Making the Abstract Concrete: The Place of Geometric Signs in French Upper Paleolithic Parietal Art

by

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B.A., University of Victoria, 2005

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Abstract

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In Paleolithic cave art, geometric signs tend to outnumber figurative images and yet, they remain relatively understudied. To address this gap in our knowledge, I compiled a digital catalogue of all known geometric signs found in parietal art in France, and then trended the results looking for patterns of continuity and change over time and space. I focused on parietal art, as I could be certain of its provenance, and picked France as my region due to its abundance of decorated sites and its natural boundaries of water and mountain ranges. The database is searchable by a variety of criteria such as sign category, method of production, date range, site type, geographical coordinates and region. It is now being converted into an online resource. To provide a visual dimension, it includes a selection of linked photographs and reproductions of the different signs. In this thesis, I detail the chronological and regional patterning in sign type and frequency and the implications of these patterns for understanding where, when and why the making of these signs was meaningful to the Pleistocene peoples who created them.

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Chapter 1: Defining and Framing the Research

"Something should be said about figures and signs whose significance is obscure and which often float in an atmosphere of pure symbolism or abstraction" (Graziosi 1960: 185).

"The abstract signs are, indeed, fascinating but they are also extremely enigmatic. For more than a century, they have defied all attempts to interpret them. Today they are largely forgotten" (Forbes and Crowder 1979: 350).

"The non-figurative category of Ice-Age markings was neglected until relatively recently, for the simple reason that it seemed uninteresting, or impossible to explain and define" (Bahn & Vertut 1997: 166).

When I began this research project, the above quotes typified what I found while searching for information about the non-figurative signs of the French Upper Paleolithic. They left me with more questions than answers. I was surprised to discover that there was no definitive catalogue that allowed any inter-site research into the geometric motifs from this era. When this type of image is mentioned in books or papers, it tends to be either in the inventory listings of art at individual sites, or in regards to its relationship with the other types of depictions (see for example Leroi-Gourhan 1993). After the initial identification of these abstract signs at the site level, there did not seem to have been further scholarship that focused on the regional perspective[1], or that examined the temporal use of these symbols across the 22,000-year span of art production in the Upper Paleolithic. Since this was what I wished to study, I realized that I would need to start by creating a comprehensive reference framework within which I could complete analysis from this broader perspective.

[1] Two exceptions to this are Leroi-Gourhan's structuralist paradigm (1986, 1993, 1995, 2006), which did include some comparative analysis between cave sites, and Conkey's research on the non-figurative symbols found on UP portable art (1978, 1980).

This chapter will introduce my interest in non-figurative images within the Upper Paleolithic field, and define some of the vocabulary commonly used by researchers. I will then touch on the fields of symbolic behaviour and cognitive evolution, both of which have influenced the way in which scholars try to understand the larger implications of creating art as an indicator of 'modern' cognition. Having chosen to structure my research around the concept of contextualization, there will be a section on this theoretical perspective; followed by an outline of the approach I adopted to complete this research, framed within all the scholarship presented in this chapter.

Introduction to my Research Topic

The Upper Paleolithic in Europe is a period of prehistory spanning from roughly 40,000 to 10,000 years before present (BP) (Toth and Schick 2007: 1959). This is when we see the first regular examples of art worldwide, in caves and on rock walls (collectively called parietal art), as well as on portable objects. This thesis focuses on the parietal art, as I could be certain of its provenance. I chose France as my area of study due to the large number of sites where Paleolithic art is present, as well as for the extensive amount of research that has been completed in this region. With its natural boundaries of water and mountains on three sides, and ice sheets during the Paleolithic period restricting movement to the North, this area is also geographically limited, making it possible to define reasonable edges for the study region.

The images that comprise Paleolithic art are generally organized into three categories: animals, humans, and non-figurative signs (Bahn and Vertut 1997: 134). The focus of my research is the third category, with non-figurative normally being defined as the abstract and geometric signs, as opposed to the figurative images of animals and

humans (Bahn and Vertut 1997: 134). They are seen to be non-representational in character, though there has been some debate regarding their association (or lack thereof) with objects or beings in the real world (Gonzalez Morales 1997: 194). While animal depictions are a common theme in all known regions where rock art is present, the choice of what to portray seems to be contextual, with image-makers generally choosing contemporary fauna from their local environment (Rice and Paterson 1986; Clottes 1996). Geometric signs on the other hand, are non-figurative to begin with, and while it is reasonable to assume that the meaning may very well have changed over time and space, there is no need to change the shape of something that is already abstract.

What Andre Leroi-Gourhan considered to be the "most fascinating area of Paleolithic art" (1979: 350) has tended to be overlooked in favour of the more visually impacting paintings and engravings of animals and humans. The meaning of these symbols is unclear and identification is difficult. This has led to their study being overshadowed by the artistic implications inherent in the figurative depictions. What caught my interest about the non-figurative signs was the sheer number of them. At many sites, they outnumber the animal and human images by a ratio of two to one or greater (Bahn & Vertut 1997: 166), and yet comparatively, very little work has been done in this area. While my initial examination found a great deal of variety among non-figurative sign types, there also appeared to be a surprising degree of continuity, both spatial and temporal.

A Word about Words

There are many terms that have developed topic-specific meanings in this field of study. A quick survey of their usage in this context will help clarify the research to follow. This collection of images is commonly referred to as Paleolithic art, but the use of the word art is often contested as being too culturally-specific to modern Western culture, and thereby carrying with it a number of assumptions of implied ethnocentric meaning (White 1997: 93, Lewis-Williams 2002: 41). The word art is often seen to be closely tied to notions of aesthetics and the Western tradition of art-making as separate from artisanship, making it problematic when some modern groups who still produce rock art do not even have a word for it in their vocabulary (White 1997: 93). In recent years, some researchers have instead begun using the expression "Pleistocene visual cultures" to refer not only to the art, but also to the symbolic culture within which it was created (Nowell 2006). This being acknowledged, I have chosen to follow the precedent of Lewis-Williams, who believes that as long as we remain aware of the "dangers of importing Western connotations", it becomes a "handy monosyllable" with which to reference this body of work (2002: 41). Davidson has identified Pleistocene art in this context as being the making or marking of surfaces, and includes paintings, engravings, sculptures, drawings and stencils in this category (1997: 125).

Davidson and Noble have used the term depiction to refer to this mark-making behaviour, and within this definition, also include other deliberate modifications that result in a recognizable image or pattern (1989: 125). Image is defined as "a tangible or visible representation", or as "a mental conception held in common by members of a group" (http://www.merriam-webster.com/dictionary/image), and is often employed to describe these representations. I will also be using the term representation, the preferred

choice of White, who believes that this concept better encompasses the full diversity of possible forms and underlying logics and motivations (1997: 93).

Focusing on the non-figurative images, there are several terms that relate specifically to this category. The terms 'sign' and 'symbol' originated in the field of linguistics, and were later applied to the study of Paleolithic art. Because of this, a brief overview of their definitions within this scholarship will also illuminate their meaning in relation to the non-figurative images. Peirce sees a linguistic sign as fulfilling three roles: it relates to a thought, making it interpretable; it represents an object or concept, making the thought and the sign equivalent; and it acts as the connection between the thought and its equivalent object or concept (1868: 148). A linguistic sign then, is seen to be the link between a concept and a sound pattern (de Saussure 1972: 66), and in a similar way, Paleolithic non-figurative signs can be seen as the link between a concept and a visual pattern.

The linguistic sign has two fundamental characteristics: it is arbitrary, and being auditory in nature, it has a temporal lifetime, the moment at which it is being uttered (de Saussure 1972: 67). While the concept of the arbitrariness of signs is useful for the study of those found in the Upper Paleolithic, the permanence of these markings means they have a much longer temporal lifetime than something verbal, allowing us to access them in a way not possible with their linguistic counterparts. Within the framework of Paleolithic art, the term sign is understood to refer to the geometric or abstract motifs, and is widely used by Paleolithic art researchers to refer to the non-figurative images (see for example Bahn and Vertut 2001; Lewis-Williams 2002; Clottes 2008). Conkey also recognizes the system of signs found in Paleolithic art, and emphasizes their "polysemic

and multivalent" nature for the makers and viewers throughout this period, making them a potential example of human cultural adaptation (1999: 303).

While the terms sign and symbol are often used interchangeably in the field of Paleolithic art, it is useful to note that one of the defining differences is that symbols are thought to never be entirely arbitrary (de Saussure 1972: 68), as opposed to the recognized arbitrariness of a sign. Chase defines symbols as signs referring to things in the real world (1994: 628). By things in the real world, he means objects and concepts, as well as "a whole new *kind* of things", which have no existence in the 'real' world but do exist in the symbolic realm (Chase 1994: 628). In linguistics, the term symbol is used specifically to refer to the sound pattern part of the sign paradigm, which also includes the original conceptual signification (de Saussure 1972: 67). From this linguistic organization, the equivalent in Paleolithic art would be that the symbol is the visual pattern, or the actual marking made during the production process, making it an appropriate term to use in this study.

Symbolic Behaviour and Cognitive Evolution

I believe that Paleolithic art has the potential to contribute to our understanding of human cognitive evolution and symbolic behaviour. These perspectives underpin the theoretical framework of my research, and it therefore seems appropriate to briefly review some of the literature. The 'out-of-Africa model' theorizes that all anatomically modern humans (AMH) originated in this region, and then expanded throughout the Old World in a series of migrations (Stringer 2002; Brumm and Moore 2005; Balme et al. 2008). While the 'out-of Africa' hypothesis is supported by recent mtDNA evidence, suggesting that modern humans are of relatively recent African origin (Carbonell and Vaquero 1998:

374), there is still some debate as to exactly when they left, and where they went from there (Bar-Yosef 2002: 382). The first tool industry associated with AMH is the Aurignacian, and its relatively abrupt appearance in Europe is suggestive of movement into this region rather than being an indigenous invention (Mellars 1992: 229). Bar-Yosef also sees a significant difference between the Aurignacian and the Chatelperronian industry produced by Neanderthals, leading him to the conclusion that their origins lie outside of Western Europe (2002: 381). He points to the presence of the Aurignacian at an earlier period in the Mediterranean Levant as evidence of an external origination (Bar-Yosef 2002: 373). Though the actual pattern of dispersal remains in doubt, it seems that the vast majority of scholars can agree on an 'into-Eurasia' hypothesis.

Some researchers believe that a 'symbolic revolution', thought to have accompanied AMH into Eurasia, began in early modern human groups in Africa, before any other region was colonized (Lindly and Clark 1990; Davidson 1997; Brumm and Moore 2005). This would suggest that upon arrival in Eurasia, "modern humans were already equipped with the essential techno-cultural elements that characterize the UP" (Bar-Yosef 2002: 382). Many researchers see this 'revolution' as providing the first real examples of material culture intersecting with complex, socially constructed symbolic thinking (Brumm and Moore 2005). Opposed to the idea of an abrupt revolution is the theory of a gradual, cumulative transition from the Middle to Upper Paleolithic periods. This hypothesis sees an accumulation of material and behavioural traits progressively leading to the formation of Upper Paleolithic social and cultural constructs" (Bar-Yosef 2002: 376). Coward and Gamble also strongly disagree that these processes were revolutionary, but do believe it is possible to identify temporal markers that can provide a

long-term perspective based on archaeological evidence (2008: 1971). Whether the transition between the Middle and Upper Paleolithic is seen to be gradual or revolutionary, there is general agreement that cultural and technological changes happened more rapidly in the UP, and resulted in more material evidence than the slower pace of cultural changes beforehand (Bar-Yosef 2002: 365).

Art, body ornamentation and stone tool styles are the archaeological evidence commonly used to differentiate modern human behaviour from that of earlier hominid species. The big difference that Gamble sees is in the stretching of the social landscape across time and space (1998: 442). He believes symbolic resources, especially those in material form such as art, ornamentation and tools, were the means by which culture could be maintained across these larger temporal and spatial distances (1998: 442). When trying to identify the capacity for modern human behaviour and culture, it is most likely to be a list of criteria though, rather than a single component, which will allow this assessment. These include communication, symbolic expressions for information storage (mobile and parietal art), self-awareness and group identity, as well as new hunting tools and technologies (Bar-Yosef 2002: 383). These changes in behaviour are identifiable in the archaeological record as material elements such as stone, bone and antler technology, exchange, site structure, and as symbolic components such as red ochre, mobile imagery and burials (Bar-Yosef 2002: 378).

Davidson and Noble suggest that intention is paramount, and that actions need to be discernible as deliberate, not the result of accident or incident (1989: 125). Behavioural modernity is often characterized by the standardization and repetition of patterns, such as we see in Paleolithic art, as it suggests a series of forms that are

collectively recognized (Dibble 1989). Repeated patterning is one of the criteria used when looking to identify symbolic behaviour in scratch marks and other engravings on portable items during the Middle and early Upper Paleolithic (Dibble 1989: 330). As Dibble has suggested, isolated instances are not sufficient evidence, multiple examples of similar patterning are required, since these are what imply that there was a shared meaning or understanding (1989: 330).

Robb has reviewed the approaches scholars have taken to the study of symbols, and sees these methods as falling into three categories: symbols as tokens of information transmission, symbols as structural elements of a worldview, and symbols as "tesserae with variable meaning" (1998: 332-338). From the information transmission perspective, symbols are thought to serve primarily as instruments of communication, conveying information and meaning to their viewers, and having a material life in the sense that "they can be produced, exchanged, monopolized, subverted and destroyed" (Robb 1998: 332). Within the structuralist approach, symbols are seen to frame an essentially cultural world and to provide structure for the thought processes that accompany it (Robb 1998: 335). One of the best-known examples of this approach is the work of Leroi-Gourhan, who divided Paleolithic art into categories structured by spatially organized binary oppositions between male and female animals and signs (see for example his 1982, 1986, and 1993 studies).

The third approach Robb outlines is focused on the notion that it is not the artifact or the people, but the interaction between the two that creates meaning (1998: 337). From this post-structuralist perspective, the symbols are thought to resemble mosaic tesserae with the qualities of colour, shape and size, but they are inherently arbitrary until

assembled and experienced by those interpreting them (Robb 1998: 337-338). Robb warns though, that if we deny that the symbols had a fixed meaning, then we "risk seeing ancient peoples' ongoing reinterpretation of symbols as a quasi-voluntaristic act…and we short-change the effect of inherited and unquestioned terms of thought" (1998: 338).

Whitney Davis has introduced the concept of 'Archaeopsychology' into discussion in this field, and has suggested that the Paleolithic art images studied by archaeologists or art historians are a particular type of artifact that he terms 'artifact-signs' (1988: 184). Davis believes that this particular group of artifacts is distinguishable as a subset because they express "the feelings or world views of their makers", and that they have cultural connotations and value exhibited by their intentionality or mental 'directedness' (1988: 184). He sees them as being artifacts, since they have physical properties which can be described and classified, but also sees a psychological aspect related to the viewer's interpretation of them, making them representational (Davis 1988: 185). In his article, Davis also raises the question of whether works of rock art deserve to be separated from other types of artifacts, due to the subjective, yet physical properties of permanence, visibility, and accessibility or inaccessibility (1988: 185). He also draws attention to the lack of any agreed upon meanings being allocated to these signs, and queries whether it is possible to make useful statements about the 'archaeological' place of representational activity in a society, suggesting the avenues of "chronology, frequency, distribution, socio-economic and other behavioural correlates" (Davis 1988: 186).

While Davis's contribution to this research actually raises more questions than it answers, its inclusion here does seem appropriate since the interpretation of these abstract

signs is in fact very contentious. The idea of assigning something representational value without actually understanding its cultural context is quite problematic, and yet, most researchers in the field of Upper Paleolithic rock art do believe that it is representational in nature. Therefore, Davis's critique is quite apt. As well, the question of whether social or behavioural meaning can be inferred without having any understanding of what the symbols denote is an important one, since this issue continues to be raised without there being any hope of resolution in the near future. Davis's discussion of rock art as an 'artifact-sign' is also quite helpful, as it offers a new way to view the subjects of enquiry as archaeological material remains, while also allowing for the possibility of socio-cultural significance to those who engaged in the production and creation of these images and engravings.

Forbes and Crowder see signs as "undoubtedly intentional, and we may reasonably assume that they have some significance" (1979: 356). Bahn also believes that these signs were not created at random, and that their production must have followed a set of rules or laws that were known to the makers of these representations (1997: 168). It is from this perspective that I am approaching the geometric signs of the European UP. Repeated patterning of the same image across both time and space, suggests that there may have been an underlying meaning that was shared or understood amongst the early modern humans engaging in this behaviour. Researchers such as Jean Clottes have noted the overall unity that exists in the Paleolithic art of Europe. Spatially and temporally, there is similarity in cave usage, techniques of image production, and in the themes of "big animals, few humans, [and] many geometric signs" (Clottes 2005: 22).

A base assumption regarding non-figurative signs is of course necessary; that there is intentionality in these markings, and maybe even more importantly, that there is some inherent meaning, even if we are unable to access it. Bahn has suggested that this non-figurative category may have had equal, if not greater, importance to its creators than the 'recognizable' figures that have garnered the majority of attention (1997: 166). While these markings may appear abstract to us, the meaning must have been clear to those who produced them, and their contemporaries who saw and/or used them (Bahn & Vertut 1997: 169). Gonzalez Morales has warned though, that trying to reach generalized conclusions about Paleolithic art without considering its temporality will result in gross oversimplifications (1997: 190). He believes there was a regionalization of signs, and that they do not "seem to be stable in time but show clear diachronic variability (1997:196). Gonzalez-Morales has also drawn attention to the unlikely possibility held by many researchers that these representations were endowed with the same meaning and function for over 20,000 years (Gonzalez Morales 1997: 195).

Culture and Context

Clifford Geertz's 1973 theory of thick description divides the study of culture into three layers of depth: production, contextualization and interpretation. Geertz sees culture as an "interworked (sic) system of cultural signs" (1973: 14), making this paradigm a useful way to approach the study of Paleolithic art. Production is defined as the actual creation or behaviour of culture, whether generated verbally, physically, or using material resources; contextualization is the examination of the social reality within which culture is created and describable; and interpretation is the understanding or translation of what a product of culture means (Geertz 1973: 3-30). Using this structure to frame my own

work, my focus will be on the second stage of Geertz's paradigm: the contextualization of Pleistocene visual culture. With extensive research having already been done on the production portion of Geertz's model (see for example Clottes 1996, 1997; Watchman 1997; and Fritz and Tosello 2007), I would like to now focus on the contextualization of what images were being chosen and reproduced. By creating a comprehensive compilation of parietal art sites at the regional level, and doing some preliminary trending, I hope to add to the contextualization needed if we are ever to move into Geertz's third layer of thick description, that of interpretation.

Emphasizing the importance of the social environment as the bridge between production and interpretation, Conkey asks "why would the making of imagery be meaningful and to whom, in what contexts?" (1997: 359). She hypothesizes that while the imagery may be related to macroprocesses (i.e. grand vitalistic and evolutionary schemes for the imagery), "nevertheless, the specific forms, shapes, raw materials, and transformations through time and space are not likely to be explained by such processes" (Conkey 1997: 344). Conkey further suggests that context and interpretation are inextricably entwined, and that the application of context can provide a useful frame for approaching interpretive work (Conkey 1997: 343). Context is central to an understanding of the people who engaged in this symbolic behaviour, and in order to be in a position to even attempt any interpretation, the context must be clearly understood first.

Since this research is focused on Geertz's second layer of contextualization, rather than his third layer of interpretation, I have chosen to omit an overview of the many interpretive theories associated with this body of work. Rather than endeavouring to

replicate some of the excellent reviews that have been written regarding the subject of meaning in Paleolithic art (see for example Conkey 1987; Bahn and Vertut 1997; Lewis-Williams 2002; Nowell 2006), I will instead include interpretation of the non-figurative images only when they directly impact the names given to the specific sign categories as it relates to the creation of my typology (see Chapter 3). I see this as an acceptable exclusion as I am focusing on what sign types people chose to depict as well as the identification of usage trends for individual symbol categories, rather than trying to offer any interpretation of what the signs 'mean'.

The Research Project

I believe that there is more than one way to arrive at an interpretation, especially as meaning can sometimes be discovered indirectly by looking at the implications of behaviour. Even if we do not explicitly understand why a group of people chose the subject matter they did, their choice of theme and reproduction of these images still offers insight into what they deemed important or meaningful. By examining the end results of the artists' decisions of what to represent and reproduce over the temporal and spatial span of the French Upper Paleolithic, there is certainly the potential for deriving contextual meaning directly from their choice of preferred subject matter. The goal of my research project is to look at the trends of use of the non-figurative signs from a broad regional perspective, as well as across the time span of the Upper Paleolithic era. What I hoped to find were patterns that would contribute to our understanding of the continuity (or discontinuity) of individual symbol usage, and potentially allow us to infer which signs appear to have been important to the people who produced this form of art. There were three main questions I addressed while completing this project:

- Are there any non-figurative signs that remained in use throughout the time span of the Upper Paleolithic in the French region?
- What is the geographical range within which we see the same signs in use, and how are they moving across the landscape?
- Do certain sign categories increase in popularity after the Last Glacial Maximum (i.e. did groups brought together in 'refuge areas' exchange cultural information in the form of preferred symbol choice)?

This thesis is an attempt to answer these questions. Chapter 2 lays out the spatial and temporal backdrop upon which this research is grounded, looks at the movement of the Pleistocene peoples across the fluctuating landscape of 'Ice Age' Europe, and explores how this could have influenced their cultural development. Chapter 2 also brings the temporal element into focus, connecting time and space, outlines the stylistic sub-cultures associated with this period, and includes a brief overview of the dating techniques used by researchers. Chapter 3 is a more technical discussion of the various research tools I used throughout this project, and how I structured my study. It also includes the typology of geometric signs that I created, and touches on some of the difficulties I encountered when trying to bring together several localised typologies. Chapter 4 contains my interpretation of the results, as well as graphs, and spatial images which allow the sign types to be visually tracked across the landscape, structured by the stylistic periods discussed in Chapter 2. Chapter 5 includes some broader implications of my research chapter, interesting regional patterns and specific problems I encountered, as well as potential areas for further study.

Chapter 2: Spatial and Temporal Dimensions

> The picture of the past 100,000 years in Europe that emerges then, is one of near-continuous climatic oscillation, sometimes rendering parts of northern Europe uninhabitable. In any given region, there were several periods over that time span during which humans would have been required to readapt to changing environmental conditions by altering their diet, their hunting and gathering strategies, their technology, and their knowledge of the world around them (White 1986: 28).

Conkey believes that establishing the context for the Upper Paleolithic period is an essential aspect of research in this field. She sees this as a geography of social action, where the interactions that Paleolithic peoples had with the landscape and the environment, along with the social memories this created, could have greatly impacted how they envisioned their world (Conkey 1997: 360). Certainly in Europe, many researchers have tended to focus on context at the site level, with studies looking at context "of and within specific caves" (Conkey 1997: 346). Conkey has proposed that researchers should be working towards "specifying the 'informing context' of the imagery", and that this can be done by identifying the social relations and cognitive processes that informed the art, and that would have linked it to the broader social formations (1997: 361). When I was framing my research, I kept returning to her question: "How was the landscape experienced, and in what ways were the landscapes imbued with all sorts of biographical and cultural significance?" (Conkey 1997: 360). Rather than trying to study Paleolithic art in a cultural vacuum, embedding the art in its bounded reality allows the incorporation of interaction, communication, production, and the cosmological context as mediating factors in the creation of this imagery (Conkey 1997: 359).

Conkey's perspective is one of the foundations of my research, and it is hard to imagine that the interaction between human, geography and climate did not have a significant influence on the cultural evolutionary path of these people. Practically speaking, the environment and landscape are also important components to understand, since they are the spatial determinants as to where these people were living at different times, and therefore produced the images which are the basis of my research. The purpose of this chapter is to create an informing context for the Upper Paleolithic period. I will do this by looking at the relationship between environmental conditions in 'Ice Age' Europe and the earliest modern humans to move into this region, by mapping out their movement through the landscape on both spatial and temporal scales, and by examining the strength of the dating techniques employed in this field.

The beginning of the Upper Paleolithic in Europe is associated with the arrival of modern humans, or *Homo sapiens sapiens*, into Europe, and its end with the transition to the Neolithic, or the change in mode of subsistence from hunting-gathering to early farming and a more sedentary lifestyle (Straus 1991b: 265). This phase of prehistory is subdivided into a stylistic timeline based on changes in tool assemblages. During this time, there was continuous advancement in stone tool manufacture, resulting in the production of ever more specialized implements (Stiner and Kuhn 2006: 703). There was some regional variation in tool technology, and therefore in the dates at which they can be said to have moved into a new phase or style. While there is also some variation within the stylistic periods (Stiner and Kuhn 2006: 708), this grouping of the tool technologies at least provides a general framework for identifying change over time and space. In addition, different chronologies are used for Western and Eastern Europe. The

general order from oldest to youngest in Western Europe is: Aurignacian, Gravettian, Solutrean, and Early, Middle and Late Magdalenian (White 1986: 30). For the purposes of this analysis, I will be using the timeline from Western Europe, as this region is the focus of my research.

It is important to acknowledge that there was a second species already living in Europe at the time of modern human arrival. The individuals from this *Homo* species are commonly known as Neanderthals, and while there is now some evidence of them being in association with symbolic artifacts such as pendants at the site of Arcy-sur-Cure in France (Stringer 2002: 569), the majority of the representational art is connected with modern human activity in Europe. This is why I have chosen this group of individuals as my area of focus.

Upper Paleolithic Ecology

Soon after the arrival of the first anatomically modern humans on the Eurasian continent, there is a new pattern of frequent, if not continual change in human behaviour that continues throughout the European Upper Paleolithic period (Stiner and Kuhn 2006: 706). These constant changes in technology and hunting practices, along with an increasing body of symbolic artifacts have been linked to the glacial environment that dominated the landscape throughout the Upper Paleolithic period (Straus 1991b: 259). For this reason, I see an understanding of the pressures created by an 'Ice Age' climate to be an important part of the creation of context.

Having studied the Paleoclimate, Alverson sees large-scale glacial-interglacial oscillations, each cycling over a period of about 100,000 years, as the dominant climatic factor (2007: 362). When the first modern humans ventured into Europe, they seem to

have arrived during the Würm Interstadial period that spanned from approximately 38,000 to 34,000 BP (Straus 1991a, Table1). This climatic time frame is characterized as having warmer temperatures and the glaciers being in a period of retreat rather than in a 'stadial' period of glacier advance (American Meteorological Society). These new arrivals to Europe would have found sea levels lower than they are at present, with large amounts of water locked up in the glacial sheets, and large coastal plains along much of the Mediterranean, making lateral as well as northern movement quite unproblematic for humans moving up from the Levant (Stringer 2002: 568). During this geologically brief interlude, Europe would have been quite warm relatively, and after the retreat of the previous glacial maximum of 65,000 years ago (Straus 1991a, Table 1: 190), the vegetation and animal populations would have once again covered a large part of the continent (Gibbard & van Kolfschoten 2004: 447).

In Europe, the type of vegetation growing at particular stages has also been used to decide where to create the divides between glacial, interstadial, and interglacial intervals. This is seen to be especially true of the late Pleistocene, or the glacial events associated with modern humans. Pollen samples collected from sedimentary cores in Europe have allowed scientists to assemble a fairly complete record of the floral changes associated with climatic change (Gibbard & van Kolfschoten 2004: 448). With this particular area of study, the goal is to ascertain what types of vegetation were dominant at different stages of the glacial cycle. Glacial periods tend to be associated with herb-dominated vegetation, transitional phases between glacial and temperate conditions (interstadials) with birch and pine forests, and temperate periods (such as the current Holocene) with deciduous, mixed, and/or coniferous forest (Gibbard & van Kolfschoten

2004: 448). This model would suggest that at the time of their arrival, modern humans would have encountered birch and pine forests, along with more temperate conditions, making their transition into this region a reasonable choice considering their inability to predict or envision the major climatic changes that were to later take place.

Along with an initially hospitable climate, one of the main pull factors for the first modern human arrivals would have been the dietary resources available to them in this animal-rich environment. White suggests there were nearly a dozen species of large-bodied animals inhabiting the landscape at this time, a situation that no longer exists in these latitudes at present (1986: 24). He believes that far from being impoverished, the Paleolithic environment of Europe contained a higher animal biomass than any landscape in which hunting and gathering peoples live today (White 1986: 24). White sees the modern plains of Africa as being a much better comparison than the tundras of the present-day (1986: 24). For a hunter-gatherer people, such as *H. sapiens sapiens*, this access to game would have had a great deal of influence on their decision to stay in this environment, and to expand rapidly across the Eurasian continent. Even at the later Glacial Maximum, there were still adequate food resources to exploit in parts of Europe (Straus 1991b: 268), possibly explaining their decision to stay even when conditions became less inviting.

From studying the European Paleolithic climate, Alverson has concluded that it was climatic variability, and not stability, which led to changing societal structures (2007: 372). The old adage, *necessity is the mother of invention*, seems to fit in well with what we see happening with modern humans in Europe as they responded to the stresses of living in an 'Ice Age' environment. Carbonell and Vaquero also see a link between

climatic variability and adjusting social structure, with the cultural innovations having a cause-effect relationship with the biological transformations (1998: 373). They point to the differences between material remains from Archaic *Homo sapiens* in Africa, and their European descendants, *Homo sapiens sapiens*, in terms of "their capacity for developing culturally mediated behaviors" (Carbonell and Vaquero 1998: 373).

Stylistic Periods and the Landscape

It is most commonly believed that modern humans migrated up through the Levant, bringing their own tool technology with them (Bar-Yosef 2002: 373). Even though they were more gracile, or small-boned, than the Neanderthals already living in Europe, their physical remains still suggest they would have been a hardy and robust people, able to adjust to the colder climate in Europe (Stringer 2002: 568). They appear to have lived in small hunter-gatherer bands, and to have been adapted to a life of mobility (Stiner and Kuhn 2006: 706). It has been proposed that the advance of modern humans into the more northerly climates in Europe over the following millennia, matched the rapid advances and new developments in fire, clothing, and shelter technologies, as well as innovations in hunting strategies and related weaponry (Straus 1991b: 259).

The first Upper Paleolithic tool/culture phase that we associate with *H. sapiens sapiens* in Europe is called the Aurignacian stylistic period, and spans the period of 35,000 to 28,000 BP (Clottes 2008: 314). The starting point of this period has been recently contested though, as Aurignacian sites in Northern Spain and Hungary have been dated to approximately 40,000 BP using multiple dating techniques (Stringer 2002: 568). These dates could push back the arrival of modern humans in Europe, as the geographical distance between these two locations implies an earlier arrival time for there to already be

such a wide diffusion. Mellars interprets the data in a similar way, suggesting that the broad distribution of the early Aurignacian refutes the theory of a wave of advance, since the oldest manifestations in northern Spain appear to be contemporaneous with those in the east of the continent (1992: 229). The Aurignacian is also the first period for which we have evidence of art, both portable and parietal, with the Grotte Chauvet having paintings dating to as old as 33,000 BP (Clottes 1996: 277).

When tool technologies are compared to the glacial cycles active in this region, it quickly becomes apparent that the stylistic phases associated with each tool assemblage seem to mirror the climatic stages. The geological term Upper Pleniglacial refers to the Last Glacial Maximum (LGM) when the ice sheets reached their greatest extent, covering a significant part of the Eurasian landmass (Straus 1991a: 190). This event is centered on a much later date of 18,000 BP, but it is thought that the climate began to change and the temperature to drop, as early as 29,000 BP (Straus 1991b: 260).

The next stylistic period, known as the Gravettian, begins in fairly close proximity to the commencement of this climatic shift, starting at 28,000 BP, and continuing in Western Europe until 22,000 BP (Clottes 2008: 314). This period has been often characterized as the 'Golden Age' of the Upper Paleolithic, and contains "virtually all of the behaviours identified on the archaeologist's shopping list as modern", and suggestive of a complex society (Aldhouse-Green 2002: 1). In this period, we see a lot of technological advances in tool-making, as well as elaborate burial practices (White 1986: 43). There is also an increasing body of symbolic representations, though this cultural phase is more commonly associated with portable art and figurines than with cave art (Bahn and Vertut 1997: 87).

The Gravettian is the time interval that Straus identifies as the beginning of the exodus from NW Europe (1991b: 260) due to the steady decrease in temperature, and the resulting expansion of the Arctic ice sheets. He sees the depopulation of Western Europe above the northern 48th parallel as being a "gradual, but ultimately cumulative, southward contraction of the territories (or lifetime exploitation ranges) of hunter-gatherer bands" (Straus 1991b: 262). Straus believes that worsening temperatures, severe winters, unpredictable conditions, changing vegetation, and dwindling game would all have made survival "increasingly untenable at the northern fringes" (Straus 1991b: 262).

While Straus sees a marked decline in population and habitation in NW Europe throughout the Gravettian, he observes at the same time a continuity of settlement in SW France (1991b: 262), with a notable increase in the number of sites, compared to those present at the time of the Aurignacian (1991b: 267). He sees the population in this more temperate region rising throughout the Gravettian, and peaking during the Solutrean, with this pattern reflecting the decrease in temperature, and steady increase of glacial sheets in Northern Europe (Straus 1991b: 267). Straus believes this population shift to be the end result of modern humans abandoning the more northerly part of their territory in Western Europe and collectively 'retreating' toward the refuge areas in the southern regions (1991b: 267).

White also underscores the importance of this region, noting it rapidly became more densely populated during this time period, resulting in what he calls "regular social aggregation" (1982: 176). It has been theorized that the increase and frequency of inter-group contact that occurred as modern humans moved into closer proximity with one another might have been the catalyst for the greater social complexity seen during the

latter half of the Upper Paleolithic (Bahn and Vertut 1997). The interrelationship previously noted between the environment and the constant biocultural adaptation required of modern humans in 'Ice Age' Europe is highlighted in this example of the changing lifeways of those alive during the Gravettian. The events of this time frame also provide a great deal of necessary background information and context for the 'explosion of art' that will follow during the height of the glacial cycle (White 1986: 28).

The role of SW Europe as a place of refuge for humans during the LGM seems to now be well established (Straus 1991a: 197). Straus suggests that along with a southern migration, some of the strategies for surviving this extreme environment would have included the further development of sophisticated, variegated hunting tactics (including logistical mobility) and improved weapons (Straus 1991b: 270). The LGM was the period of maximum southward extension of the Scandinavian glacier and corresponded closely to the time span of the Solutrean industry of France and Spain: 22,000 – 17,000 BP (Clottes 2008: 315). Straus believes that even though Upper Paleolithic hunting-gathering peoples had relatively sophisticated adaptations, they had no choice but to respond to environmental conditions such as temperature, humidity, seasonality, vegetation, and wildlife availability by changing the extent of their range (1991b: 259).

Pollen samples from NW Europe at the time of the LGM suggest that the parts of the landscape not under ice show the presence of plants associated with tundra, steppe-tundra, or polar desert environments, and even some zones with barren ground (Straus 1991b: 261). Straus hypothesizes that the regions with the densest human settlements during this time would have been those with abundant natural shelter and strategic valleys (1991b: 262). These landscape features would have attracted and directed the

movements of many prey species, such as reindeer, horse, and bison (Straus 1991b: 262), as well as having more vegetation associated with temperate conditions (Gibbard & van Kolfschoten 2004: 448).

The Solutrean stylistic period, which existed in SW France throughout the LGM, is associated with a marked increase in the production of cave paintings and engravings, as well as more examples of parietal art being found in association with habitation sites than in any other phase (White 1986: 132). Straus has also noticed the correlation between LGM refuge areas and the location and frequency of the art, believing it to be no coincidence that the two overlap to such a large degree (1991b: 270). He has proposed that the rise in art production might have been a response to the intersection of increased human population densities and severe LGM environmental conditions in SW Europe (Straus 1991b: 270). Straus, along with several other researchers (see for example Conkey 1980 and Jochim 1983), have proposed that cave art sites could have served a role in social integration during this period, with these locations acting as aggregation sites where rituals were performed (Straus 1991b: 270). The dominant art style of this period is complex engraving, built upon the techniques derived from the Aurignacian and Gravettian (White 1986: 132).

It is the stylistic period following the Solutrean though, known as the Magdalenian, that accounts for 80% of all known Upper Paleolithic art, as well as the most specialized tools of the entire period (White 1986: 47-48). Modern humans living during this culture phase, dating from 17,000 to 11,000 BP (Clottes 2008: 314), were also the first ones to regularly venture deep into caves in order to create parietal symbolic representations (Clottes 2005: 21). It should be noted here, that while the dates I have

provided for the Solutrean and the Magdalenian are contiguous, there are many scholars who have different timelines for this transition, resulting in an overlap between these two phases by up to 1500 years. White sees the Magdalenian first appearing around 18,000 BP (1986: 138), and Straus believes that the Solutrean continues until 16,500 BP (1991a: 189). Straus explains this discrepancy by suggesting that it is difficult to separate the two culture phases, and that from an archaeological perspective, making a true distinction between the Solutrean and early Magdalenian culture-stratigraphic units is problematic (1991a: 197). It is certainly possible that the separation between these two phases is more ambiguous than clear-cut, especially as the actual Glacial Maximum is at its peak around 18,000 BP (Gibbard & van Kolfschoten 2004: 447), and this climatic change is thought to mark the origination of the Magdalenian tool industry. This culture is also centered geographically around the regions of SW France and Northern Spain (White 1986: 138). Straus provides a description of what SW France would have been like during this geological event:

> While indeed cold during the LGM, the slopes and valleys of Aquitaine would have provided pasture for a wide variety and abundance of ungulate game species, shelter, south-facing exposures, and locally available water in streams to support the growth of bushes and some trees (hence a supply of firewood), as well as a wealth of protected, sun-warmed rock shelters and cave mouths for human habitation (Straus 1991b: 265).

By the Middle to Late Magdalenian, the ice sheets were beginning to recede. This geological stage, known as the Tardiglacial, dates from 16,000 to 10,000 BP (Vialou 2006: 311), and marks the end of the Upper Paleolithic. Straus believes there to be a continued correlation, both geographical and temporal with the plentiful cave art of Western Europe and Tardiglacial human settlement in this region (Straus 1991a: 197). This is also the period though, when population densities start to decrease in the LGM

refuge areas, and we begin to see "the territorial infilling, with permanent (albeit not sedentary) habitation, well under way in northwestern Europe" (Straus 1991b: 272). This then, is the end of the 'Ice Age', and the transitional period into our current era, known as the Holocene (Table 1 Straus 1991a: 190).

Dating the Art

Having outlined the stylistic periods associated with the Upper Paleolithic, and examined their inextricable relationship with the environmental conditions of this period; I would like to now turn the discussion to how researchers assign the art itself to these different phases. This happens to be a crucial question, as without the ability to create a chronological context, it is difficult to say anything else that is meaningful about these symbolic representations. While the stylistic periods of Western Europe were originally created to document the evolving tool types from this era, these same temporal parameters were then employed to group the art as well. This associative dating technique is the basis for the chronologies of Upper Paleolithic art, and along with the spatial elements discussed above, was a foundation of my research.

Early researchers such as Breuil and Leroi-Gourhan used three levels of integration and assumption to create "grand stylistic schemes" (Pettitt and Pike 2007: 29). The first step involved creating a timeline for the portable art that was found in occupation layers at the site in association with tools that had already been assigned to the Aurignacian, Gravettian, Solutrean and Magdalenian stylistic periods (Bahn and Vertut 1997: 60). The second step involved linking parietal art that had stylistic similarities to the portable pieces, thereby incorporating it into the timeline (Pettitt and Pike 2007: 29). The third step involved using stylistic comparison to integrate other

examples of parietal art where no occupation layers existed (Pettitt and Pike 2007: 29). This technique is known as stylistically based relative dating, and relies on the aforementioned material culture, and its validity is strengthened when it is found in archaeologically dated layers that overlay the art (i.e. it must have been created prior to being covered up) (Pettitt and Pike 2007: 29). One way used to verify this was by superposition (the assumption that the underlying representations are from older stylistic periods), which thereby created a type of parietal seriation (Pettitt and Pike 2007: 28).

Using the third step of stylistic dating when there is no archaeological information or superpositioning is probably the most problematic. At this type of site, stylistic period is assigned based purely on perceived similarities in form and technique that could suggest contemporaneity with a stylistically dated site (Bahn and Vertut 1997: 60). One potential problem with this method though, is the validity of the original site being associated with that period in the first place. I ran into this issue repeatedly when trying to assign a period to a site I was working with. The site was dated based on similarities in theme and technique with another site, which was also based on the same criteria in relation to a different site, and so on, until the point where sometimes the argument began to seem rather circular.

A potential difficulty that arises when trying to associate occupation layers with the parietal art is that we do not generally have proof that the people who left these remains were also the creators of the depictions. This association is greatly strengthened if we are able to find pigment in a layer that matches what was used on the wall (especially if we can chronometrically date it), or if we can find tools directly associated with the art production (Bahn and Vertut 1997: 63). Researchers also sometimes

discover fragments of decorated wall that have fallen and become stratified in the archaeological layers (Bahn and Vertut 1997: 61), creating an unambiguous link between the stratified layers and the representations. This establishes a minimum age by which the representations must have been completed, but a maximum date is not possible to obtain as we only know when it fell from the walls, not when it was actually created (Bahn and Vertut 1997: 61).

Other more recent methods of dating include direct dating, indirect stratigraphic dating, and indirect architectural dating (Pettitt and Pike 2007: 29). Direct dating involves using Radiocarbon technology on a sample of pigment from an image, most commonly used with charcoal; it is possible it could be used with organic binders as well (Pettitt and Pike 2007: 29). Some of the issues associated with this method include possible contamination of the sample, and the fact that the wood (charcoal) is being dated, not the actual moment at which it was used for this application (Bahn and Vertut 1997: 61). Indirect stratigraphic dating relies on the formation of geological materials such as flowstone (U-series dating) or organic accretion (Radiocarbon) forming over the images; this provides a minimum date for the art (Pettitt and Pike 2007: 29). One difficulty with this method is the clear establishment that the formation does in fact overlay the art; it is also nearly impossible to tell the period of elapsed time between image production and the formation on top of it (Bahn and Vertut 1997: 60).

Indirect architectural dating involves dating the formation of a stratigraphic layer (flowstone by U-series, cave sediments by ^{14}C of charcoal and bone) that appears to have blocked the entrance to a decorated chamber and provides a minimum age for the decoration (Pettitt and Pike 2007: 29). An issue with this method is that it relies on the

assumption that the dated layer clearly blocked the chamber and that there were no alternative entrances (Pettitt and Pike 2007: 29). Bahn highlights Cosquer as a slightly better case for this type of dating, since when the water level rose towards the end of the Pleistocene, we know that this must have occurred after the art was completed, as the entrance remains underwater to this day (1997: 61). Bahn also mentions the potential of assessing a maximum age in high valleys where we know that glacial activity made it impossible to inhabit a site until after the LGM (examples are Niaux, Fontanet and Les Eglises) (1997: 62).

