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PLEISTOCENE ART OF THE WORLD

Short articles



# SYMPOSIUM 1

## PLEISTOCENE ART IN EUROPE

Chairman | **Jean CLOTTE**  
(France)



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## THE DISTRIBUTION OF FRANCO-CANTABRIAN ROCK ART

**Robert G. BEDNARIK**

Rock art of Pleistocene antiquity has been proposed to exist at up to 400 sites across Europe. Until about 25 years ago, the only sites admitted to this list were limestone cave sites, but then began efforts to admit other types of sites. This included especially a series of open schist sites on the Iberian Peninsula. Since then, more sites have been added, sometimes under controversial circumstances, often without critical assessment of the claims made, and always without credible dating evidence. It has therefore become necessary to review this growing list sceptically.

At the eastern boundary of Europe, Kapova and Ignatiev Caves in the Ural Mountains reputedly contain Pleistocene paintings, but carbon dating from the second site has yielded a Holocene age. There is no evidence in favour of Pleistocene antiquity of the paintings in Cuciulat cave, Romania, but the cave art discovered only this year in Coliboaia is certainly of the Pleistocene.

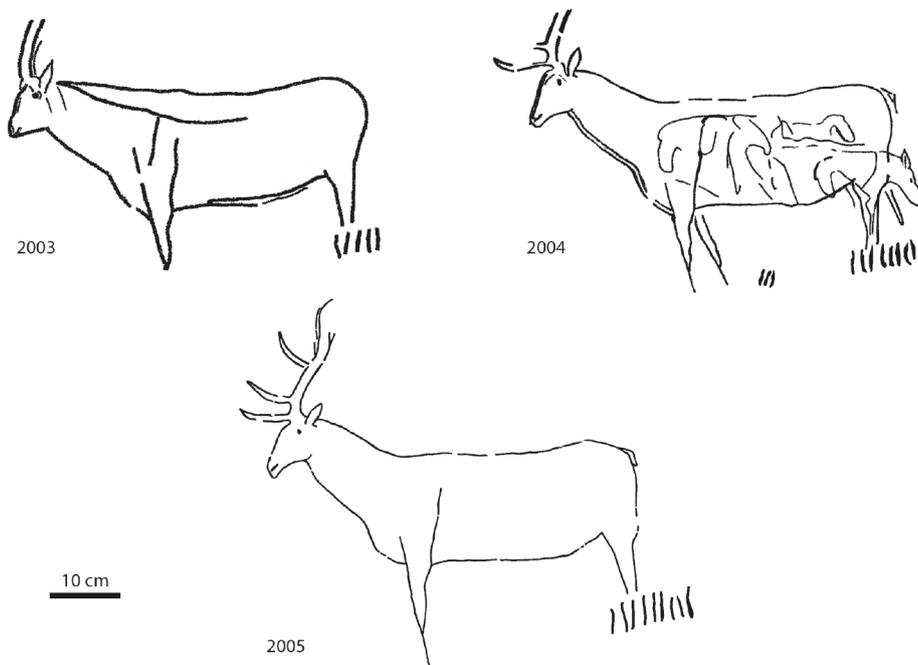
In central Europe, palaeoart and natural or recent markings have been claimed to be Pleistocene rock art in Kleines Schulerloch, Kastlgänghöhle, Hohle Fels, Geissenklösterle (all Germany), Mladeč Cave and Bycí Skála (both Czech Republic), Stubwieswipfel and Kienbachklamm (both Austria); all of these claims have been convincingly refuted.

The first open air rock art site assigned a Pleistocene antiquity was Fornols-Haut, Campôme, in the French Pyrenees. However, in view of the high elevation of the site, which during the Final Pleistocene would have been within the periglacial zone of the Pyrenean glaciers, it seems odd that people would have even visited the site during that time. Since then, a whole series of open petroglyph sites, in various parts of the Iberian Peninsula, have been attributed to the Upper Palaeolithic (UP). In all cases this was initially on purely stylistic hunches, which in some cases it was later sought to reinforce with occupation evidence. These sites are of percussion petroglyphs, i.e. of a technique that has typically not been used in the Franco-Cantabrian cave art. They all occur on schist, usually in deeply cut, geologically recent valleys. With a few exceptions, horses and cattle appear to be depicted. The fluid, accomplished artwork that is the usual hallmark of the cave art is absent in most of these depictions. Moreover, the dominant motif type in the Franco-Cantabrian cave art are the so-called signs, geometric images of unknown significance, outnumbering the zoomorphs several times. They are completely absent at all of the open sites, as are any images of extinct species. Finally, these many sites are controversial because those who advocate the Pleistocene age of their contents tend to be rather emotive when their claims are subjected to testing.

