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**From the Walls to the Grave: Linking the Parietal and Portable Geometric Signs found in European Upper Paleolithic Art.**

**Slide 2**

The out-of-Africa model theorizes that all humans originated in this region around 200,000 years ago, and expanded outwards in a series of migrations (Stringer 2002), having already developed fully modern behaviour (Brumm and Moore 2005). Soon after the arrival of the first anatomically modern humans on the Eurasian continent around 40,000 years ago, 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 1991: 259). There is no doubt that surviving 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).

**Slide 3**

Art and personal adornment are the archaeological evidence generally used to differentiate modern human behaviour from that of our earlier hominid ancestors. Many researchers believe these artifacts indicate a significant advancement in the cognitive evolution of early modern humans, and provide the first real examples of material culture intersecting with complex, socially constructed abstract thinking (Brumm and Moore 2005). The timing of this ‘creative explosion’ is the subject of continued debate, as scholars try to pinpoint the beginnings of behavioural modernity and the symbolic innovations that accompanied it (Bar-Yosef 2002). The Upper Paleolithic (UP) in Europe, spans from roughly 35,000 to 10,000 years ago, and the portable artifacts shown in this slide include a 32,000 year old ivory statue of a lion-headed human, a 35,000 year old bone flute (so far 10 have been found throughout Central Europe, and yes, they do play music!), and a 30,000 year old necklace made of pierced marine shells. As you can see from these examples, the level of artistic sophistication displayed was already fairly developed early on.

**Slide 4**

Most of the oldest known rock art in the world is found in Europe during the UP period. When the topic of rock art from Ice Age Europe is mentioned, the first thing that comes to mind for most people is the spectacular animal imagery. Whether it is the bulls of Altamira, the ‘Chinese’ horses of Lascaux, the mammoths of Rouffignac or the rhino and lion paintings at Chauvet, Paleolithic art and animals are tightly intertwined. The artistic mastery shown in the rendering of the animals cannot be denied, but what about all the geometric signs that so often appear around or near the animals at the same sites? Some examples of these non-figurative images can be seen in this slide surrounding and overlying the animal depictions.

**Slide 5**

The two main methods of production are painting and engraving and this collection of images is organized into three categories: animals, humans, and geometric signs (Bahn and Vertut 1997). The animal depictions account for the vast majority of the figurative imagery, while human representations are found in less than 10% of sites. The non-figurative signs comprise a large number of geometric shapes (e.g. grids, dots, triangles) and at many sites outnumber the animal and human images by a ratio of two to one or greater (Bahn & Vertut 1997: 166), and yet, very little work has been done in this area.

**Slide 6**

Geometric signs are found at nearly all decorated UP sites in Western Europe, but the meaning(s) they held for the Ice Age peoples who produced and replicated them remain elusive. For the past 100 years, this category has generally been the dumping ground for all unidentifiable imagery from this period, resulting in there potentially being two types of motifs combined in this grouping: stylized but mundane images of everyday life (e.g. tools, weapons, housing) which we are just not necessarily recognizing (Gonzalez Morales 1997), and truly abstract shapes which could very well be symbolic representations of important concepts/ideas, or the manifestations of transcendent, shamanistic experiences in the form of entopics (Lewis-Williams 2002).

**Slide 7**

When I started my research, I was surprised to discover that there were no large-scale studies focusing specifically on the geometric signs. I wanted to know how many distinct shapes there were, and whether the same ones repeated across space and time. To begin addressing this gap in our knowledge, my MA research consisted of compiling and analyzing a relational database of all known geometric signs found in France during the UP period, then looking for patterns of continuity and change over time and space. For my MA thesis, I detailed chronological and regional patterning in sign type frequency and the implications of these patterns for understanding where, when and why the making of these signs was meaningful to their creators. As part of my PhD research, I am now extending my study area to include geometric signs from UP sites in other countries such as Spain and Italy, and even into E Europe and Russia to see if the same patterns hold at the continental level.