As science continues to improve, so too does our ability to confidently assign parietal sites to a specific timeframe or stylistic period. Pettitt and Pike estimate that approximately 95% of caves with parietal art have not been directly dated, and that based on the prohibitive cost and difficulties of chronometric dating, this issue is unlikely to be resolved any time in the near future (2007: 28). Knowing this, the best way to obtain accurate dates for a site involves using multiple methods that can then be compared with each other. This strengthens the likelihood that many of the pitfalls associated with dating the images can be avoided. As Davidson has noted, one of the major issues that researchers face when it comes to the study of Paleolithic art is the lack of good chronological resolution (1997: 128). I can certainly attest to this shortcoming, as many of the earlier site discoveries have not yet been revisited, so the dating is based on some pretty weak evidence (i.e. stylistic dating based on perceived similarities with other sites).

The goal of this chapter was to provide the spatial and temporal background for my research, and to explore how these two related elements shaped the people who lived during the Upper Paleolithic, as well as those who have studied them since. Fluctuating

environmental conditions, the need for continuous adaptation and innovation, faunal availability, and a new level of population concentration during the LGM, would all have been contributing factors that informed the context of the lives of the first modern humans in Europe. There is no doubt that surviving through these enormous changes in the landscape and the resulting alterations in lifestyle would have created long-lasting social memories among these people. These experiences would have in turn affected their worldview, and influenced the cultural material that they produced (Stiner and Kuhn 2006: 694). Having established the context within which the non-figurative signs of Europe were created, the following chapters will focus on the cultural material itself and my findings based on the dual elements of space and time.

Chapter 3: Methodology

In both parietal and portable art, a full survey of the presence and interrelationships of different motifs, as well as of their association with each other and with other figures, is required, but will entail a more complete published corpus than we have, followed by computer analysis (Bahn & Vertut 1997: 168).

Research Methods

The main tool that I used to organize my research was a database that I built for this project. With the computer technology now available, the logical choice seemed to be to create a digital catalogue rather than using the traditional method of compiling a paper version. The most useful electronic form is a relational database as it allows the designer to build in multiple relationships simultaneously. All the data in this program can then be filtered, similar to an online advanced search, to permit fairly specific questions regarding time periods, sign category, site type, methods of production and spatial information.

While I was in the process of inputting the data for each site, I included a lot of information that I did not personally need for the completion of this project. My goal was to establish a baseline of temporal presence or absence by sign category for each site, but I also included site type (cave, rock shelter, open air), method of production (painting and/or engraving, plus paint colours), and a precise inventory for each sign type present. I felt that this database should be as comprehensive as possible, and since I was already completing such a close reading of the literature for each site, it did not take that much longer to input these other sections. One of the objectives I had for this research was to make it available on the Internet after completion. Because of this, I tried to include all categories I thought could be potentially useful either for myself in the future, or for other researchers interested in this topic.

I framed the structure of my research and the resulting database around the questions of *who* was doing *what*; *where* and *when* was this being done; and *how* was it being accomplished? *Who* was by far the most straightforward category, being *Homo sapiens sapiens*, and specifically those who arrived in Europe during the Upper Paleolithic (see Chapter 2 for details). The other categories were all incorporated into the framework of the database itself. The w*hat* category refers to the non-figurative signs themselves, and these were grouped based on similarity of physical form (see typology below). I ended up with three levels of *where*, the first referring to the individual sites, located in space by geographic coordinates; the second to the regional placement of each site, along with modern country affiliation; and the third indicating the archaeological site type, divided into cave, rock shelter or open-air site. *When* has two related categories: all sites (except Le Bison due to lack of information) were assigned to a stylistic period (or multiple ones if there was more than one period of decoration), and were also given a date range. If there were any chronometric dates available (direct or indirect), then the date range was more specific. If not, the site was given the broad date range associated with each stylistic period. These divisions were based on the stylistic timelines used by both Vialou (2006: 308-311), and Clottes (2008: 313-315). *How* was a fairly simple category, based on the method of production. It was divided into painting and/or engraving, and included all the possible paint colours that were used at the sites I studied.

The three main sources that I used for researching the sites were the EuroPreArt online database (www.europreart.net), and two reference books, *L'Art des Cavernes: Atlas des Grottes Ornées Paléolithiques Françaises*, and *Préhistoire de l'Art Occidental*. I generally started with EuroPreArt, as their website includes a generalised inventory for

each site. Unfortunately, some of the time their listing for the non-figurative work at a site would include descriptions such as 'sexual symbols' or '*x* number of signs' without being specific. This was why I would then research each site using the other two books to try and fill in the blanks, as each of these references had different strengths. EuroPreArt had good information about the dating of each site, including its location both regionally and in relation to the nearest community (useful for the geographic coordinates, see below), and had an excellent bibliography which was repeatedly useful. *L'Art des Cavernes: Atlas des Grottes Ornées Paléolithiques Françaises* had incredibly detailed descriptions of all the images at each site, but did not include a master inventory, so this multi-paged report had to be read with great concentration, and I had to manually compile a listing of the signs (totalling individual images, tracking mode of manufacture and any paint colours) as I went through it.

Unlike the other two reference sources, *Préhistoire de l'Art Occidental* did not attempt to include every single site, though it did contain descriptions of approximately two-thirds of my dataset. This book was not as detailed as *L'Art des Cavernes: Atlas des Grottes Ornées Paléolithiques Françaises*, but since it was from 1995, it contained several sites that were not in the other book. As well, Brigitte and Gilles Delluc, two of the book's editors, had re-surveyed many of the French sites, especially in the Dordogne region, and had updated the inventories, though not necessarily providing a full listing. The Dellucs also provided very thorough site distribution maps, which allowed me to visually confirm much of the data I had been collecting. Since they are both from the structuralist school of thought, and Leroi-Gourhan was the third editor of this volume, it meant I often had to contend with interpretive descriptions of circles, ovals, open-angle

signs and triangles as ‘vulvas’, which was why the distribution maps were so important. I also used other reference material (journal articles and books) whenever it was available, in order to provide as accurate an inventory as possible for each site.

In order to avoid missing any potential site inclusions, I started with the comprehensive list of French parietal sites found in *Journey through the Ice Age* (Bahn and Vertut 1997: 42-45), and cross-referenced it with the EuroPreArt database (www.europreart.net) which was created in 2000. I then researched each cave individually, and only removed it once I had determined that there were no signs present. There were several cases where no signs were actually listed in any of the inventories (for example Pair-non-Pair), but I was able to visually identify them by looking at images from the site, or found them attached to the description of an animal or human image rather than being seen as a separate entity. I also searched through all the major journals (and the French regional ones), looking for discoveries that post-dated these listings, and found several exciting new discoveries to add to this inventory (including Margot in Mayenne and Grotte d’Antoine in the Dordogne). I ended up with 143 physical sites, which converted to 153 total sites, as I included each period of occupation with related signs as its own entity for trending purposes.

Other than some difficulties in accumulating sufficient data for each site, probably the most challenging part of this project was creating a typology of the sign types out of several regional versions. Gonzalez Morales has cautioned that we must be aware of the possibility that these categories were created because they appeared to have the same meaning to the researcher, rather than having been organized this way by the artist (1997: 195). Many of the earliest sign types were assumed to be narrative, or pictographic in

nature, and were named accordingly using a Latin-based typology (for example penniform = spear or arrow, tectiform = hut or animal trap, and claviform = club), and a hunting magic theme (Bahn & Vertut 1997: 167). Bahn has suggested that while these interpretive names are no longer taken literally, they are now so embedded in the literature that they have been retained as general descriptions of certain sign type shapes (1997: 167). Based on this, I included these descriptive category names in my typology since they are the most widely recognized designations (see below for the full description of each of these categories within the typology). One could also make the argument that Leroi-Gourhan's binary division of the signs into male and female categories (1967, 1982, 1986) had a similar impact when it came to adding the term 'sexual symbol', and variants upon that theme, to the nomenclature. But these have not been included in the typology due to the interpretive nature of this theory and the variety of geometric shapes which underlie these broad categorizations.

With different researchers working in each of the regions, often at separate times, some of them have chosen to use alternate category names, or have grouped the signs in a different way. This resulted in some confusion when trying to ascertain whether non-figurative signs from two different sites were in fact the same (especially if there are no images), which is necessary when trying to create a typology. Part of the issue with multiple names for the same geometric shape seems to stem from the desire of later researchers to distance themselves from the early interpretive names. In an attempt to be more objective, what used to be called an arrow is now identified by some as "a chevron with a median longitudinal line" (Bahn & Vertut 1997: 174). Within this chapter, I will

be defining the salient characteristics of each sign type, as well as acknowledging the alternate names which I have collapsed into each category.

Trending the Data

With the database complete, I was able to begin the process of trending the data. I did this in two ways: the first involved using Microsoft Excel to generate temporal graphs, and the second involved using Google Earth to create spatial maps. I produced two different kinds of temporal graph, both of which were at the sign type level, and evaluated the sites across time. For the first graph, I looked at the percentage of signs present in each period compared with the total number of sites with that particular sign type. In order to balance the effect of having such a large number of Magdalenian sites (74 total), I also created a second type of graph that looked at the presence of the signs in each period compared to the total number of sites known from the same time frame. Using this second style of comparison, I was surprised by how much the percentages changed, making it a worthwhile inclusion in this study.

In order to add a visual aspect to the trending, I input the geographic coordinates for each site by stylistic time period into Google Earth's terrain map. This made it possible to look at all locations where a sign type was present simultaneously, or to zero in on a specific time period (or periods) where I was seeing interesting patterns. The flexibility of this program to zoom in and out, and to add or remove sites and time periods easily, contributed to the degree of resolution I was able to achieve when tracking the movement of each sign type across the time and space of the study region. Both of these trending methods can be seen in the following chapter along with the data analysis for each sign category.

Database Categories and Description

Site name: This is the base unit for the database, and all data were input in relation to its presence or absence at the individual site level. For sites where there was more than one name, I tried to choose the most widely recognized one.

Geographic Coordinates: Coordinates were obtained for every site in the database. It was difficult to find the precise coordinates for all the sites (the majority I did find came from the UNESCO World Heritage site), so if sites were not on this list, I used the coordinates for the closest known settlement. In nearly all cases there was a community within one to two kilometres of the site (almost none were further than five kilometres). I felt that since my goal was to look for large-scale patterning, this margin of error was acceptable. These coordinates were all converted to decimal degrees to make them more compatible with the computer programs I was using.

Regional Location and Country: I followed the French system of assigning sites to the residential departments in which they are situated. With the geographic coordinates known, this artificial division becomes less relevant, but considering much of the literature addresses the sites by regional groupings (for example the Dordogne, or the Ardèche), it still seemed like a useful category, as it allows the sites to be filtered by regional affiliation. At this point, the only country represented is France, but I built in the capacity to add other countries for when I wish to expand the database.

Comments: This was the field where I could elaborate on how the site was dated (stylistic versus chronometric, or a combination of both). I also provided as detailed an

inventory as possible of what geometric signs were present at a site. This included exact number if known, method of production for individual signs within a site (painting and/or engraving, plus the colours if known), any contested signs at the site, and any non-figurative images that I had moved from their original designation (example vulva to circle), or that I saw, but were not identified in official inventories.

Location Type

Cave: The vast majority of the sites fell into this category. Clottes has suggested that this predominance of cave sites is based on environmental factors, which make them excellent places to find well-preserved evidence of ancient human behaviour and activity (2005: 21). While there is recent scholarship examining where the art is located within a cave (see for example Clottes 1997, 2005), I did not choose to highlight these differences in my research unless multiple periods of occupation occurred in different locations within the site. If I felt it was relevant to a discussion of how representations within a site were assigned to different periods (see for example Pech-Merle), then I did include this information in the comments section.

Rock Shelter: Decorated rock shelters were often inhabited as opposed to the deep caves where there is very little evidence of long-term occupation (Clottes 1997: 203). For this reason, I thought it important to differentiate this site type from the decorated caves, as there is a different pattern of usage, and recent research has suggested that there may have been some thematic variance in what was depicted (see for example Clottes 1997, 2005, Lewis-Williams 2002).

Open-air: While it has long been thought that parietal art must have existed at open-air sites along with the portable art (Bahn 1998: 155), it is only fairly recently that any sites have been found to confirm this. The site of Fornols Haut near Campôme is the only site I currently have in this category, but knowing that this type of site has also been found in the Côa Valley in Portugal, and the search is on for more of these open-air locations, I thought it was important to give it its own category.

Dating Methods

Stylistic period [Timeline from Vialou (2006: 308-311) and Clottes (2008: 313-315)]:

- Aurignacian: 35,000 to 28,000 BP
- Gravettian: 28,000 to 22,000 BP
- Solutrean: 22,000 to 17,000 BP

The Magdalenian period is sometimes further divided into the Early, Middle and Late Magdalenian periods, but these can be quite subjective or localized divisions. For the purposes of my research I chose to separate it into only two sub-sections, where I felt that the stylistic change was significant enough to warrant a different categorization:

- Magdalenian: 17,000 BP to 13,000 BP
- Late Magdalenian: 13,000 BP to 10,000 BP (this sub-category covers the terminal end of the Pleistocene)

Date Range: As mentioned above, if no chronometric dates were available, I gave the site the date range of its associated stylistic period. If I was able to obtain some more

precise dates, these were entered as a maximum and minimum by expanding the dates which always include some potential uncertainty (+/-) to give it the widest possible range.

Method of Production

Painting: This category includes not only painting, but also drawing, with my criteria being that something was applied to the cave walls, rather than being etched in. I also included all the paint colours as separate categories so they could be identified as present or absent. I only incorporated the colours that applied to the non-figurative images within my dataset. These colours are red, black, yellow, white and brown.

Engraving: Along with the more typical definition of engraving as using some sort of implement to mark the walls, I also included finger fluting in this category as it has the same sort of effect, just without the use of a tool.

Non-Figurative Typology

Aviform: This term comes from the Latin word for bird-shaped (Bahn & Vertut 1997: 167). A typical aviform is defined as "a geometric sign consisting of a kind of thick horizontal bar with a downward extension at each end and an upward bar at its centre" (Clottes 2008: 315). Alternative names for this category include 'accolade signs' (used by Lorblanchet, especially in the Lot region), and named after the type of

punctuation bracket it resembles '{', and 'Placard-type signs' (used by Clottes), named after one of the caves that has this sign type in it (Bahn & Vertut 1997: 167).

Circle

Circle: This geometric sign is shaped exactly how one would think. Circles are also sometimes identified as being a vulva, or an incomplete vulva in a site inventory (Bahn & Vertut 1997: 187).

Claviform

Claviform: This term comes from the Latin word for club-shaped (Bahn & Vertut 1997: 167). A typical claviform is defined as a vertical bar with a small bump at the upper end (Clottes 2008: 314). It is also known as a 'P-sign' (Marshack 1972: 311), and is sometimes interpreted, and therefore identified in inventories, as a stylized female figure (Bahn & Vertut 1997: 167).

Cordiform

Cordiform: This term comes from the Latin word for heart-shaped (Clottes 2008: 314), and rather than resembling an actual heart, it is shaped more like the Western version associated with Valentine's Day, making it a fairly interpretive category name.

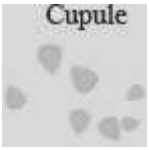
Crosshatch

Crosshatch: The Merriam-Webster online dictionary defines this term as "two series of parallel lines that intersect" (http://www.merriam-webster.com/dictionary/crosshatch). The versions found at Paleolithic sites do not tend to be quite this neat, and often have more than just two series of intersecting lines.

Cruciform

Cruciform: This term comes from the Latin word for cross-shaped (Bahn & Vertut 1997: 167), and is basically just two parallel intersecting lines, with no specific orientation in this context.

Cupule



Cupule: This sign type is also sometimes referred to as a 'cup-mark', and is defined as "a small, shallow and usually circular depression, a few centimetres in diameter, dug into the surface of a rock face" (Clottes 2008: 314). It is basically an engraved dot.

Dot

Dot: As the name implies, this sign type consists of varying sized points, always done with paint or by drawing (Vialou 2006: 311). In the early days of the

discipline, dots were sometimes identified as “wounds” in site inventories, and were part of the hunting magic hypothesis (Gould 1996: 18).

Finger Fluting

Finger Fluting: Also known as digital fluting, ‘macaronis’ or ‘meanders’ (Vialou 2006: 310), finger fluting is the act of making lines by drawing fingers over a soft surface (Sharpe and Van Gelder 2006: 281). In volume, these markings account for a sizeable proportion of cave art in France, and can be figurative in shape, form non-figurative patterns or motifs, or “present no recognizable symbol, picture or pattern” (Sharpe and Van Gelder 2006: 281). While finger fluting is most certainly a technique in the production of art, it is the third category where there is no discernible pattern or image that makes me also include it as a sign type in its own right. When the end goal was simply to make these markings, not use this technique to create a defined representation, it becomes a type of sign, separate from its other uses, and has been defined as non-figurative (Sharpe and Van Gelder 2006: 281).

Flabelliform

Flabelliform: This was actually a category I created using the Latin-based naming convention, and means fan-shaped. I noticed that there was a whole grouping of signs that had different names, with no single term being predominant. They have been variously described as comets (Graziosi 1960), radiating light beams (Lorblanchet), a goose foot (Brigitte and Gilles Delluc), and broken, double vulvas (Bahn & Vertut 1997:

187). They generally look like an open-angle sign, but with multiple interior lines extending from the apex.

Half-Circle

Half-Circle: As the name suggests, this sign type is half of a circle, but was common enough that I felt it needed its own category rather than being lumped in with complete circles. This category is also sometimes known as an incomplete vulva (Bahn & Vertut 1997: 187).

Line

Line: This is one of the simplest and most common signs found at parietal art sites. Early researchers commonly ignored lines, and Breuil in particular interpreted many of them as *traits parasites*, and often failed to record them when documenting the images at a site (Bahn and Vertut 1997: 51). Being aware of this omission, I made a point whenever possible of assessing for myself, or relying on later research, to determine whether this sign type was present at a given site.

Negative Hand

Negative Hand: I have included this as a sign type, even though it is technically recognizable as being in the shape of a hand, because of the common pattern of missing fingers, suggested by some to represent "a kind of gestural language or code" (White 1986: 113). It is also known as a hand stencil, and is made by placing the hand

against the wall, and spraying it with paint (Clottes 2008: 314); it is never made by engraving.

Open-Angle

Open-Angle: This sign type is named for its geometric form, and is defined as being shaped like a 'V', and sometimes having one bisecting line (Vialou 2006: 308). I have included chevron with this sign type, since it is basically just two or more open-angle signs in a column formation (Vialou 2006: 309), and does not seem distinct enough to merit its own category. Open-angles are also sometimes identified as being a vulva, or an incomplete vulva in a site inventory (Bahn & Vertut 1997: 187).

Oval

Oval: This sign type is named for its geometric form, and as the name implies, is shaped like an oval. This sign type is also sometimes identified as being a vulva (Bahn & Vertut 1997: 187).

Pectiform

Pectiform: This term comes from the Latin word for comb-shaped (Bahn & Vertut 1997: 167), and as the description implies, has a central line, with a series of lines extending from one side of it at 90° angles. I debated whether to combine this sign type in with the penniforms, since they have many similarities, but after having seen some

very distinct pectiforms in Spanish sites such as Cueva la Pileta, I believe it should have its own category.

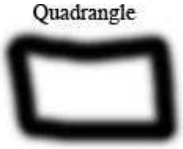
Penniform

Penniform: This term comes from the Latin word for feather-shaped (Bahn & Vertut 1997: 167). It is defined as a "sign with a branching or branchlike shape" (Clottes 2008: 315), and as being reminiscent of a feather (Vialou 2006: 309). There are many other terms used to identify this sign type including barbed signs (Vialou 2006: 311), ramiform signs (Clottes 2008: 315), and arrows, missiles or projectiles (Bahn & Vertut 1997: 172).

Positive Hand

Positive Hand: This sign type is created by pressing all or part of the hand to a parietal surface, after having applied paint or clay to the palm side of the hand (Clottes 2008: 315). I have included it for the same reasons for which I included the negative hand category.

Quadrangle



Quadrangle: This sign type is named for its geometric form, and I chose this particular version of a four-sided shape, since it as a bit more generalized than some of the other four-sided figures. With that in mind, I have included trapezoids, rectangles

and squares in this category, since none of them seemed distinct enough to merit their own class. As well, since a parietal quadrangle is defined as occasionally having appendices extending from it, or as being filled in (sometimes with smaller quadrangles such as we see at Lascaux) (Vialou 2006: 311), I have also included the categories of scutiform (meaning shield-shaped, or a quadrangle with extending lines), and "cloisonné" (used by Brigitte and Gilles Delluc to refer to quadrangles with interior crosshatching) in this sign type. Additionally, any signs identified as squared vulvas or 'trouser vulvas' were also included (Bahn & Vertut 1997: 187).

Reniform

Reniform: This term comes from the Latin word for kidney-shaped, and I first saw it used to describe some of the geometric shapes from Abri Cellier (Davis 1987). While this shape is a bit ambiguous, it did not seem close enough to either a circle or an oval to be included with those sign types, so I chose to leave it in its own category.

Scalariform

Scalariform: This term comes from the Latin word for ladder-shaped, and I first saw this term being used to describe the geometric sign above the fish at Abri du Poisson (Roussot 1984). As the name suggests, this sign type is composed of two parallel lines, with interior lines connecting the two main lines at 90° angles. I felt this form was distinctive enough to merit its own category.

Serpentiform

Serpentiform: This term comes from the Latin word for serpent-shaped, and in form looks like a curving zigzag.

Spiral

Spiral: This sign type is named for its geometric form, and as the name implies, is shaped like a spiral.

Tectiform

Tectiform: This term comes from the Latin word for roof-shaped (Vialou 2006: 311), and the defining characteristics of this sign are a downward facing open-angle sign (like a peaked roof), with an interior vertical line also extending downwards, and having a horizontal line for a base. Some early researchers actually interpreted it as representing a hut or some sort of trap (Bahn & Vertut 1997: 172), and the term tectiform, related to these interpretations, remains widely accepted as its category name, even though the meaning is no longer seen to be certain.

Triangle

Triangle: This sign type is named for its geometric form, and as the name implies, is shaped like a triangle. The biggest issue surrounding its name is that it is also widely identified as a vulva (Bahn & Vertut 1997: 187), but considering the interpretive

nature of that classification, if they are independent of a female figure I have chosen to call them all triangles.

Zigzag

Zigzag: This sign type is named for its geometric form, and as the name implies, is shaped like a zigzag.

While the majority of the categories in the database were in place from the beginning, the typology section actually remained more fluid until the end. This was a necessity since each new site that I examined had the potential to add more categories to the typology. The 26 sign types I have included are the end result of this process, and offer a fairly definitive organization of the geometric shapes I observed at the 153 sites included in this study. These non-figurative images were the starting point of all the trending I went on to do, and therefore a clear understanding of the sign categories is necessary before proceeding to the results I obtained. Having outlined the organization of my research, and defined the categories of the non-figurative signs themselves, I will now be turning to the intriguing part of this research, the spatial and temporal findings.

Chapter 4: Interpretation of Results by Sign Type

Some authors study the subject matter in Paleolithic art synchronically, without taking into account the chronology of the entire tradition. This denies a historical dimension to the Paleolithic art and negates the dynamics of change throughout the thousands of years of its development (Gonzalez Morales 1997: 190).

The focus of this chapter is the results I obtained by trending the sign types across both time and space. By bringing these two elements together, the interpretation I was able to achieve was multi-dimensional, and many suggestive patterns presented themselves. I dealt with each sign type individually, and have included a chronologically written description of spatial movement, as well as incorporating the graphs and some spatial imaging for each category. At the end of the interpretation, I have highlighted some of the more interesting trends, and suggested possible explanations and areas for further study.

Before introducing the sign types themselves though, I wanted to touch on the two large-scale graphs which I created to assist with this analysis and that both appear below. The first records the total presence of sign types in the study region with the temporal aspect removed. This graph is based on the 153 sites included in the research, and documents how many of the sites overall contained each sign category. This seemed like a good place to start as it gave me a general feel for how frequently the sign types occurred, and allowed me to see which ones were generally the most popular to reproduce. The second graph focuses specifically on the temporal aspect of the study, breaking down the total number of sites by time period. I knew that in many cases the Magdalenian would be over-represented due to the larger number of sites from this period (White 1986: 47-48), and this graph gave me a better sense of how the sites were grouped temporally.

Table 1 - Total Presence of Sign Types in UP France (n=153 sites)

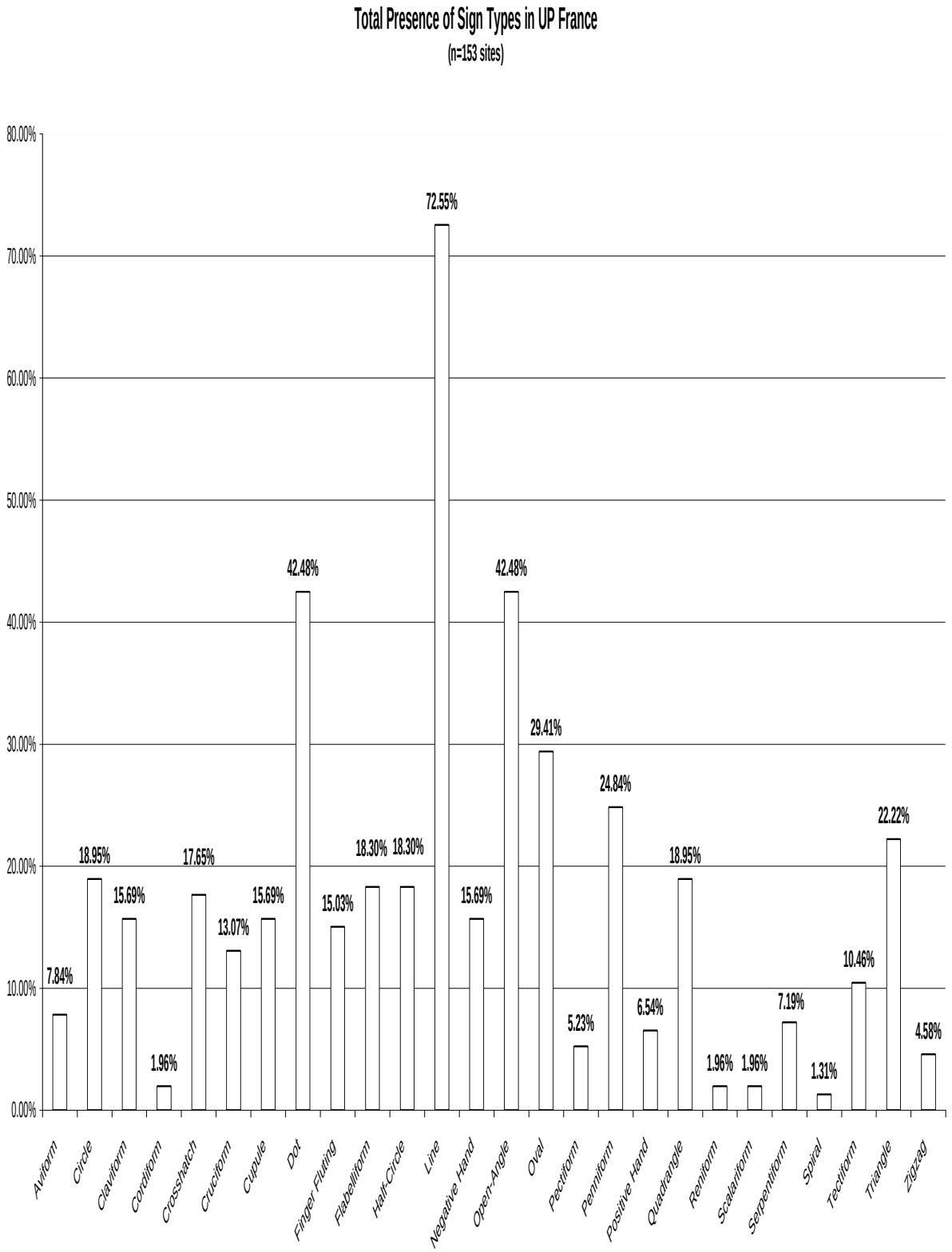
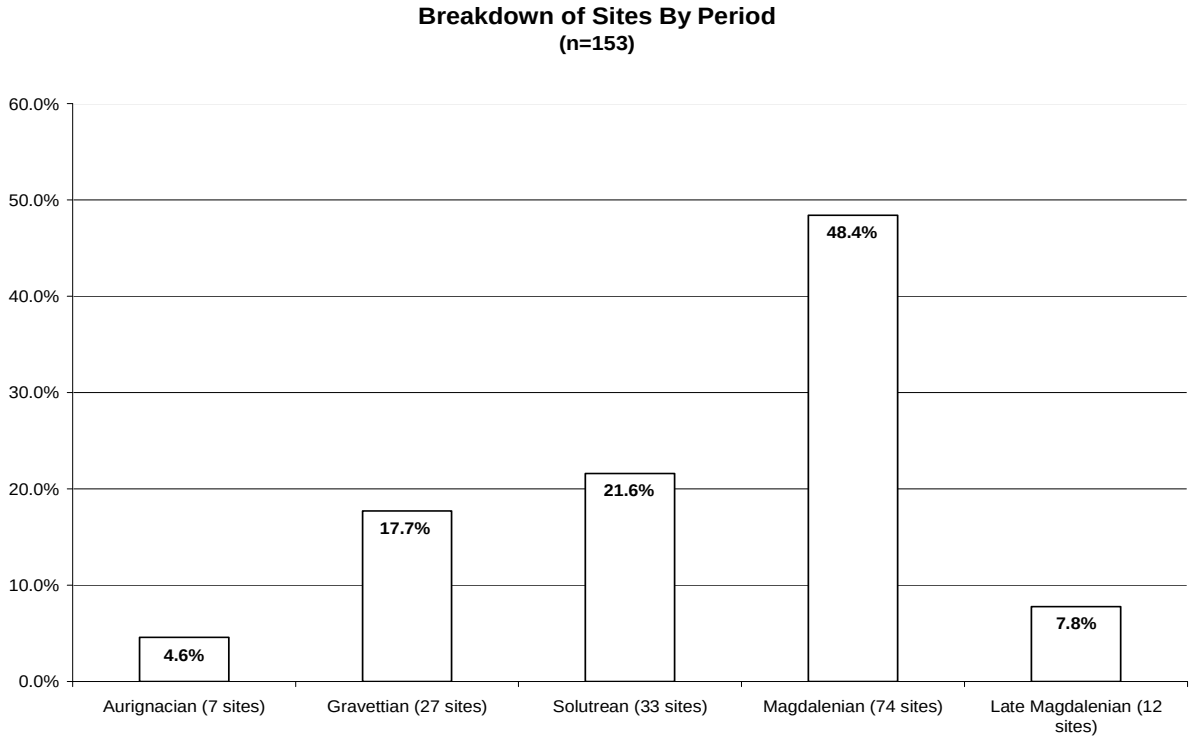


Table 2 – Breakdown of All Sites by Period



Interpretation of Individual Sign Types
Note: the stylistic periods are colour-coded on the spatial maps. The Aurignacian is white, the Gravettian is blue, the Solutrean is green, the Magdalenian is pink, and the Late Magdalenian is yellow.

Aviform

Only 12 sites have aviforms present, making it quite a rare category. It occurs in three periods: the Aurignacian, the Solutrean and the Magdalenian. Clottes has suggested that this sign type is at its peak in the Solutrean (2008: 315), and he is correct in that assertion. Aviforms are present in one out of every five sites from this period (21.2%), and when compared across time, the Solutrean accounts for 58.3% of all known sites containing this sign type. The geographic distribution during the Solutrean is quite

broad, ranging from the Charente in the middle of the country, to sites along the Pyrénées, near the Mediterranean, and in the Ardèche to the east. There are only four Magdalenian sites with aviforms, giving it an occurrence frequency in this period of 5.4%. Spatially, there is a visible contraction of the range of this sign type, with it now centered on the Dordogne/Lot region (3 sites), and one site located near the Pyrénées. There is a single Aurignacian site, Grotte Chauvet in the Ardèche, but since there are no Gravettian sites with this sign type, it is hard to make an argument for continuity. One possible way to resolve this question would be to bring the Spanish sites with aviforms into this discussion (for example La Pasiega and Altamira), in case the sign type moved south, before returning north at a later period. As well, seeing as how unusual aviforms are in France, it would be interesting to look at the extent of its presence in Spain, as well as elsewhere in Eurasia.

Table 3 - Aviform Period Frequencies

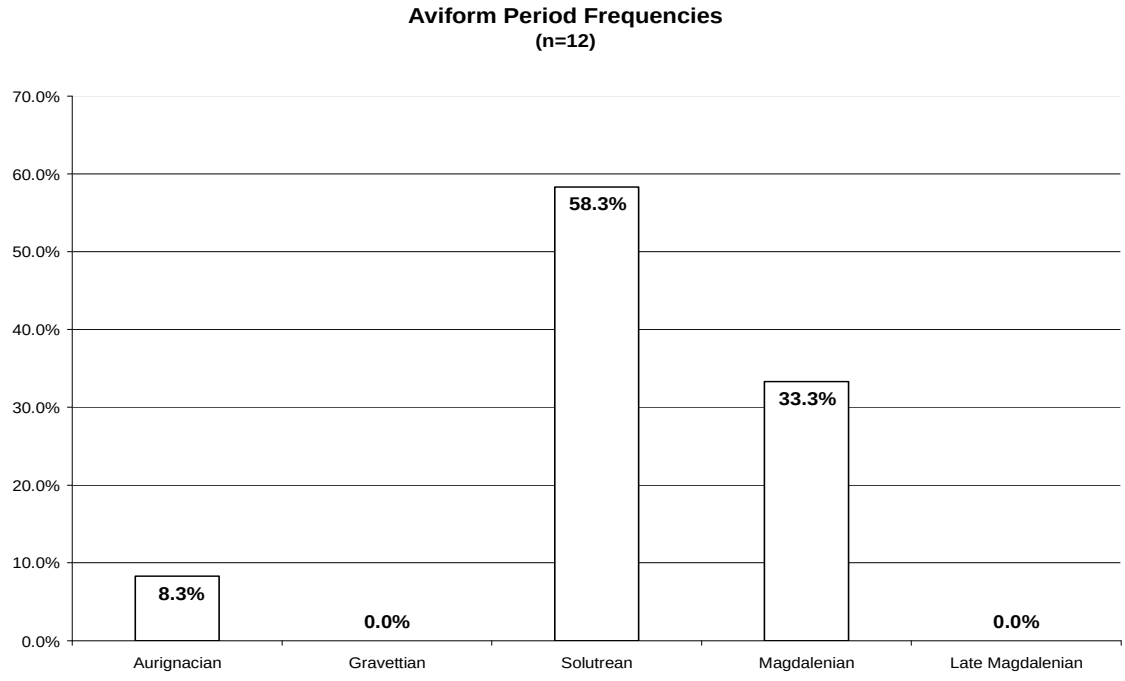


Table 4 - Proportion of Aviforms to Period Site Totals

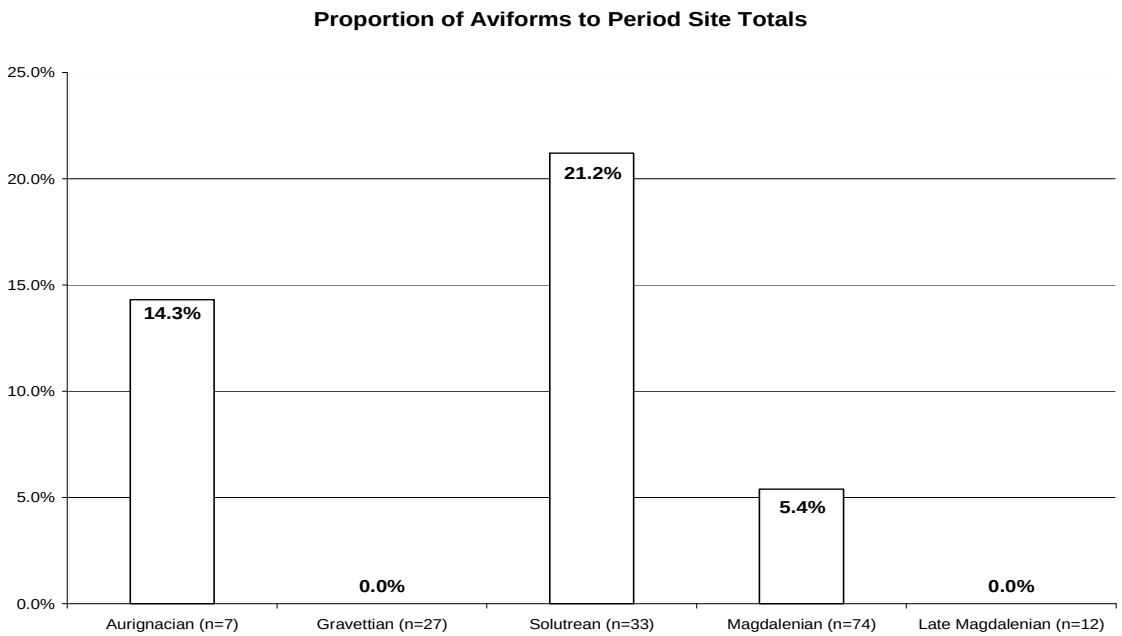


Figure 1 - Aviforms: All Periods

Circle

Circle

This sign type is present at 29 sites and occurs in all periods. When compared proportionally with period site totals, the highest frequency is in the Aurignacian (42.9%). There is also a fairly even presence in the Gravettian (14.8%), Solutrean (15.2%) and Magdalenian (21.6%), and a tapering off in the Late Magdalenian (8.3%). It has a broad spatial range in the Aurignacian, with sites in the Dordogne, on the Mediterranean, and in the Ardèche. In the Gravettian the sites are restricted to three sites in the Dordogne/Lot region, and one site located near the Pyrénées. The Solutrean sees a return to the Ardèche with two sites in this region, a continued presence in the Dordogne, also with two sites, and one site near the Pyrénées.

While it might not have the highest proportional frequency, the Magdalenian does have the largest number of sites with circles (16), and there are some clear patterns that emerge. Circles are no longer present at sites in the Ardèche/Gard region, but are strongly represented along the length of the Pyrénées with ten sites in this region. There are also four sites in the Dordogne, and two sites to the north, Gouy being in the far north, and Blanchard located halfway in between. There is only one Late Magdalenian site located in the Dordogne. Based on the northerly trajectory suggested by Blanchard and Gouy in the Magdalenian, it would be intriguing to compare these sites with those in the UK that are associated with the Creswellian industry. Another interesting feature of this sign type is the sharp decrease in usage during the Late Magdalenian, with there being only one site left in France for this period. Enlarging the scope of this study could

answer the question of whether circles became an unpopular choice, or if their use just moved into different parts of Eurasia.

Table 5 - Circle Period Frequencies

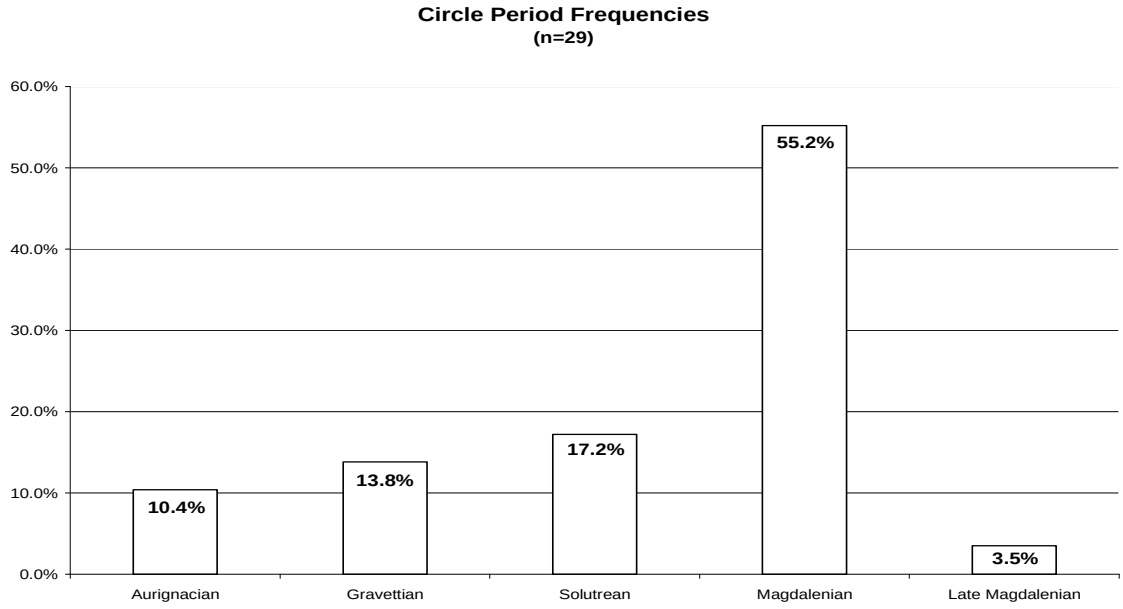


Table 6 - Proportion of Circles to Period Site Totals

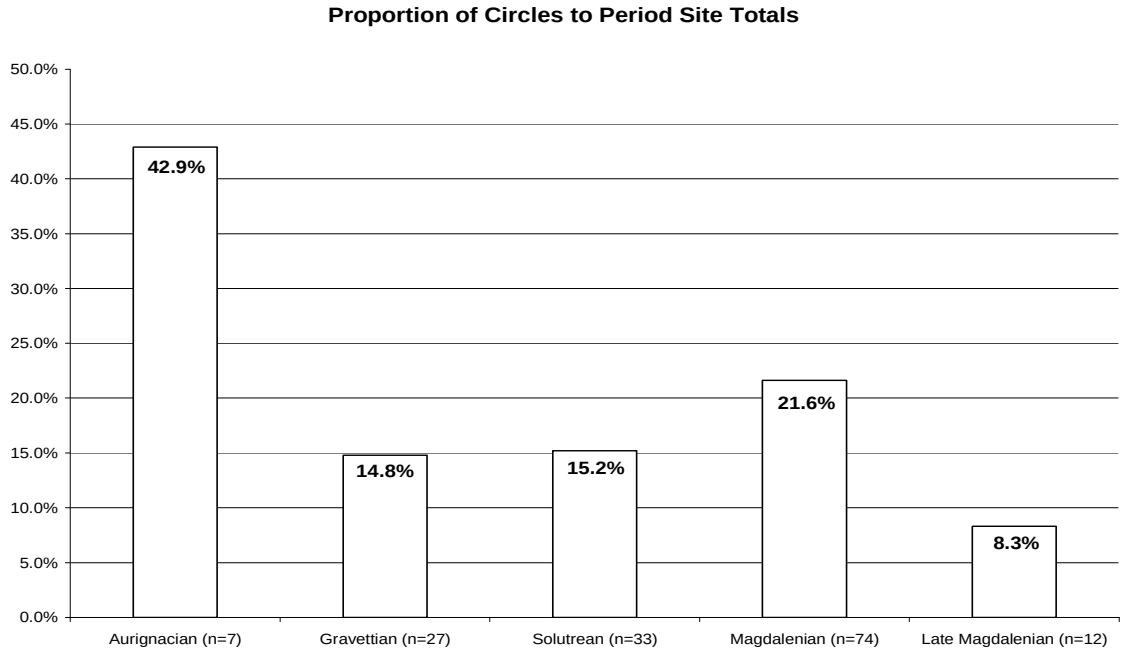


Figure 2 - Circle: Aurignacian, Gravettian and Solutrean sites

Figure 3 - Circle: Magdalenian and Late Magdalenian sites

Claviform

Claviform

The first appearance of this sign type is in the Solutrean, suggesting either a later innovation or an import from another region. Altogether there are 24 sites where the claviform is present. When looking at the proportion of sites with claviforms compared to the number of sites from each period, there is a clear upward trend of use: 12.1% in the Solutrean, 23% in the Magdalenian and 25% in the Late Magdalenian. This suggests a continued and growing importance of the symbol type once it had been introduced. Traditionally, it was believed that the distribution of the claviform sign was heavily centered on the Ariège region of the Pyrénées (Bahn & Vertut 1997: 168, Vialou 2006: 309). While this region is an important focal point of this sign type, it is by no means exclusive to this area. In fact, during the Solutrean, three out of the four known sites are far to the east in the Ardèche/Gard region, and only the Les Trois-Frères site is in Ariège.