One of the largest of these sites, Siega Verde in western Spain, comprises hundreds of zoomorphs and inscriptions, some with dates. The wear occasioned by the suspended load of the frequently flooding Agueda River has been calibrated via these dates, showing that only very few of the petroglyphs can be >200 years old. The same geological context applies to the approximately

15 rock art sites on the lower Côa River in eastern Portugal, only about 50 km from Siega Verde, and all of that rock art is of the late Holocene. Another nearby site, but in the Douro valley, that had already earlier been claimed to be of the Pleistocene is Mazouco. The only complete figure there has been vandalised and is of no analytical relevance. The UP age of a few engravings in Escoural Cave in southern Portugal has also been questioned, as there is only Middle Palaeolithic and Chalcolithic occupation evidence and the few motifs bear no stylistic resemblance to securely dated rock art of the UP.

There are numerous further open schist sites in the Iberian Peninsula that have been claimed to be UP. They include Domingo García and the nearby sites Carbonero Mayor, Bernardos and Ortigosa; Piedras Blancas near Escullar, and Almería, all in Spain. Ocreza in Portugal, like some of the other sites, comprises a single image, and a few other petroglyphs in the vicinity are clearly not Palaeolithic.



Three published recordings by the same authors of one petroglyph in Church Hole, UK, claimed to be Palaeolithic.

There have also been a few claims of Ice Age palaeoart from Britain, all of which are surrounded by controversy. The first for rock art, in 1912, concerned Bacon's Hole in Wales. The red paintings turned out to be only 18 years old. A series of portable finds has been plagued by uncertainties, including equine engravings from Robin Hood's Cave and Sherborne, and an engraved horse mandible from Kendrick Cave. The Pleistocene "petroglyphs" in Wye Valley, "inlaid with green malachite", were natural markings with some green algae. Recently three petroglyphs in Church Hole were attributed to the Palaeolithic, and the number of images gradually increased first to 125 ("the most richly carved and engraved ceiling in the whole of cave art"), but after critical review fell to ten, of which only three are figurative. There is no proof of Pleistocene antiquity, a Th/U date tendered has no relevance or credibility.



## WHO IS THE ARTIST?

### Paleolithic Art and the Sexes

**Claudine COHEN**

Paleolithic portable and parietal art contributes to inquiries concerning the role of women in prehistory. From the Atlantic coast to the Don valley, speculation has been inspired by painted, engraved or sculpted female silhouettes, realistic or stylized representations of vulva, sexual scenes and “Venuses”, with a slender or opulent form, carved in ivory, bone or limestone. Are these an expression of hunting or fertility rituals, a blatant expression of the male libido, or proof of a primitive matriarch or a Mother Goddess religion? These questions have recently returned to the forefront and raise the question of the identity of the authors and users of these images: were they men or women? In what ways can these representations, and other prehistoric artifacts, provide elements of response to this question?

When speaking of art, it is useful to demystify the elements that have long been taken as “given” in terms of differences between the sexes. Are we not biased toward thinking that prehistoric art was produced by and for men? In fact, there is nothing in the nature of this art to indicate that women would have been excluded from its production. It is probably true that some animal themes would show a degree of knowledge of animal behavior that only hunters would have. Nonetheless, attempts to experimentally replicate and study the techniques employed, analyses of footprints in decorated caves, and positive and negative hand prints on their walls, do not exclude the possibility that women could have at least participated in the creation of parietal figures and portable art objects.

Though we might, with skepticism, be able to accept the hypothesis proposed by LeRoy Mc Dermott that the earliest female representations were “self-portraits” resulting from the vision that women had of their own body, the thesis of Randall White and Michael Bisson concerning the assemblage of statuettes from Grimaldi is more convincing. These figurines are small and some have a perforated hole in their upper part which would have permitted them to be worn as pendants, while others that had a tapered end could have been held in the hand or stuck in the dirt. These could have been used as amulets to protect women during pregnancy or childbirth; this is an archetypal female use linked to the need for them to protect themselves during a time of intense emotion and risk. If this is the case, it could well be true that these objects were manufactured by women for their personal use or for that of other women.