**Slide 8**

Other than some difficulties in accumulating sufficient data for each site, probably the most challenging part of this project was creating a unified typology of the French geometric sign types out of several regional versions. Many of the earliest sign types were assumed to be narrative, or pictographic in nature, and were named accordingly using a Latin-based typology (e.g. penniform = spear or arrow, tectiform = hut or animal trap, and claviform = club), as well as being based on a hunting magic interpretation (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.

**Slide 9**

This slide shows the number of UP rock art sites in France (147 out of 170 sites total) that include geometric signs in their inventory. The geometric signs used in France during the Ice Age show definite spatial and temporal patterning between the sites, and 70% of these sign types remained in use for over 25,000 years. The repetition of the same signs for so long and the choices that they were making regarding what to portray at each site points towards intentionality. No sign appears everywhere, so they were obviously making decisions as to what they should represent rather than anything being an automatic inclusion.

**Slide 10**

The way I have approached purpose and meaning in my work is to look at it indirectly. With such a limited number of geometric signs being used across time and space, I do not need to understand exactly what they meant to know that they were important to the people who produced them. This continuity suggests the geometric signs were being used with purpose, and that they were meaningful to those who created them. If they did have significance, and were being used to convey information, then we could be looking at an early form of graphic communication. But what does this actually mean?

With such strong evidence of relationships between the sign types at the site level, the next logical step was to focus in on the configurations of the signs within the sites themselves. Finding pairings at this level would support the notion of an early form of graphic communication through the structured use of the signs. While there has certainly been speculation in this direction before, there has not, until now, been a large enough dataset to look for this type of repeated patterning.

**Slide 11**

I recently started working on a project with the goal of trying to identify examples of signs being paired or clustered, and then used my database to see if these co-occurrences repeated at multiple sites. Since the objective was to look at the potential for the signs to be a form of graphic communication, I chose to incorporate linguistic theory and literature into this study.

If we wish to approach the geometric signs from this perspective, then the initial step is to ascertain exactly what constitutes a writing system. With this in place, we can then compare the elements found in the art with those required for the identification of such a system. Coulmas identifies three fundamental characteristics as being necessary for the recognition of a writing system (1989: 17):

1. It consists of artificial graphic marks on a durable surface

2. Its purpose is to communicate something

3. This purpose is achieved by virtue of the marks’ conventional relation to language

When comparing the rock art against these requirements, the first characteristic is certainly present since we are dealing with paintings and engravings on rock surfaces. The second is more subjective, but there is quite a bit of indirect evidence to suggest that the making of these marks was purposeful, and that they were meaningful to those who created them (see for example d’Errico 1995; Conkey 1999; Lewis-Williams 2002). As Llamazares has suggested, “those shapes and signs certainly had meaning for their authors. No human act is banal, not even those which seem to be so” (2004: 242).

It is Coulmas’ third characteristic though, where there is much less certainty, and where we run into the biggest barriers. Establishing a conventional relationship with language is problematic when we have no way to identify what language (or languages) the Paleolithic people of Europe were speaking at the time the rock art was being produced. Due to the sheer amount of time that separates modern scholars from the Upper Paleolithic period, it is doubtful if we will ever be able to identify the spoken language or completely understand its context, so we need to find other ways to try and access this information if we are to look for conventionality in the way the signs were being used.

**Slide 12**

Houston has suggested that the first glimmers of writing systems often seem to coincide with times of great societal change (2004: 239). This observation certainly seems to apply to the situation of the peoples of the European Upper Paleolithic, especially during the Glacial Maximum that centered around 22,000 – 17,000 BP (Straus 1991). When the ice sheets reached their maximum extension southwards during this period, the people also had to move south, and were forced to live in much higher population concentrations than they had previously experienced when they were spread out across the landscape (Straus 1991). Interestingly, while there are geometric signs present throughout the UP (von Petzinger 2009), the first time we find repeated pairings and larger configurations is during this period of massive upheaval and societal change, and these patterns continue through until the end of the Ice Age.