In the Magdalenian, there are two clear groupings of eight sites each, one along the Pyrénées, and the other in the Dordogne/Lot region. There is also one occurrence of this sign type in Northern France at the site of Gouy. The Late Magdalenian shows a similar pattern, with one site in the Dordogne, and two along the Pyrénées. Considering that there are also sites in Spain with this sign type (for example El Pindal and La Cullalvera), an opportunity for further study would be to incorporate this region, looking for larger-scale temporal and spatial patterning. This might also help to determine whether this sign type was imported from Spain (or elsewhere), or if it originated in the French region during the Solutrean period.

Table 7 - Claviform Period Frequencies

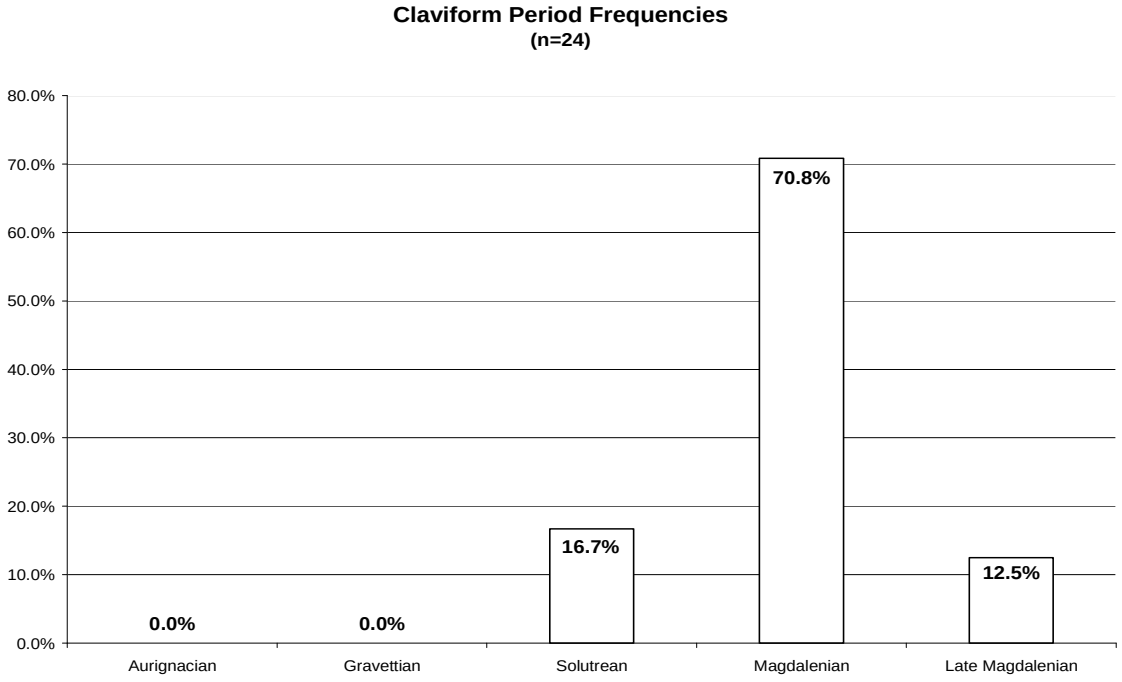


Table 8 - Proportion of Claviforms to Period Site Totals

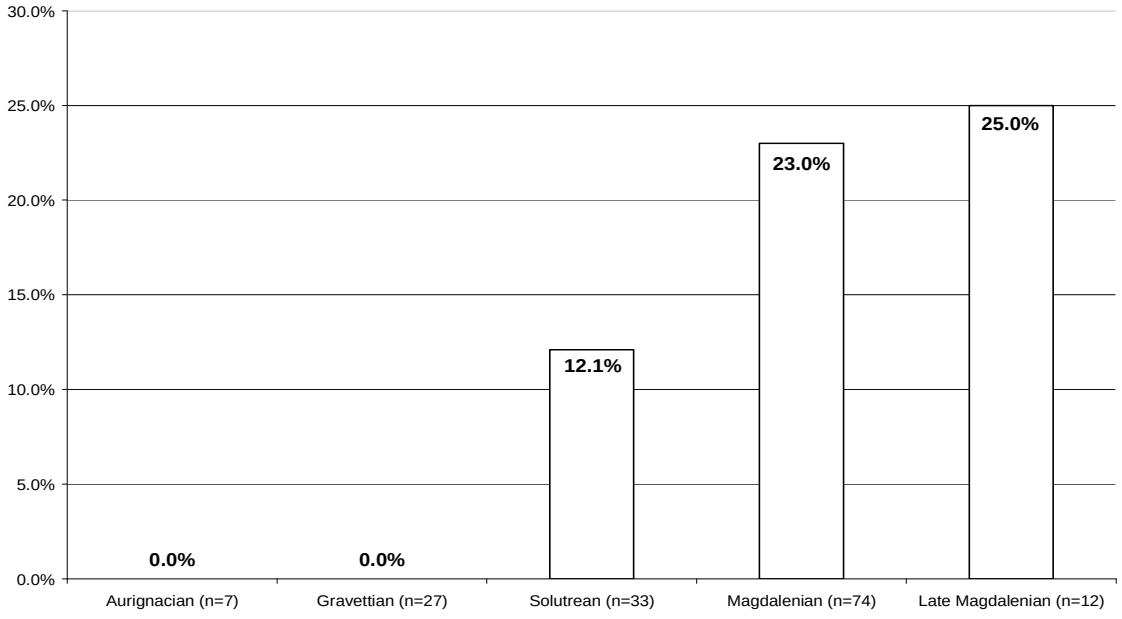


Figure 4 - Claviform: All Periods

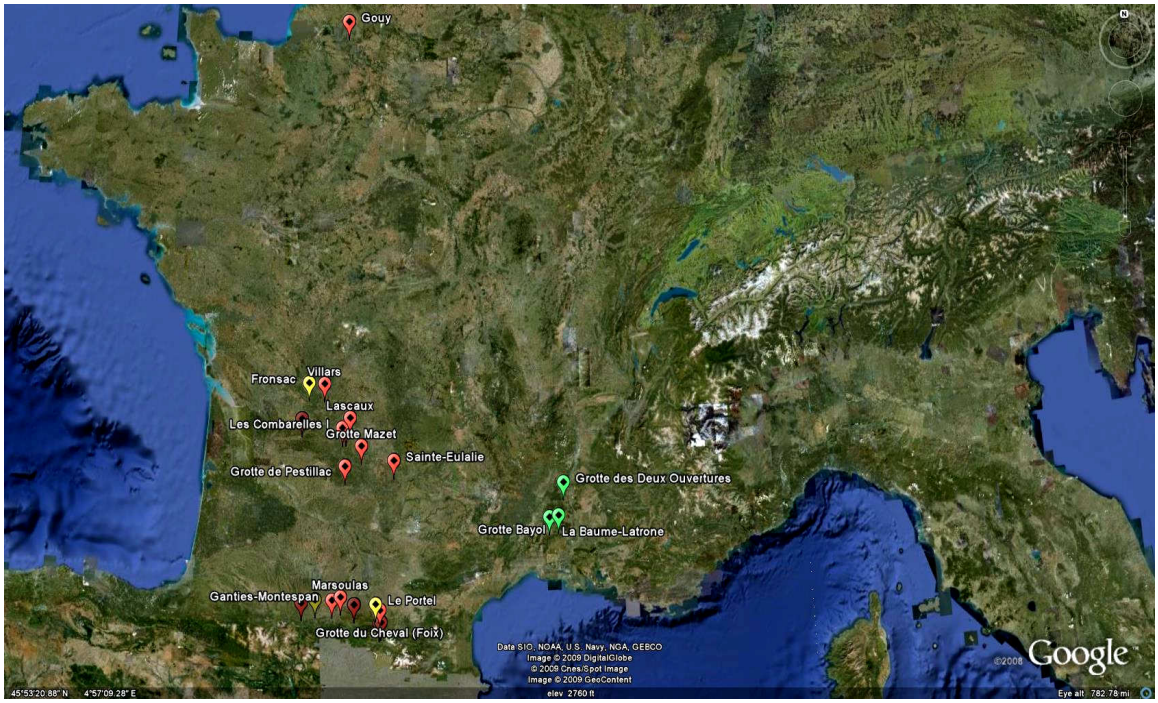


Figure 5 - Claviform: Close-up of S. France - All Periods

** For more claviform images, see Chapter 5

Cordiform

With only 3 sites in three different periods throughout the entire UP, this dataset is not really large enough to interpret in any meaningful way. Though two of the sites are located in the Ardèche, one is from the Aurignacian, and the other is from the Late Magdalenian, suggesting a temporal distance of at least 15,000 years, and making it doubtful that this is more than coincidence. Added to this is the fact that the Aurignacian site is Grotte Chauvet, thought to have been blocked off by a rock collapse sometime in the later Gravettian period (Clottes 2003), making it unlikely that the later group ever saw this earlier example. The other site is located in the Ariège region of the Pyrénées.

Table 9 - Cordiform Period Frequencies

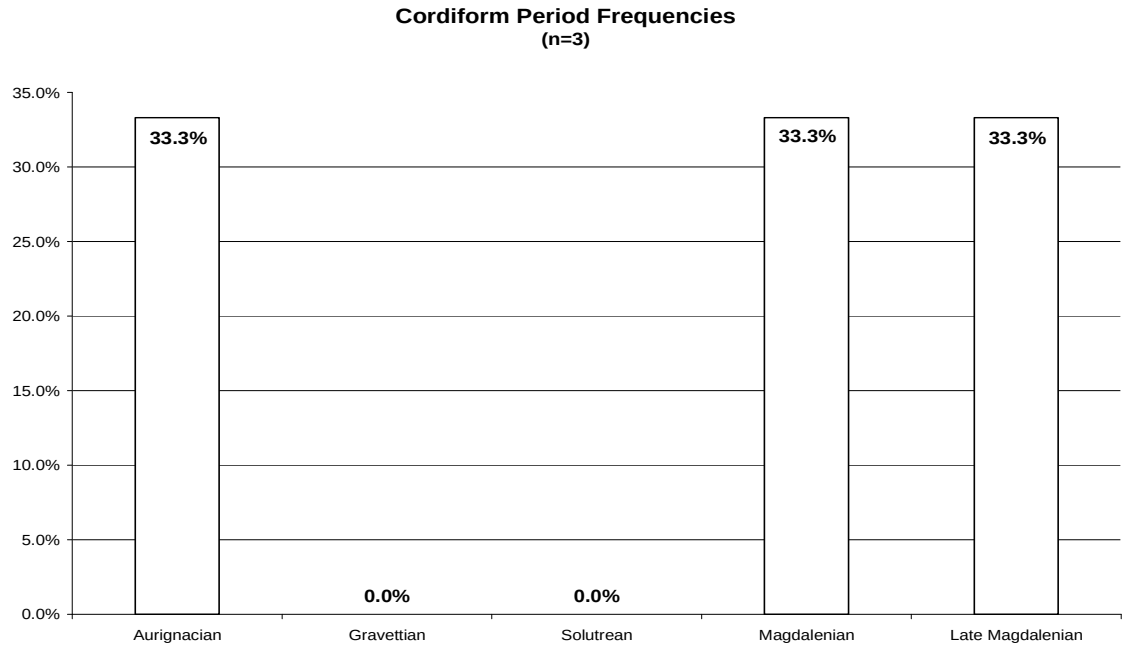


Table 10 - Proportion of Cordiforms to Period Site Totals

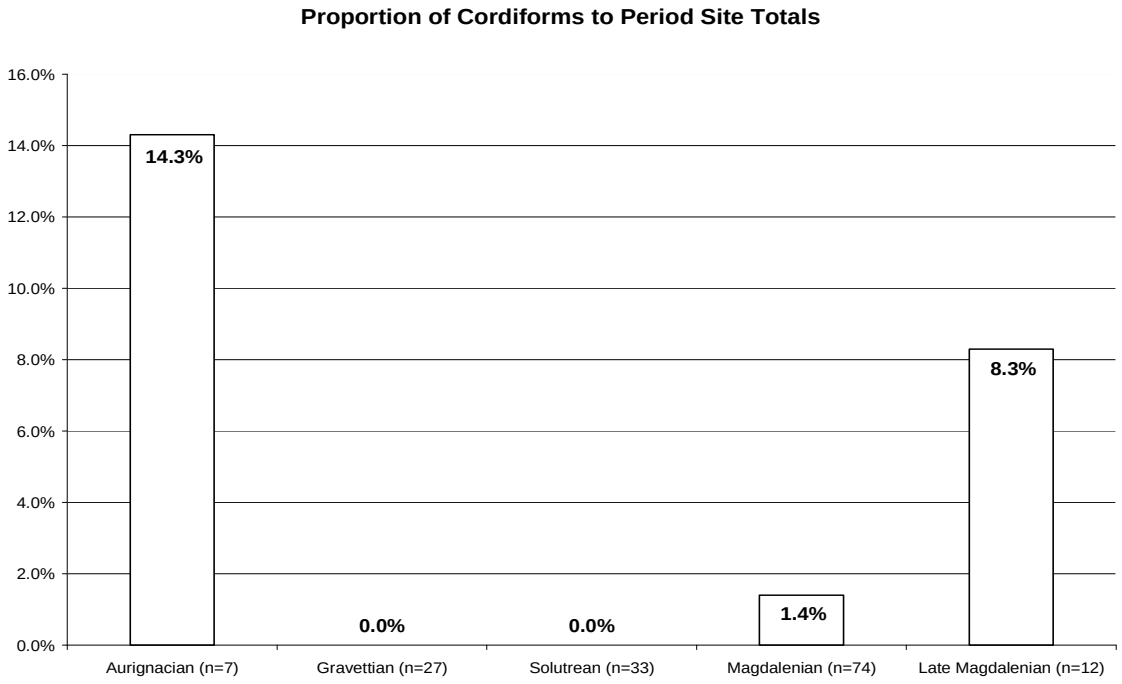
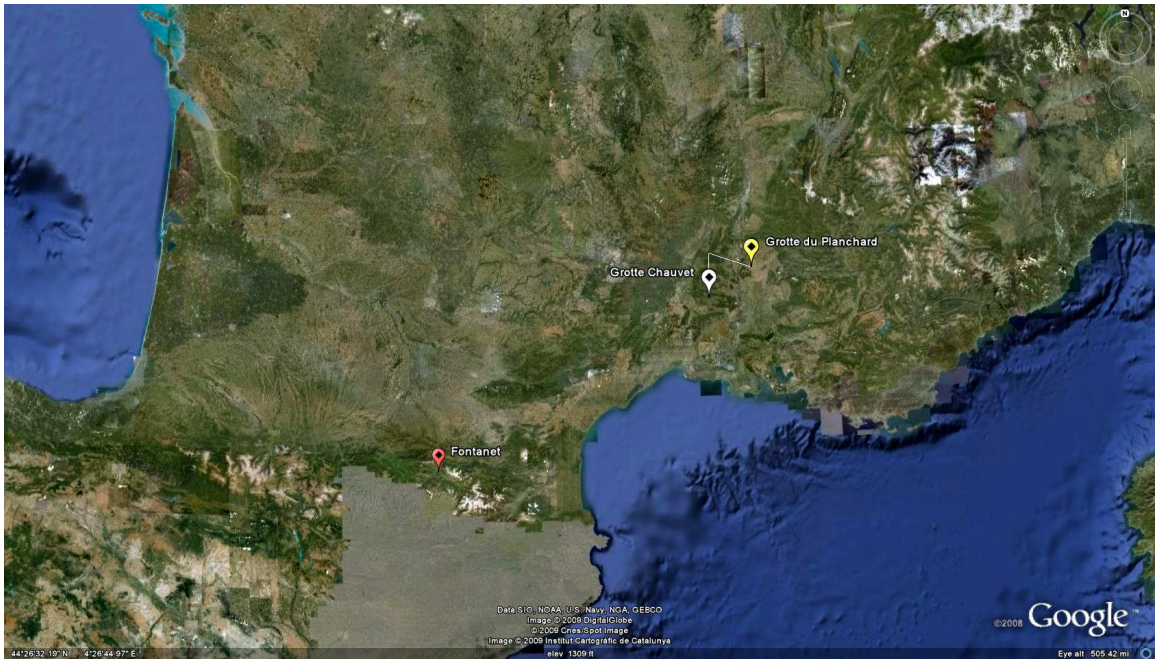


Figure 6 - Cordiform: All Periods



Crosshatch

Crosshatch

Out of the 27 sites where this sign type is present, 22 of these are from the Magdalenian. With only one site each in the Aurignacian, Gravettian, and Solutrean, it is hard to know what made people choose to keep reproducing this sign in such a small percentage of the sites. The Magdalenian explodes on the scene with nearly one in three caves from this period including the crosshatch symbol. There is a clear grouping of sites along the Pyrénées using this sign, as well as a strong presence in the Dordogne, Lot and nearby regions. There are also two sites in the north with crosshatch signs from this period, but none in the Ardèche/Gard region. The Late Magdalenian displays a sharp drop in frequency, with only two sites from this period having crosshatch signs present. When I see such an abrupt change in popularity, both before and after the Magdalenian, it makes me quite curious as to whether this pattern would become any clearer if there was a larger spatial dataset to work with.

Table 11 - Crosshatch Period Frequencies

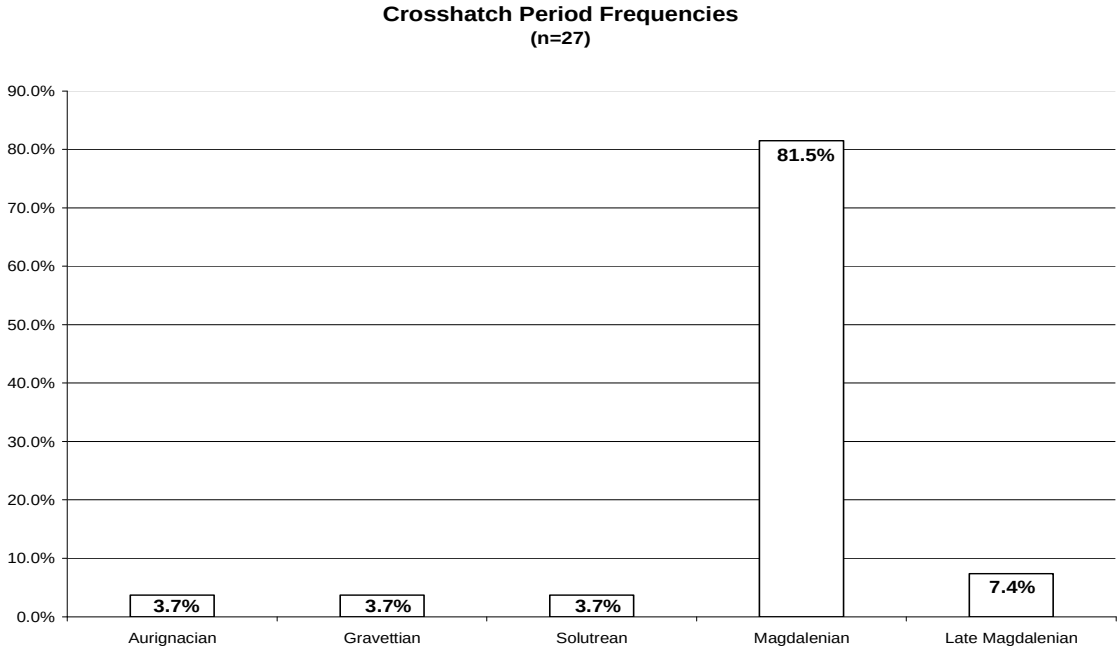


Table 12 - Proportion of Crosshatches to Period Site Totals

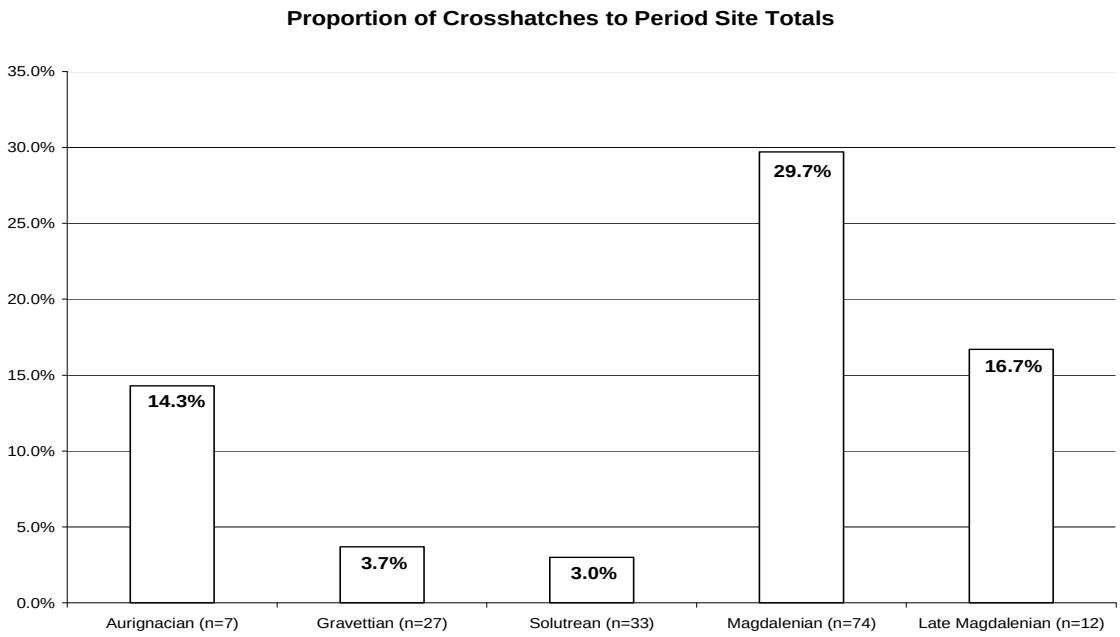


Figure 7 - Crosshatch: All Periods

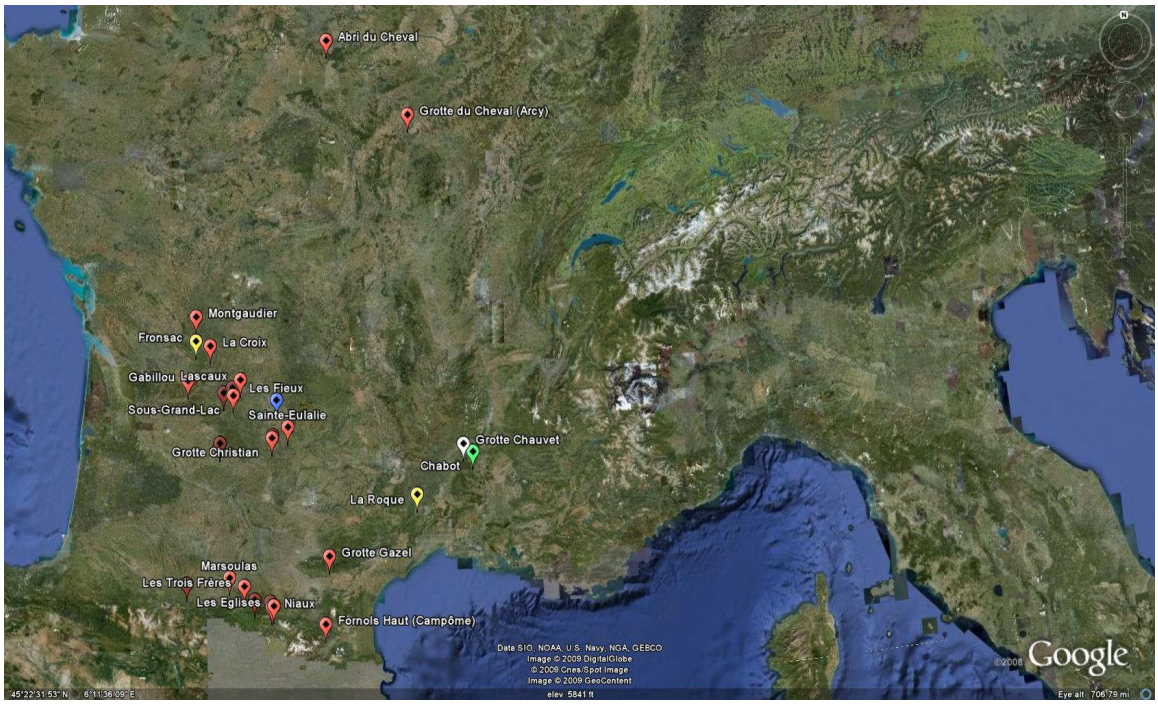


Figure 8 - Crosshatch: Close-up of S. France - All Periods

Cruciform

Cruciform

This sign type is present at 20 sites and occurs in all periods, though the majority of occurrences are in the Solutrean (4 sites) and Magdalenian (12 sites). There is a steady increase in the presence of cruciforms up to the Magdalenian, at which point it decreases sharply in the Late Magdalenian (1 site). When compared proportionally within the timeframe of each period, the Aurignacian demonstrates an increased occurrence at 14.3%, as does the Late Magdalenian (8.3%), but the Magdalenian remains the period of highest occurrence with 16.2%.

The only site from the Aurignacian is located in the Ardèche, while the Gravettian sites consist of one in the Dordogne, and one near the Pyrénées. In the Solutrean this sign type shows a broader distribution pattern, with one site in the Ardèche, one on the Mediterranean, and two sites in the Lot region. During this period, there are no sites with this sign type present near the Pyrénées. The Magdalenian sees a polarization of the sites, with a grouping of seven sites in the Dordogne/Lot region, and another grouping of five sites along the Pyrénées. The only Late Magdalenian site is located in the Dordogne. Interestingly, this sign type does not appear in any of the northern sites, and in fact, never moved further north than the Dordogne region. With no evidence of cruciforms moving northwards, the location of the Magdalenian group near the border with Spain suggests that further study in that direction may bring a larger pattern into focus.

Table 13 - Cruciform Period Frequencies

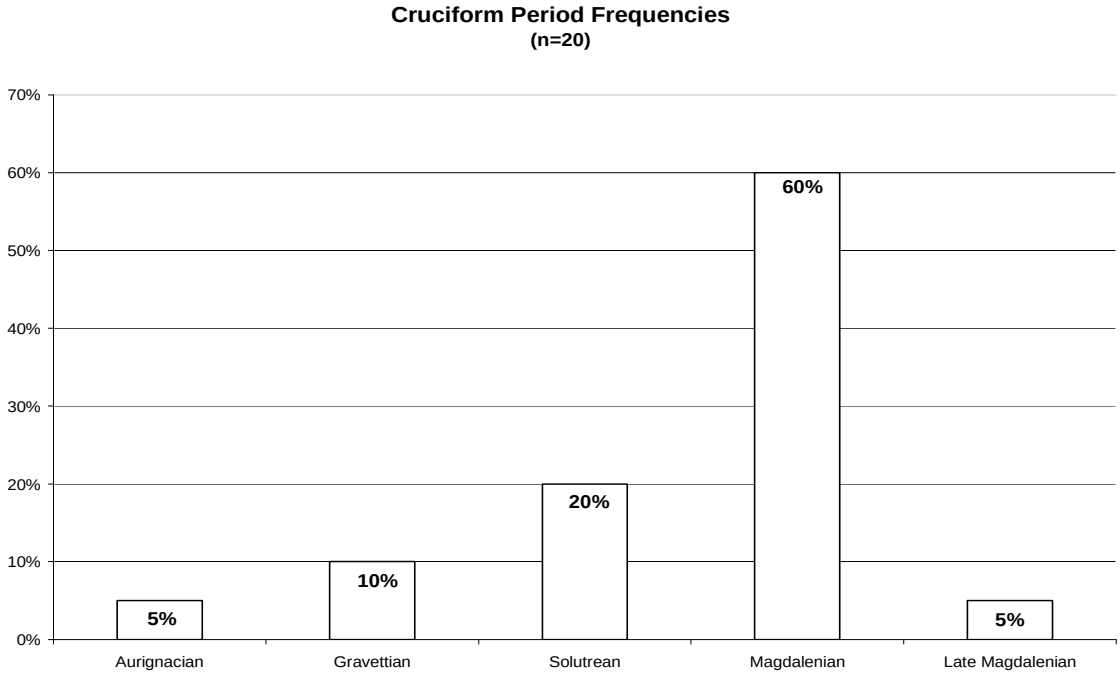


Table 14 - Proportion of Cruciforms to Period Site Totals

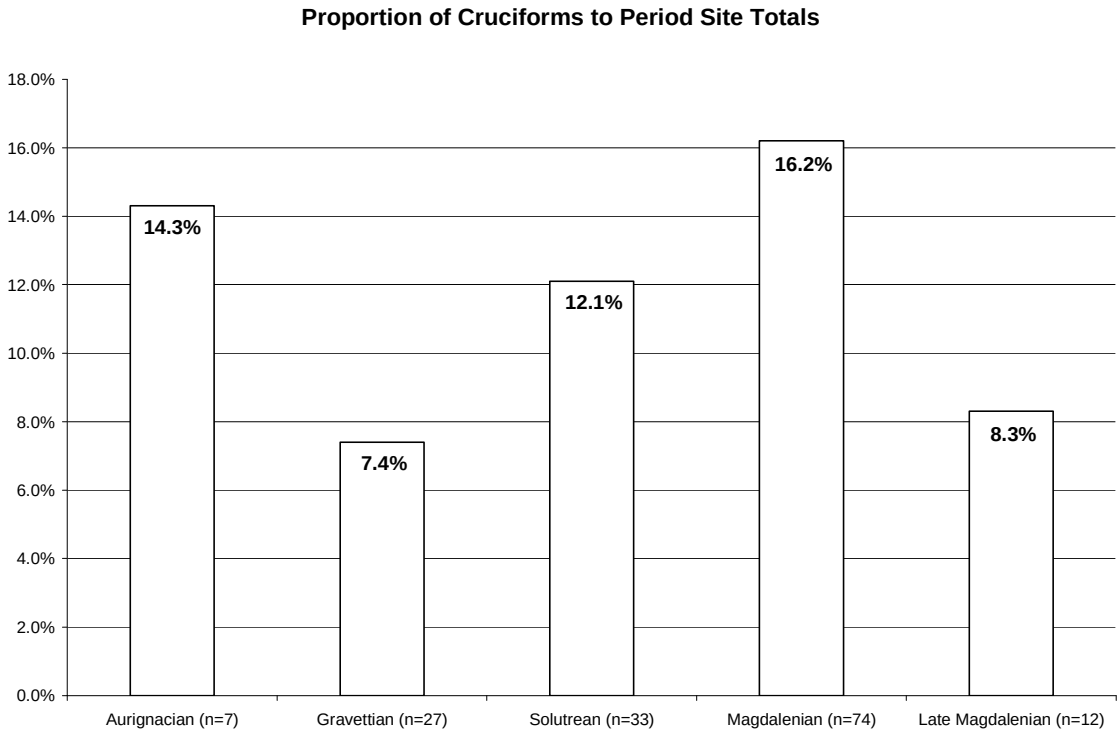
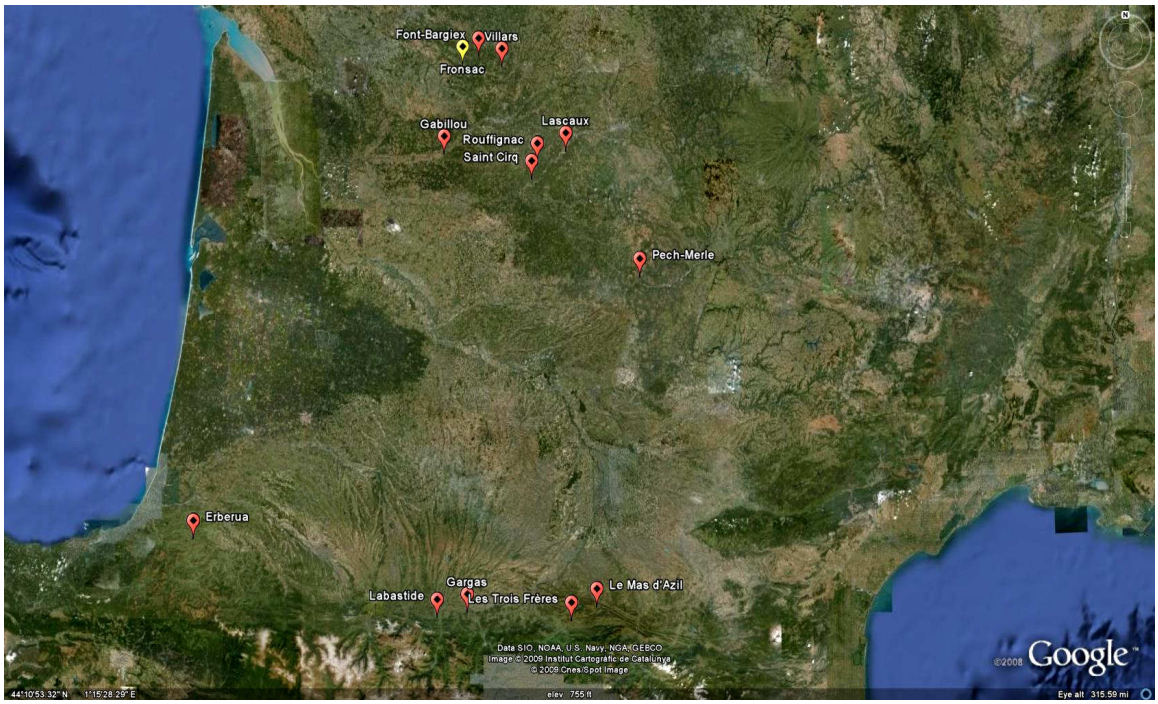
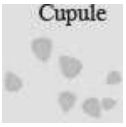


Figure 9- Cruciform: Aurignacian, Gravettian and Solutrean sites

Figure 10 - Cruciform: Magdalenian and Late Magdalenian sites



Cupule



This sign type is present at 24 sites and occurs in all periods. When comparing across time, the Magdalenian accounts for over 50% of the sites, but when period totals are compared to the related site totals, the Aurignacian increases to 57.1%, and all other categories drop. Spatially, the cupule sign is confined to a single grouping centered on the Dordogne/Lot region for both the Aurignacian (4 sites) and Gravettian (5 sites) periods. In the Solutrean, there is only a single site near the Mediterranean along the Pyrénées. In the Magdalenian there is a polarization of sites, with one group in the Dordogne region, and the other along the Pyrénées. There is also one site to the far north. The Late Magdalenian only has one site, and this is located in the Hautes-Pyrénées region. There is not a single example of this sign type in the Ardèche/Gard region during any period.

The high frequency of this sign type during the Aurignacian, combined with its localization to four sites in close proximity is certainly suggestive of a regional origination. This becomes even more evocative when the only five sites in the following period are also grouped so closely in the same region. I would be interested to see if there was any other regions in Eurasia that also have cupules of this extreme age. The contraction of this sign type in the Solutrean to a single site far to the south is also quite curious, especially when there is such a strong resurgence of this sign type afterwards in the Magdalenian. This also seems like a potential area for future study, and it could be useful to ascertain whether Spain also had cupules, and if so, in what periods?

Table 15 - Cupule Period Frequencies

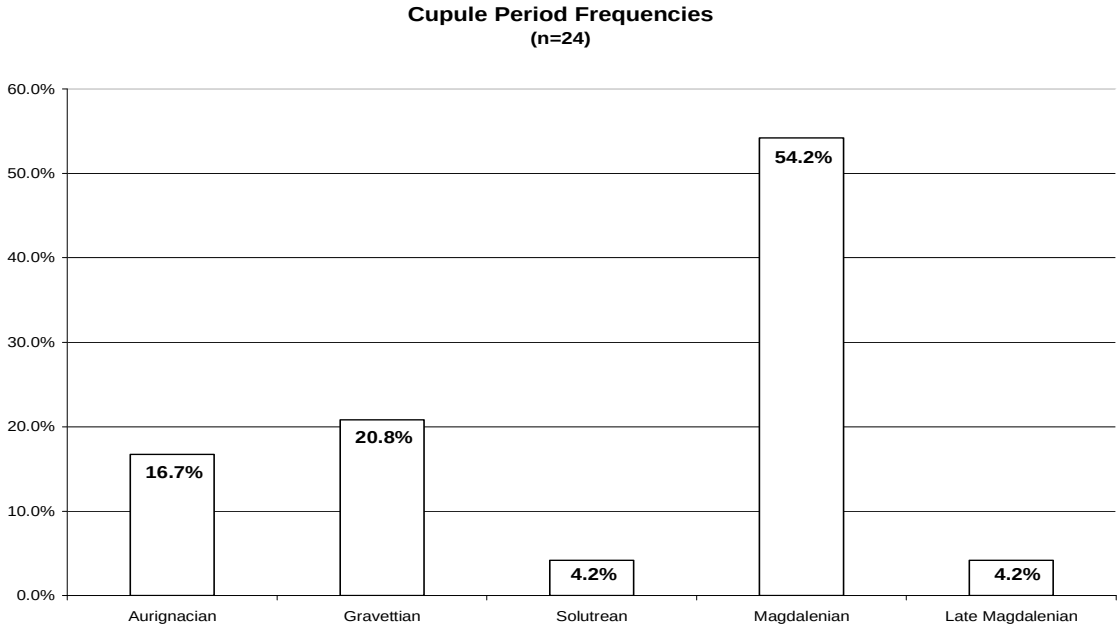


Table 16 - Proportion of Cupules to Period Site Totals

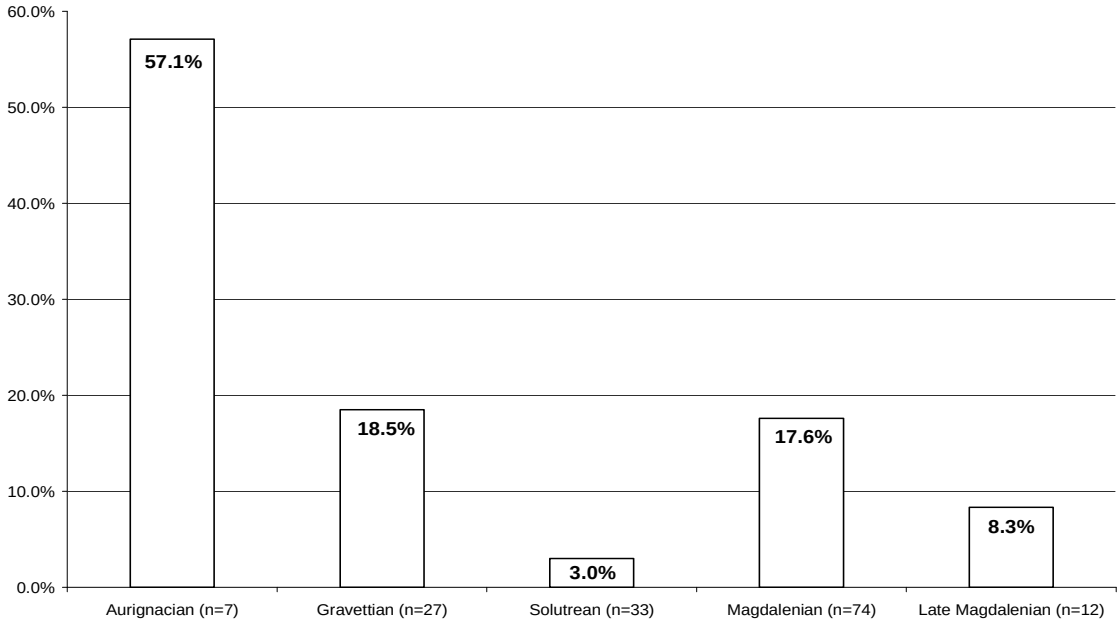


Figure 11 - Cupule: Aurignacian, Gravettian and Solutrean sites

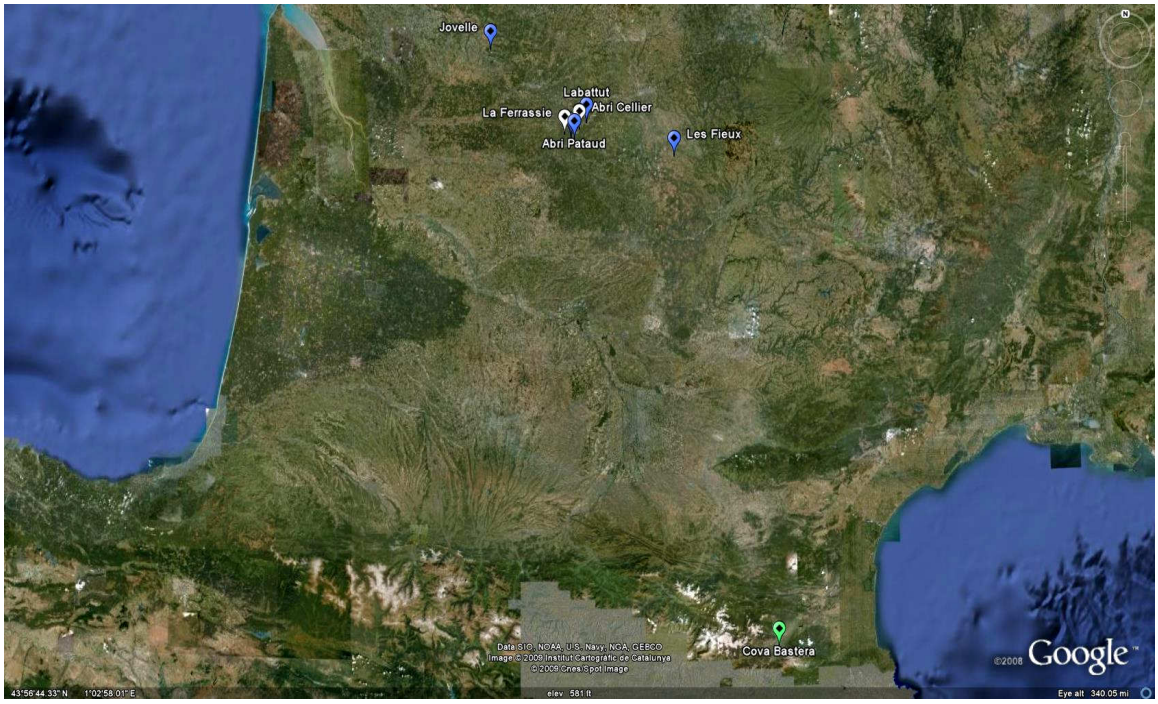
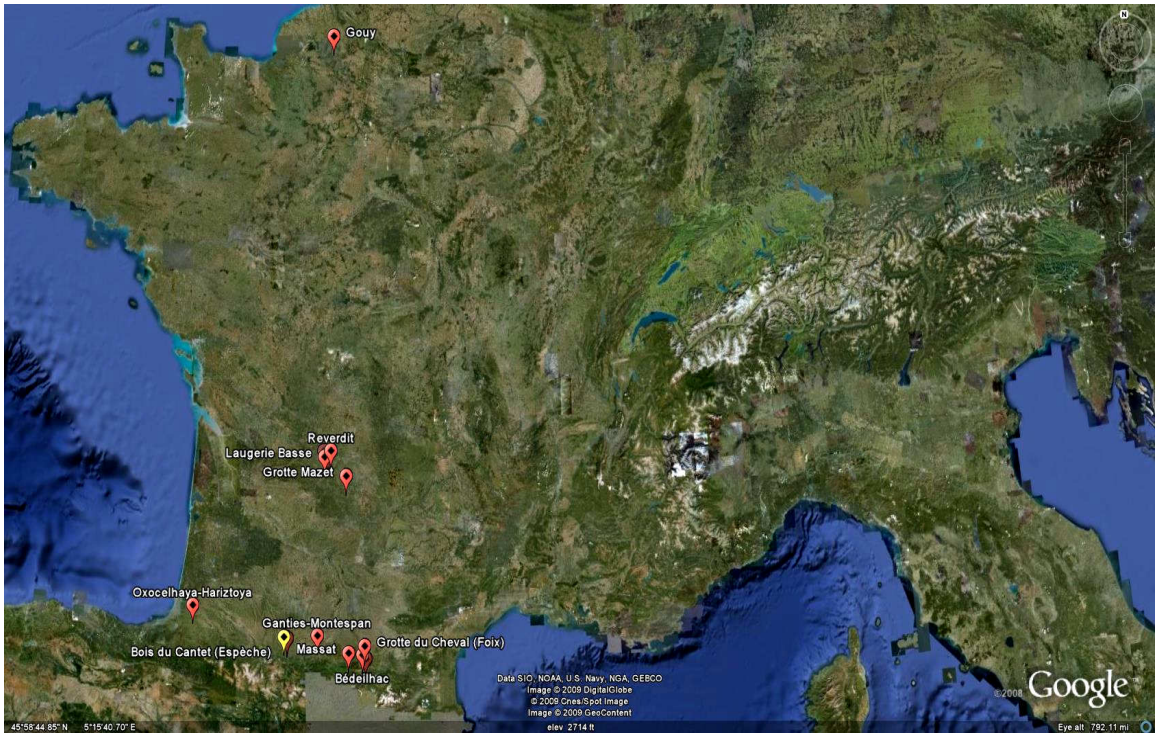
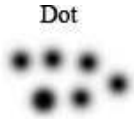


Figure 12 - Cupule: Magdalenian and Late Magdalenian sites



Dot



This sign type is present at 65 sites, occurs in all periods, and is the second most numerous sign type (tied with open-angle signs). When compared across time, the Magdalenian accounts for over 50% of the sites, though this sign is also quite common in the Gravettian and Solutrean. When period totals are compared to the related site totals, the Aurignacian is the only period to have a low proportion of dots (one site in the Ardèche), whereas the rest of the periods have dots present at 30% to 50% of their sites. In the Gravettian, there is a large grouping of this sign type in the Dordogne/Lot region, with one site in Charente, and three sites even further north. There are also two sites near the Pyrénées.