The question of the sexual identity of the authors of Paleolithic art was recently discussed in relation to the identification of images of positive and negative handprints in parietal art. An American zoologist, Dale Guthrie, postulated in 2005 that most of the hands represented belonged to young men and that the majority of Paleolithic paintings would thus have been realized by adolescents isolated from the rest of the tribe, such as young males hunting in groups. The female representations with exaggerated sexual features and the vulva often represented in portable art,

or drawn or engraved on cave walls, would be the expression of their desires and frustrations. Guthrie thus sees the influence of “testosterone in Paleolithic images” and sees in this more or less erotic or humorous graffiti the ancestors of modern inscriptions and “tags”. Based on measurements, he identifies the hands represented as those of young men. The rapidity and carelessness with which these hands were realized suggest that all, or nearly all, of them were made as part of a game. The supposed mutilations result from intentional modifications of the image or contortions of the fingers. The predominance of prepubescent children or adolescents represented by the footprints on the ground suggest initiation rituals involving young people.

Another American researcher, Dean Snow, contests this hypothesis and claims that he can identify the authors of the positive and negative handprints in Paleolithic rock art as women, using computer software that he developed. The negative handprints surrounding the famous horse decorated with dots in the cave of Pech Merle (Lot, France) would be mostly female, and perhaps represent the signature of the female artists who would have thus realized the panel. This might be confirmed by other sites from the same period, such as Gargas (Hautes-Pyrénées, France), Maltravieso (Spain) and El Castillo (Cantabria). If verified, this conclusion would contribute to contestations of the traditional view of Paleolithic art as the work of men. An anthropologist, Jean-Michel Chazine, also notes the abundance of decorated women’s hands associated with female symbols in the Paleolithic caves that he discovered on the island of Borneo. This supports the hypothesis that women could have participated in the realization of Paleolithic art.



Female statuette, discovered in 1987 by Nikolai D. Praslov at Kostenki I, Russia. Sculpted ivory, approximately 6 cm long, dated to 22 000 BC. The often tiny size of Paleolithic “Venuses” with an opulent belly suggests that they may have served as amulets, perhaps fabricated by women and meant to protect them during pregnancy, and sometimes worn as pendants (photo: N.D. Praslov).

The idea that prehistoric parietal and portable art was made or used by women is also supported by evidence from comparative ethnography: among Australian aborigines, sacred art is sometimes the work of women and in particular places or on specific occasions, is viewed by women only. If we accept that Paleolithic art had a ritual or religious function, some images and objects (such as the phallic-shaped objects often discovered) could have been reserved for women or for the initiation of female adolescents, rather than for an exclusive use by men.

At some later sites, (the Mesolithic site of Lepenski Vir, for example) artistic forms with a distinct size and shape were found, perhaps indicating a female expression that was different, or even opposite, that of men. At other more recent sites, pottery manufacturing techniques might show a sexual division of places and roles, depending on whether the objects were meant for domestic use or for exchanges on a larger scale.

Little by little, our hypotheses and interpretations concerning these artistic representations and objects can thus be revised and lead to a better understanding of the identity of their authors and the roles of women in prehistoric societies. New “scenarios” of human activities in distant prehistoric times have thus been proposed, invalidating the clichés centered on “man the hunter”, dominating a group of females while continually pursuing large prey. They have renewed the question of labor division in prehistoric societies and emphasized the importance of production and subsistence activities, which throughout prehistory could be practiced by women – small prey hunting, collecting, stone tool manufacturing, weaving, pottery, and the production of engraved or painted images and sculpted figurines.

Productive, inventive, and why not, artistic; the new original woman, brought to life through a convergence of research and speculation nourished by a militant ideology, has ceased to be invisible.