The study I am currently working on has taken the first step in addressing Coulmas’ third characteristic of a writing system, namely that of a conventional association with language, and there is good indirect evidence of this in the form of the geometric signs being paired intentionally. While we are not able to discern a direct relationship to any known language, the specific way in which the signs are being configured, and the repetition of this practice at multiple sites, in both France and Spain, is suggestive of these symbols being used in a conventional way. This implies that there was a system, but how can we identify the manner in which the creators of these markings organized and utilized them? To try and answer this question, I turned to an unusual item of personal adornment comprised of deer teeth engraved with geometric signs. With some of the larger configurations I was seeing on cave walls, I was uncertain where to “break” them, and was hopeful that this necklace could provide some clues.

**Slide 13**

The Paleolithic site of St. Germain-la-Rivière in France is located 30 km east of Bordeaux, and includes the burial of a young adult woman, C14 dated to 15,780 ± 200 BP (Vanhaeren and d’Errico 2005: 119, 121). The burial was covered up by several deliberately placed slabs of stone, as can be seen in the accompanying photo on this slide, and also produced associated grave goods when excavated. Among these was a series of 70 pierced red deer teeth, thought to have been used as personal adornment, possibly a necklace (Blanchard et al. 1972). Unfortunately when the burial was first excavated in 1934, the sequence and placement of the teeth was not recorded (Blanchard 1935; Blanchard n.d.), so re-constructing the original order of the teeth is not a possibility.

**Slide 14**

47 of the 70 teeth are marked with a geometric sign, or a combination of two or more. What makes this necklace so unusual is the large number of teeth that have geometric signs engraved on them. While there are other examples of personal adornment that do have this type of marking, these are generally comprised of a handful of examples at best (see for example the two wolves’ teeth from Laugerie-Basse – Taborin 2004: 38). To have such a large body of signs from one source provides a unique opportunity to grasp the full range of potential geometric configurations. I believe that the St. Germain teeth have the capacity to clarify the organization of the signs from the perspective of those who used them. Each tooth gives us an idea of how the signs were divided, structured, and paired up by them, rather than by a modern researcher such as myself attempting to define typological categories.

The majority of the red deer canines come from adult males, and out of this large number of teeth, only five pairs have been identified – all others are single teeth from different individuals (Vanhaeren and d’Errico 2005: 122). Another intriguing feature of the teeth is that they do not originate in France. At this time, only reindeer were present in France, and the closest probable source for this species would have been Northern Spain (Vanhaeren and d’Errico 2003: 195). It is known that these two regions had trade networks in place during this period (Strauss 1991), so while it is not necessarily surprising to see exotic goods moving over those distances, it does raise the question of whether the teeth were engraved before or after transport – I will come back to this issue on a later slide.

**Slide 15**

This past January, I physically went to France to photograph the necklace at the museum where it is housed, as a full inventory of the geometric signs has never been recorded or published. Having collected this data, I was then able to divide the teeth up into categories based on the production of the markings (or lack thereof). Of the 70 teeth that make up this necklace, 40 have clear, deliberate markings, an example of which can be seen in the photograph on this slide. There were also 7 teeth with deliberate markings, but where the engraving was less precise, and then 23 teeth that had no intentional markings at all. In the next three slides I will go through each of these categories in greater depth.

**Slide 16**

This slide provides a couple of examples of what the “deliberate and clear” teeth look like. These teeth, of which there are 40, make up the majority of the necklace, and are very similar to each other style-wise. As you can see, the incisions have been made with a stone tool, and there is no hesitation or re-touching of the lines – they look very purposeful. The reason why the lines appear darker than the surrounding tooth is that there is red ochre within the engraved markings on the majority of the teeth. Ochre is the mineral iron oxide, and is also used to produce the red paint for cave paintings, and is often found in UP burials.