The Solutrean sees a contraction of this sign type's range, and its appearance in the Ardèche region (5 sites) for the first time since the Aurignacian. The other two major groupings of this period are in the Dordogne/Lot region and along the Pyrénées. There are 33 Magdalenian sites, and these are arranged in two huge groups, one in the Dordogne/Lot region, and the other along the Pyrénées. There is also one site to the north, and one in the Ardèche region. The spatial patterning of the Late Magdalenian is quite interesting, as the sites are all situated around the margins of my geographic range, with two near the Pyrénées, one to the far north, and one in the Ardèche. This outward trending of the sign's range suggests that further research should focus on Spain and the UK to see if this sign type is present.

Table 17 - Dot Period Frequencies

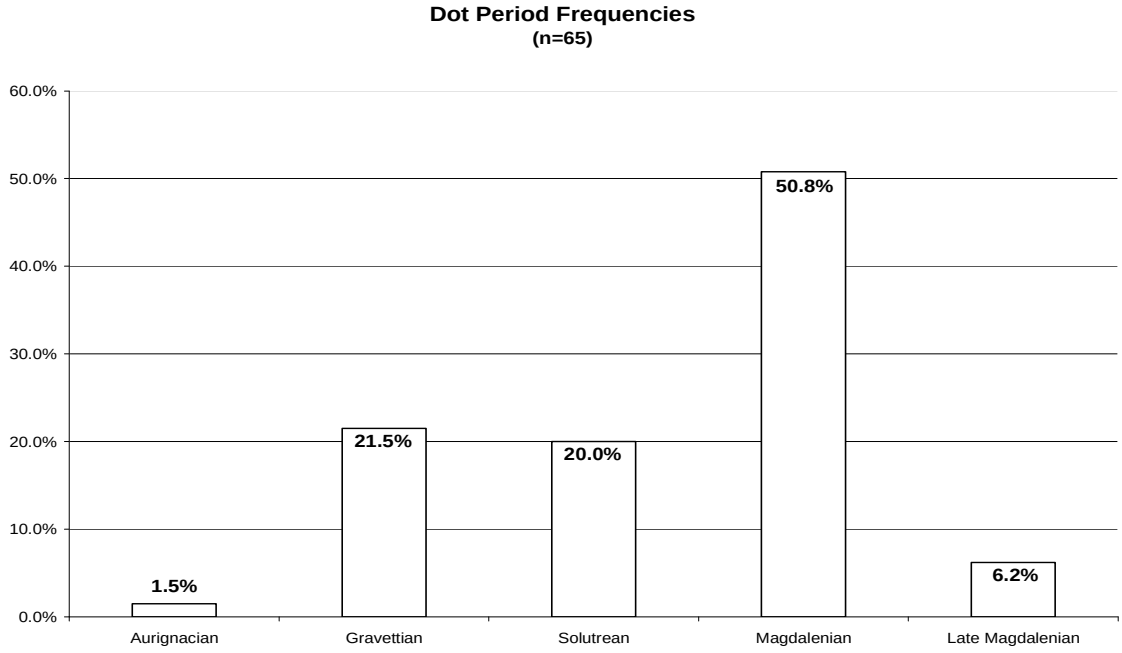


Table 18 - Proportion of Dots to Period Site Totals

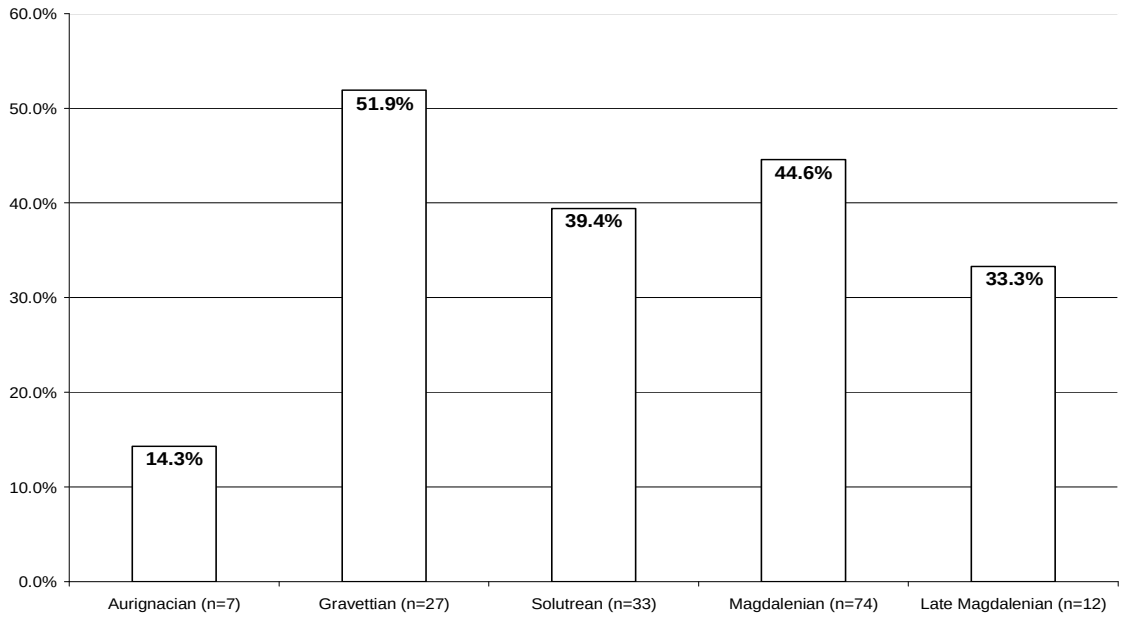


Figure 13- Dot: Aurignacian, Gravettian and Solutrean sites

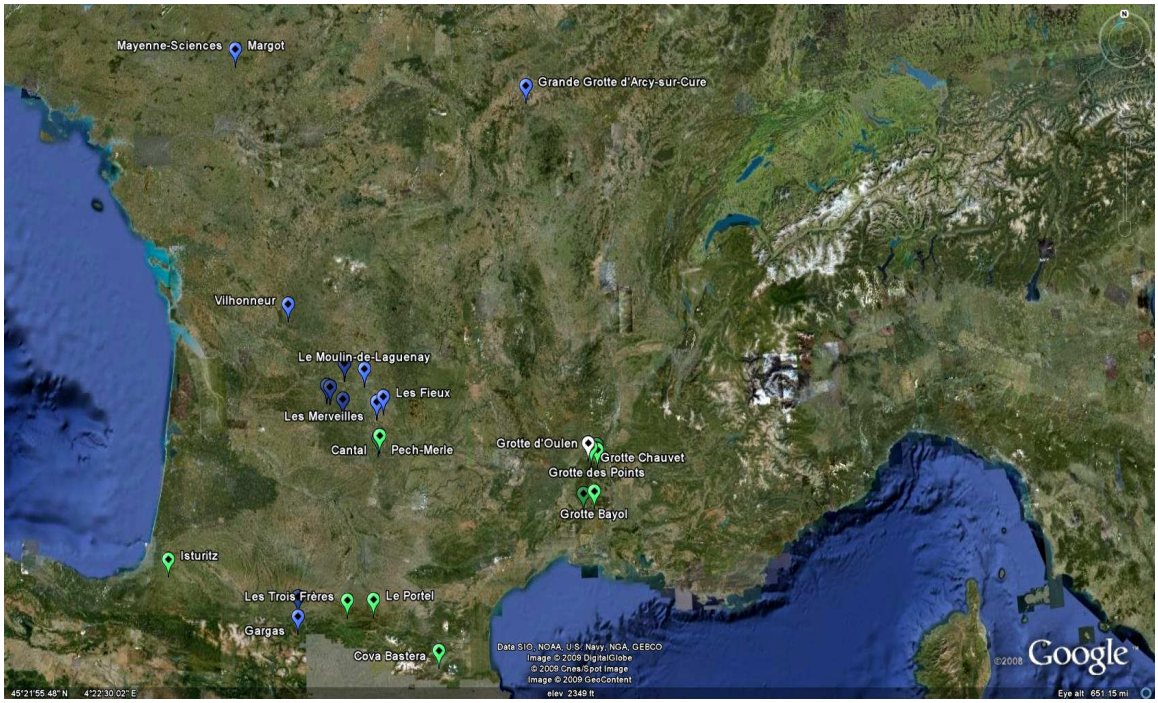
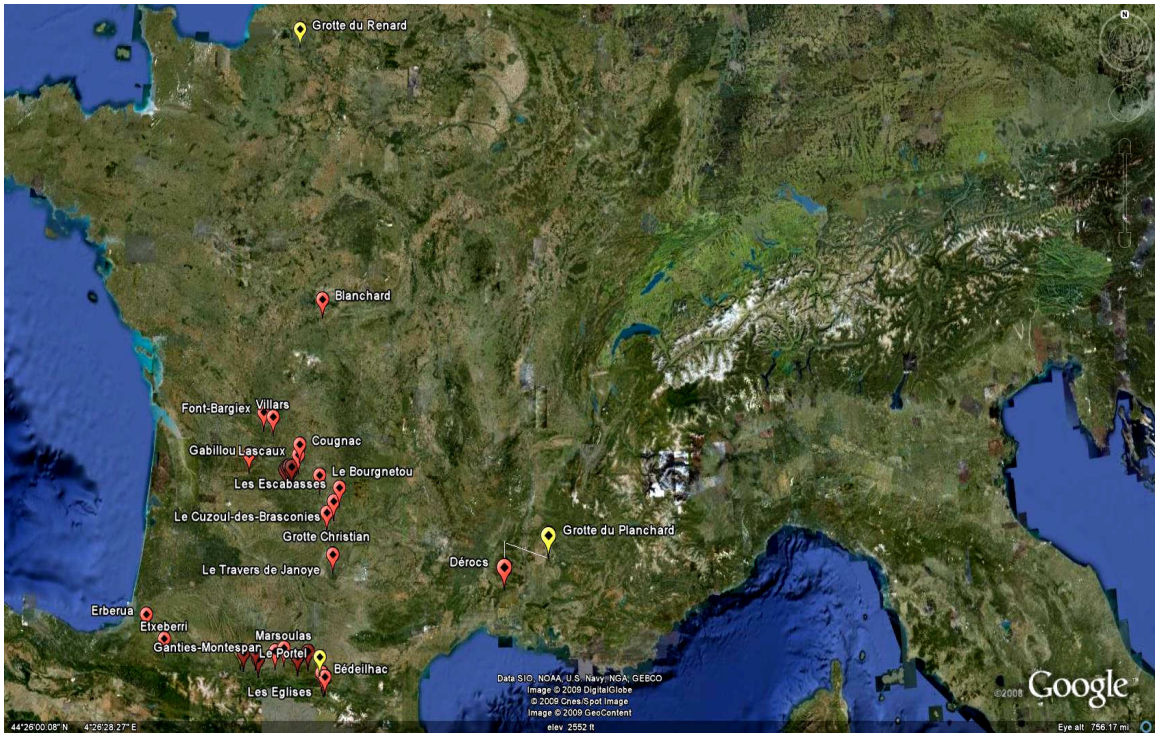


Figure 14 - Dot: Magdalenian and Late Magdalenian sites



Finger Fluting

Finger Fluting

This sign type is present at 23 sites and occurs in all periods. When compared across time, the Magdalenian accounts for nearly 50% of the sites, though this sign is also quite common in the Gravettian. When period totals are compared to the related site totals, the Aurignacian and Gravettian take on greater importance, while the Magdalenian becomes much less so (14.9%). The Aurignacian sites are located in the Ardèche and near the Mediterranean, whereas the Gravettian has a much larger range, with a site to the north, another along the Pyrénées, a third near the Mediterranean, and a larger grouping in the Dordogne. There are only three Solutrean sites, and they form a triangle with one site in the Dordogne, one in the Pyrénées, and one in Ardèche. The Magdalenian includes two large groupings, one in the Dordogne/Lot region and the other along the Pyrénées. There is also a single site in Ardèche, and one site to the north. There is only one Late Magdalenian site, and it is situated near the Pyrénées. The continuity of this sign type in the Pyrénées region is actually quite unusual, with it being present in every period from the Gravettian onward. The fact that this region also contains the only Late Magdalenian site suggests that it could be useful to see what was going on in Spain in regards to this sign type.

Table 19 - Finger Fluting Period Frequencies

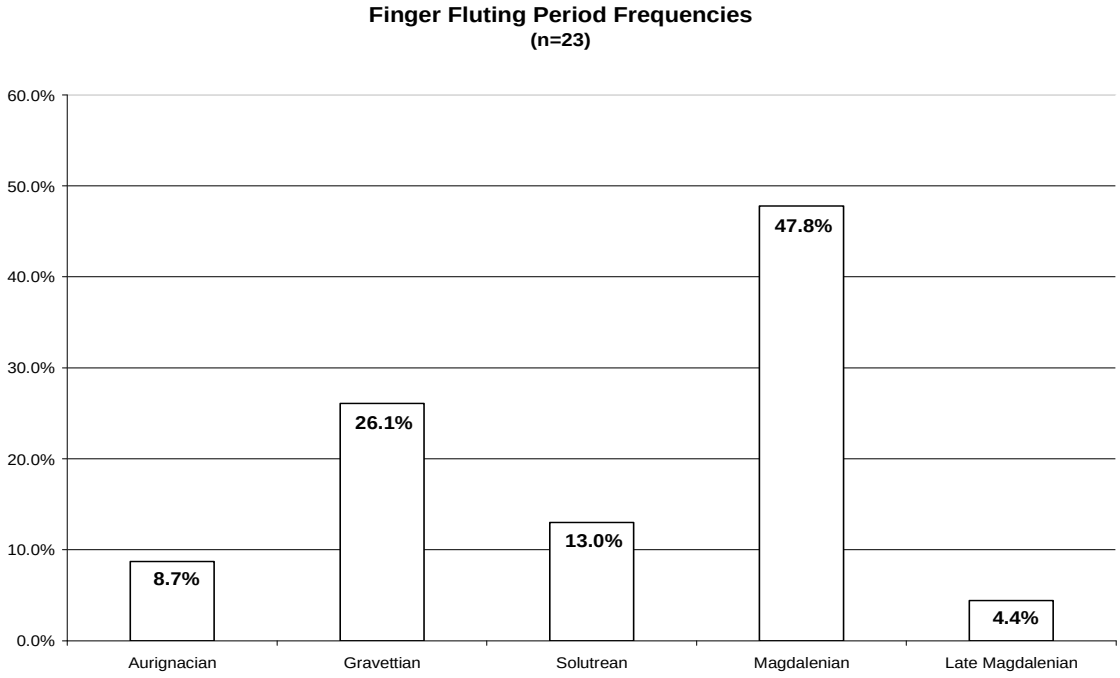


Table 20 - Proportion of Finger Flutings to Period Site Totals

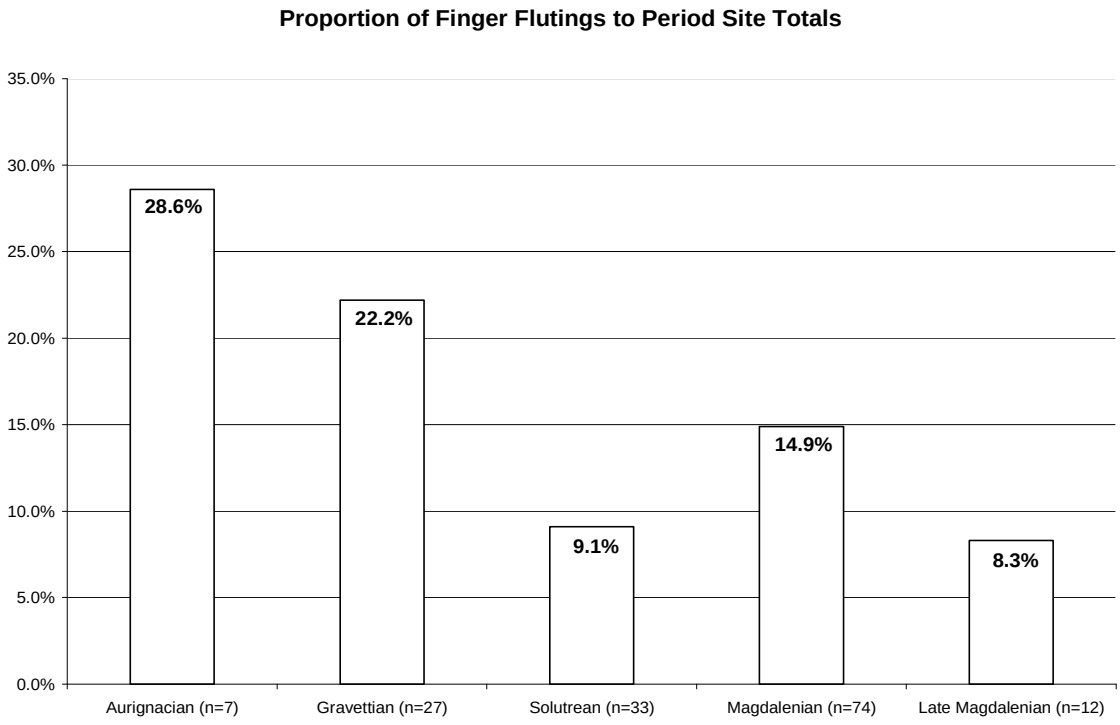
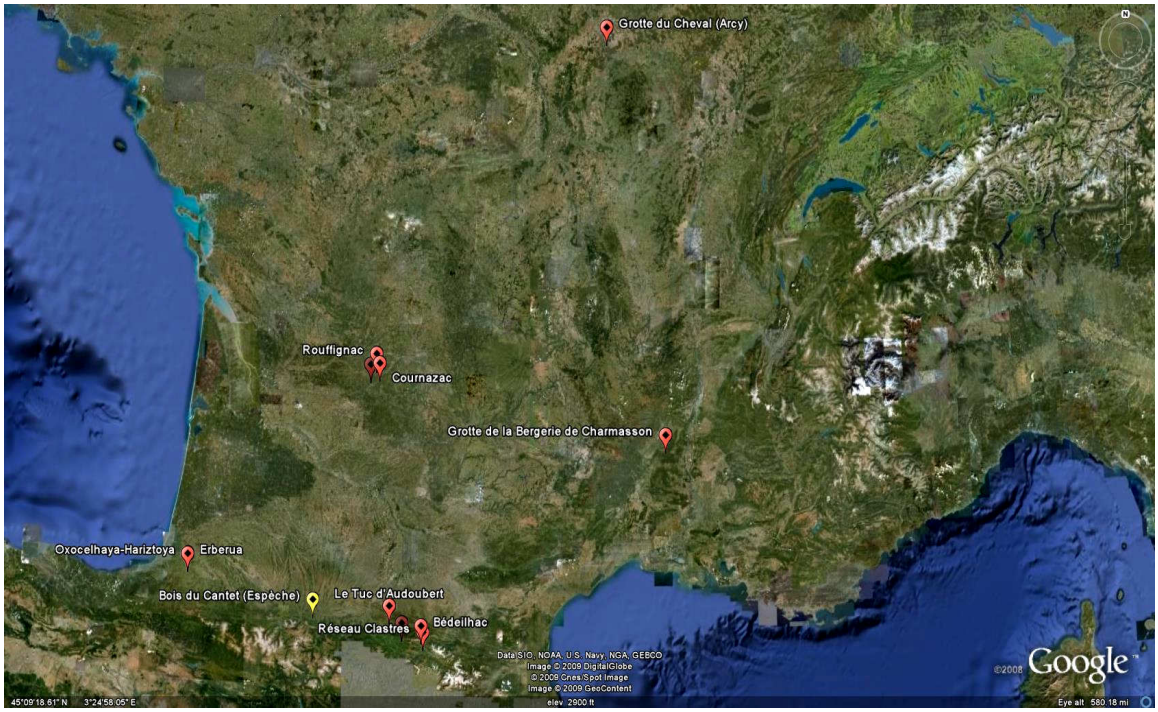


Figure 15 - Finger Fluting: Aurignacian, Gravettian and Solutrean sites

Figure 16 - Finger Fluting: Magdalenian and Late Magdalenian sites



Flabelliform

This sign type is present at 28 sites and occurs in all periods. When compared across time, the Magdalenian accounts for the vast majority of flabelliforms with 67.9% occurring in this period. Comparing the presence of this sign in each period with the period site totals, results in the Aurignacian increasing to the highest frequency with 28.6%, followed by the Magdalenian at 25.7%. While a significant drop for the Magdalenian period, it still signals a strong presence with 1 out of every 4 sites from this period having this sign present. The Solutrean has a 15.2% occurrence frequency, and appears to have been replicated somewhat regularly. While it is also present in the Gravettian and Late Magdalenian, with 1 site per period, the frequency is much lower than the other periods.

The Aurignacian sites are both located in SE France, while the only Gravettian site is in the Dordogne. The Solutrean sites are more dispersed, with two near the Pyrénées, one in the Ardèche, one near the Mediterranean, and one in the Lot region. The Magdalenian includes two large groupings, one in the Dordogne/Lot region and the other along the Pyrénées. There is also one site to the far north at Gouy. The only Late Magdalenian site is located near the Pyrénées. This is another one of those sign types where popularity increases greatly during the Magdalenian, but then decreases sharply afterwards in the Late Magdalenian. In order to determine if this sign type was in the process of being abandoned or if its usage continued in other parts of Eurasia, a larger scale study would be required.

Table 21 - Flabelliform Period Frequencies

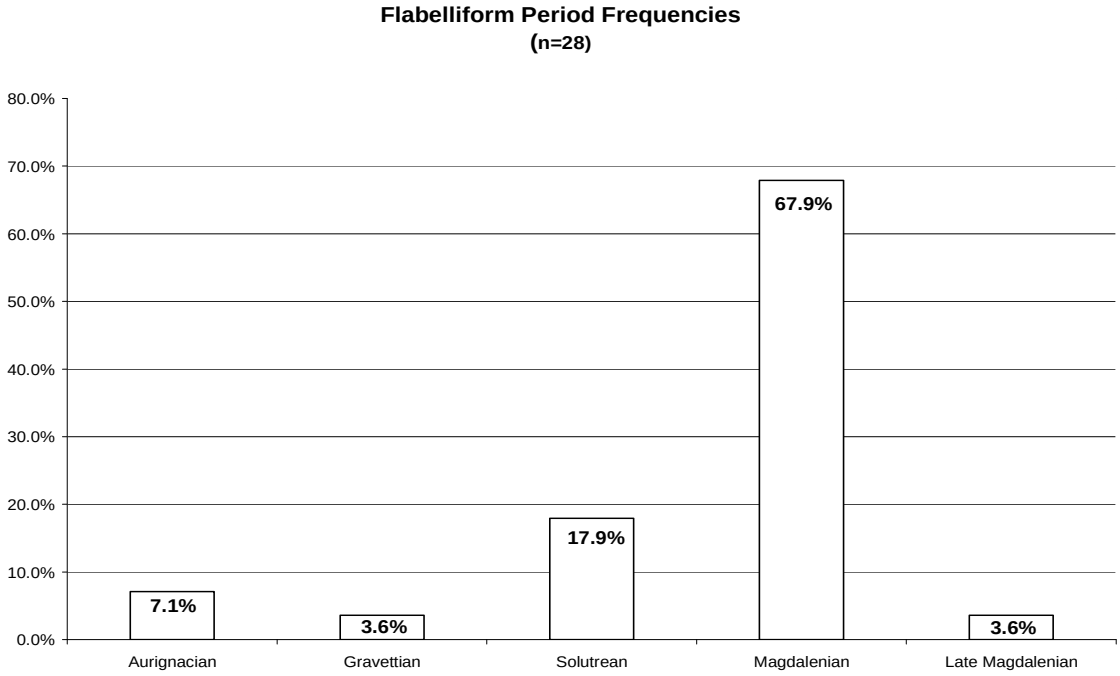


Table 22 - Proportion of Flabelliforms to Period Site Totals

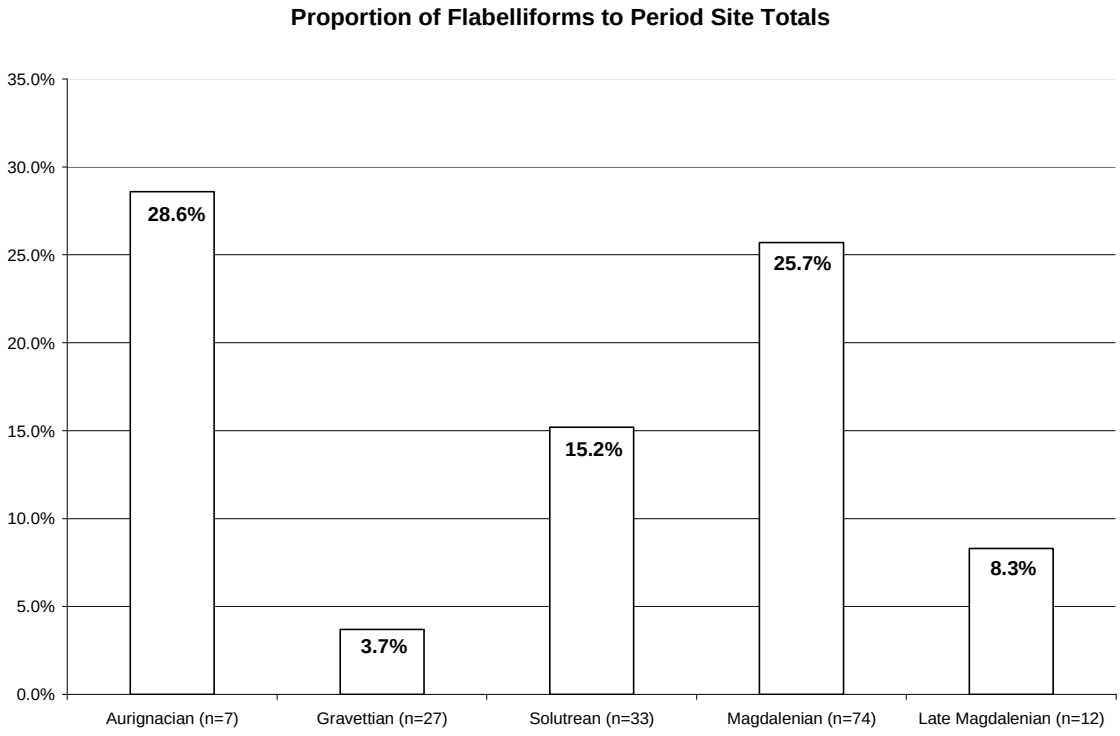
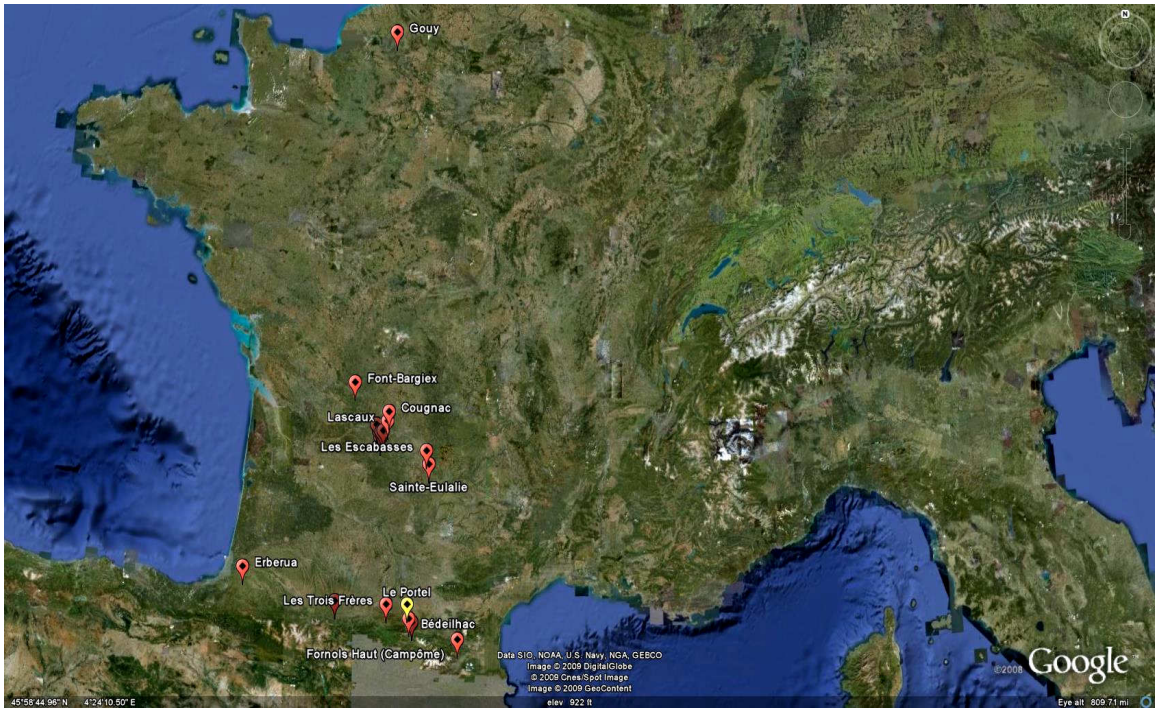


Figure 17 - Flabelliform: Aurignacian, Gravettian and Solutrean sites

Figure 18 - Flabelliform: Magdalenian and Late Magdalenian sites



Half-Circle

Half-Circle

This sign type is present at 28 sites and occurs in all periods. When compared across time, the Solutrean (21.4%) and Magdalenian (57.1%) periods have the highest frequencies, with a lower number of occurrences in the Aurignacian (3.6%), Gravettian (10.7%) and Late Magdalenian (7.1%). When the presence of this sign in each period is compared to the period site totals, its occurrence becomes much more regular, with 14.3% in the Aurignacian, 11.1% in the Gravettian, 18.2% in the Solutrean, 21.6% in the Magdalenian, and 16.7% in the Late Magdalenian. This sign is unusual, as it appears to remain consistently in use throughout the entire span of the French Upper Paleolithic.

When analyzing the spatial data for this sign type, the first thing I noticed was that there were no sites anywhere in northern France in any period. The only Aurignacian site is located in the Ardèche, while the three Gravettian sites are in the Dordogne, or nearby in Gironde. There is one grouping of Solutrean sites in the Ardèche region, along with one site in Lot, and the other near the Pyrénées. There are no sites in Ardèche during the Magdalenian; instead they are tightly grouped around the Dordogne/Lot, region, with one site near the Pyrénées. The only two Late Magdalenian sites are also near the Pyrénées. The fact that there is no northward movement of this sign type suggests that any larger patterning may found to the south. If the Spanish data could be brought into the database, we might see some interesting patterns emerge.

Table 23 - Half-Circle Period Frequencies

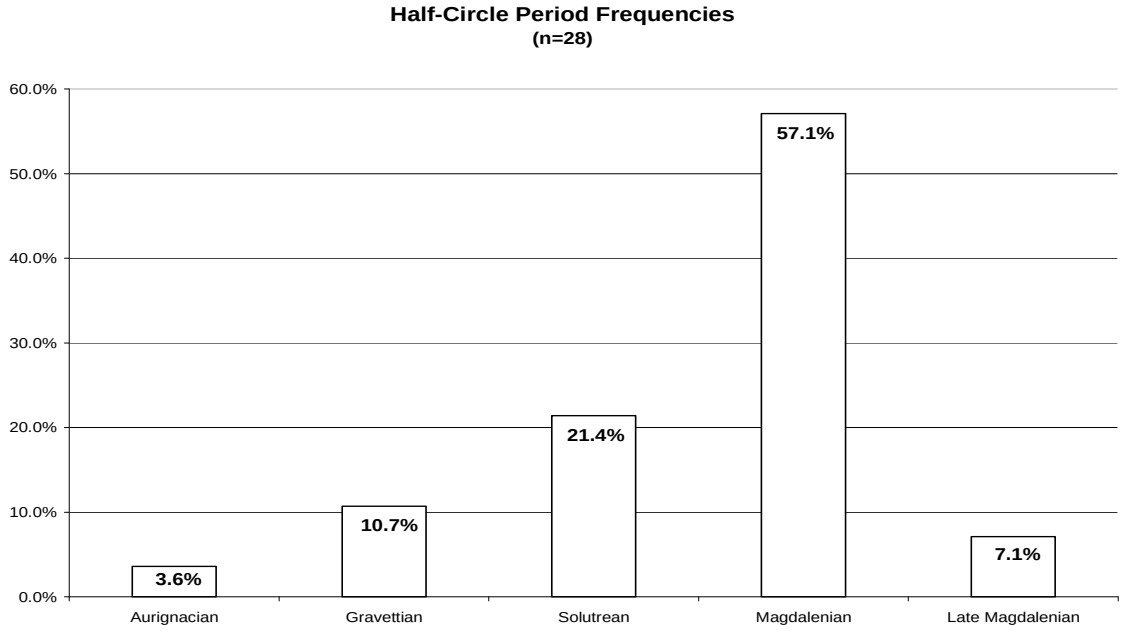


Table 24 - Proportion of Half-Circles to Period Site Totals

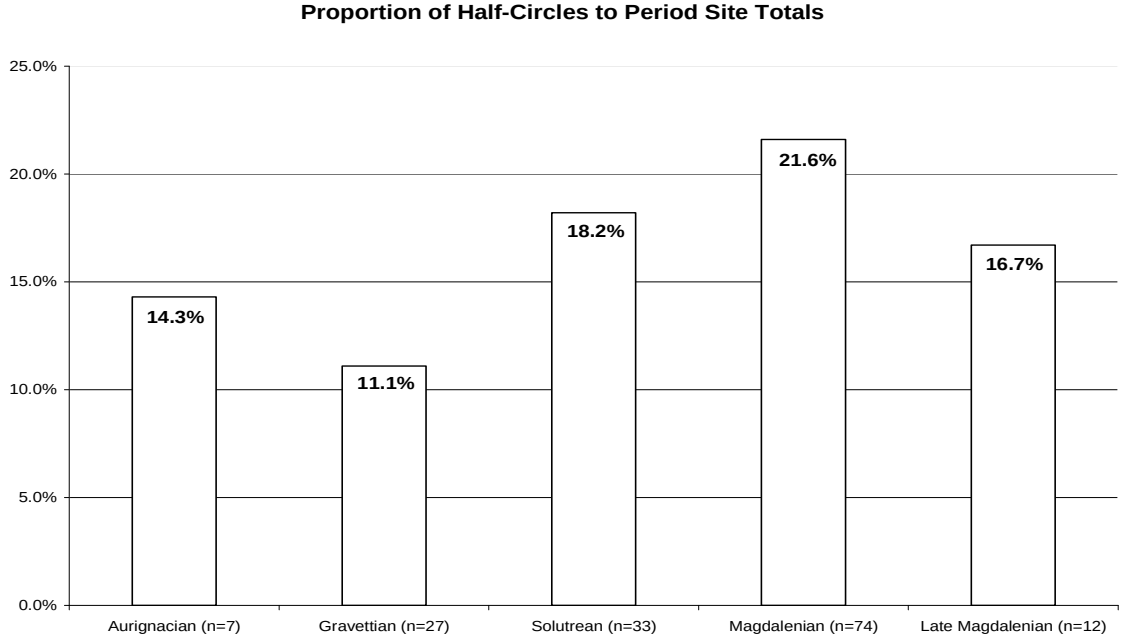
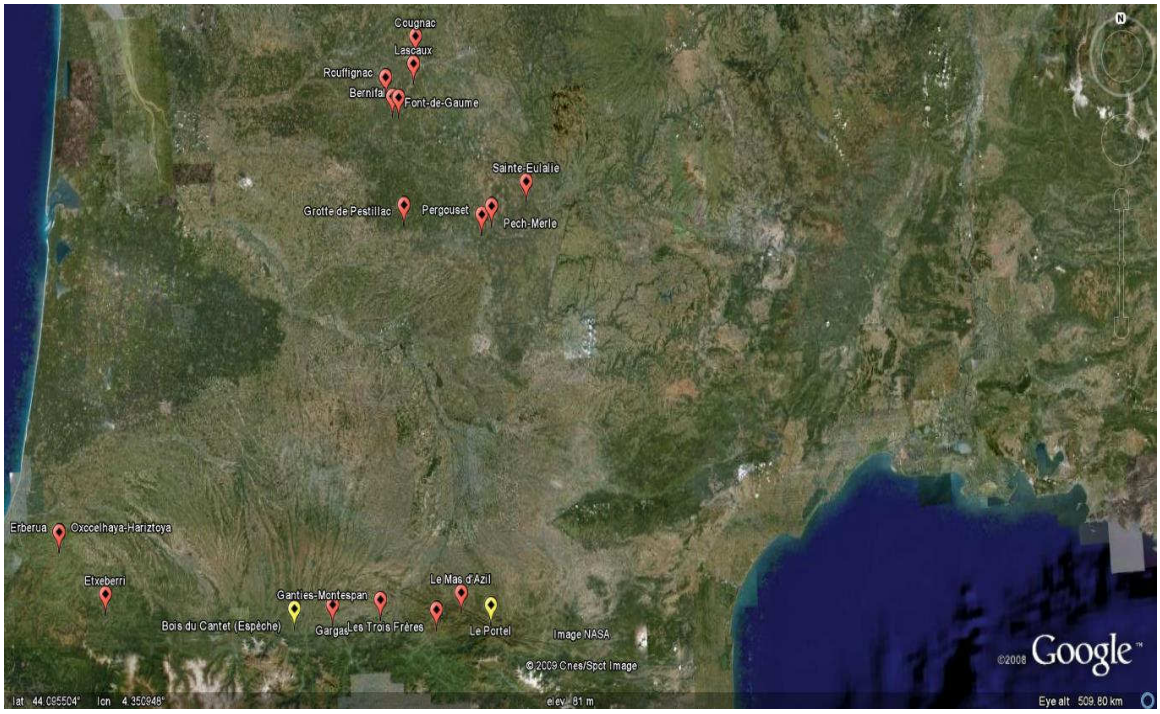
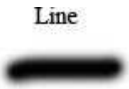


Figure 19 - Half-Circle: Aurignacian, Gravettian and Solutrean sites

Figure 20 - Half-Circle: Magdalenian and Late Magdalenian sites



Line



This sign type is present at 111 sites, and occurs in all periods. This is the most common sign type, and has an overall occurrence frequency of 75% in the study region. When compared across time, the Magdalenian accounts for 50% of all sites with lines. This sign type was then compared proportionally to the period site totals, and the occurrence frequencies rose dramatically, with no period below 63%.