## ANIMALS AS THE ANAMORPHISM OF MAN

**Amélie BALAZUT**

In Europe, there is a very interesting Pleistocene artistic tradition of representing composite figures as though in the place of human figures, which are curiously rare in parietal art. Much less frequent than animal representations, human representations in European Pleistocene parietal art are also those that are most often treated in a strange manner, never being represented as realistically as their animal counterparts. They are all very schematic, caricatural, or even amorphous or supernatural. A large majority are subject to animalistic distortions, with human and animal features being combined. Animal features, which are more or less obvious or subdued, are nearly always included in the representations of humans. Far beyond distortion, human



The bristled horse of Chauvet Cave.

representations are truly metamorphosed into hybrid beings, or therianthropes, which do not exist in the natural world. This same deviance is seen in the representation of sexual parts, with many ithyphallic figures having proportions that are greater than the anatomic reality of men, and sometimes even of animals, resulting in strange looking creatures. And there is yet another particularity that afflicts the human figure; not only are they deprived of their true human nature, some figures appear to be dead or sometimes mortally wounded by weapons or other non identifiable marks. In addition, these figures are often marginalized within hidden niches or in deep cavities in the cave. The intention seems to have been to place them in a particular location that evokes a tangible dialog between the cave and these figures. This significant dialog is also found in the use of the configurations of the cavern to represent other human figures. This clear dialog in fact concerns the entire parietal structure.

Is this treatment of the human figure specific to European Pleistocene art? According to our current knowledge, this is not a geographically isolated phenomenon, but rather a truly global artistic tradition that is not exclusive to the Pleistocene period. This same predilection for animal images and their assimilation with human figures is present in the art of archaic hunter-gatherers around the world. The recurrence of this phenomenon arises from a conceptual matrix that is common to all populations sharing the same type of economy and very likely the same beliefs and thought systems. In this context, animals are understood through metaphorical and analogical systems that recognize a true kinship relationship between humans and animals. Through therianthropic images, humans are thus allowed to coincide with their true animal nature, which is kept out of reach in their profane life. As a tangible interface between the profane world and the supernatural and sacred world, these images are there to recall and render perceptible the interdependence of these two universes, that of the living and the dead, and that of humans and animals.

All of these figures represent that which humans are, and yet are not: animal at the same time as human and human at the same time as animal. Through these images, humans thus expressed the remaining elements of their animality, which could nonetheless be seen only at the expense of their humanity. Why, indeed, such an absence, or self-effacement, in face of animal vitality, and why therefore such a diversion of the human figure and its marginalization within the depths of the earth if not to represent this un-representable human animality? For humans, art is an opportunity to experiment, enabling us to look into ourselves and at the same time to reflect upon the impossibility of representing our own past, our own animality. It is only because humans are forbidden to express their animality that we seek at all costs to represent it, as is attested by Paleolithic art and its therianthropic figures and all of the animal and hybrid figures that we encounter in the artistic practices of hunter-gatherer populations. By representing themselves with animal traits, humans found a positive and heightened manner, Nietzsche would say, to look into themselves and to coincide with their own animal nature. Paleolithic parietal art, from which the origins of art and all arts emerged, followed the advent of this initial desire, which, since the time when man became human, has driven him to represent the strangeness of his own humanity. And whether we are considering the plethora of animal figures themselves or the stranger and rarer therianthropic figures, all are the evaded or liberated image of their own animal humanity. In this sense, the animal is the anamorphism of man, through which he is able not only to liberate himself from his point of view, but also to embrace that of the other, who, in his otherness, is none other than he who dwells in the depths of himself.



## IMAGES OF THE SELF IN THE MAGDALENIAN:

### the Role of Human Representation in Paleolithic Societies – Territories and Movements

Oscar FUENTES

More than a century of research on prehistoric art has opened a window onto the life and traditions of human groups during the Upper Paleolithic, enabling us to better understand their cultural universe and its many symbols. The pioneers of the discipline rapidly focused their work on animal themes to formulate their hypotheses, marveling at the beauty of the forms (Altamira, Font-de-Gaume).

Human representations, which are also present in parietal and portable art, are not ignored, but considered in a different way. With an esthetic quality that is less striking than that of the animal representations, this theme appears ambiguous, incomplete, and often quite deformed and awkward. Though human iconography is difficult to apprehend in the history of the discipline of prehistory, it has played a key role in interpretative theories (masked men and magical art, for example). There is thus a paradox that characterizes the human figure and constitutes one of the interests of this theme. On one hand, it is severely judged by its observers (seen as awkward, bestialized, caricatural or grotesque), and on the other, it is central to some interpretative theories (magical art, masked man, awkwardness, indeterminism, ...).

