13.6
10	1	.6	.6	14.2
11	3	1.8	1.8	16.0
17	1	.6	.6	16.6
18	1	.6	.6	17.2
21	2	1.2	1.2	18.3
23	2	1.2	1.2	19.5
26	1	.6	.6	20.1
28	3	1.8	1.8	21.9
29	1	.6	.6	22.5
30	2	1.2	1.2	23.7
31	1	.6	.6	24.3
35	2	1.2	1.2	25.4
40	1	.6	.6	26.0
44	2	1.2	1.2	27.2
45	3	1.8	1.8	29.0
46	10	5.9	5.9	34.9
47	19	11.2	11.2	46.2
48	6	3.6	3.6	49.7
49	1	.6	.6	50.3
51	2	1.2	1.2	51.5
57	1	.6	.6	52.1
58	5	3.0	3.0	55.0
59	1	.6	.6	55.6
60	9	5.3	5.3	60.9
61	2	1.2	1.2	62.1
65	1	.6	.6	62.7
66	1	.6	.6	63.3
74	3	1.8	1.8	65.1
75	1	.6	.6	65.7
77	24	14.2	14.2	79.9
78	1	.6	.6	80.5
79	1	.6	.6	81.1
85	3	1.8	1.8	82.8
86	1	.6	.6	83.4
88	1	.6	.6	84.0
89	2	1.2	1.2	85.2
90	25	14.8	14.8	100.0
Total	169	100.0	100.0	

Appendix 4.2. Abric Romani's layer 4 Typological List

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	3	2.1	2.1	2.1
	3	2	1.4	1.4	3.5
	4	5	3.5	3.5	6.9
	9	16	11.1	11.1	18.1
	10	10	6.9	6.9	25.0
	11	4	2.8	2.8	27.8
	12	4	2.8	2.8	30.6
	13	3	2.1	2.1	32.6
	14	3	2.1	2.1	34.7
	17	3	2.1	2.1	36.8
	18	17	11.8	11.8	48.6
	19	3	2.1	2.1	50.7
	20	1	.7	.7	51.4
	21	2	1.4	1.4	52.8
	22	5	3.5	3.5	56.3
	23	4	2.8	2.8	59.0
	24	9	6.3	6.3	65.3
	25	4	2.8	2.8	68.1
	28	11	7.6	7.6	75.7
	29	4	2.8	2.8	78.5
	30	9	6.3	6.3	84.7
	36	1	.7	.7	85.4
	37	3	2.1	2.1	87.5
	38	1	.7	.7	88.2
	40	1	.7	.7	88.9
	42	1	.7	.7	89.6
	43	11	7.6	7.6	97.2
	50	4	2.8	2.8	100.0
	Total	144	100.0	100.0	

Appendix 4.3. Abric Romani's Typological lists divided into collections: Layer 2

Count		Collection			Total
		Abric Romani C	Abric Romani B	Abric Romani V	
TYPOLOGICAL	1		1		1
	3	1			1
	5	6	4		10
	6	3			3
	8	1	6		7
	9	1			1
	10	1			1
	11	2	1		3
	17		1		1
	18		1		1
	21		2		2
	23		2		2
	26		1		1
	28		3		3
	29		1		1
	30		2		2
	31		1		1
	35		2		2
	40		1		1
	44		2		2
	45	2	1		3
	46	4	5	1	10
	47	7	11	1	19
	48	1	4	1	6
	49		1		1
	51	1	1		2
	57		1		1
	58	3	2		5
	59		1		1
	60	2	6	1	9
	61		2		2
	65	1			1
	66	1			1
	74		3		3
	75		1		1
	77	13	11		24
	78		1		1
	79		1		1
	85		3		3
	86		1		1
	88		1		1
	89		2		2
	90	3	22		25
Total		53	112	4	169

Appendix 4.4. Abric Romani's Typological lists divided into collections: Layer 4

Count		Collection			Total
		Abric Romani C	Abric Romani B	Abric Romani V	
TYOLOGICAL	1	1	2		3
	3	2			2
	4		5		5
	9	12	4		16
	10	9	1		10
	11	3	1		4
	12	3	1		4
	13		2	1	3
	14	1	2		3
	17	1	2		3
	18	16	1		17
	19	2	1		3
	20	1			1
	21	2			2
	22	4	1		5
	23	4			4
	24	8	1		9
	25	2	2		4
	28	9	2		11
	29	1	3		4
	30	9			9
	36	1			1
	37	3			3
	38		1		1
	40		1		1
	42	1			1
	43	9	2		11
	50	3	1		4
Total		107	36	1	144