With a 100% occurrence frequency, the Aurignacian is mainly grouped around the Dordogne region, with two other sites in SE France. The Gravettian has a much wider distribution pattern. There are three sites in the north, the main concentration is centered in the Dordogne and Lot along with the surrounding area, and there are also two sites situated near the Pyrénées. The Solutrean sites have a broad distribution pattern as well, with concentrations in the Ardèche/Gard region, the Dordogne/Lot region, and along the Pyrénées. Altogether, the Magdalenian has 55 sites with lines present. These include 5 sites moving progressively further north, a large grouping centered on the Dordogne/Lot region, and another grouping of sites near the Pyrénées. The Late Magdalenian has 10 sites with this sign type present. These are loosely grouped, with 3 sites each in the Ardèche, the Dordogne, and near the Pyrénées, and another site in the north.

Considering how common this sign type is, it made me wonder why lines were not present at the remaining 25% of the sites in the study region. Its omission from these other sites suggests that the makers of the art were in fact making a conscious choice to include this sign type, it just happened to be a very popular one. I am also interested in the five northern sites in the Magdalenian period as the sites move progressively

northwards, and their alignment could be suggestive of a migration route or a cultural network, making this another potential area for further study.

Table 25 - Line Period Frequencies

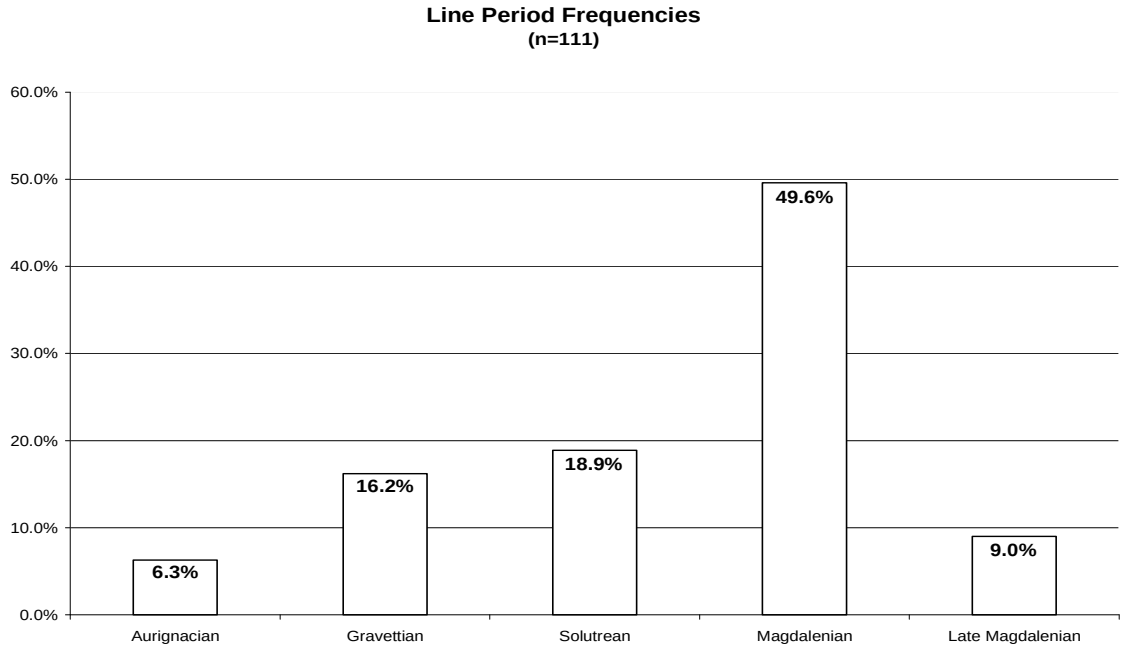


Table 26 - Proportion of Lines to Period Site Totals

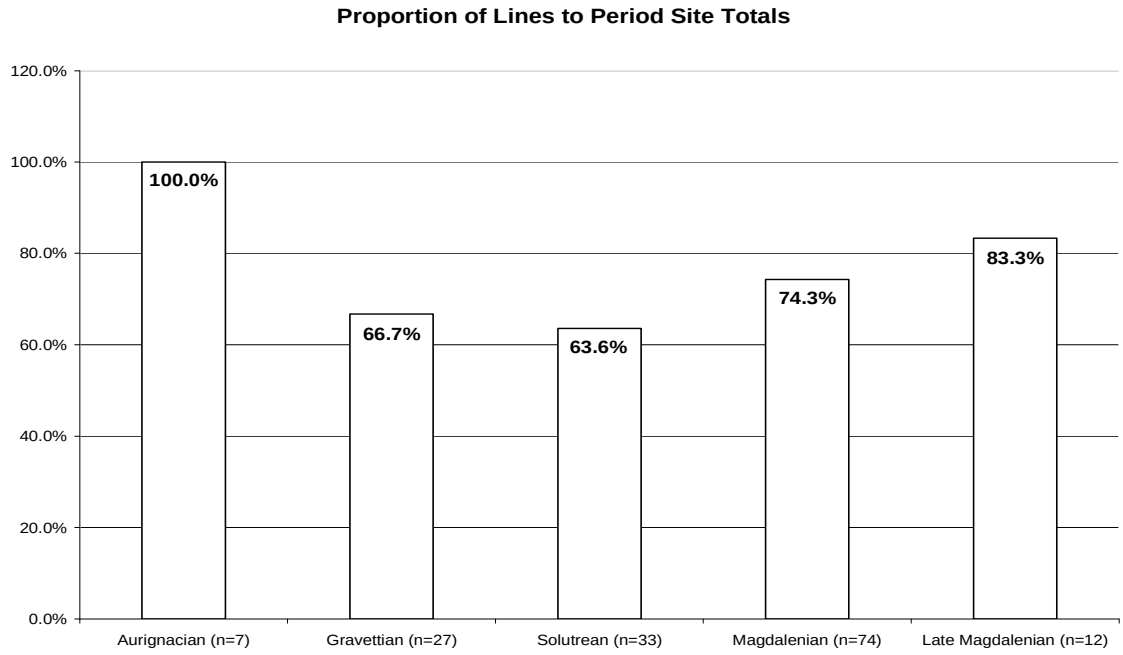


Figure 21 - Line: Aurignacian, Gravettian and Solutrean sites

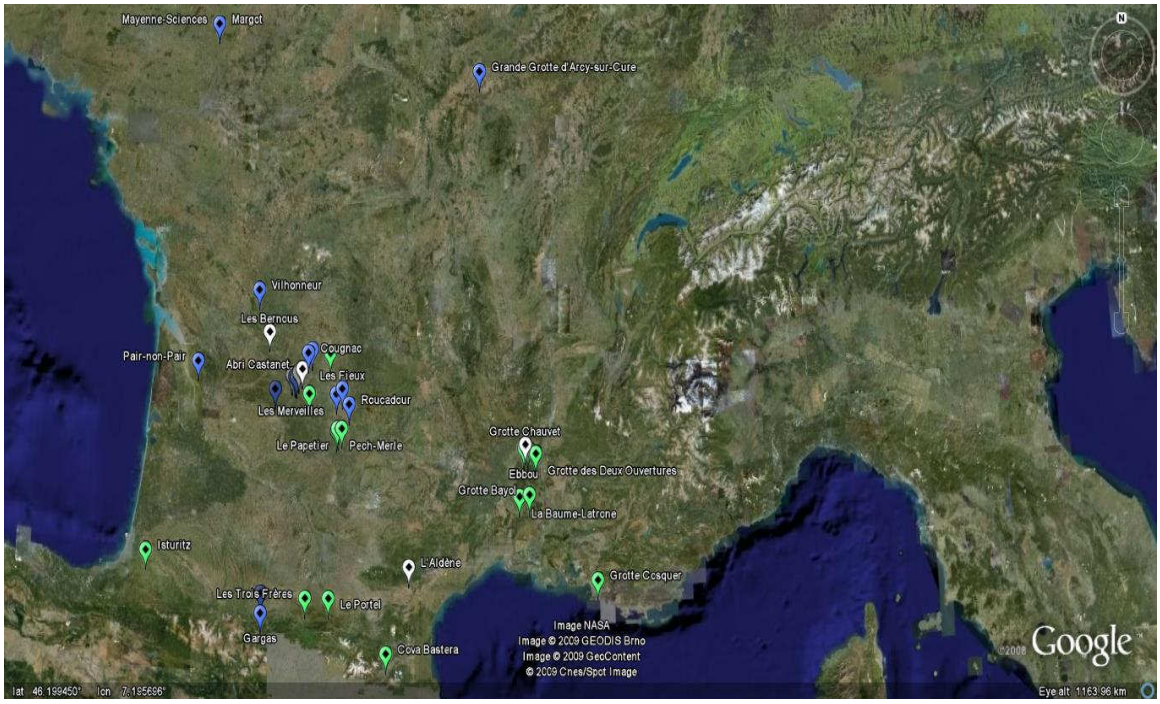
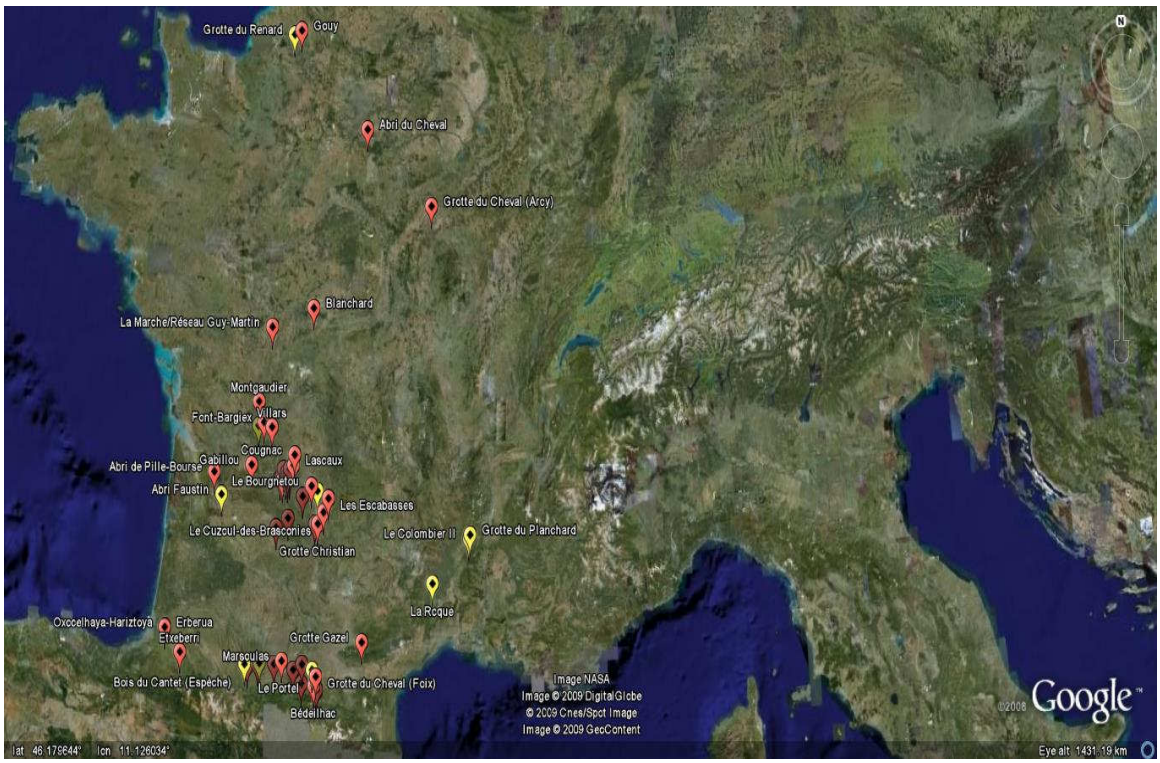


Figure 22 - Line: Magdalenian and Late Magdalenian sites



Negative Hand

Negative Hand

This sign type is present at 23 sites, and occurs in all periods except the Late Magdalenian. This is one of those unusual sign categories where doing two different styles of graph does not change the percentages. The Gravettian contains the majority of these representations either way, though we do see an increase in the Aurignacian when the sign type is trended against period totals, and a decrease in both the Solutrean and Magdalenian. The only Aurignacian site is Chauvet, located in the Ardèche region. The Gravettian sites have an unusual distribution pattern, with a major grouping in the Dordogne/Lot region, three sites that get progressively further north, one site on the Mediterranean, and two sites near the Pyrénées, a region which does not generally have sites this old.

There are only four Solutrean sites, grouped in pairs, two are found in the Dordogne, and the other two are near the Pyrénées. There are only four Magdalenian sites as well. Three of these sites are in close proximity in the Dordogne region, and the fourth is in the Pyrénées-Atlantiques. This sign type is a bit different than most of the others as it peaks in popularity early, and then decreases to the point of vanishing from the archaeological record by the Late Magdalenian. Another unusual aspect of the negative hand sign type is the broad geographic range of this sign in the Gravettian period. I am not certain if this sign type also occurs in Spain, but it would be interesting to see if it appeared in Spain around the same time, as the presence of two Gravettian sites near the Pyrénées (a rare occurrence) could be suggestive of a larger spatial pattern.

Table 27 - Negative Hand Period Frequencies

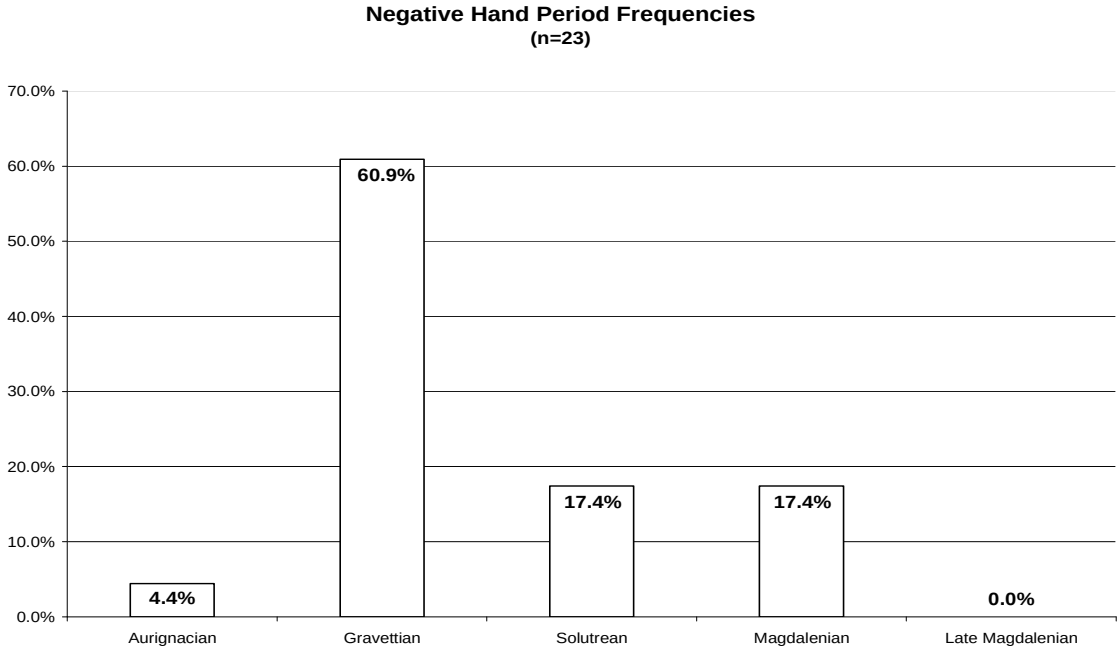


Table 28 - Proportion of Negative Hands to Period Site Totals

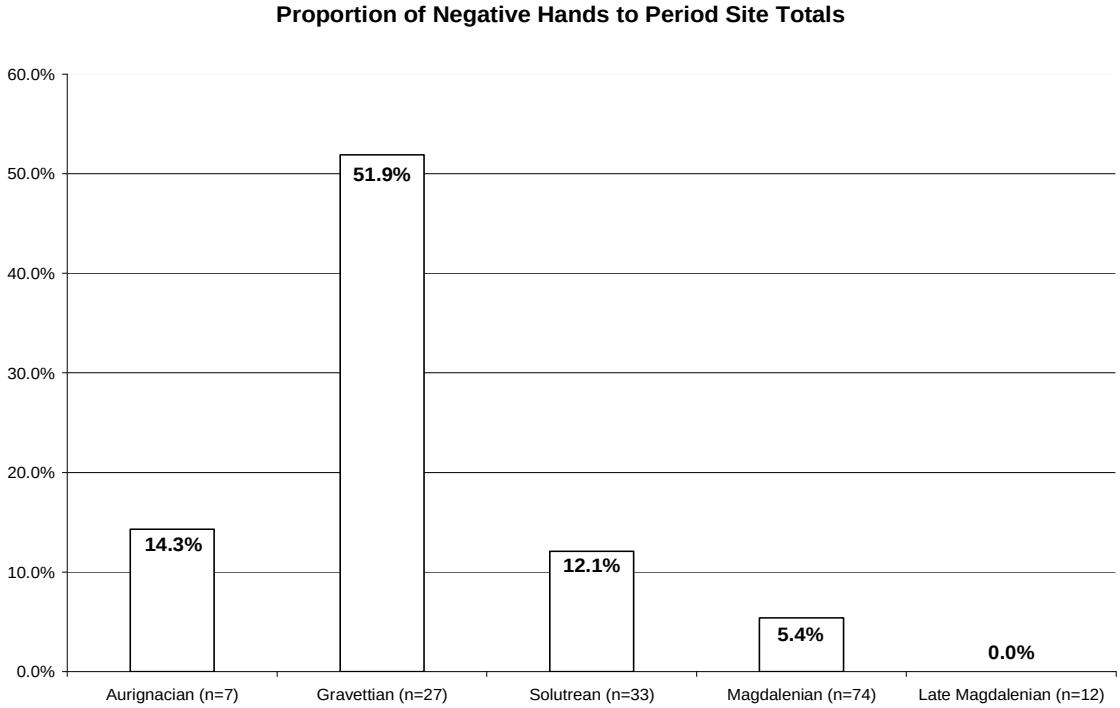


Figure 23 - Negative Hand: All Periods

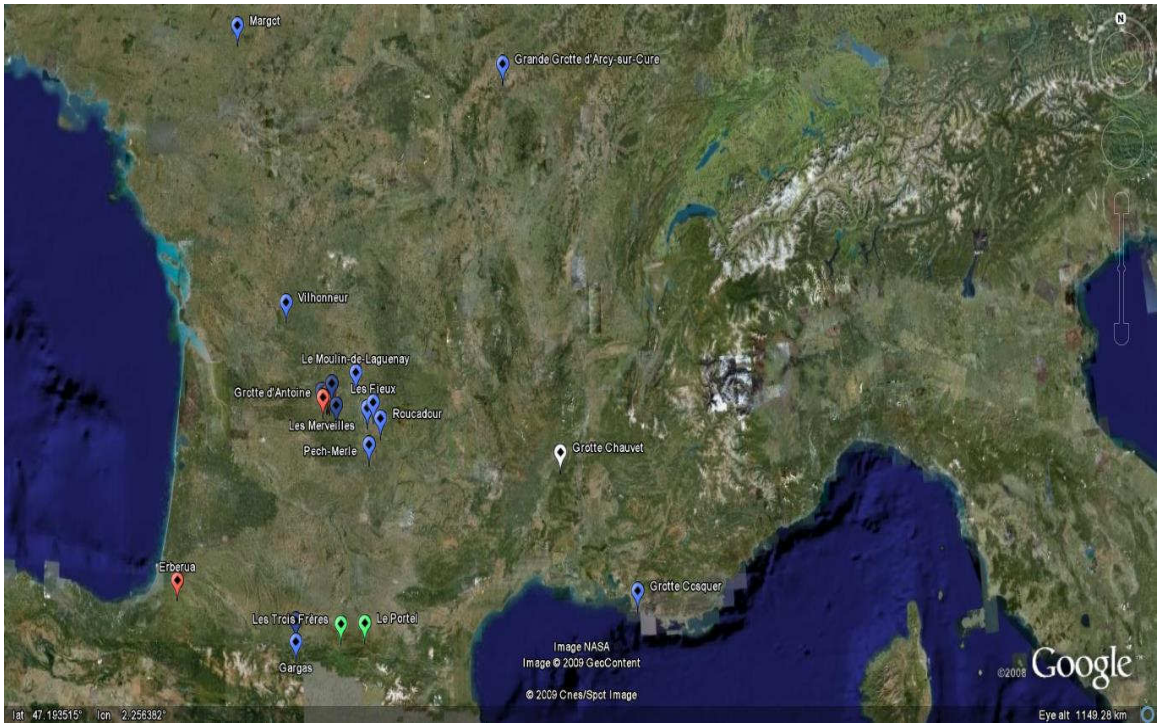
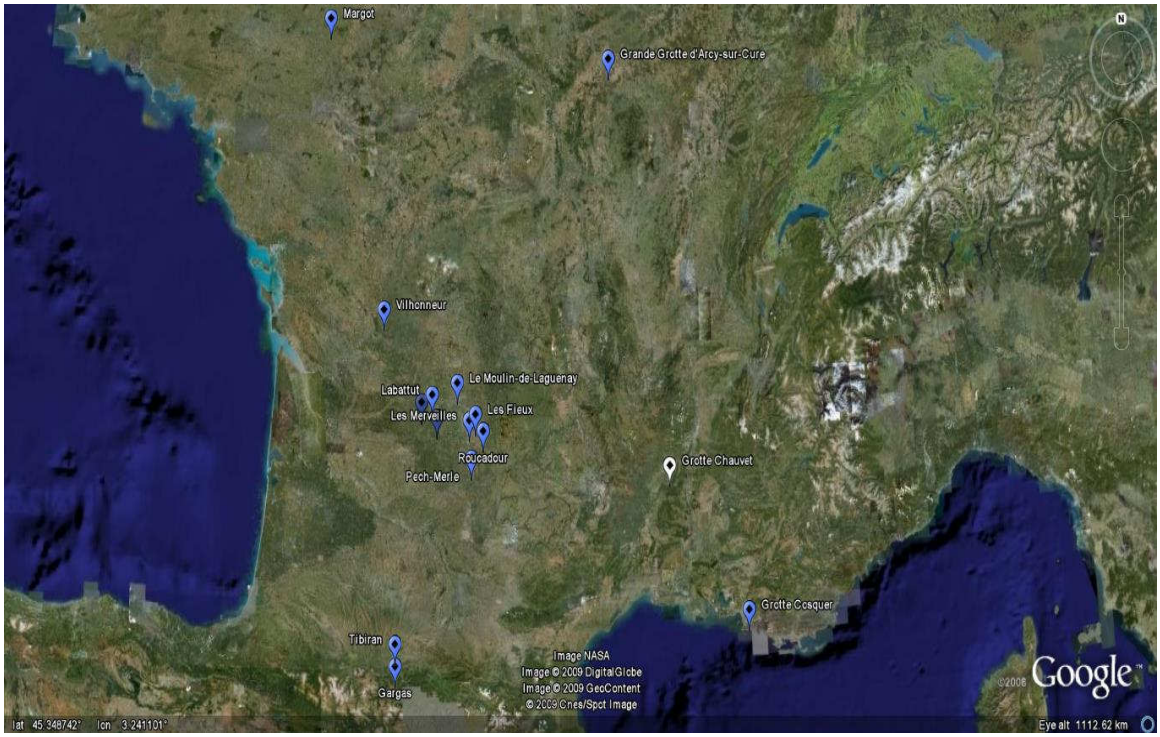


Figure 24 - Negative Hand: Aurignacian and Gravettian sites



Open-angle

With 65 sites, this sign type ties with the dot category for the second most numerous non-figurative category in this region. Since this was one of the categories that had several different names when I began the process of building the typology, it has not traditionally been grouped with the most abundant sign types, and in fact, has been identified as a Magdalenian sign (Vialou 2006: 308). When compared across time, the Magdalenian does dominate, accounting for forty of the sites where open-angles occur, but it is present in all periods, and when the periods are compared against their own period totals, the distribution becomes a lot more even. This sign type is now present in about one-half of all sites from the Aurignacian, Magdalenian, and Late Magdalenian periods, and appears at 18.5% of Gravettian sites, and 33.3% of Solutrean sites.

In the Aurignacian, there is already a broad distribution pattern, with one site in the Dordogne, one in the Ardèche, and one site near the Mediterranean. In the Gravettian, this sign type is centered in the Dordogne region, with one site to the far north at Mayenne-Sciences, and one near the Pyrénées. In the Solutrean, there is a strong presence in the Ardèche region, with eight sites grouped together. There are also two sites in the Dordogne/Lot region, and one site on the Mediterranean coast. The Magdalenian period is almost completely polarized between the Dordogne/Lot region (23 sites), and the area along the Pyrénées (16 sites). There is also one site far to the north at Gouy, and in this period there are no sites in the Ardèche/Gard region. Open-angle signs become quite diffused in the Late Magdalenian, with one site in the far north, one site in

the Dordogne, and another in nearby Gironde, two sites near the Pyrénées, and one site in Hérault, south of the Ardèche/Gard region.

While it is sometimes difficult to discern patterns when looking at such a widely distributed sign type, the clear temporal and spatial patterning actually makes this sign type very useful. After a wide-spread start in the Aurignacian, we see the pattern starting to tighten down around the Dordogne, a shift in focus during the Solutrean to the Ardèche region, a return shift to two large groupings in the Magdalenian centered on the Pyrénées and the Dordogne/Lot region, and a final dispersal of this sign type in the Late Magdalenian which is very suggestive of potential movement into the UK and Spain. This sign type is definitely a candidate for further study.

Table 29 - Open-Angle Period Frequencies

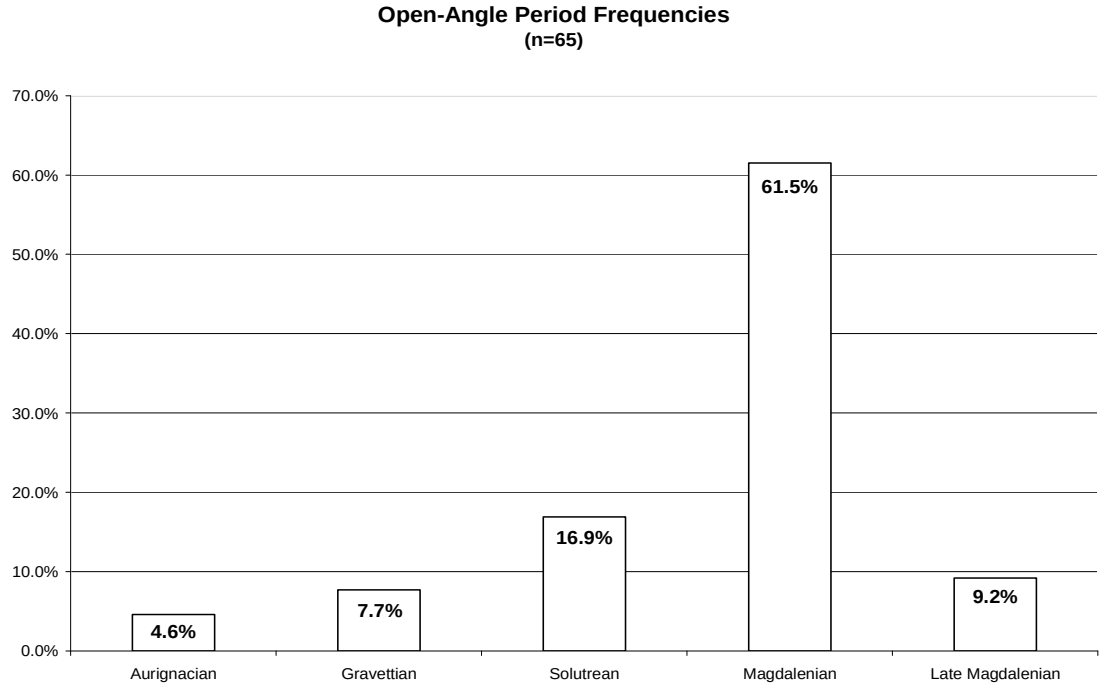


Table 30 - Proportion of Open-Angles to Period Site Totals

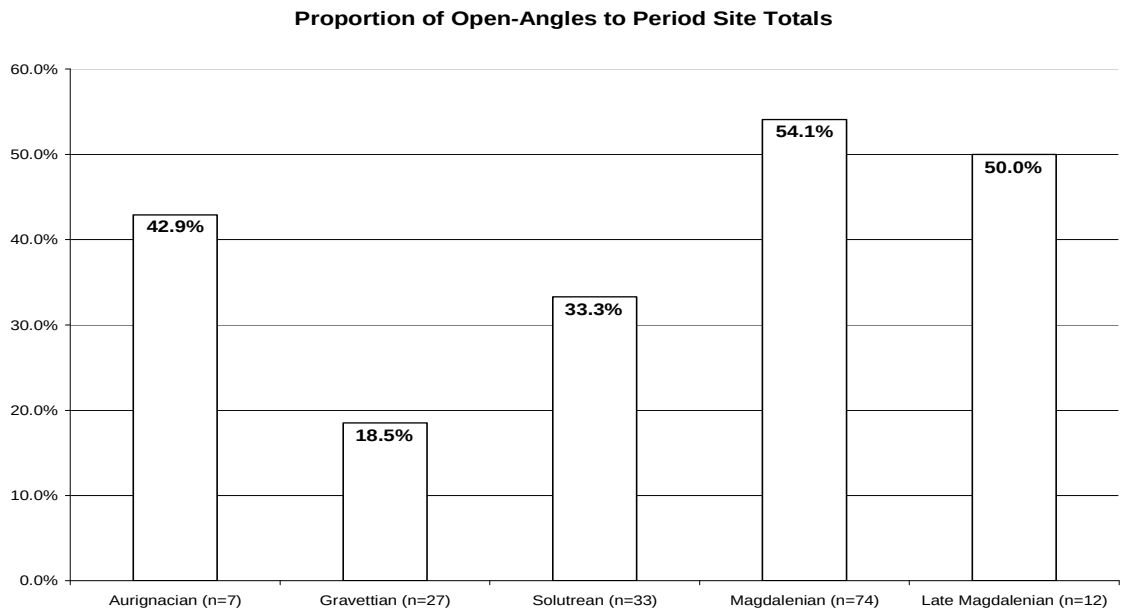
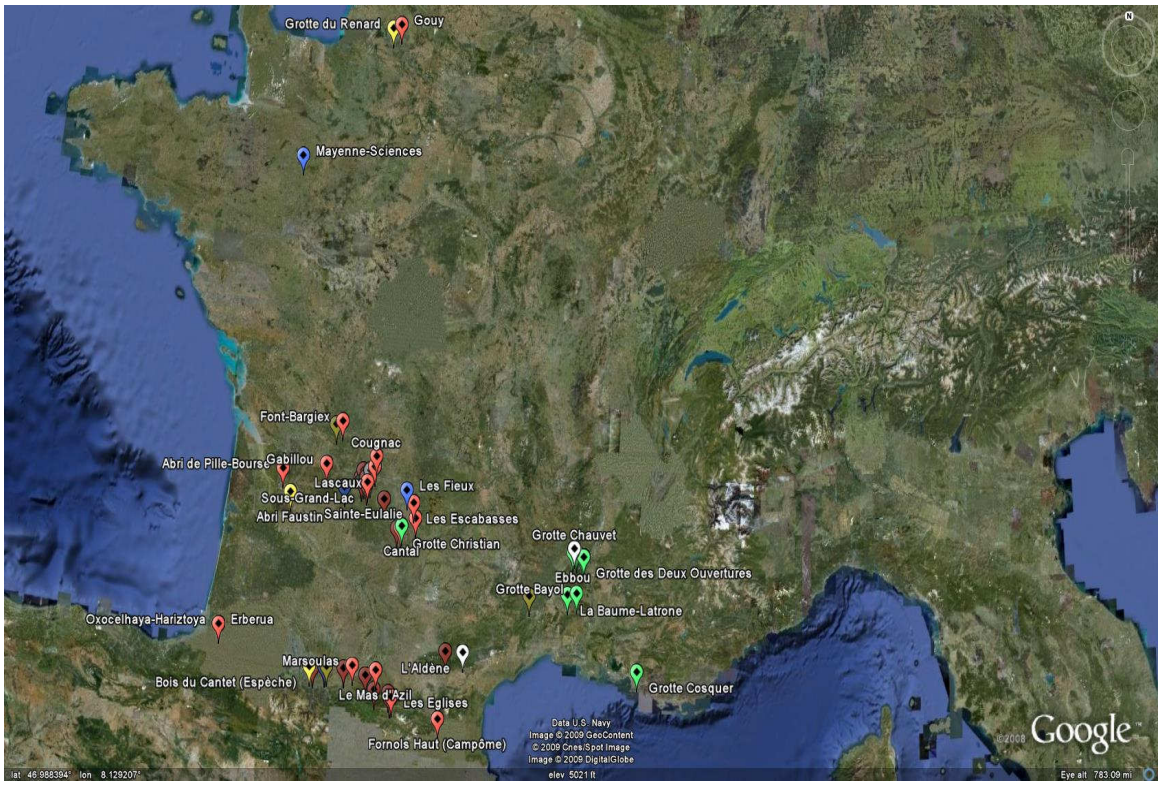


Figure 25 - Open-Angle: All Periods



** For more open-angle images, see Chapter 5

Oval

Oval

This sign type is present at 45 sites, making it the fourth most commonly occurring sign in my region of study. It occurs in all periods, and is most common in the Magdalenian when compared across time. Looking at the presence of ovals in each period compared to the total number of sites from the same time frame suggests a different temporal distribution, with the Aurignacian rising sharply to a 57.1% frequency, and the other four periods all having an occurrence frequency of between 22% and 30%.

With three out of the four Aurignacian sites located in close proximity in the Dordogne region, it could suggest that this was the original area of use for this sign type. The fourth site is located in Hérault to the southeast. The Gravettian period shows a similar concentration in this region, with five of the six sites either in the Dordogne, or in nearby areas. The sixth site is far to the north at Mayenne-Sciences. The Solutrean is the first period where this sign type really expands out across landscape with a new concentration of six sites in the Ardèche/Gard region, though there remains a second grouping of four sites in the Dordogne/Lot region. Ovals make their first appearance near the Pyrénées in the Magdalenian with a concentration of nine sites. There is an increase to eleven sites in the Dordogne/Lot region in the same period, and two sites appear far to the north. In the Late Magdalenian, this sign type disappears from the Dordogne, though there remains one site in the Pyrénées, and ovals reappear at two sites in the Ardèche.

This oval sign type displays very interesting patterning, with a very strong tie to the Dordogne region for the first two periods. The way in which it abruptly appears in a

high concentration in the Ardèche during the Solutrean, and then vanishes from this region, only to appear for the first time in an even greater concentration near the Pyrénées during the Magdalenian is also very intriguing. With almost a 30% occurrence frequency for this sign type in France, it would be useful to look for its presence in other parts of Eurasia. I am especially interested in the early periods, as there are not many signs that have such a clear-cut link to a region, such as we see with oval signs in the Dordogne.

Table 31 - Oval Period Frequencies

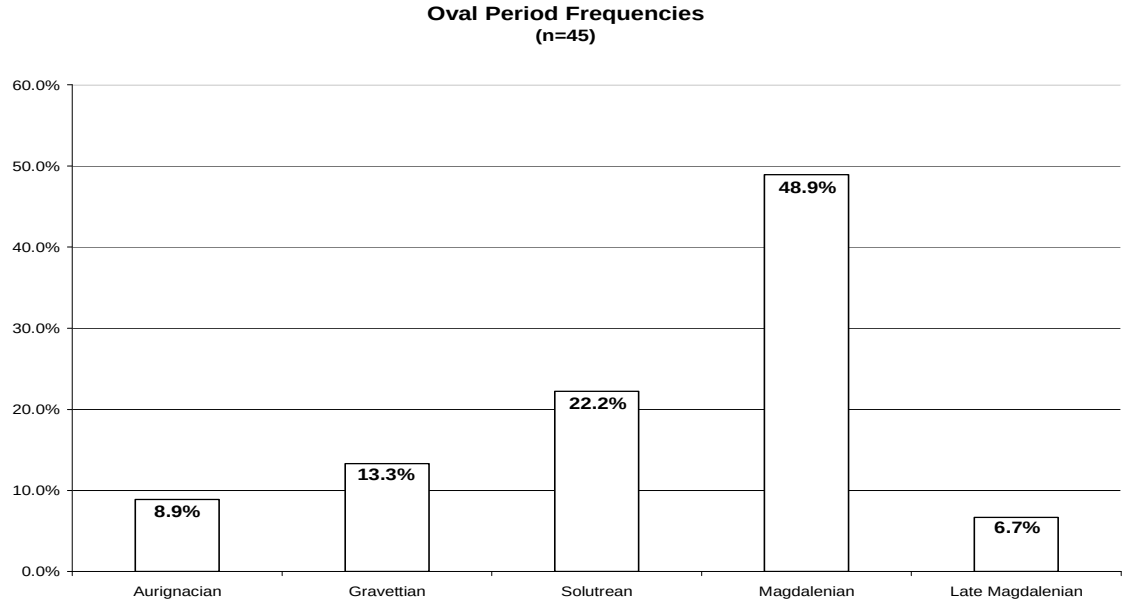


Table 32 - Proportion of Ovals to Period Site Totals

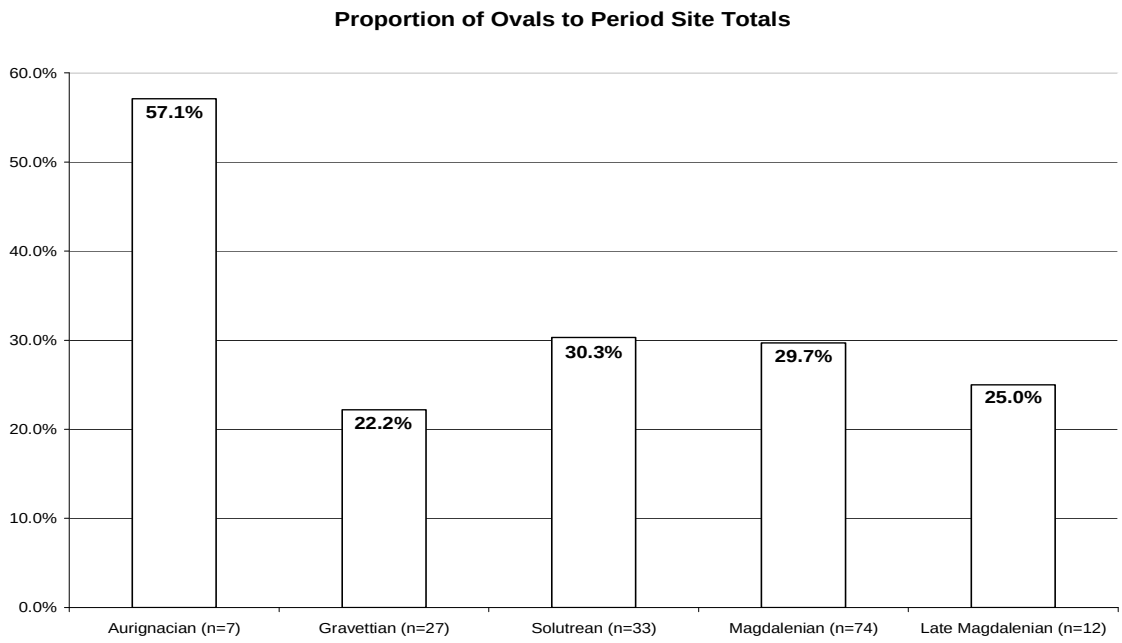


Figure 26 - Oval: All Periods

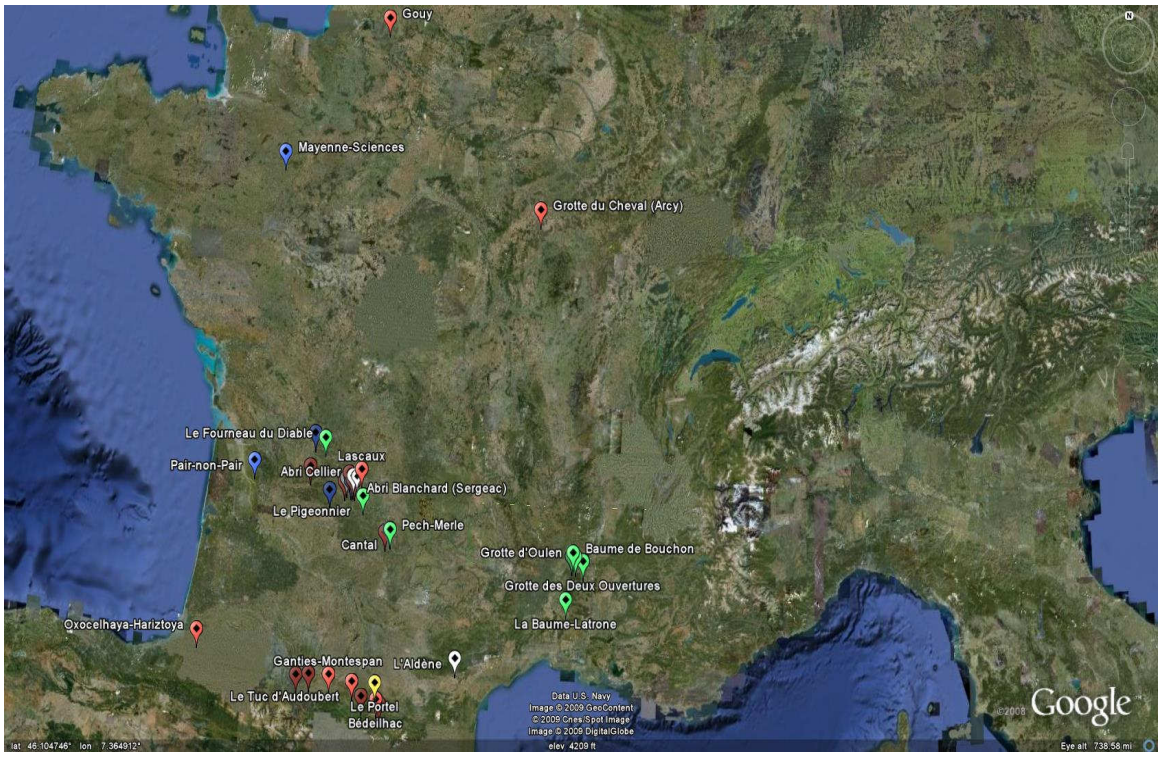


Figure 27 - Oval: Aurignacian and Gravettian sites

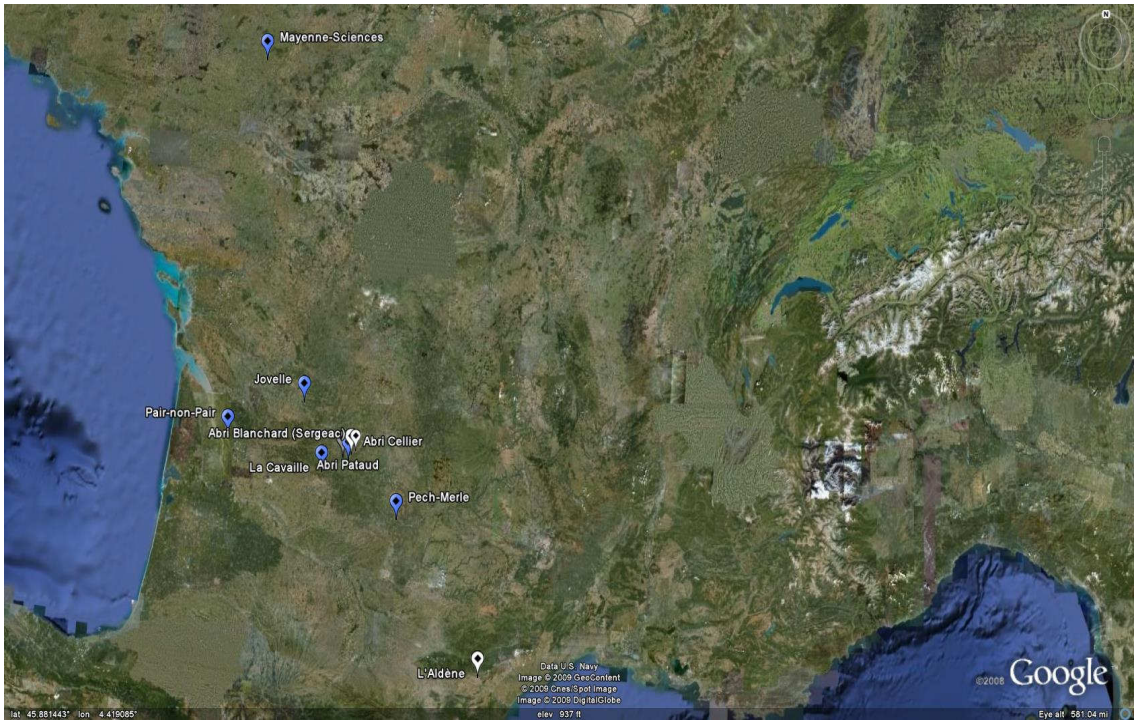
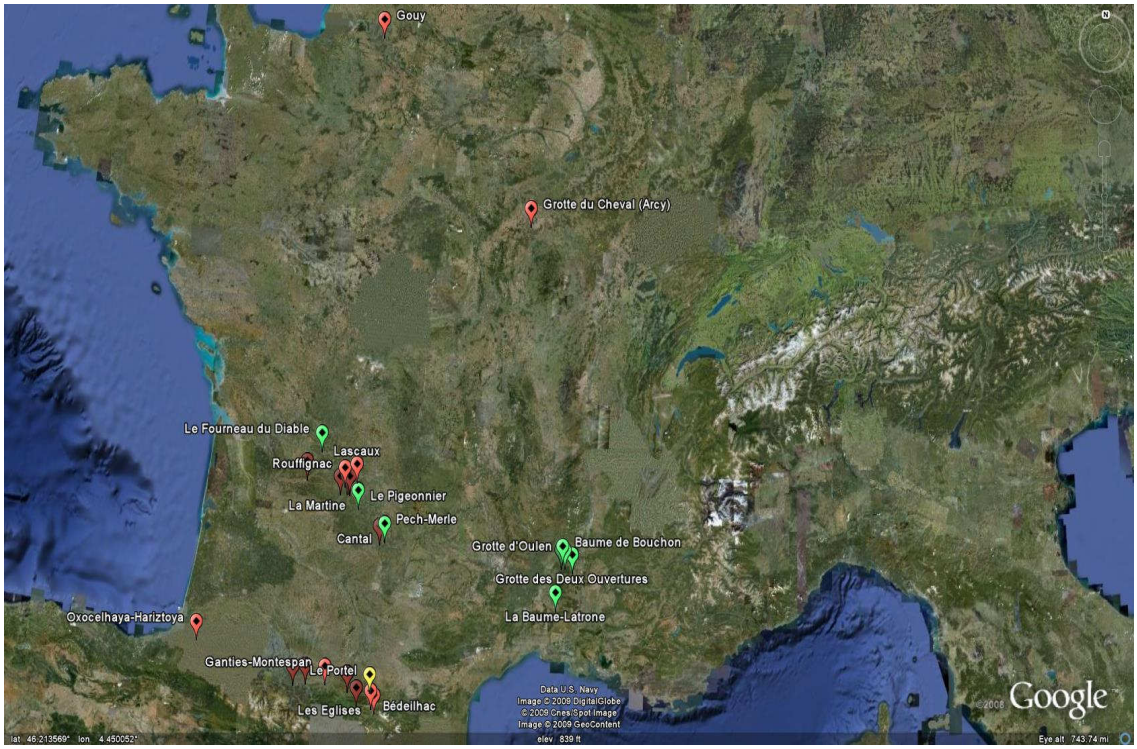


Figure 28 - Oval: Solutrean, Magdalenian and Late Magdalenian sites



Pectiform

This sign type is present at 8 sites, and occurs in only three periods: the Gravettian, Magdalenian and Late Magdalenian. With only one site in the Gravettian, and one in the Late Magdalenian, the Magdalenian clearly has the highest occurrence frequency, though the small number of sites where this sign type occurs makes it difficult to establish any real patterning. The Gravettian site and the majority of the Magdalenian sites are in the Dordogne/Lot region, with two more Magdalenian sites near the Pyrénées, and the only Late Magdalenian site being in the Ardèche region. Noting that there is a break in the timeline with an absence of Solutrean sites, and knowing that this sign type is present in Spain (for example Cueva la Pileta), more information would probably be gained by expanding the geographic range of research.