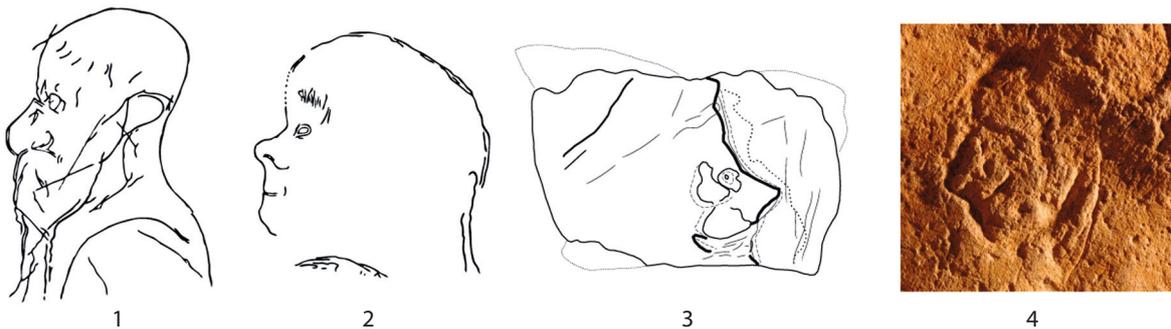
The representation of the human body in Paleolithic art continues to suffer from its specificity. After the structuralist studies of André Leroi-Gourhan, the human theme was classed in the category of marginal themes by Georges Sauvet (1979). Throughout the history of this discipline and its numerous methodological shifts, human representations have been considered in various ways, and were gradually marginalized. In my opinion, the great lack of understanding of this theme arises from the fact that we first considered Paleolithic art through the looking glass of the animal, and also because there is great formal variability in the representation of a theme that is so rarely represented.

These observations incite certain questions. Despite their small number, the subjects display a great variety of forms, attitudes and stylistic conventions. Could these variations be linked to cultural identities? Or is there no choice involved at all? I believe that the act of “representing oneself” necessarily implies other concepts, a personal implication that is stronger (the expression of one’s own identity and how it is perceived) than that involved in the representation of animals (animals that are observed, analyzed, dreamed?). The human image conveys the very essence of our being, our existence. Representing oneself implies including oneself in the image, and probably also including that which we are, that which defines us. Representing one’s body could lead us to view Paleolithic societies in terms of individualities, to conceive the idea of the individual in the society, his or her role and status in the social structure.

How do we approach human representations? What was the role of this iconography in Upper Paleolithic societies?

This theme, though it is statistically marginal, has already been interrogated in the past, but it has never been analyzed from the perspective of individual and social identity, or been considered in terms of a cultural or territorial context. In the Magdalenian, human representations become more numerous than in preceding periods. We witness not only an explosion in numbers, but also in forms, which must be addressed and clarified. And herein lies my interest in this period.

In my work, I thus propose to address all of the points raised, starting from human representation in the Magdalenian of southwestern France (relying on a corpus of reference sites). The methodology will follow two axes: a direct analysis of the images and their archaeological contexts, and observation of elements extrinsic to the image. Sites such as Le Roc-aux-Sorciers, Les Fadets and La Marche (east of the Vienne) have yielded a large quantity of representations of an exceptional graphic quality (figure). Approaching an expressive realism and iconography, these images raise the question of the existence of true portraits. The analysis of a figure in its archaeological context and its dissection into anatomical choices allows us to detect tendencies and to propose a theoretical model to aid us in our understanding of Magdalenian silhouettes.



Realistic human profiles:

1-2: La Marche, engravings on limestone (tracing: L. Pales);

3: Le Roc-aux-Sorciers, engraving and sculpture on a limestone plaque (tracing: O. Fuentes);

4: Le Roc-aux-Sorciers, parietal engraving (photo: A. Maulny).

My study of the proposed corpus will contribute to our understanding for the role of the human figure in the Magdalenian social fabric. This study of our own image will perhaps enable me to propose directions from which to address the social structures and relationships between human groups in different geographic contexts. In the sites east of the Vienne, we see the development of a detailed and expressive figure, approaching realism, while in the Perigordian sites (Les Combarelles, Laugerie-Basse), the human form takes more diverse forms, ranging from detailed subjects to other very deformed or composite ones. In the Pyrenees (Marsoulas, Les Trois-Frères, Isturitz), the human silhouette is characterized by imaginary deformations, including animal elements, with many composite subjects. All of this raises questions concerning the notions of “territory”, “exchange” and “displacement”. In association with other fields of study and other archaeological remains, human representations may contribute to our understanding of the social aspects of human groups during the last glacial period.