**Slide 17**

This slide provides a couple of examples of what the “deliberate but less precise” category of teeth look like. As you can see, while the markings are still made with a stone tool, they are not as clearly or neatly engraved, and in some cases lines have been gone over more than once. Considering there are only seven teeth that were produced in this manner, it almost seems like they may have been made at a different time and/or by a different person with a different tool.

**Slide 18**

This slide provides a couple of examples of what the unmarked teeth look like. In some cases, there are engraved markings on them, but these are around the hole that has been drilled, or look like accidental gouges as opposed to being deliberate (this can be seen on the left tooth). The rest of the teeth have no markings whatsoever; though three of them have double holes pierced through them instead of single ones (the right tooth is one of these). If we knew the actual order of the teeth on the necklace, it would be interesting to see if these teeth acted as “breaks” between the teeth with markings, but unfortunately without this information having been recorded at the time of excavation, it is unlikely that this will ever be known.

**Slide 19**

With the signs on the teeth documented, the next step for me was to see if matches could be found on the cave walls. The short answer is that there are definite correlations between the necklace and the non-figurative imagery, and the next two slides offer some specific examples of this.

The cave of Bernifal is located approximately 150 km distant from St. Germain-la-Rivière. It has been stylistically dated to between 13,000 and 17,000 BP (Roussot 1984: 173-174), making it roughly contemporaneous with the burial site. As you can see in the photo and accompanying drawing, the site of Bernifal has a row of engraved geometric signs above a mammoth. As I mentioned before, one of the difficulties I have encountered in my research is trying to decide what constitutes a sign – should each individual marking be treated separately, or are these signs sometimes composed of multiple markings? When I matched up Bernifal’s engravings with the teeth, I was surprised to find that the engraving broke down into three components, as can be seen in the three photos of the teeth in this slide.

I think that this is one of the reasons that the necklace is such a valuable tool: the teeth are small, bounded units, and it would be a reasonable assumption that any markings found on a particular tooth relate closely to any other signs that are present, either in the form of associated markings, or as a single compound symbol.

**Slide 20**

The cave of Gabillou is located approximately 75 km distant from St. Germain-la-Rivière. It has also been stylistically dated to between 13,000 and 17,000 BP (Gaussen 1984: 231), again making it roughly contemporaneous with the burial site. In the case of this site, I was not working with a long string of signs in one location, but rather was able to identify components of different teeth throughout the site.

In the far left example, the tooth has only a single asterisk marking on it, and we find the same sign at Gabillou on an arch by itself at the entrance to a chamber within the cave. In the middle example, I wanted to draw attention to the cruciform-line combination visible in multiple locations within the cave, and also present on one of the teeth. This particular tooth also includes three lines in a row, but there does appear to be a space separating these two components, so this could very well be an example of a tooth with two related signs on it. There are also several locations at this site where three parallel lines do appear together.

In the example on the right, I wanted to draw attention to the “pi” sign that appears both on the tooth next to three lines and by itself on a wall at Gabillou. It should be noted that I currently do not have the “pi” sign in its own category in my typology, and that this geometric shape does not appear on the official inventory for Gabillou. It was actually while I was at the museum in France photographing the teeth that I had the opportunity to see an out-of-print book about Gabillou (Gaussen 1964) that happened to include a line drawing of a “pi” sign at the site. This was the first time that I even knew that this particular sign existed in a rock art site, which was quite exciting since I had just found it on two different teeth from the necklace.

In this sense, the teeth are also helping inform me about the signs on the wall, and the “pi” sign is not the only one which I will now be re-visiting. The asterisk sign that I showed in the first example on this slide is also one that I did not have in my typology, but using the teeth as a guide, I have now gone back and been able to identify it at four French sites by scouring through written descriptions and older sources. This lack of data about the geometric signs is an ongoing challenge, and I will address it further in an upcoming slide.