Table 33 - Pectiform Period Frequencies

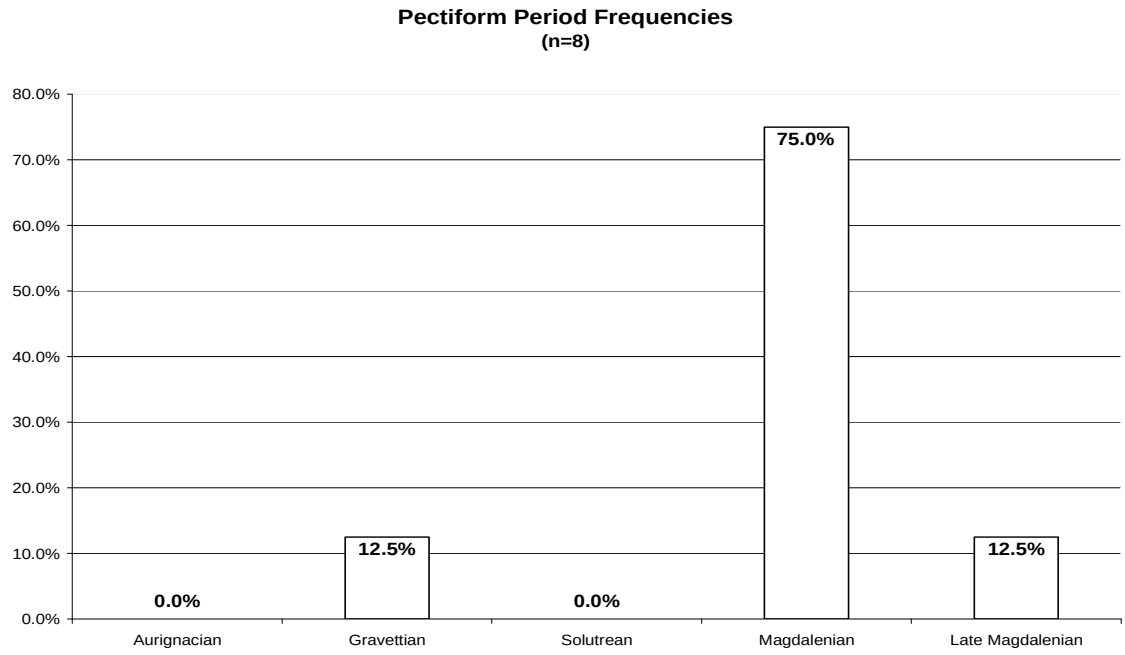


Table 34 - Proportion of Pectiforms to Period Site Totals

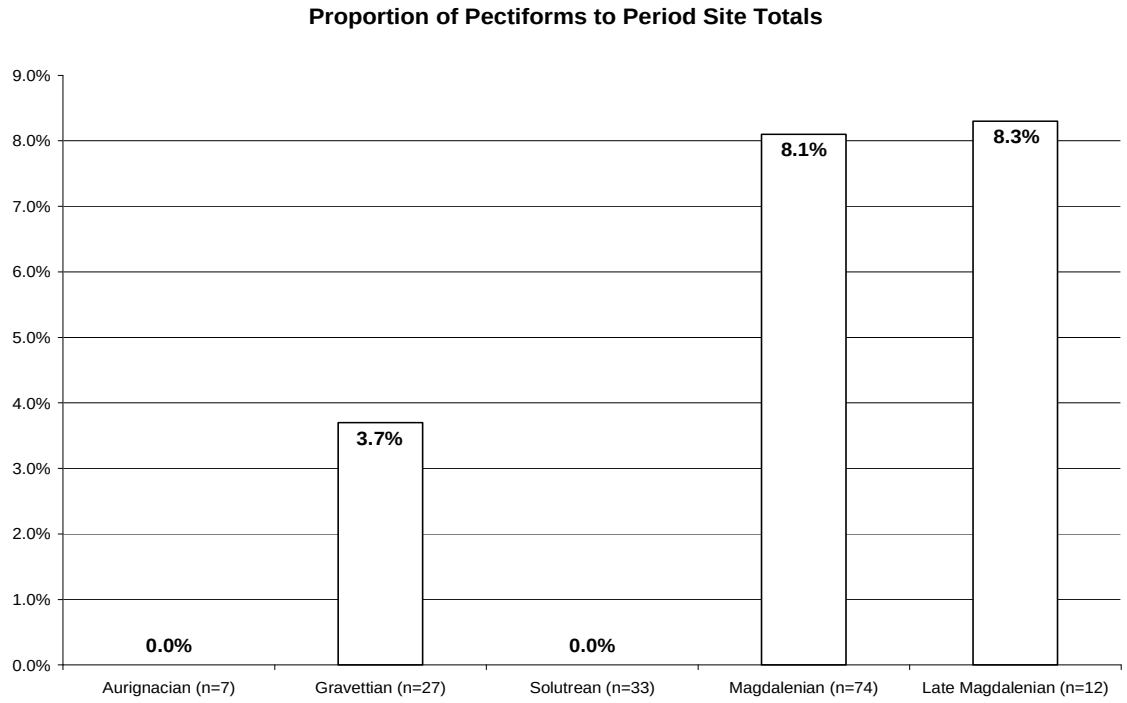
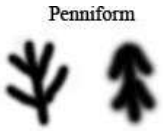


Figure 29 - Pectiform: All Periods

Penniform



This sign type is present at 38 sites, and occurs in all periods except the Aurignacian. When compared across time, the Magdalenian accounts for the vast majority with a 65.8% occurrence frequency. Looking at the presence of penniforms in each period compared to the total number of sites from the same time frame offers up a much more even temporal distribution, with the Gravettian and Solutrean having close to a 15% frequency, and the Magdalenian and Late Magdalenian become equivalent, both with a 33% frequency.

The Gravettian has an interesting spatial distribution pattern, with two sites in the Dordogne, while the other two sites are much further to the north. In the Solutrean, there is a heavy concentration of sites in SE France. The only other Solutrean site with this sign type is found in Lot. The Magdalenian period includes 25 sites, concentrated in two major groupings, one in the Dordogne/Lot region, and the other along the Pyrénées. There is also one site to the far north at Gouy. The four Late Magdalenian sites are quite spread out, with two near the Pyrénées, one in Ardèche, and the other in the Dordogne. Without having evidence of this sign type in the Aurignacian, the data seems to suggest that it was either a local Gravettian invention, or that the sign may have been introduced from elsewhere. Knowing that this sign type has been recorded in Spain (see for example Monedas and El Castillo), finding out the dates of these images in Spain, as well as adding the sites to my database, may produce some very interesting answers.

Table 35 - Penniform Period Frequencies

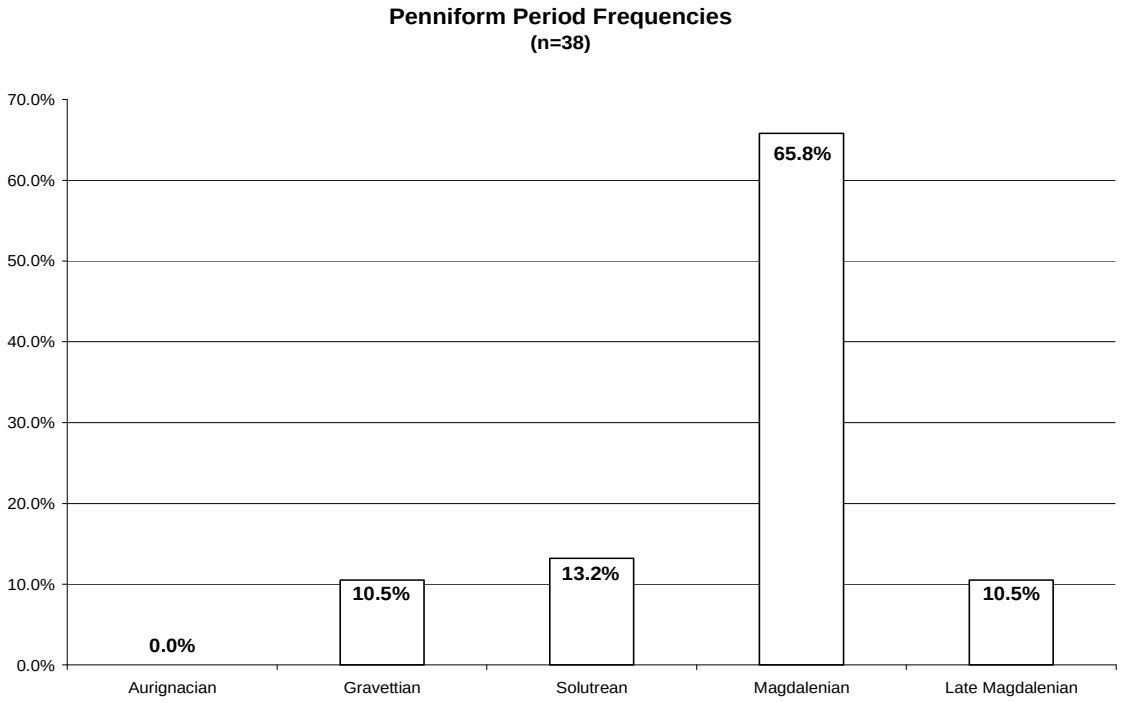


Table 36 - Proportion of Penniforms to Period Site Totals

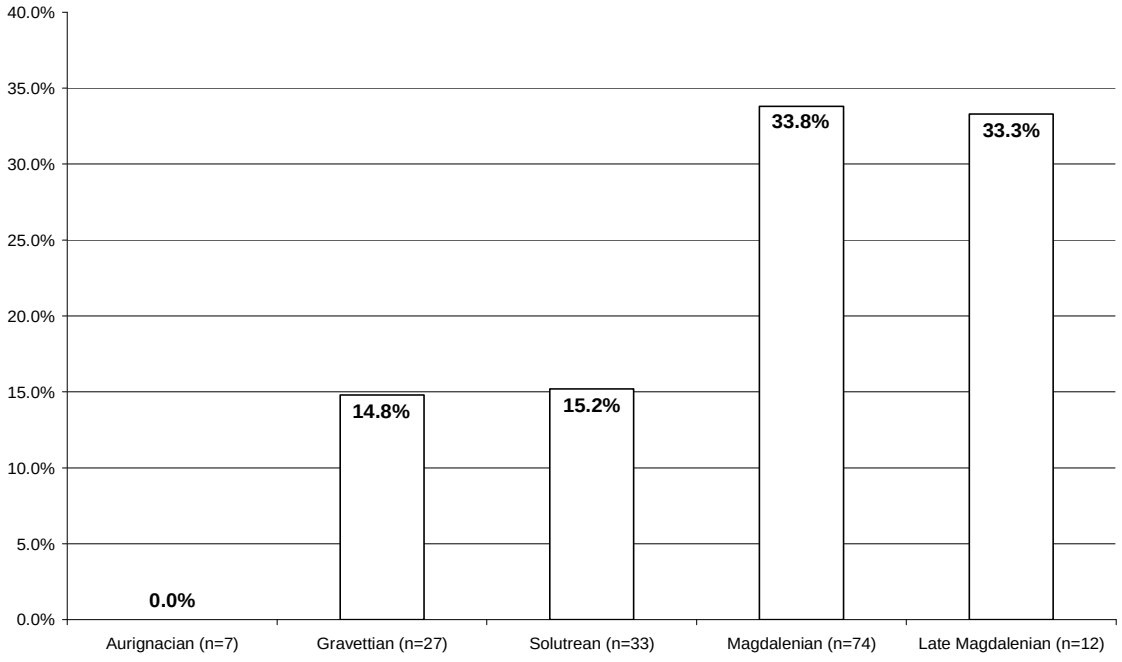


Figure 30 - Penniform: Gravettian and Solutrean sites

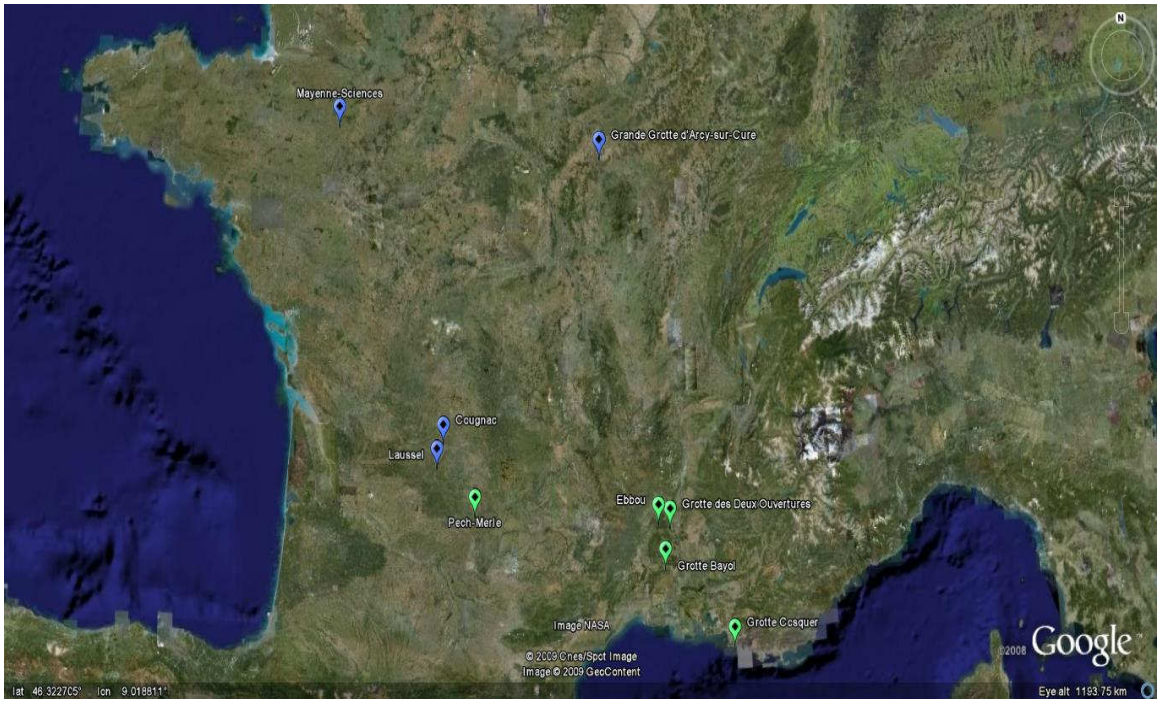
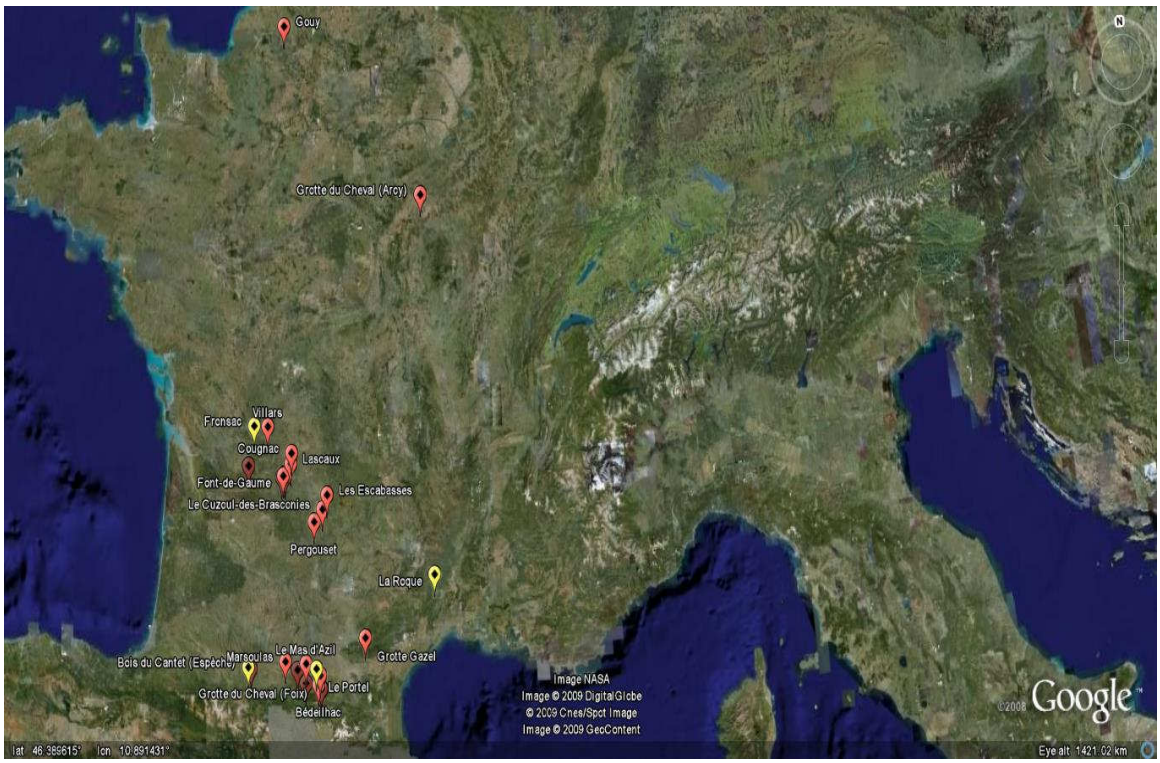


Figure 31 - Penniform: Magdalenian and Late Magdalenian sites



Positive Hand

There are 10 sites where this sign type is present, and it appears in all periods other than the Late Magdalenian. Positive hands are an interesting category, since the highest occurrence frequency is in the Gravettian, followed by a steady decline into the Magdalenian. Even more interesting is the geographic range in the Gravettian, with two sites in the north, one in the Dordogne, and one on the Mediterranean. The Solutrean sees a contraction down to the Dordogne and Ardèche regions, and by the Magdalenian there are just two sites, one in the Dordogne, and one in Ariège. With such a small sample, it is difficult to do much interpretation, though the peak in the Gravettian and the disappearance of this sign type before the end of the UP does suggest that it may have no longer been relevant to those creating the art. There is certainly the possibility that by expanding the geographic range of the research, a more definitive answer may be found.

Table 37 - Positive Hand Period Frequencies

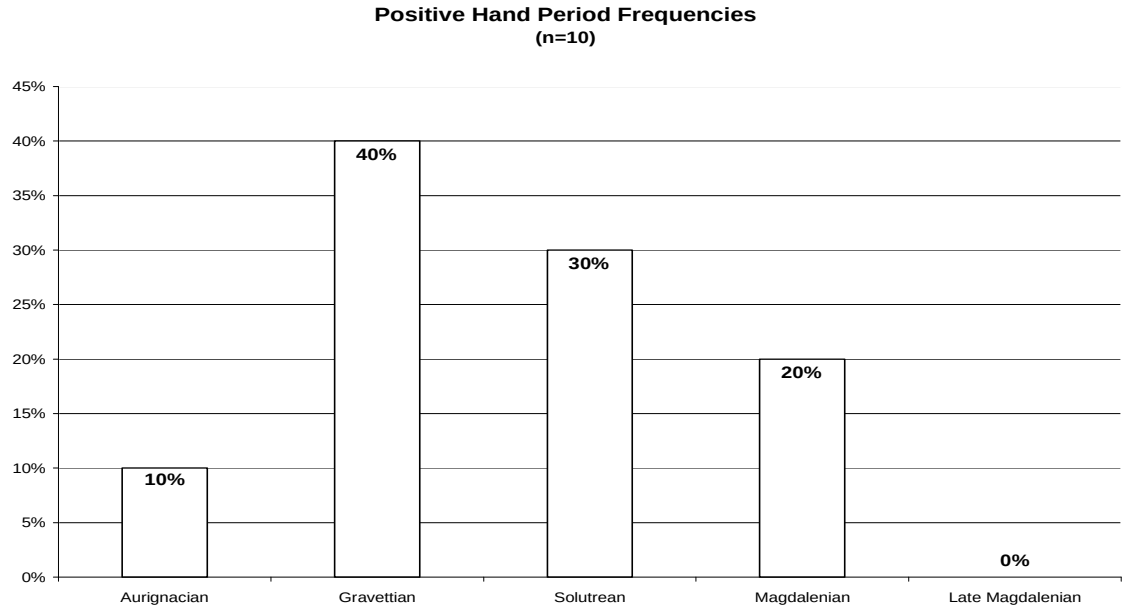


Table 38 - Proportion of Positive Hands to Period Site Totals

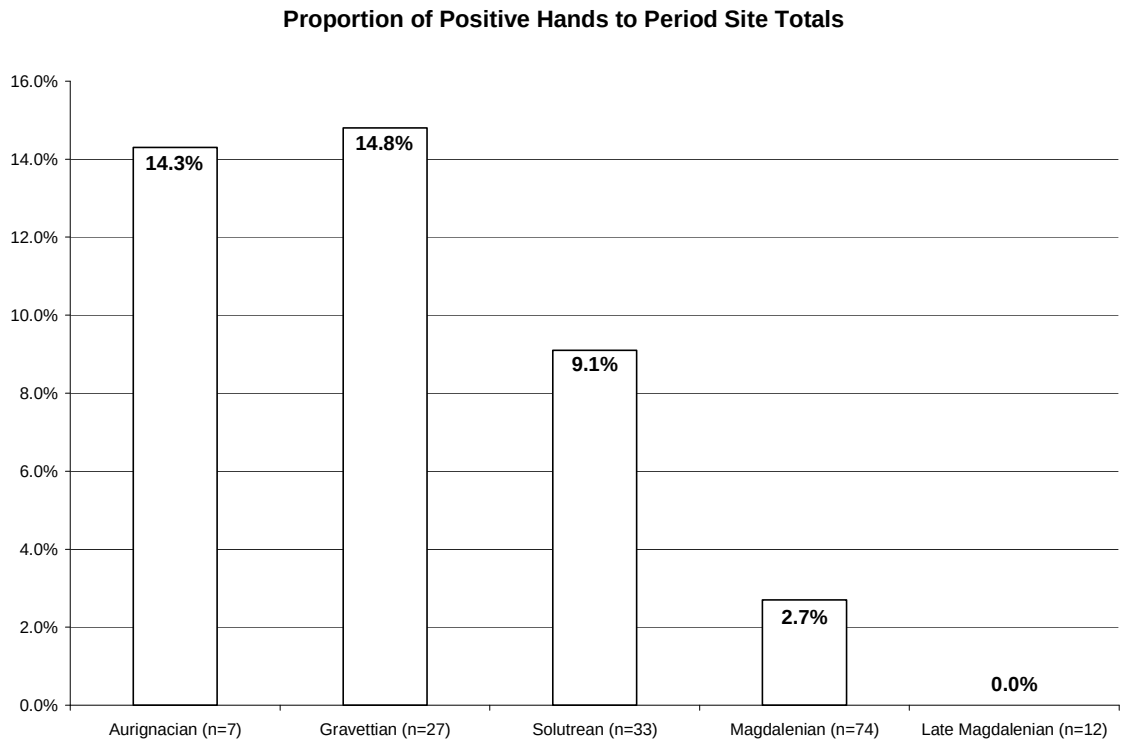
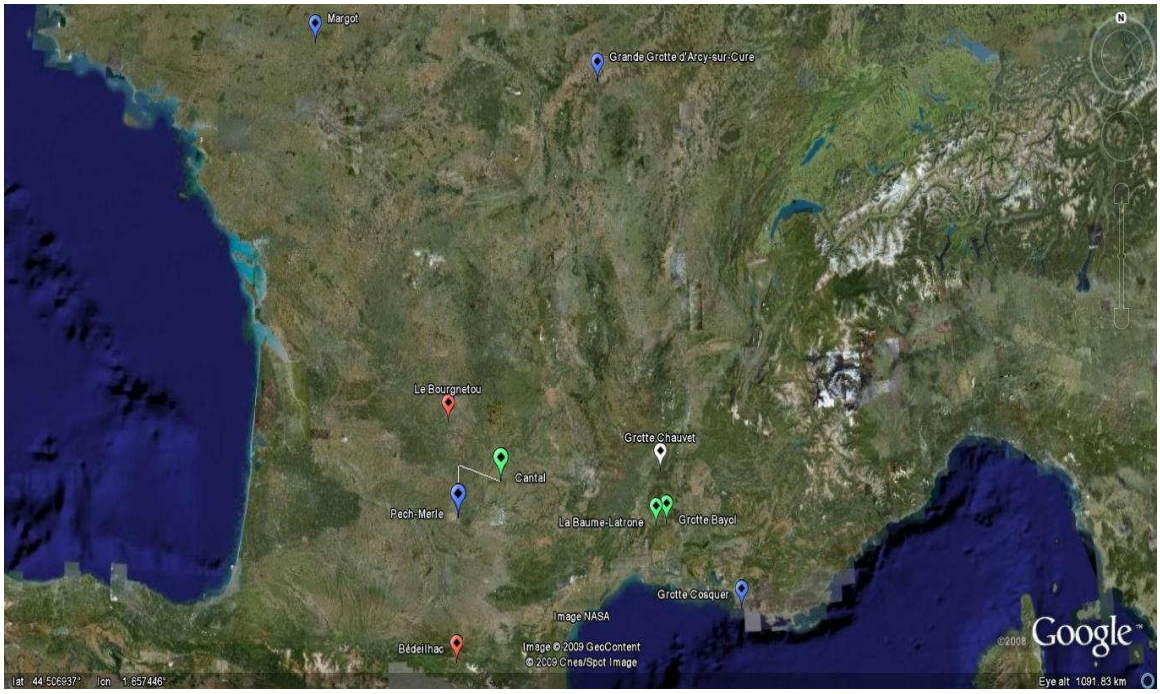


Figure 32 - Positive Hand: All Periods



Quadrangle

This sign type occurs in all periods, and is present at 29 sites in the study region. While comparing across time suggests a strong peak in the Magdalenian, looking at the presence of quadrangles in each period compared to the total number of sites from the same time frame, offers up a much more even temporal distribution. The Aurignacian ends up having the highest occurrence frequency with nearly one in three sites containing quadrangles, and after a brief drop in the Gravettian, the following three periods have quadrangles at approximately one in every five sites.

Traditionally, it has been thought that quadrangle signs were concentrated in the Dordogne, especially at Lascaux and Gabillou (Bahn & Vertut 1997: 168). While the Aurignacian sites are in the Dordogne, and this region does have quadrangles present in every period, there are other regions where this sign type becomes concentrated in later periods. In the Gravettian, this sign type does remain focused in the Dordogne, but we also have northern movement as evidenced by the site of Grande Grotte d'Arcy-sur-Cure. In the Solutrean, a distinctive pattern emerges as we see this sign type beginning to spread southwards both to the Ardèche (Grotte Bayol, Grotte Cosquer), and the Western Pyrénées (Isturitz). By the Magdalenian, we have two clear groupings of sites with quadrangle signs: one in the Dordogne/Lot region (8 sites), and the other along the length of the Pyrénées (7 sites). Knowing that there are also sites in the Cantabrian region with quadrangles (for example Castillo, La Pasiega, Las Chimenas and Altamira), it would be interesting to compare these groupings temporally in the search for larger patterns.

Table 39 - Quadrangle Period Frequencies

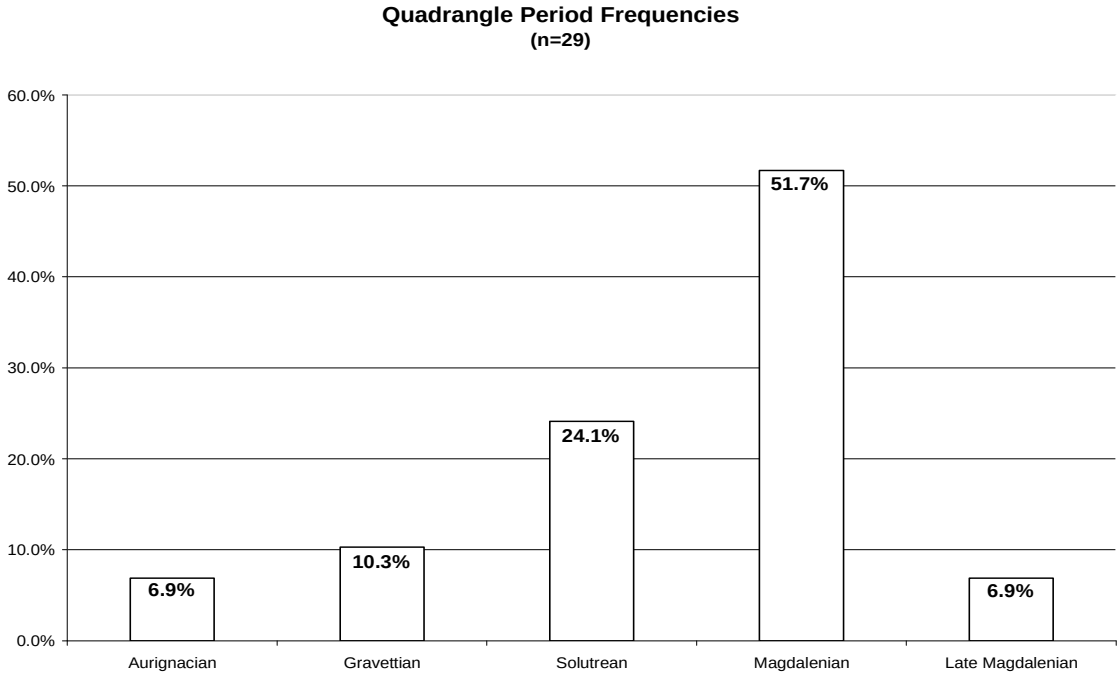


Table 40 - Proportion of Quadrangles to Period Site Totals

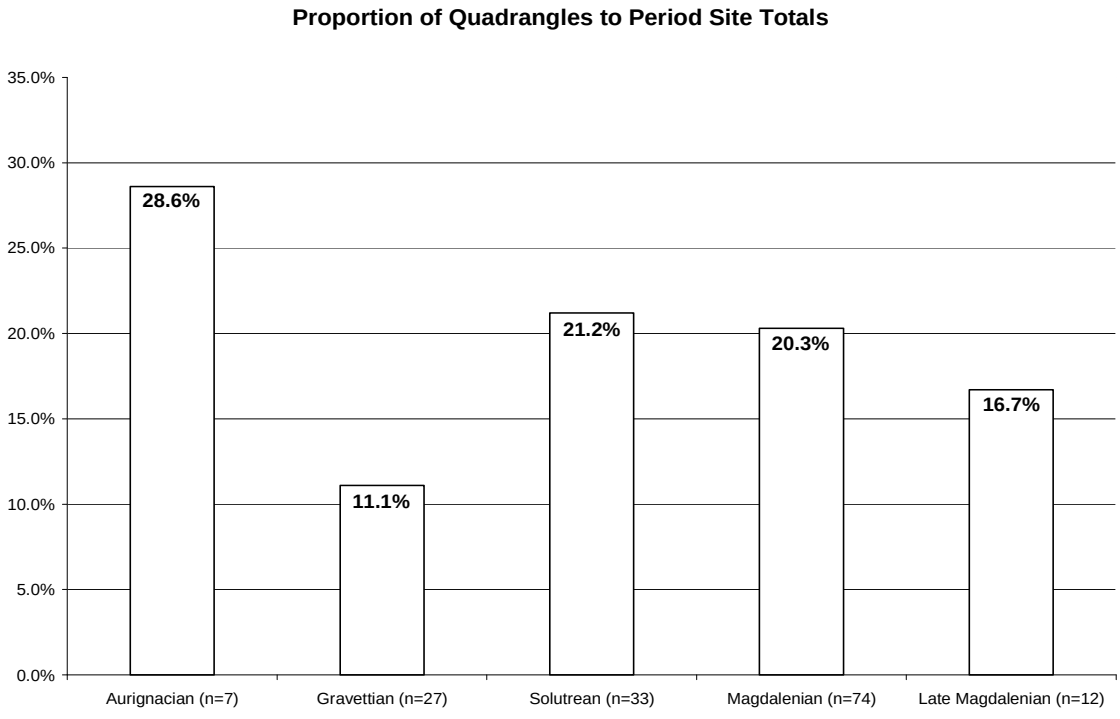


Figure 33 - Quadrangle: Aurignacian, Gravettian and Solutrean sites

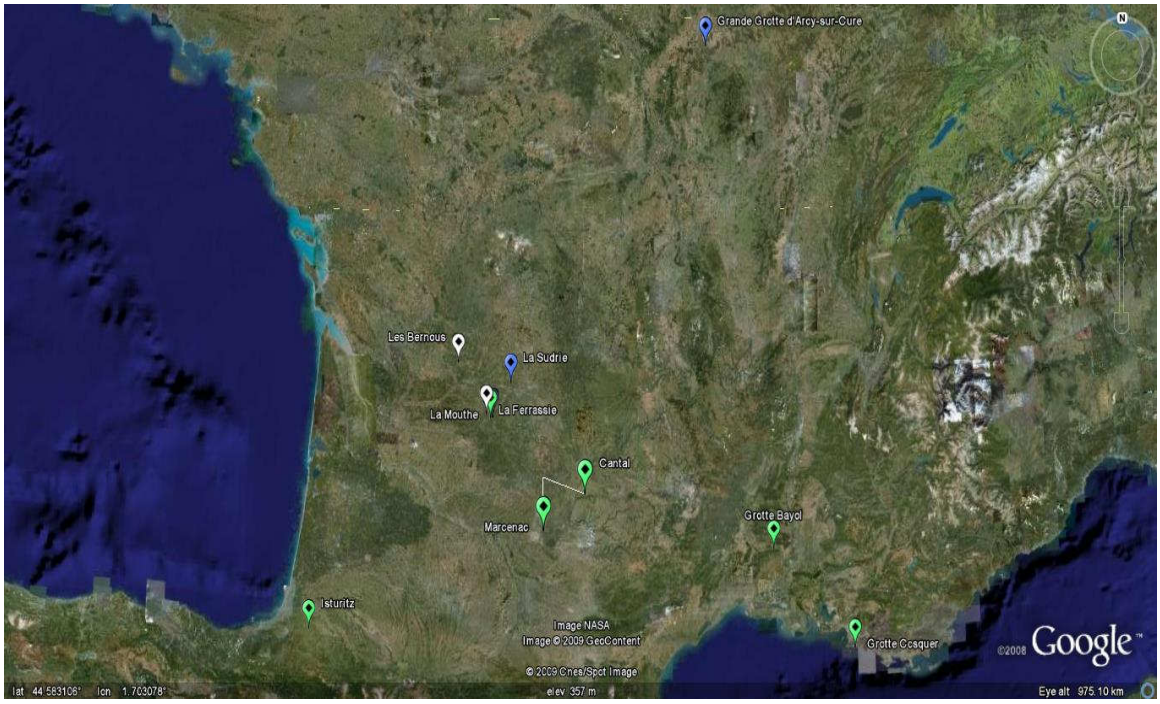


Figure 34 - Quadrangle: Magdalenian and Late Magdalenian sites

Reniform

With only 3 sites in three different periods (Aurignacian, Gravettian and Magdalenian) throughout the entire UP, this dataset did not really seem large enough to interpret in any meaningful way until I input it into the spatial software. I then discovered that all three sites were in very close proximity to each other in the Dordogne region, and while this information is more suggestive than anything else, it is still an interesting pattern to note.