## THE ACOUSTIC DIMENSION OF PALEOLITHIC PAINTED CAVES AND STONES

Igor REZNIKOFF

Numerous studies of the acoustics in Paleolithic caves decorated with paintings, engravings and diverse signs have revealed a remarkable correlation between the images and the quality of the resonance where they are located: most of the images are situated in the most sonorous parts of caves.

### Density of images and resonance

In general, the density of the images is proportional to the intensity or richness of the resonance. A simple method for measuring the richness of resonance is to count the number of echoes obtained from the resonance of a human voice. At the Grande Grotte of Arcy-sur-Cure, for example, as we advance inside the cave from an area with 2 echoes, to another with 4, to 5 and then 6 or 7, the density of images increases as well, until they finally cover nearly the entire ceiling of the terminal apse, as well as the lateral walls and niches. In Kapova cave, as we pass from 4-5 echoes (Hall of Signs) to 5-6 echoes (Cupola Hall), and then into the upper level, with as many as 7-8 echoes, the paintings become increasingly dense in terms of both painted surfaces and remarkable panels. At Niaux, this increase in image density is clearly related to the intensity of resonance; this is especially evident in the density of images in the Salon Noir, which is a very sonorous space (7-8 echoes, duration 7 seconds).

### Remarkable places

The Niaux Salon Noir is exemplary in its abundance of paintings all around the Salon and in their quality, as well as in the sonority of this rotunda, which resonates like a Roman chapel. The sound/image concordance is exceptional here: imitating animal sounds (figure) gives a real impression that they are there in the cave. In terms of sonority, we can to a certain degree compare the Salon Noir with the Great Hall of Isturitz, a true concert hall in which we find the famous pillar decorated with reindeer; it is also here that flutes made from bird bones were discovered. The Hall of Paintings at Kapova is also a special place, being both sonorous and containing two magnificent panels with bison, horses and especially mammoths.

### Decorated sonorous niches

These are niches into which we can partly enter, sometimes only with the head. They are often very sonorous and decorated, either inside (Camarin of Le Portel, completely decorated), or outside, where there are often red dots, or in their immediate proximity. In these niches, a human voice with *mm*'s or *hm*'s of medium intensity can create spectacular imitations of animal cries and bison moos or roars, what we call the "bison effect".



Niaux, Salon Noir, Pannel 6,  
a place rich in resonance (photo: J. Clottes).

## Red dots

The red dots that are numerous in some caves appear to be signs that indicated very sonorous areas, or that served as guides in the cave by use of its resonance. This function appears quite clear in narrow tunnels where red dots are found in the very spots where the resonance is greatest. This is the case at Le Portel, where in a long, narrow passageway the only sign present is one red dot that is easy to locate by searching for the acoustic center of the tunnel with a voice. In Oxocelhaya cave, there are two such tunnels, one in the Laplace Gallery, opposite a falling bison, and the other in association with a whole network of red dots and lithophonic stalactites; the red dots are always found at the point of maximum resonance. This coincidence is so remarkable that its conclusion seems certain: these are signs with a purely sonorous significance, serving as guides in these narrow tunnels.

## Statistical considerations

When considering the sound / image relationship, we can of course wonder if the seemingly clear concordance in a given cave is simply accidental. However, in many caves, since more than 80%, or even 90%, of the images correspond with sonorous locations, it would be difficult, or even non-scientific, to speak of accidental coincidences. This coincidence can be calculated very precisely in the case of red dots located at the point of maximum resonance in some tunnels. When we consider the type of red dots found at Le Portel and Oxocelhaya, we obtain probabilities of approximately one millionth that the four red dots concerned would all be located at the point of maximum resonance (which is the case). These probabilities are almost null and the sonorous significance of these red dots in tunnels appears even more certain given that there is no more reason for a red dot to be placed there than elsewhere.