Appendix 5/6.1. Iberian Sites



Key to the Map of Iberian Sites

- 1) Foz do Enxarrique
- 2) Figueira Brava
- 3) Columbeira
- 4) Caldeirão
- 5) Salemas sites
- 6) Pego do Diabo
- 7) Conceição
- 8) Lapa dos Furos
- 9) Gato Preto
- 10) Gruta da Oliveira
- 11) Gruta do Escoural
- 12) Jarama VI
- 13) Abric Romaní
- 14) Roca dels Bous
- 15) Ermitons
- 16) Reclau Viver
- 17) L'Arbreda
- 18) El Castillo
- 19) Cueva Morín
- 20) El Pendo
- 21) La Viña
- 22) El Conde
- 23) Amalda
- 24) Ekain
- 25) Labeko Koba

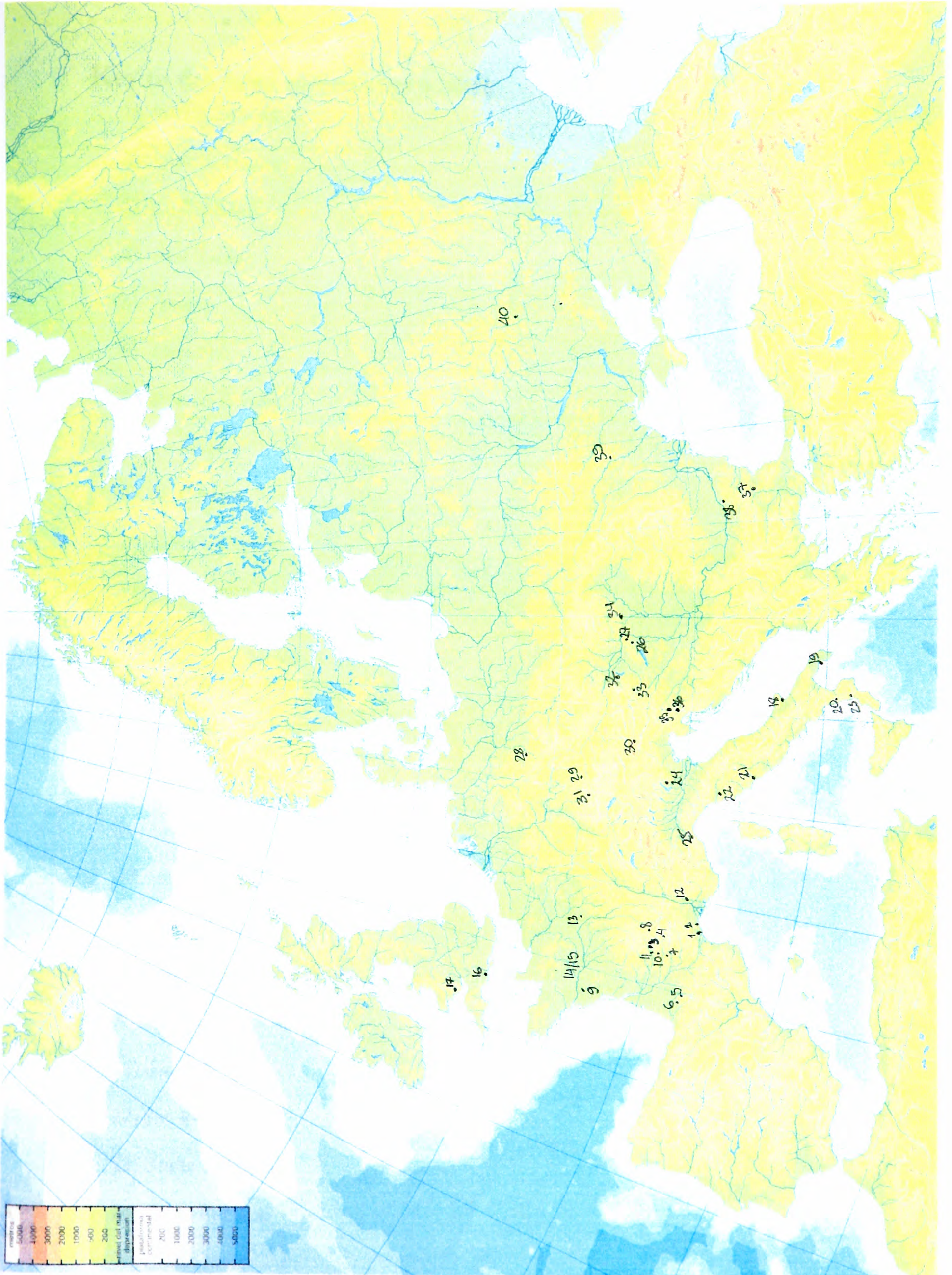
- 26) Lezetxiki
- 27) Gabasa
- 28) Peña Miel
- 29) Cueva Millán
- 30) Cueva de la Ermita
- 31) A Valiña
- 32) Cova Negra
- 33) Cova Beneito
- 34) Perneras
- 35) Mallaetes
- 36) Zafarraya
- 37) Bajondillo
- 38) Carihuela
- 39) Gorham's cave
- 40) Vangard's Cave