Table 41 - Reniform Period Frequencies

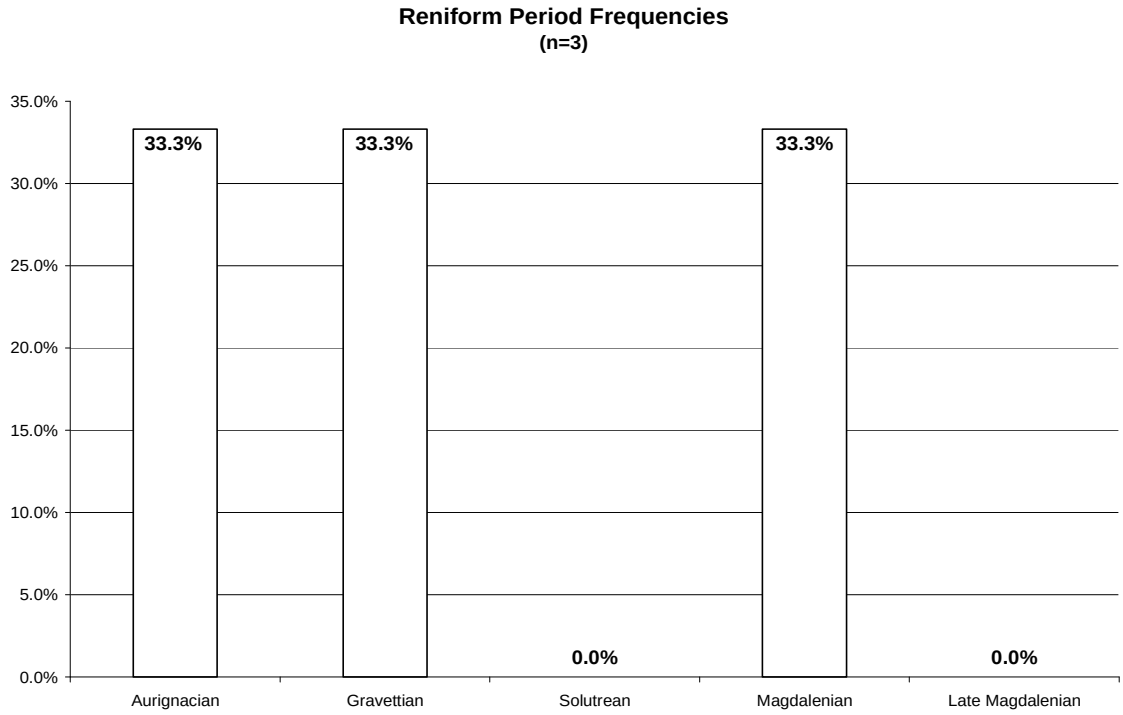


Table 42 - Proportion of Reniforms to Period Site Totals

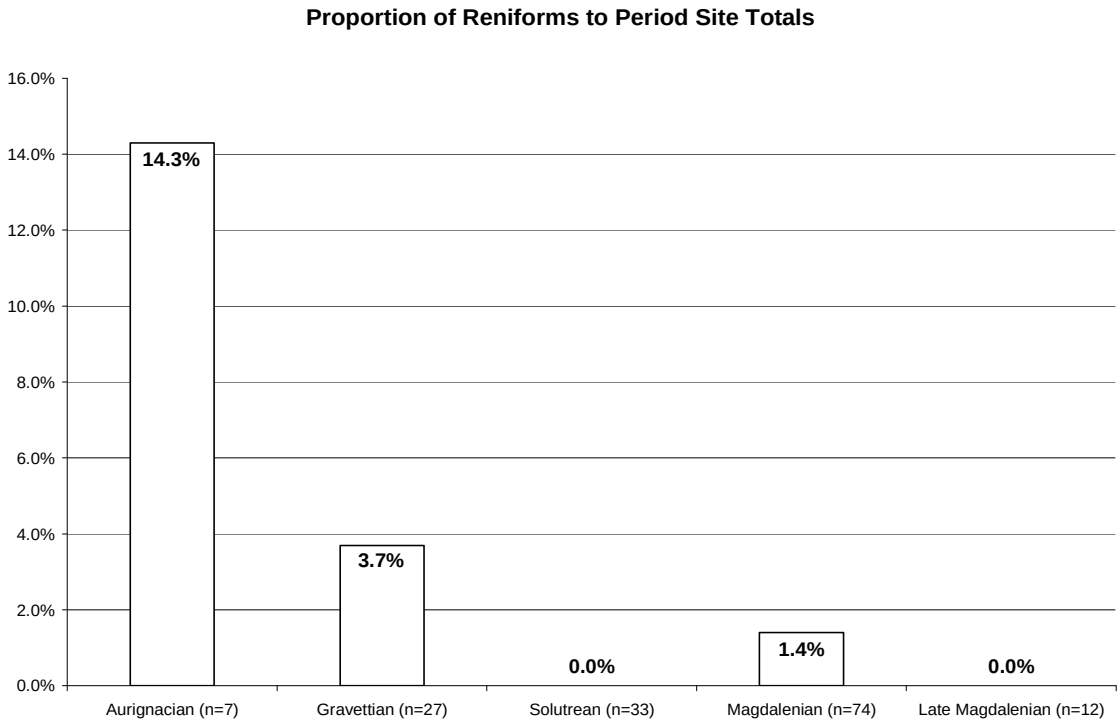
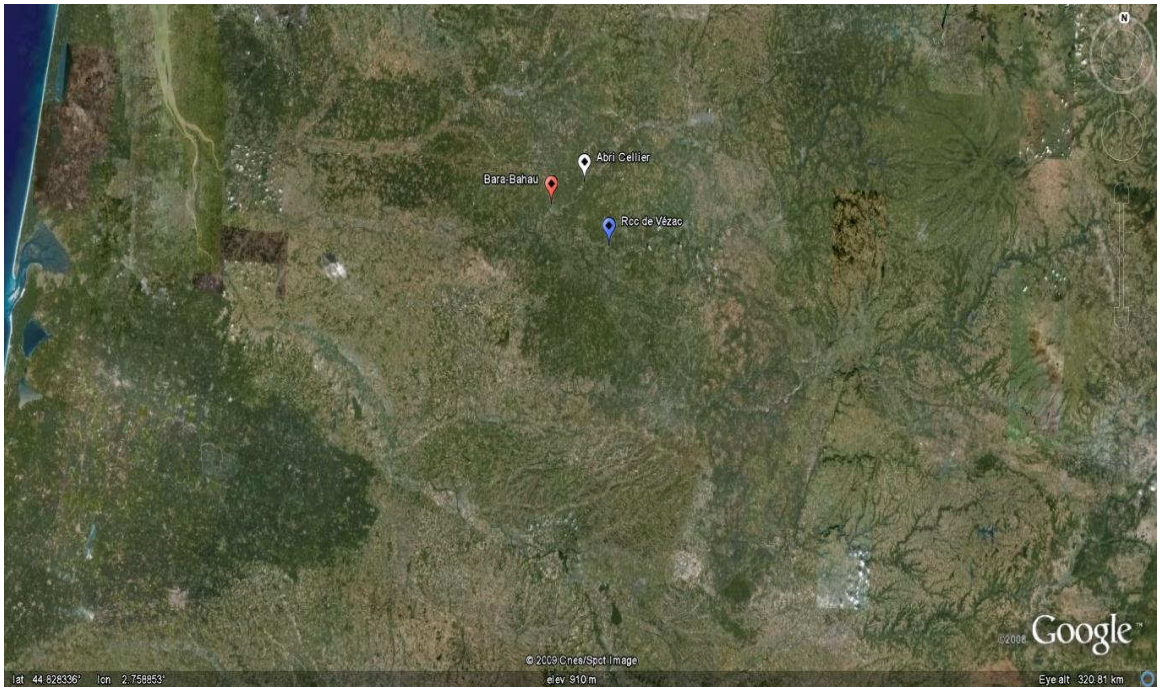
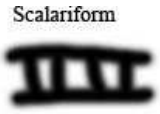


Figure 35 - Reniform: All Periods



Scalariform



With only 3 sites in three different periods (Gravettian, Magdalenian and Late Magdalenian) throughout the entire UP, this dataset is not really large enough to interpret in any meaningful way. Spatially, the Gravettian and Magdalenian sites are near each other in the Dordogne, and the Late Magdalenian site is in the Ardèche region. Interestingly, this sign type is present at some Spanish sites (see for example Altamira), suggesting this may be a better candidate for comparative study if the geographical range were expanded to encompass the whole of Eurasia.

Table 43 - Scalariform Period Frequencies

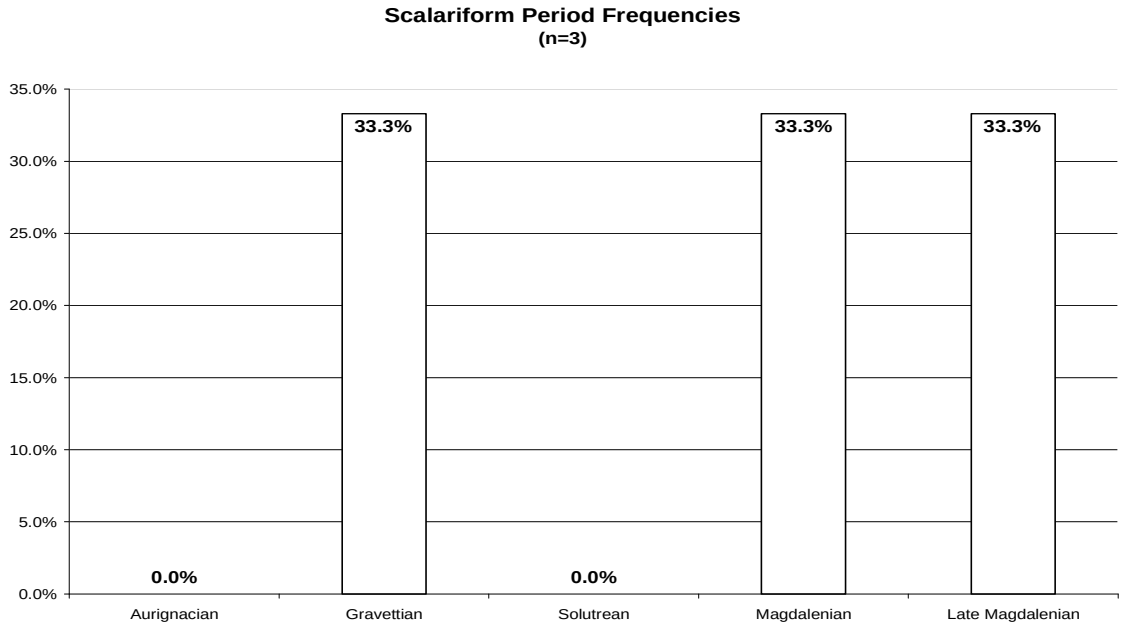


Table 44 - Proportion of Scalariforms to Period Site Totals

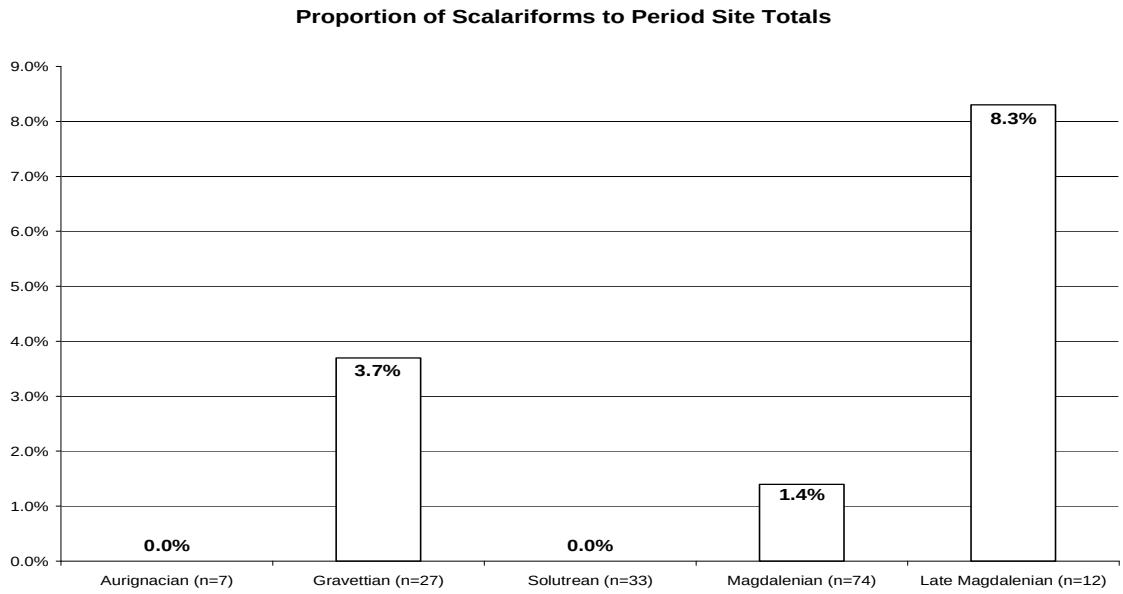
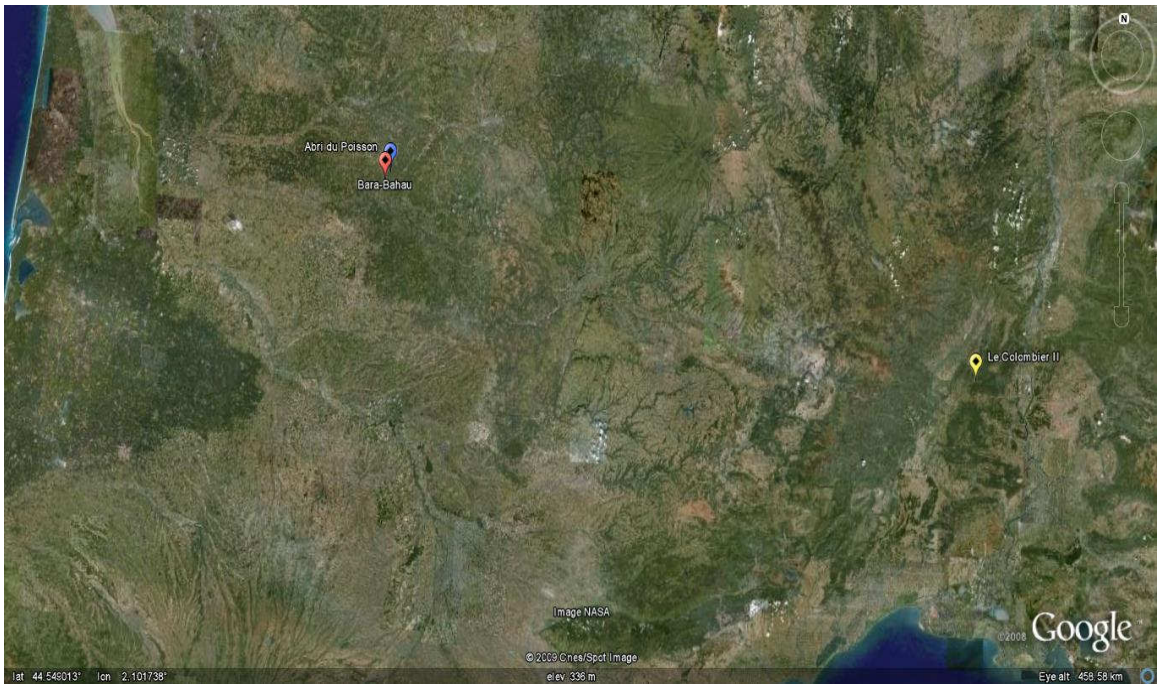


Figure 36 - Scalariform: All Periods



Serpentiform

Serpentiform

This sign type is present at 11 sites, and occurs in the Aurignacian, Gravettian and Magdalenian periods. The majority of occurrences are from the Magdalenian (8 sites), and there is a break in the timeline with no Solutrean sites being found. Serpentiforms first appear in the Ardèche region in the Aurignacian, and then move north (Grande Grotte d'Arcy-sur-Cure) and into the Dordogne during the Gravettian. In the Magdalenian period, there are two groupings, one in the Dordogne, and the other along the Pyrénées, with one site in the far north at Gouy. This interesting spread outwards to the edge of my geographic range suggests that expanding this range might potentially allow the tracking of this symbol into other parts of Europe.

Table 45 - Serpentiform Period Frequencies

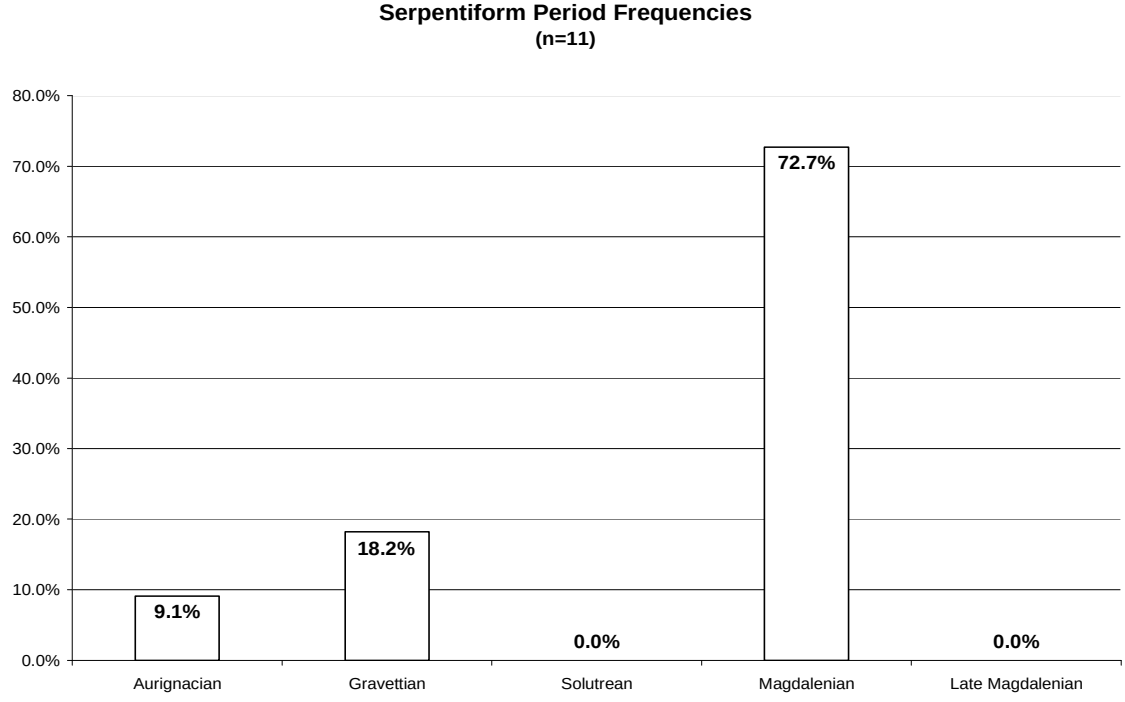


Table 46 - Proportion of Serpentiforms to Period Site Totals

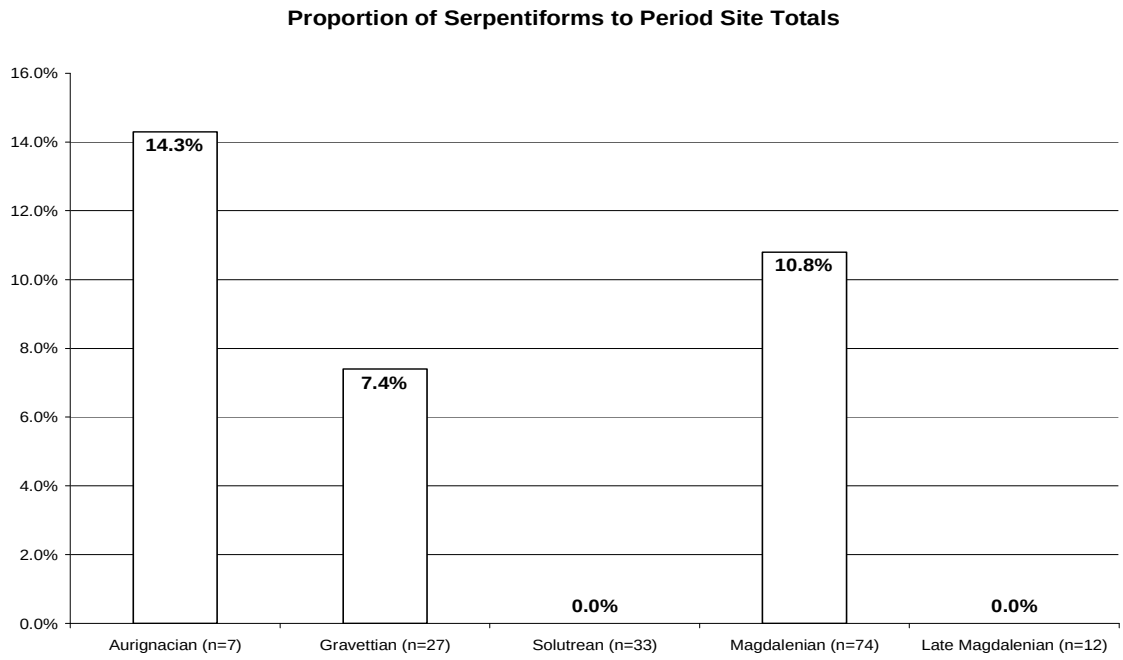
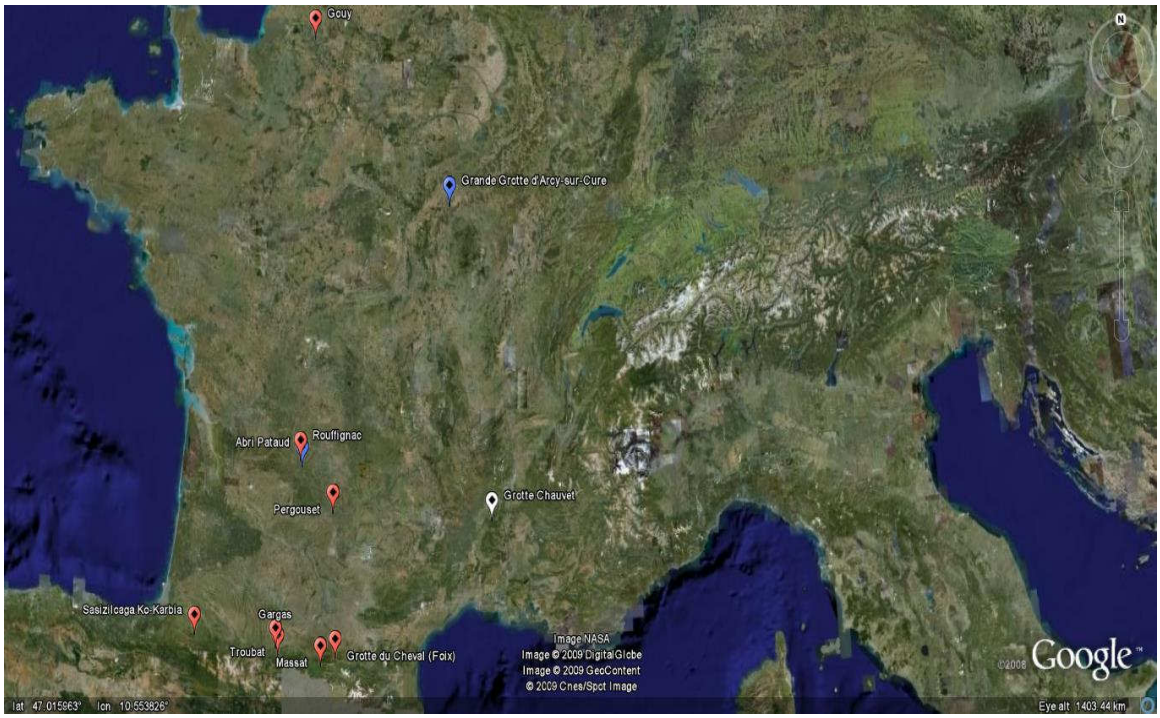


Figure 37 - Serpentiform: All Periods



Spiral

Spiral

There are only 2 sites with this sign type, one in the Gravettian and the other in the Magdalenian, so this dataset is really too small to be useful for this project. The Gravettian occurrence is quite far north at the site of Grande Grotte d'Arcy-sur-Cure, and the Magdalenian site is in the Dordogne. Since the spiral symbol is very common in many later European cultural traditions, I was actually rather surprised that there were not more occurrences of this sign type, as I had assumed it would be widespread. I have only included the proportional graph, as the other graph does not really have anything to contribute.

Table 47 - Proportion of Spirals to Period Site Totals

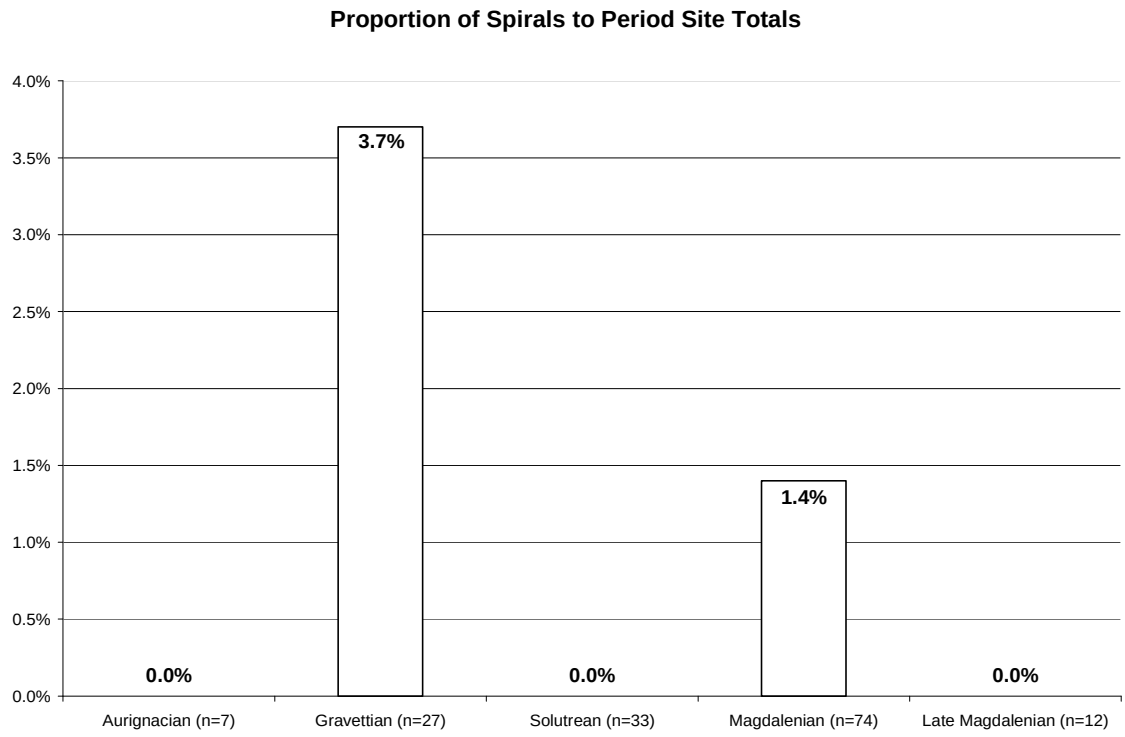
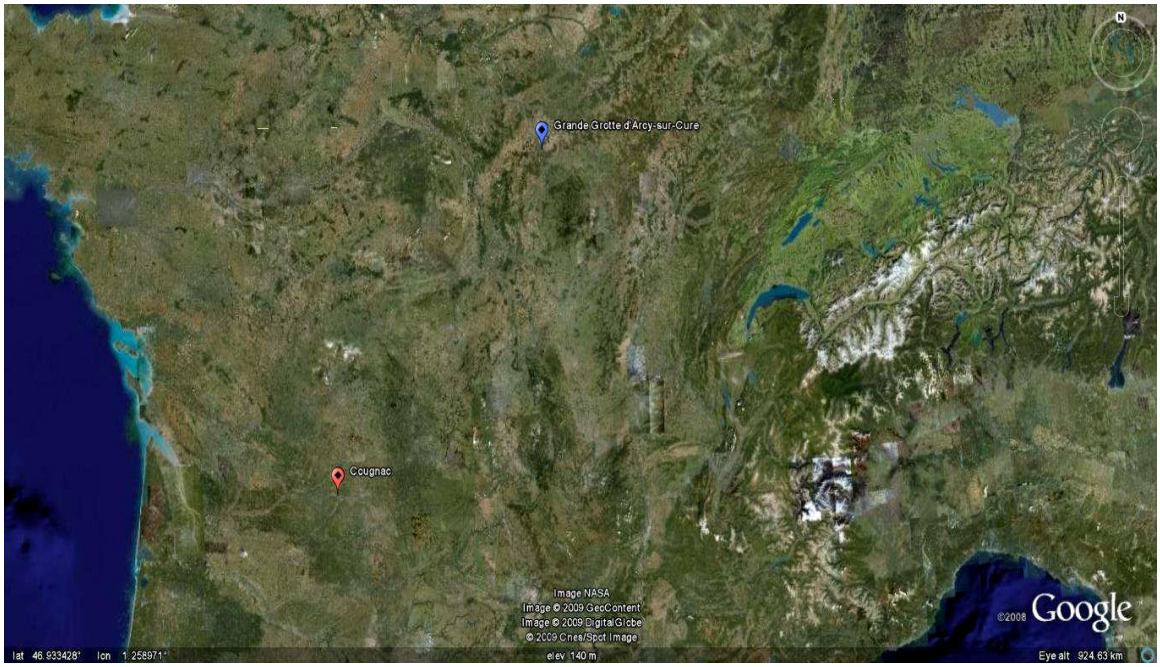


Figure 38 - Spiral: All Periods



Tectiform

There are only 15 dated sites for this sign type, though the undated Upper Paleolithic site of Le Bison also does contain a tectiform (eliminated from temporal analysis due to lack of information). This is an interesting category of sign, because whether compared across time or by period in relation to total sites from the same time frame, the Magdalenian clearly has the most sites with tectiforms present. Traditionally, it had been thought that the tectiform sign type was restricted to the Dordogne region (Bahn & Vertut 1997: 168), and even more specifically a product of the Magdalenian (Vialou 2006: 311). While the majority are indeed in the Dordogne during this period (seven out of twelve Magdalenian sites), it is interesting to note that the earliest example

of this sign type actually occurs in the Lot region during the Gravettian at Les Fieux, and that the two known Solutrean sites are in Lot and Gard. During the Magdalenian, we have five sites outside the Dordogne, including two nearby in Lot, one to the west in Gironde, and two quite a bit further to the south along the Pyrénées. Even knowing that this sign type is not quite as localized as previously believed, it still appears to be a fairly unusual sign type (it only has a 10.46% occurrence frequency), and to the best of my knowledge, no tectiforms have ever been identified outside of the French region.

Table 48 - Tectiform Period Frequencies

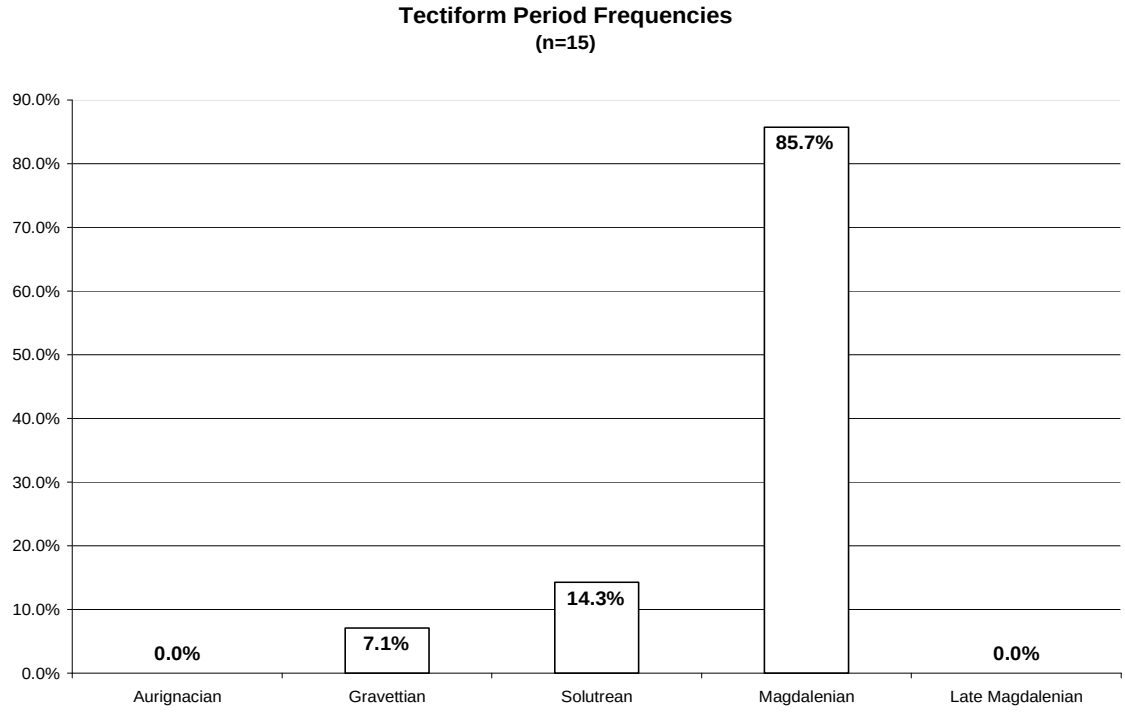


Table 49 - Proportion of Tectiforms to Period Site Totals

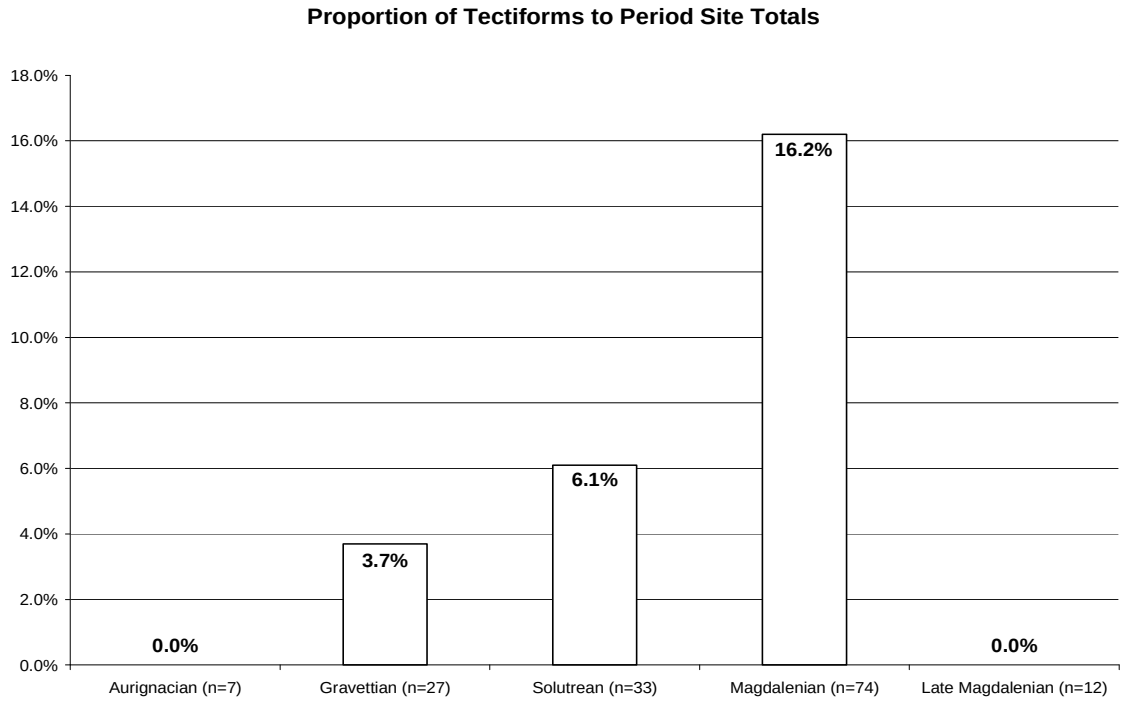
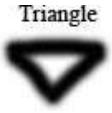


Figure 39 - Tectiform: All Periods (zoomed out)

Figure 40 - Tectiform: All Periods (close-up)

Triangle



There are 34 sites where this sign type is present, and it appears in all periods. When compared across time, the Magdalenian has the highest occurrence frequency (58.8%), but when the presence of this sign type is compared with period site totals, the temporal distribution becomes a lot more even. Every period other than the Solutrean has approximately a one to four ratio of sites where the triangle sign type can be found. The spatial distribution of the Gravettian sites is particularly interesting, as there is a main grouping in the Dordogne/Lot region, and then there are two sites fairly far to the north. There are only three Solutrean sites, all in the Ardèche region, and then in the Magdalenian there is a major increase (20 sites), but none of these sites are in the

Ardèche. There is a large grouping of sites spread over SW France, a smaller concentration along the Pyrénées, and then a set of three sites that move progressively farther north, ending up with Gouy. Of the two Late Magdalenian sites, one is also far to the north, and the other is in the Dordogne. Knowing that this sign type has already been identified at the Creswell Crags site in the UK, it would be intriguing to incorporate the larger geographic range of Eurasia to see if there were other trajectories that this symbol might have followed.

Table 50 - Triangle Period Frequencies

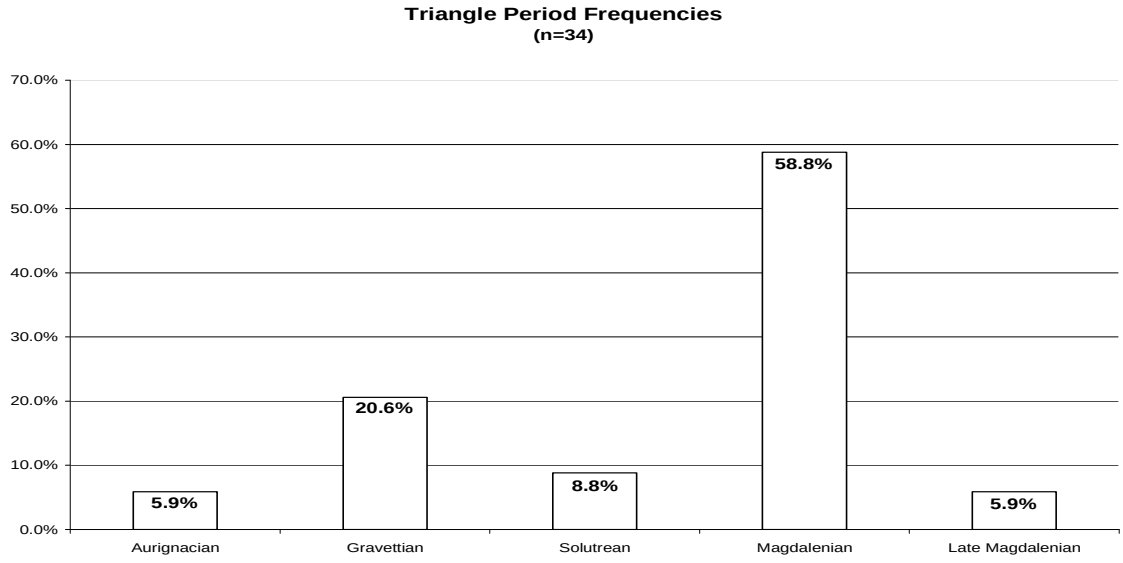


Table 51 - Proportion of Triangles to Period Site Totals

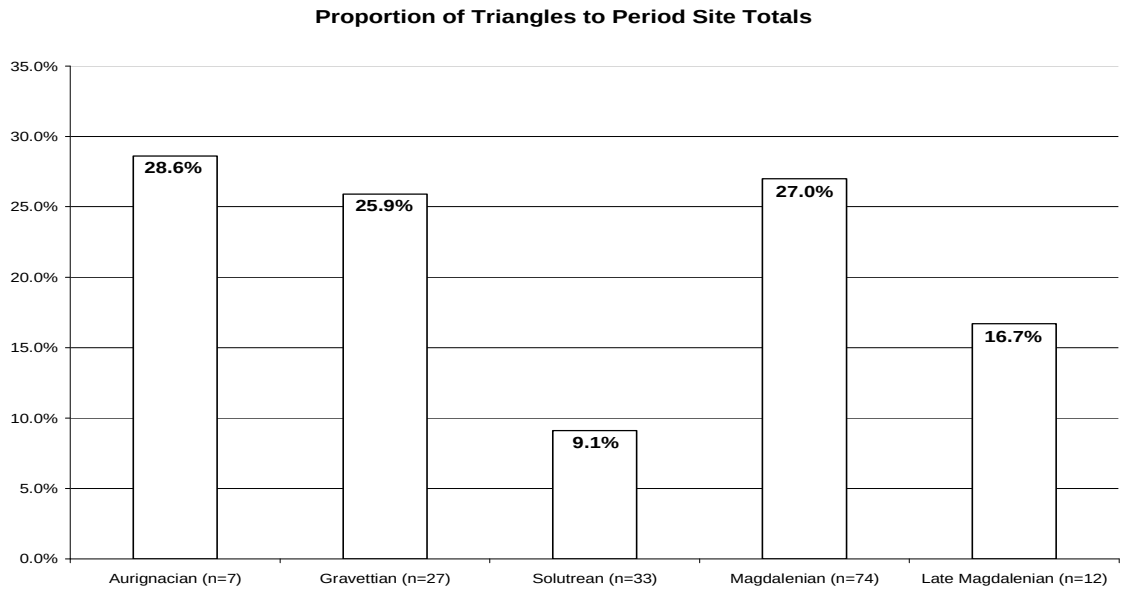


Figure 41 - Triangle: Aurignacian, Gravettian and Solutrean sites

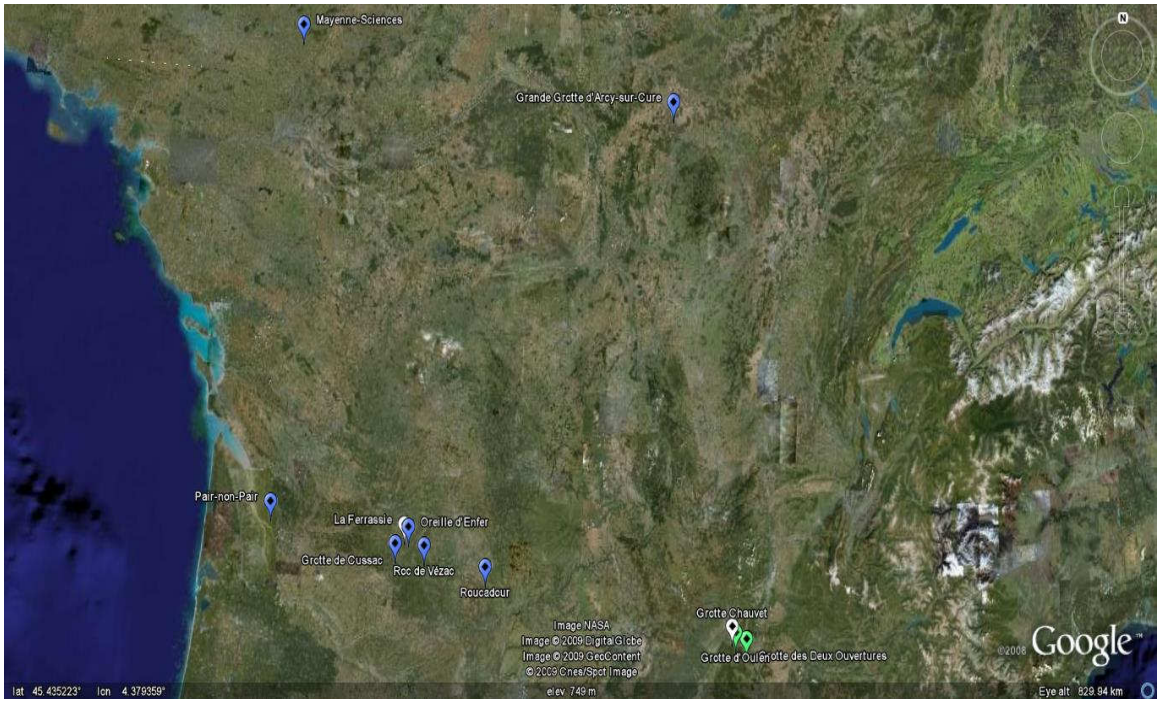
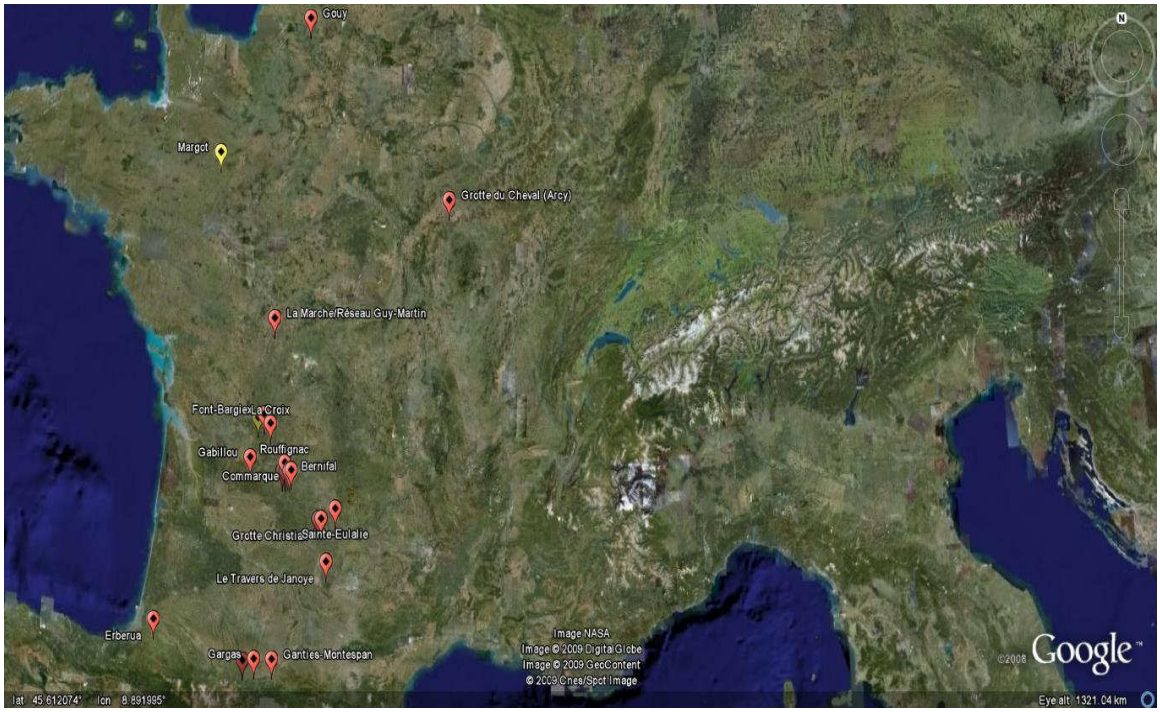


Figure 42 - Triangle: Magdalenian and Late Magdalenian sites



Zigzag

There are 7 sites where this sign is present, one in the Solutrean (Grotte Cosquer), and the other six in the Magdalenian. The majority of the Magdalenian sites are in the Dordogne/Lot region, along with two sites near the Pyrénées. The brevity of this sign's appearance is actually a bit surprising, considering it is a common symbol in later European cultural traditions. I would be interested to see if it occurs elsewhere in Eurasia during the UP, especially if it has a longer period of continuity.