## Paintings on stones in the open-air

We have also studied the resonance in areas surrounding stones decorated with paintings on lakeshores in Finland, in the Massif de la Sainte-Baume in Provence, and in the Vallée des Merveilles. At this latter site especially, the results of our first study were remarkable. In the middle of a natural setting, we heard mostly echo effects, and sometimes surprising ones.



## ANIMATION IN PALEOLITHIC ART:

### Recent Observations

Marc AZÉMA in collaboration with Florent RIVÈRE

The images of animals represented by Upper Paleolithic artists are often animated. Sometimes spectacular, sometimes discrete, these movements express precise behaviors whose association within graphic arrangements, on walls or on objects, shows the existence of an original form of graphic narration. Prehistoric humans also conceptualized sequential animation and finally... cinematography. Even better, recent observations of Magdalenian portable art objects, coupled with experimentation, appear to demonstrate the existence of a true optical toy, a Paleolithic “thaumatrope” that prefigured the concept of the camera!

### Paleolithic graphic narration

A selection of graphic compositions shows the emergence of graphic narration during the Upper Paleolithic, as early as the Aurignacian.

In the Chauvet Cave (Ardèche), which was decorated approximately 31 000 BP, other than the Grand Panel, all of the End Chamber appears to have been devoted to cave lions. Throughout the underground space, felines are engaged in behavioral phases (sequences) mixing mating with acts of hunting.

La Baume-Latrone (Gard), contains an astonishing composition on its Great Ceiling in which a large lion roars and attacks a herd of mammoths by himself.

We can finish with two Magdalenian compositions that show that graphic narration was used throughout the Upper Paleolithic. The panel of the “little Sorcerer with the musical bow” in the cave of Les Trois-Frères (Ariège) and the Great Ceiling in Altamira (Cantabria) show a succession of behavioral sequences depicting a herd of bison during the rutting season.

### Sequential animation: the first animated Paleolithic drawings

With their desire to bring their images to life, Paleolithic artists developed two processes for the decomposition of movement, the first consisting of the superimposition of successive images, and the second of the juxtaposition of successive images. Through these two processes, prehistoric humans foresaw the existence of one of the fundamental characteristics of visual perception, the persistence of vision.

The first process is visible in France in 53 figures. It implies the superimposition of positions successively taken by the animal. The decomposition of movement concerns the entire body or one part of it (the head, limbs or tail). This graphic process first focused on the movement of

the limbs, and in particular, rapid movements (trod, gallop), more often than on the movement of the head, or even less often, the tail. Most of the figures show only one part of the body animated in this way; it is rare to see the synchronization of movement decomposed with several body parts.

In the second process, the positions taken successively in time by the animal are juxtaposed, one after the other, and oriented in the same direction, following the principle of a row. At least one object, engraved at the end of the Magdalenian, attests to the existence of this process: a bovid rib discovered in the Upper Magdalenian layers of the cave of La Vache (Ariège) shows, from left to right, three consecutive phases of the course of a running lion.

## Optical toys and pre-cameras in the Paleolithic!

Paleolithic artists pushed their graphic experiments even further and probably invented the first optical toys... at the origin of cinema. In 2007, Florent Rivère, an experimenter of prehistoric techniques, contacted me to inform me of observations made of Magdalenian disks, which confirmed my hypotheses in a spectacular manner.

Paleolithic artists appear to have invented the “thaumatrope”, and optical toy that we had believed until now to have been conceived in 1825, and which is the direct ancestor of the cinema camera. According to the scientific literature, this device was invented by the astronomer John Hershel. The thaumatrope, literally “wheel of miracles” (from the *thauma*, “miracle” and *tropion*, “turn”), is composed of a disk with a drawing on both faces and maintained above and below by a string. The illusion created when we make the disk pivot over itself can express the movement of an animal, performing a dance or an action.

Through experimentation, we have shown that several Magdalenian disks, including the disk with a chamois from the site of Laugerie-Basse (Dordogne), fulfill these conditions (figure).



Bone disk from Laugerie-Basse, on both sides there is a chamois whose movement is decomposed (diameter: 31 mm, Musée du Périgord, drawing: Roussot 1984, figure 3).

## Conclusion

Using two procedures, graphic narration and sequential animation, Paleolithic artists more than 30 000 years ago, at the dawn of artistic representation, foresaw the foundations, the grammar and the technique of the shooting script.