Appendix 5.2. Typological comparison between Abric Romaní layer 2 and the Corominas collection

			Collection	
			Reclau Viver	Abric Romani
TYPOLOGICAL	1	Count	5	1
		% within Collection	2.8%	.6%
	2	Count	5	
		% within Collection	2.8%	
	3	Count	2	1
		% within Collection	1.1%	.6%
	5	Count	18	10
		% within Collection	10.1%	5.9%
	6	Count	1	3
		% within Collection	.6%	1.8%
	7	Count	6	
		% within Collection	3.4%	
	8	Count	2	7
		% within Collection	1.1%	4.1%
	9	Count		1
		% within Collection		.6%
	10	Count	5	1
		% within Collection	2.8%	.6%
	11	Count	20	3
		% within Collection	11.2%	1.8%
	12	Count	2	
		% within Collection	1.1%	
	13	Count	3	
		% within Collection	1.7%	
	14	Count	4	
		% within Collection	2.2%	
	17	Count		1
		% within Collection		.6%
	18	Count		1
		% within Collection		.6%
	21	Count		2
	% within Collection		1.2%	
23	Count	1	2	
	% within Collection	.6%	1.2%	
24	Count	1		
	% within Collection	.6%		
26	Count		1	
	% within Collection		.6%	
28	Count		3	
	% within Collection		1.8%	
29	Count		1	
	% within Collection		.6%	
30	Count		2	
	% within Collection		1.2%	
31	Count		1	
	% within Collection		.6%	
35	Count		2	
	% within Collection		1.2%	
40	Count		1	
	% within Collection		.6%	
44	Count		2	
	% within Collection		1.2%	
45	Count	5	3	
	% within Collection	2.8%	1.8%	

			Collection	
			Reclau Viver	Abric Romani
TYPOLOGICAL	46	Count	3	10
		% within Collection	1.7%	5.9%
	47	Count	11	19
		% within Collection	6.2%	11.2%
	48	Count	1	6
		% within Collection	.6%	3.6%
	49	Count		1
		% within Collection		.6%
	51	Count	1	2
		% within Collection	.6%	1.2%
	57	Count		1
		% within Collection		.6%
	58	Count		5
		% within Collection		3.0%
	59	Count		1
		% within Collection		.6%
	60	Count	5	9
		% within Collection	2.8%	5.3%
	61	Count	1	2
		% within Collection	.6%	1.2%
	64	Count	2	
		% within Collection	1.1%	
	65	Count		1
		% within Collection		.6%
	66	Count		1
		% within Collection		.6%
	67	Count	2	
		% within Collection	1.1%	
	68	Count	2	
		% within Collection	1.1%	
	74	Count	2	3
		% within Collection	1.1%	1.8%
	75	Count	4	1
		% within Collection	2.2%	.6%
	77	Count	54	24
		% within Collection	30.3%	14.2%
	78	Count		1
		% within Collection		.6%
	79	Count		1
		% within Collection		.6%
	85	Count		3
		% within Collection		1.8%
	86	Count		1
		% within Collection		.6%
	88	Count		1
		% within Collection		.6%
	89	Count		2
		% within Collection		1.2%
	90	Count	10	25
		% within Collection	5.6%	14.8%
Total		Count	178	169
		% within Collection	100.0%	100.0%

Appendix 7.1. European sites



Key to the Map of European Sites

- 1) Grotte Tournal
- 2) Grotte Cosquer
- 3) La Ferrassie
- 4) Abri Pataud
- 5) Isturitz
- 6) Gatzarria
- 7) Roc-de-Combe
- 8) Le Piage
- 9) St. Césaire
- 10) Combe-Capelle
- 11) CroMagnon
- 12) Chauvet
- 13) Arcy-sur-Cure
- 14) Seclin
- 15) Rocourt
- 16) Kent's Cavern
- 17) Paviland Cave
- 18) Riparo Paglicci
- 19) Grotta del Cavallo & Grotta-Riparo Uluzzo
- 20) Grotta di Castelcivita
- 21) Grotta la Fabbrica
- 22) San Romano
- 23) Grotta de la Cala
- 24) Grotta Fumane

- 25) Riparo Mochi
- 26) Szeleta
- 27) Jankovich
- 28) Breirtenbach
- 29) Vogelherd
- 30) Krems Hundsteig
- 31) Geißenklösterle
- 32) Stranska Skala
- 33) Willendorf II
- 34) Istállóskö
- 35) Vindija
- 36) Velika Pečina
- 37) Bacho Kiro
- 38) Temnata Cave
- 39) Moldova V
- 40) Kostenki-Borchevo