Table 52 - Zigzag Period Frequencies

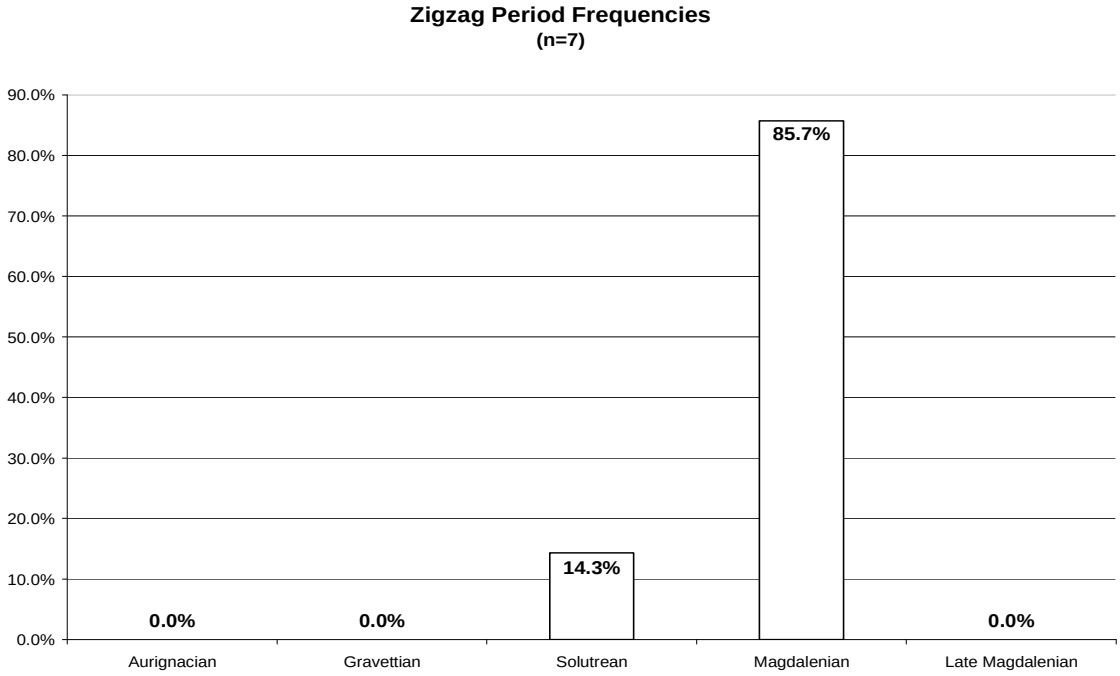


Table 53 - Proportion of Zigzags to Period Site Totals

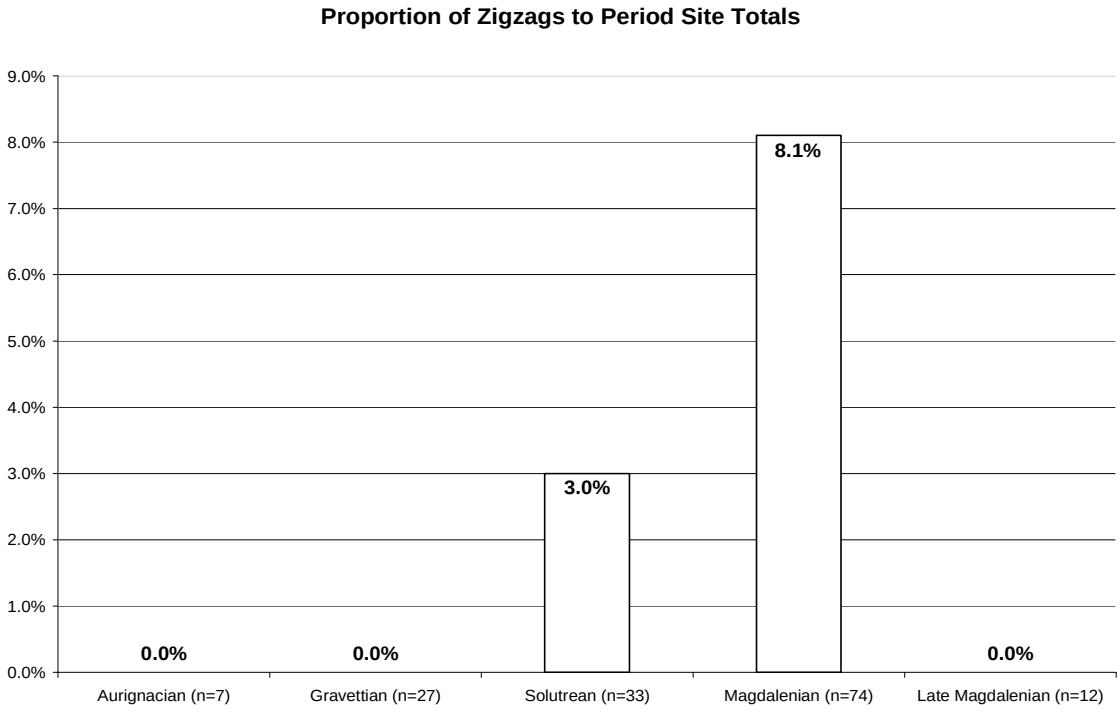


Figure 43 - Zigzag: All Periods

The main focus of this project was tracing the temporal and spatial patterns of the sign categories, but while working on this research, certain larger patterns began to emerge. Since the sign types were my focal point, this chapter has taken an in-depth look at each of these categories, and while the next section will not be as detailed, I still thought it was important to include some of the observations that had occurred to me during my research. With 26 different signs to work with, I believe this may have allowed me to see repeated patterning on the regional scale that would not have been so apparent if working with the other categories of Paleolithic art, where we see the same few animals (horse and bison make up 60% of the animal imagery) appear repeatedly (Clottes 1995, 1996), making trending more difficult.

Chapter 5: Observations, Implications and Conclusions

The similarities between the sequences of change in different regions suggests this was not just the product of individual historical particularities, but part of a single process by which humans explored the limits of recently discovered symbolism (Davidson 1997: 125)

In this final chapter, I am going to pull the degree of resolution out even farther as I look at some of the larger patterns that became apparent as I worked with the sign type categories. These observations include relationships between regions, particularities of each of the main geographical areas, my thoughts on the origins of symbolic behaviour in relation to Aurignacian sites, and issues surrounding the Aurignacian site of Grotte Chauvet specifically. Many of these patterns and observations seem to have implications which could help clarify some of the ongoing debates within the field of Upper Paleolithic research. I will also draw attention to some possible areas for further study, and offer some closing thoughts about this research project.

Inter-regional and regional patterning

The 'Parietal Triangle': As I was completing the spatial analysis for this project, I noticed that there were three regions that seemed to have a clear relationship, with sign types moving between them at different periods. I have identified these regions as Dordogne/Lot, Ardèche/Gard and the zone along the Pyrénées. I will highlight two different examples of this correlation, and then will discuss the implications below. The first example is the claviform sign type which first appears in the Solutrean with three sites in the Ardèche/Gard region, one near the Pyrénées, and none in the Dordogne/Lot region. In the Magdalenian this configuration has changed. There are now no sites in Ardèche/Gard, a large grouping in Dordogne/Lot, and a similar concentration along the

Pyrénées. Below I have included images of the claviform sign type for both the Solutrean and Magdalenian periods:

Figure 44 - Claviform: Solutrean Distribution

Figure 45 - Claviform: Magdalenian Distribution

Another example of this connection between the three regions can be seen with the open-angle sign category. In the Gravettian this sign type is present in Dordogne/Lot and near the Pyrénées, but not in Ardèche/Gard. In the Solutrean, open-angles are now absent from the Pyrénées, but present in Dordogne/Lot and Ardèche/Gard. The Magdalenian sees a return of this sign type to the Pyrénées, a continuation in the Dordogne, and its disappearance from Ardèche/Gard. Below are distribution map images from these three periods:

Figure 46 - Open-angle: Gravettian distribution

Figure 47 - Open-angle: Solutrean distribution

Figure 48 - Open-angle: Magdalenian distribution

I saw this sort of connection between these areas repeatedly throughout my analysis. There is clear temporal movement across the landscape, and the way signs disappear in one region only to reappear in one or more of the other ones, is suggestive of strong linkages between the three. As suggested by Coward and Gamble, it appears that material and symbolic resources were travelling extended distances in both time and space, potentially allowing the social networks of the UP to extend beyond the spatial and temporal limitations of individual physical bodies and instances of interaction (2008: 1973).

Another possibility, as discussed in Chapter 2, is the large-scale migrations that were taking place in these time periods as people moved into the more temperate regions in order to escape the harsh climate of the LGM (Straus 1991a, 1991b). The polarization of claviform signs that we see in the Magdalenian between the Dordogne/Lot region and the area along the Pyrénées could certainly be a result of their status as 'refuge areas' (Straus 1991a: 197). The sharp increase in actual sites where this sign type is present could also be explained by the appearance of regular social aggregation sites in these regions (Conkey 1980; White 1982: 176), where symbolic information, such as sign types, could have been transmitted between culture groups now living in much closer proximity (Straus 1991b: 270; Bahn and Vertut 1997), and resulting in a wider distribution pattern. Gamble sees symbolic resources as being at their most effective in extended networks, and being less important when "people are in close, face-to-face contact with each other" (1998: 433). This suggests that the continued usage of some sign types exemplifies an ongoing extension of these potentially connected social groupings.

The association between these three regions is unmistakable, but identifying its exact nature will require further research, as the movement of the sign types is not always the same. Whereas the Dordogne/Lot region had no claviforms during the Solutrean, open-angle signs are present in Dordogne/Lot at the same period. This example shows that the interchange does not appear to be based simply on people being present or absent from a region during a given period, since the Dordogne/Lot region was occupied throughout the UP. There is the possibility that what we are seeing is evidence of both immigration and emigration going on in these three regions around the same time, or this change in sign types could stem simply from shifting preferences regarding what to depict.

What is even more interesting about the movement between these three regions is the complete absence of parietal sites in between. The sign types seem to move directly from one area to another with no intermediate locations. This lack of sites in the middle of the triangle formed by these three regions is what made me start referring to it as the 'Parietal Triangle'. In order to understand the full story of what was going on between these regions, I believe we will need to pursue Conkey's suggestion of thinking "beyond the art and between the caves" (1997), and look towards other types of Upper Paleolithic sites to see if any patterns become clearer. Conkey had noticed "a certain coherence to the images" in sites within a region, and knowing how mobile the Paleolithic peoples were, this led her to infer that there must have been social relationships linking the decorated caves (1997: 359). Conkey was proposing this avenue of research at the regional level, but I believe it could also be applied inter-regionally to try and understand how sign types moved across the landscape. Since there may have been some geological

factors affecting the location of parietal sites, it would be interesting to see if we could find any evidence of these sign types on portable art in the center of the triangle, as it could be a matter of differing media, rather than actual absence.

The development within each of the three regions mentioned above is also quite suggestive, as there are very different temporal trends for each one. For this reason, I thought I would highlight some of the large-scale regional patterns I observed that were particular to each of these areas, as well as touch on the region to the north.

Dordogne/Lot: This region is the only one that has sites from every stylistic period, and Straus has noted that along with continuity of settlement, there is also an increase in sites over time (1991b: 262, 267). The Dordogne/Lot area is thought to be one of the main refuge areas of the LGM, due to its temperate climate throughout the UP (Straus 1991a: 197). The majority of known decorated Aurignacian sites are from this area (five out of seven sites), and in fact occur in close proximity. This is also the only region where we see the same sign type in continual use throughout the entire time frame of the Upper Paleolithic, including the circle, line, open-angle and quadrangle categories. There are several more sign types that first appear here during the Aurignacian, and which are present in four of the five periods (these include triangles and ovals), suggesting a high level of continuity between the different periods, both in habitation and in their symbolic behaviour.

Ardèche/Gard: There is only one Aurignacian site in this region and no Gravettian sites at all (more on this below in relation to Grotte Chauvet). There is a strong presence

during the Solutrean period, with many sites as well as a wide variety of sign types. By comparison, there are only two Magdalenian sites in this region, both of which have minimal decoration: the site of Dérocs has several panels of red dots, and the site of La Bergerie de Charmasson has only a single ibex and some finger fluting. This is a major change from the rich and diverse images evident at Grotte Chauvet and the Solutrean sites. Considering that there were 74 Magdalenian sites in my dataset, and that it is generally understood to be the most prolific period of art production (White 1986: 47-48), this lack of sites becomes even more puzzling. After this phase of under-representation, the Late Magdalenian sites located in this region account for 25% of all known sites from this period, and we also see a return to a greater diversity of sign types.

The Pyrénées: To date, there are no known Aurignacian sites in this region (though L'Aldène in Hérault to the SE is not that far away), and only two Gravettian sites, neither of which have a wide variety of sign types, although Gargas has the largest number of negative hands ever found together (approximately 250 separate examples). The Solutrean is also fairly under-represented in this region (4 sites), especially when compared to the large number from Ardèche/Gard and Dordogne/Lot. It is only during the Magdalenian period that the number of parietal sites in this region expands rapidly to rival the number found in Dordogne/Lot. In fact, the polarization of sites between these two regions during the Magdalenian period seems to be one of its defining characteristics. The Late Magdalenian is well-represented in this area as well. This also happens to be the only region to date with a confirmed open-air parietal site in it.

The lack of early sites, followed by the Magdalenian proliferation, seems to suggest that this region may have been one of the refuge areas discussed above and in Chapter 2. Why there is such a low number of parietal sites prior to this is a difficult question to answer, though Straus has suggested that this cooler, mountainous environment may have required more specialized technology for successful survival, and therefore only became populated as the LGM approached, territories to the north had to be abandoned, and new habitation areas found (1991a: 197). This could imply that the Pyrénées was in fact a less desirable location than the Dordogne/Lot region, and that it was only as that area became heavily occupied that some of the excess population spilled over into this other region. Straus does propose a rise in territorialism during this period, with a larger population base competing for the same resources (1991a: 197), and the increased presence in the Pyrénées could be the result. If we could achieve a fine-enough degree of chronological resolution, it would be interesting to see if the Magdalenian sites near the Pyrénées are the same age as those in the Dordogne/Lot region, or if they are from a slightly later phase of this period.

Looking at the relationship of this area with the Cantabrian region in Spain could also provide some insights about population movement and symbolic exchange, as there are some unusual sign types (for example aviforms, claviforms, scalariforms and pectiforms) that appear in both areas. There were a large number of Solutrean sites in Spain (Straus 1991a, 1991b), and it is possible that part of the influx into the French section of the Pyrénées occurred from this direction. As well, more information about environmental conditions and a comparison with non-decorative sites in this region may

facilitate our understanding of how the landscape was being used throughout the Upper Paleolithic period.

Northern France: This region only has sites from the Gravettian, later in the Magdalenian, and in the Late Magdalenian. Part of this is understandable considering that it would have been uninhabitable during the LGM, though this does not explain the lack of sites during the Aurignacian, which was an interstadial period. Another remarkable thing about this region is that there are no sign types that originate in this area. Though there are several well-decorated sites from the Gravettian, it is always with sign types which were present elsewhere during the Aurignacian, suggesting that this region may have been a territorial extension of the Paleolithic peoples to the south. In the later part of the Upper Paleolithic, the presence of sites such as Gouy could be suggestive of a jump-off point to the re-population of areas further to the north, including the United Kingdom and the Scandinavian region.

Symbolic Behaviour and the Aurignacian Sites

Aurignacian Interpretations: I was actually quite surprised to discover that 19 of the 26 different sign types were already present in the Aurignacian period. When I began this research project, I had hypothesized that many of these sign types would be later innovations, created at different points throughout the Upper Paleolithic, and possibly mirroring the increasing complexity of tool technology. Instead, I found that 73% of all known sign types were in existence during the first temporal phase. This incredible diversity suggests that the symbolic revolution/transition discussed in Chapter 1 occurred

prior to the arrival of the first modern humans in Europe. Interestingly, the same can be said for Aurignacian tool assemblages, which were already established in most regions of Europe by 35,000 BP at the latest (Mellars 1992: 228).

My findings seem to support the argument that this symboling behaviour had a place of origin outside of Europe, and was already a cognitive capacity at the time of the initial out-migrations from Africa (Brumm and Moore 2005). One potential issue with this line of reasoning revolves around the site of Grotte Chauvet, which is the only known location for 9 of the sign types present in the Aurignacian. There has been some debate regarding its assignment to this early period (see discussion below), but even if we were to remove the signs exclusive to this site, 10 sign types still appear for the first time in the Aurignacian, and I believe that the argument could nonetheless be made that symbolic behaviour originated outside of Europe.

Grotte Chauvet: There are three main issues to consider with this site, (1) the accuracy of the dating; (2) the connection of this site to others from the same period; and (3) the lack of temporal continuity. Chauvet is one of the most comprehensively dated sites from the Upper Paleolithic, with 40 different samples having been radiocarbon dated, 10 directly from paintings (Valladas and Clottes 2003: 143), and yet the debate continues regarding its assignment to the Aurignacian period (Züchner 1996; Pettitt and Bahn 2003). The main problem stems from a perceived lack of agreement between the stylistic and chronometric dating, with some researchers seeing the sophistication of these representations fitting in better with a later period or periods (Pettitt and Bahn 2003: 135, 138). The uniqueness of the depictions at this site, compared to others from the

Aurignacian, has led to challenges of the dating results, with the suggestion that possible sample contamination needs to be considered (Pettitt and Bahn 2003: 138). Two of the researchers who worked on dating Chauvet have responded to these critiques, noting the complexity of portable art from this period being found further east in Europe, which tempers its exceptionality, and the regularity of the radiocarbon dates (Valladas and Clottes 2003: 143). These dates fall into two distinct age brackets: 32,500 – 30,000 BP and 27,000 – 26,000 BP, which Valladas and Clottes state make it unlikely that the samples could have been so evenly contaminated (2003: 143). As well, some of the later dates are from torch-marks on calcite layers which cover the actual paintings, so a period of time must separate the two for the geological action of calcite formation to have occurred (Valladas and Clottes 2003: 143).

Overall I am satisfied with the chronometric dates that place this site in the Aurignacian (Valladas and Clottes 2003), but the variety of signs identified at Chauvet made for some fairly strange trending results. As discussed above, what was especially puzzling was that often this site was the only one from the Aurignacian where these signs occurred. Examples of this include aviforms, crosshatches, cruciforms, dots, half-circles, negative hands, positive hands and serpentiforms, so it is not like this was an isolated occurrence. By contrast, the other Aurignacian sites all seemed to have very similar sign type inventories (for example cupules, quadrangles and ovals).

If Chauvet is going to be assigned to this period, one possibility to explain this discrepancy could be that we are dealing with two different cultural groups. Having left behind the notion that the Upper Paleolithic was a monolithic culture, we now tend to speak of this period as encompassing multiple “visual cultures” (Nowell 2006). The

images at Chauvet have often been compared to the sophisticated figurines from the Swabian Jura region to the east (Valladas and Clottes 2003: 143), allowing the possibility of a separate visual culture to that found mainly in the Dordogne region. The continued presence of these sign types in the French region after Chauvet could suggest either an ongoing cultural expansion towards the west, or a sharing of symbolic information that spread amongst a pre-existing cultural tradition.

Continuity was also a common issue though, as there were many cases where a sign type was present at Chauvet, disappeared during the Gravettian, and then reappeared in the Solutrean. One example of this is the aviform sign, which was exclusive to the Solutrean and Magdalenian periods, except for its presence at Chauvet. Considering the length of the Gravettian period (28,000 to 22,000 BP), this lack of connection between the Aurignacian and later periods is somewhat problematic. If Chauvet is indeed from this earliest period, then I see only two real possibilities to explain this disconnect: the first would be that these sign types remained active in another format such as portable art, and the second would be that some of the later sites where this sign type is present are incorrectly dated.

Another manifestation of the temporal isolation of Chauvet is found in the negative hand category, which is only present at this site during the Aurignacian. In this case, there are in fact multiple examples of this sign type in the Gravettian, but that is also what raises this issue. There are 14 sites with negative hands from this period, with a geographical range that spans from the far north at Margot, to Grotte Cosquer on the Mediterranean in SE France, Tibiran and Gargas in the Pyrénées, and a large grouping of sites in the Dordogne/Lot region in between. Based on the number of sites located in the

Ardèche in other periods, it is apparent that there were many suitable locations. So why were there no negative hands in this region during the Gravettian? This observation becomes especially curious knowing that the earliest examples of this sign type occur here, and that negative hands never re-emerge in this region after their initial appearance. The same observation applies to the dot category, which was also unique to Chauvet in the Aurignacian, and expanded rapidly in the Gravettian in a near-identical pattern to the negative hand signs. In this particular case, the dot category does reappear in the Solutrean, but it still begs the question why didn't they stay? What is even more puzzling is that we have Gravettian ^{14}C dates from Chauvet in the form of torch marks on the calcite covering the decorative images (Valladas and Clottes 2003: 143), so we know that they were in the region for at least part of this period.

Potential areas for further study

Expansion of the database to include the rest of Eurasia: Knowing that the Pleistocene peoples were quite mobile, and certainly did not recognize the artificial borders I used to create my study region, the next stage of this study should be the inclusion of all other known parietal art sites in Eurasia. The sites located in N France after the LGM left me wondering what the cross-over in sign type would be with the Creswellian sites in the United Kingdom. Similarly, I believe to really understand what was going on at the sites along the Pyrénées, the sites from Spain and Portugal need to be brought into the equation. In order to bring in the rest of Europe, the Ardèche/Gard region needs to be analyzed in relation to sites from Italy, Germany, etc, as do the earlier sites (pre-LGM) from N France.

Cross-analysis between the sign types: While I am not interested in trying to create a structuralist paradigm such as that of Leroi-Gourhan, it would be intriguing to see if certain sign types tend to commonly appear at the same sites. One example of possible parallel development is between dots and negative signs in the Gravettian. Other than the Aurignacian site of Chauvet where they are both present, the Gravettian is the first real period where these two sign types have a significant presence. Both are present at 14 sites, and they crossover at 11 of these sites, which seemed to me to be a surprisingly high number. Altogether there are 27 Gravettian sites, so it is not that there was a lack of options; this suggests that this could be more than coincidence.

Possible synecdoche between elements of figurative images and the non-figurative signs: As I was compiling the database, there were several sites where I noticed that constituents of the animal images matched closely with free-standing geometric signs at the same site. One example of this is the concentric oval eyes on animals at Pair-non-Pair, and the presence of these same concentric ovals elsewhere with no animal present. Another example of this, also noted by Clottes (2008), is the style of tusks on a mammoth at Chauvet (two half-circles that resemble a cursive 'w'), and multiple examples of this same shape located alone throughout the site.

Conclusion

If we revisit Davidson and Noble's criteria for intentionality (1989) in Chapter 1, I think there can be no doubt that the making of these markings was intentional, as were the deliberate choices these people made regarding what to portray. With 26 sign types to choose from, every site in this study is a confirmation of conscious intent, and the way

that these signs moved across the landscape clearly demonstrates large-scale networks of symbolic knowledge and diffusion. As Gamble has suggested, there was previously a lack of structure which could relate "behaviour at a regional scale to outcomes observed at the local level of site investigation", this being especially apparent over large geographical spaces (1982: 99). With so many sign types, as well as a large number of individual sites to compare, I believe the non-figurative images could begin to fill this gap. The fact that some of these sign types were in use for the duration of the Upper Paleolithic (for example quadrangles, circles, and open-angles) suggests that they remained contextually meaningful throughout all the environmental and social changes taking place over this 22,000 year time period, giving them a high degree of continuity.

Clottes believes that "geometric signs and indeterminate marks constitute one of the most significant and mysterious characteristics of European cave art" (2008: 20). While I agree with their significance, I do not believe they need to remain mysterious. Without access to detailed information, it is difficult to say anything meaningful about these depictions, and I hope that this project has helped to dispel some of the mystery surrounding these signs. The under-representation of scholarship on this category of images can only be remedied by continuing the process of data collection, as without material to work with, it is difficult to further studies on any aspect of this subject. Davidson believes that the art is an evolving tradition (or traditions) throughout the UP that has "the capacity to reveal regularities, not just western European particularities, about the evolution of human behaviour" (1997: 133). I believe that my research database, spatial imaging, and accompanying thesis will all contribute to this field of study, and expand our understanding of the place of non-figurative signs in Paleolithic

art. By creating a comprehensive compilation of parietal art sites at the regional level, and doing some preliminary trending, I hope to have added some of the contextualization needed if we are ever to move into Geertz's third layer of thick description, that of interpretation.

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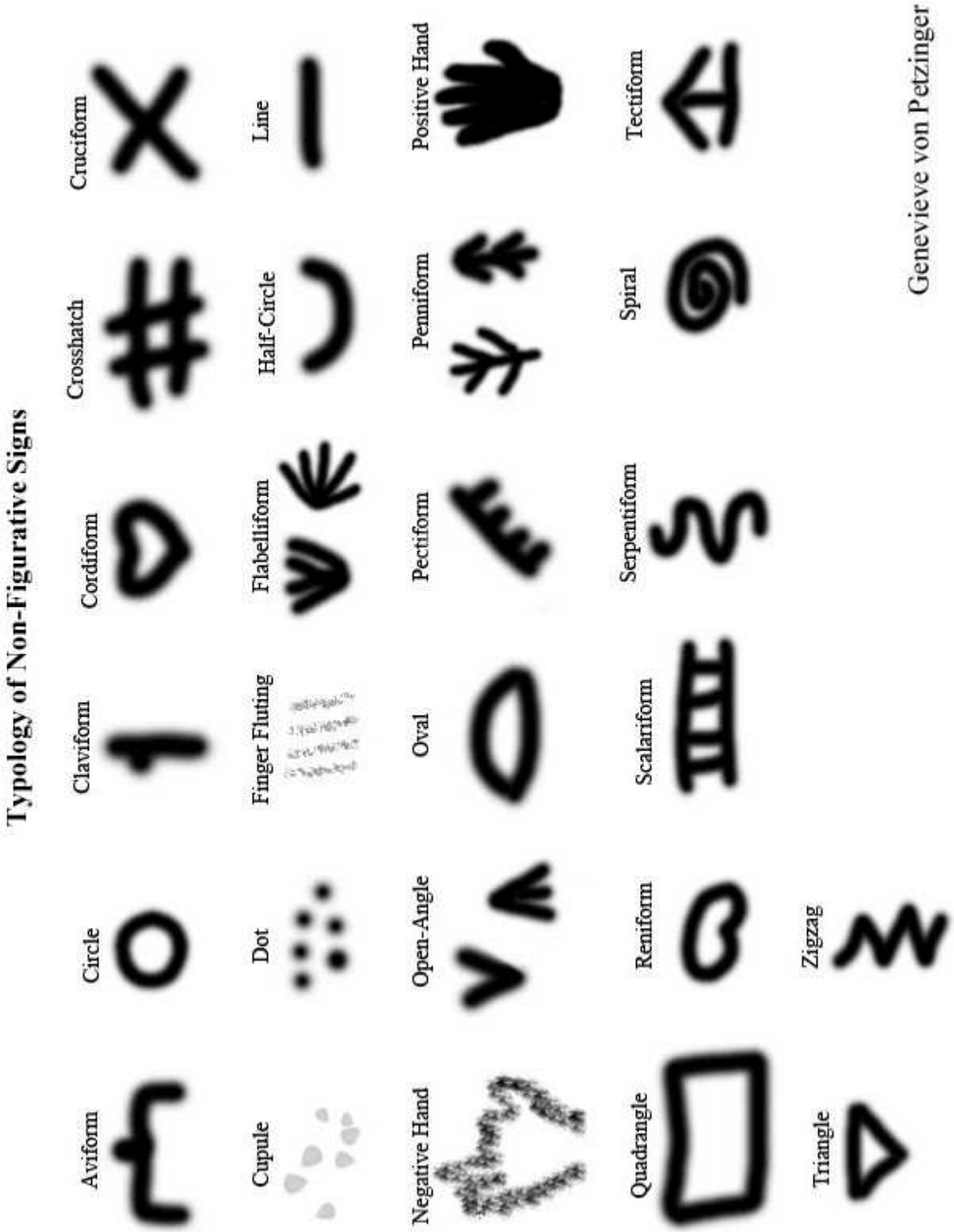
Appendix A: Typology of Non-Figurative Signs



Appendix B: Master List of Sites and Sign Types Present

Master List of Sites and Sign Types Present																										
Site Name	**Tectiform**	**Penniform**	**Pectiform**	**Aviform**	**Reniform**	**Claviform**	**Cordiform**	**Cruciform**	**Scalariform**	**Crosshatch**	**Spiral**	**Circle**	**Half-circle**	**Cupule**	**Flabelliform**	**Oval**	**Quadrangle**	**Triangle**	**Open-angle**	**Dot**	**Serpentiform**	**Zigzag**	**Line**	**Positive Hand**	**Negative Hand**	**Finger Fluting**
Abri Blanchard (Sergeac)														Y		Y							Y			
Abri Castanet												Y		Y					Y				Y			
Abri Cellier					Y									Y		Y							Y			
Abri de Pille-Bourse																			Y				Y			
Abri du Cheval										Y													Y			
Abri du Poisson									Y											Y			Y		Y	
Abri Faustin																			Y				Y			
Abri Pataud														Y		Y	Y				Y		Y			
Bara-Bahau	Y				Y				Y	Y						Y	Y						Y			Y
Baume de Bouchon																Y										
Bédeilhac		Y								Y		Y		Y	Y	Y	Y		Y	Y			Y	Y		Y
Bernifal	Y	Y											Y		Y	Y		Y	Y	Y			Y		Y	
Blanchard												Y								Y			Y			
Bois du Cantet (Espèche)		Y											Y	Y					Y	Y			Y			Y
Cantal															Y	Y	Y		Y	Y			Y	Y		
Cap Blanc															Y											
Cassegros										Y													Y			

Master List of Sites and Sign Types Present																											
Site Name	**Tectiform**	**Penniform**	**Pectiform**	**Aviform**	**Reniform**	**Claviform**	**Cordiform**	**Cruciform**	**Scalariform**	**Crosshatch**	**Spiral**	**Circle**	**Half-circle**	**Cupule**	**Flabelliform**	**Oval**	**Quadrangle**	**Triangle**	**Open-angle**	**Dot**	**Serpentiform**	**Zigzag**	**Line**	**Positive Hand**	**Negative Hand**	**Finger Fluting**
Chabot										Y									Y				Y			
Commarque						Y												Y	Y				Y			
Cougnac	Y	Y		Y							Y		Y		Y				Y	Y			Y			
Cournazac	Y																		Y	Y			Y			Y
Cova Bastera														Y						Y			Y			
Dérocs																				Y						
Ebbou		Y										Y				Y			Y				Y			
Erberua								Y				Y	Y		Y		Y	Y	Y	Y			Y		Y	Y
Etxeberri			Y										Y							Y			Y			
Fontanet		Y				Y	Y					Y		Y					Y	Y			Y			
Font-Bargiex								Y							Y			Y	Y	Y			Y			
Font-de-Gaume	Y	Y										Y	Y		Y	Y	Y			Y			Y		Y	
Fornols Haut (Campôme)										Y					Y		Y		Y			Y				
Fronsac		Y				Y		Y		Y		Y					Y	Y	Y				Y			
Gabillou		Y	Y			Y		Y		Y						Y	Y	Y	Y	Y			Y			
Ganties-Montespan	Y					Y						Y	Y	Y		Y	Y	Y	Y	Y			Y			
Gargas								Y				Y	Y			Y	Y	Y	Y	Y	Y	Y	Y		Y	Y
Gourdan						Y													Y				Y			
Gouy		Y				Y						Y		Y	Y	Y		Y	Y		Y		Y			

Master List of Sites and Sign Types Present																										
Site Name	**Tectiform**	**Penniform**	**Pectiform**	**Aviform**	**Reniform**	**Claviform**	**Cordiform**	**Cruciform**	**Scalariform**	**Crosshatch**	**Spiral**	**Circle**	**Half-circle**	**Cupule**	**Flabelliform**	**Oval**	**Quadrangle**	**Triangle**	**Open-angle**	**Dot**	**Serpentiform**	**Zigzag**	**Line**	**Positive Hand**	**Negative Hand**	**Finger Fluting**
Grande Grotte d'Arcy-sur-Cure		Y									Y						Y	Y		Y	Y		Y	Y	Y	
Grotte Bayol	Y	Y				Y		Y							Y		Y		Y	Y			Y	Y		
Grotte Carriot																							Y			
Grotte Chauvet				Y			Y	Y		Y		Y	Y		Y			Y	Y	Y	Y		Y	Y	Y	Y
Grotte Christian										Y								Y	Y	Y		Y	Y			
Grotte Cosquer		Y		Y				Y					Y		Y		Y		Y			Y	Y	Y	Y	Y
Grotte d'Antoine																			Y	Y					Y	
Grotte de Cazelle																			Y				Y			
Grotte de Cussac																		Y								Y
Grotte de la Bergerie de Charmasson																										Y
Grotte de Pestillac						Y						Y	Y										Y			
Grotte d'Enlène																				Y			Y			
Grotte des Deux Ouvertures		Y				Y										Y		Y	Y				Y			
Grotte des Points												Y								Y						
Grotte d'Oulen				Y									Y			Y		Y	Y	Y			Y			
Grotte du Cheval (Arcy)		Y								Y						Y		Y					Y			Y
Grotte du Cheval (Foix)		Y				Y								Y							Y		Y			
Grotte du Fayard																			Y							
Grotte du Placard				Y																						

Master List of Sites and Sign Types Present																										
Site Name	**Tectiform**	**Penniform**	**Pectiform**	**Aviform**	**Reniform**	**Claviform**	**Cordiform**	**Cruciform**	**Scalariform**	**Crosshatch**	**Spiral**	**Circle**	**Half-circle**	**Cupule**	**Flabelliform**	**Oval**	**Quadrangle**	**Triangle**	**Open-angle**	**Dot**	**Serpentiform**	**Zigzag**	**Line**	**Positive Hand**	**Negative Hand**	**Finger Fluting**
Grotte du Planchard							Y													Y			Y			
Grotte du Renard																			Y	Y			Y			
Grotte du Roc								Y																		
Grotte Gazel		Y								Y						Y			Y				Y			
Grotte Mazet						Y								Y					Y				Y			
Grotte Murat																							Y			
Huchard																			Y				Y			
Isturitz																	Y			Y			Y			
Jovelle														Y		Y										
La Baume-Latrone						Y							Y			Y			Y	Y			Y	Y		Y
La Bigourdane																							Y			
La Calévie																Y										
La Cavaille																Y			Y				Y			
La Croix										Y								Y								
La Croze à Gontran												Y	Y										Y			Y
La Ferrassie														Y		Y	Y	Y					Y			
La Forêt								Y		Y				Y			Y		Y				Y			
La Marche/Réseau Guy-Martin																		Y					Y			
La Martine												Y				Y										Y

Master List of Sites and Sign Types Present																										
Site Name	**Tectiform**	**Penniform**	**Pectiform**	**Aviform**	**Reniform**	**Claviform**	**Cordiform**	**Cruciform**	**Scalariform**	**Crosshatch**	**Spiral**	**Circle**	**Half-circle**	**Cupule**	**Flabelliform**	**Oval**	**Quadrangle**	**Triangle**	**Open-angle**	**Dot**	**Serpentiform**	**Zigzag**	**Line**	**Positive Hand**	**Negative Hand**	**Finger Fluting**
La Mouthe		Y															Y	Y	Y	Y						
La Roque		Y	Y							Y							Y		Y				Y			
La Sudrie																	Y						Y			
Labastide		Y		Y		Y		Y		Y				Y	Y	Y		Y	Y	Y			Y			
Labattut														Y									Y		Y	
L'Aldène												Y			Y				Y				Y			Y
Lascaux		Y		Y		Y		Y		Y		Y	Y		Y	Y	Y		Y	Y			Y			
Laugerie Basse														Y												
Laugerie Haute																							Y			
Laussel		Y																								
Le Bison	Y																								Y	
Le Bourgnetou																				Y			Y	Y		
Le Colombier I																Y										
Le Colombier II									Y							Y							Y			
Le Croc-Marin																										Y
Le Cuzoul-de-Mélanie								Y																		
Le Cuzoul-des-Brasconies		Y	Y	Y																Y		Y	Y			
Le Figuier													Y						Y							
Le Fourneau du Diable																Y							Y			

Master List of Sites and Sign Types Present																										
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Le Mammouth (Grande Grotte Saint-Front)												Y											Y			
Le Mas d'Azil		Y						Y				Y	Y						Y	Y			Y			
Le Moulin-de-Laguenay																				Y					Y	
Le Papetier	Y							Y															Y			
Le Pigeonnier																Y										
Le Portel		Y				Y							Y		Y	Y				Y			Y		Y	
Le Roc Pointu															Y				Y							
Le Travers de Janoye																		Y		Y			Y			
Le Tuc d'Audoubert						Y									Y	Y			Y				Y			Y
Les Bernous																	Y						Y			
Les Combarelles I	Y	Y				Y									Y	Y	Y	Y	Y				Y		Y	
Les Combarelles II	Y	Y														Y			Y				Y			
Les Eglises	Y	Y								Y					Y	Y	Y		Y	Y			Y			
Les Escabasses		Y													Y				Y	Y			Y			
Les Faux-Monnayeurs				Y																Y			Y			
Les Fieux	Y		Y							Y				Y	Y				Y	Y			Y		Y	
Les Merveilles													Y							Y			Y		Y	
Les Trois Frères		Y		Y		Y		Y		Y		Y	Y		Y	Y			Y	Y			Y		Y	Y
Marcenac																	Y									

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Margot																		Y		Y			Y	Y	Y	
Marsoulas		Y	Y			Y				Y							Y		Y	Y			Y			
Massat		Y								Y				Y		Y			Y		Y		Y			Y
Mayenne-Sciences		Y														Y		Y	Y	Y			Y			
Mitrot	Y																									
Montgaudier										Y							Y						Y			
Muzardie																							Y			
Niaux		Y				Y				Y		Y							Y	Y			Y			
Oreille d'Enfer													Y	Y				Y		Y			Y			
Oxocelhaya-Hariztoya												Y	Y	Y		Y			Y				Y			Y
Pair-non-Pair													Y			Y		Y					Y			
Pech-Merle		Y		Y				Y		Y		Y	Y			Y	Y		Y	Y			Y	Y	Y	Y
Pergouset		Y											Y			Y		Y	Y		Y	Y	Y			
Pradières																				Y						
Puy-Jarrige II																							Y			
Réseau Clastres																							Y			Y
Reverdit														Y									Y			
Roc de Vézac					Y													Y		Y					Y	
Roucadour												Y						Y					Y		Y	

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Rouffignac	Y		Y					Y				Y	Y	Y	Y	Y		Y	Y		Y	Y	Y			Y
Saint Cirq								Y										Y	Y				Y			
Sainte-Colome												Y														
Sainte-Eulalie	Y		Y			Y				Y			Y		Y			Y	Y							
Sasiziloaga Ko-Karbia																					Y					
Sombre																Y		Y					Y			
Sous-Grand-Lac										Y							Y		Y	Y			Y			
Tête-du-Lion																				Y						
Tibiran																				Y			Y		Y	
Troubat																				Y	Y					
Vilhonneur																				Y			Y		Y	
Villars		Y				Y		Y									Y			Y			Y			