**Slide 21**

The study of the teeth is an ongoing project at this point, but I wanted to provide you with some initial findings and conclusions before moving on to areas for further study in the next slide. As I have shown in the last two slides, there are definite correlations between the teeth and the geometric signs at rock art sites, and Bernifal and Gabillou are by no means the only sites where I have found matches. Overall, the sites that have the most geometric signs in common with the teeth are those that are roughly contemporaneous with the necklace. The St. Germain-la-Rivière burial comes from the second half of the Upper Paleolithic period, and the fact that many of the teeth are made up of multiple signs fits in well with the pattern I found previously when looking at the co-occurrence of signs within and between sites.

Furthermore, the fact that the engravings on the majority of the teeth are unique (i.e. we do not see the same configurations repeating) suggests that these markings were not just decorative, but instead served some other purpose. The two teeth on this slide, each of which have a single cruciform on them, are one of only two examples I have found of exact repeats on multiple teeth. The other example of this is a row of three parallel lines, spaced in the same manner, that also appear by themselves on two different teeth. The rest of the teeth are distinct from each other, not necessarily based on the specific signs present, but in the way they are ordered.

**Slide 22**

As I mentioned before, I am still in the process of working with the teeth, and I wanted to highlight a couple of research avenues that I am currently exploring. The first involves the provenance of the teeth themselves. As I stated in an earlier slide, red deer was not a species that lived in France at this time, and it is thought that the teeth were imported from Spain. One thing that we have not been able to establish though is where were the engravings done? I have been able to demonstrate that there are connections between the cave walls in France and the necklace, but what about the geometric signs from Spain? When looking at the co-occurrence of sign pairings at multiple rock art sites, I found the same patterns replicated at some Spanish sites as well (this was accomplished by doing a quick survey of a handful of sites I had data for in N. Spain). So the question I am now exploring is whether the same will hold true for the signs on the necklace? I am just starting to add all of the Spanish sites to my database, and I plan to compare the geometric markings on the necklace to these sites as well to see if any connections can be established. This study could have some interesting implications when it comes to cultural borrowing and sharing between these two regions.

The other area where further research is needed relates to the geometric sign inventories of the rock art sites in France. In general there are very few photos of the geometric signs, and you may have noticed that there were quite a few line drawings of them included in this presentation; this is because they have never been photographed. When I originally compiled my database for France I was forced to rely heavily on written inventories and descriptions. The emphasis was commonly on the animal depictions, with the geometric signs often being treated as an afterthought, if they were even included in the inventory. In many cases, I used existing photos and drawings and had to decide for myself what each site contained, but this was also limited by what had been visually documented. The asterisk and “pi” sign mentioned earlier in this presentation are two good examples of what can happen if I am working with partial data. To address this shortcoming, next year I will be travelling to sites throughout France and photographing the signs myself. My goal is to be able to create complete inventories for sites where data is lacking, and at that point I will be able to make better comparisons both between sites and with portable artifacts such as the necklace. I will be doing the same work in Spain and other countries as I expand the database and identify where other gaps in our knowledge may exist.

**Slide 23**

Geometric signs are one of the clearest indicators of early symbolic behaviour we presently have to work with, and they provide strong evidence of the abstract thinking and cultural complexity already in existence during the prehistoric period. By looking at the patterns of pairings and other sign configurations within the linguistic framework, we are increasing the tools at our disposal for studying cognitive evolution. This perspective has the potential to provide important insights for understanding the origins of modern symbolic behaviour, and in particular the capacity for creating and utilizing graphic forms of communication. This focus on the geometric signs is not meant to exclude the likelihood that the animal and human imagery may have also had a more symbolic, iconic meaning instead of just being representative (see Sauvet and Wlodarczyk 2008 for a study of animal imagery co-occurrence). Leroi-Gourhan referred to the whole body of art as the “language of the Upper Paleolithic” (1992), and as further research is undertaken in this area, he may very well prove to be right.

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