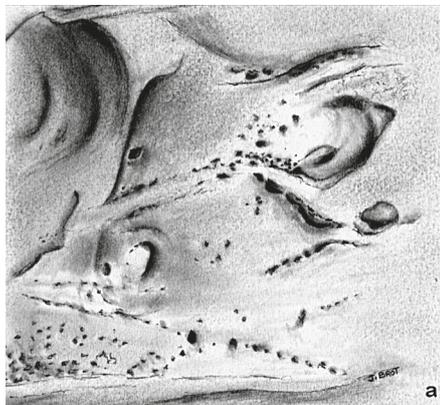
## THE USE OF NATURAL RELIEFS IN PALEOLITHIC PARIETAL ART

Jean BROT

In all periods, the use of natural reliefs and the morphology of cave and rock shelter walls is a fundamental component of many Paleolithic engraved, painted or sculpted works.

It has often been said that the natural form of the stones was used because they somehow evoked something to the artist. While it is reasonable to think that their resemblance to real things could have inspired the artists, it is also true that in many cases the use of reliefs is not necessarily linked to what their forms may have looked like. Faced with the diversity of representations, I indeed observed that at many sites, the use of natural reliefs in representations could also correspond to an artistic concept linked to the potentiality of the forms rather than that which they could evoke. This idea implies that artists see what they want to see where they want to see it, which could imply a fully reasoned artistic procedure in the choice of locations on the wall for their works, and this, of course, in function of essentially cultural criteria.

The cave of Domme (Dordogne):



Zone of undecorated wall before  
the graphic intervention of the artists



Position of the figure  
(drawings: J. Brot).

From the beginning of the 20<sup>th</sup> century until the present, the observations of numerous researchers opened more and more precise directions of research on the relationship that may have existed between the artist and the wall. But the manner in which the artist proceeded raises many questions: how did he or she integrate the volumes into the works and depending on what? What exactly did he or she see on the wall? Why do the subjects represented have the volume, dimensions and sometimes even the attitude that they have? Can we speak of traditions in this use of reliefs, or is this an innate behavior when faced with natural forms? What is the role of chance and opportunism in the use of reliefs? Were the works pre-conceptualized?

To attempt to contribute elements of response to all of these questions, in part raised by the scientific community, I selected thirty engraved and sculpted works from all the periods of the Upper Paleolithic: the rock shelters of Roc-aux-Sorciers (Vienne), La Chaire-à-Calvin (Charente), Pataud and Cap Blanc (Dordogne) and the caves of Pair-non-Pair (Gironde), Domme, Comarque and Les Combarelles (Dordogne).

Based on these sites, my main objective was to reconstruct the initial form of the natural wall in order to distinguish it from the wall modified by the artists. By making this differentiation, and thus by dissociating the image from its support, our vision of the wall changes completely; all that remains are scattered stone forms that can be differentiated from each other, while before, the form of the image fused them together. I was thus able to observe the figures as an assemblage of conceptualized forms brought together by the technique, and therefore to better apprehend the relationship that could have existed between the artist, the representation and the wall.

In order to demonstrate the potentiality of the stone forms and the well thought-out, organized and conceptual nature of this practice of using natural reliefs, my analysis of these figures included only the choices of reliefs and their assemblage procedure, since the technical actions of engraving and sculpture are well known. Based on this analysis, I made an inventory of the reliefs and developed a terminology based on the “functions of the reliefs”. These functions, depending on the role they play in the image, have a given vocation or particular quality, suggesting that each one has a multiplicity and universality of uses depending on the project to be realized.

In this research context between the suggestive potential of the support and the adaptation of a preconceived image, and with the help of numerous technical parameters, I sought to detect how it could have been possible to organize the natural reliefs with an engraving or sculpture and how the graphic line was put into place. This analysis of artistic works reveals a totally structured and mastered use of a procedure of construction, which, far from being accidental, should be considered as a technique in and of itself. This demonstration, supported by the production of experimental and artistic sculptures, also contributes new analytical elements that permit a better understanding of the consequences of the integration of stone reliefs into a representation (movements, attitudes, dimensions).

By allowing the observer to approach the moment of their conceptualization, this analysis provides a means to attempt to penetrate into a part of the mental universe of Paleolithic images.

This investigation of the potentiality of stone reliefs could apply to many parietal engravings, sculptures or paintings, as well as to portable art, and therefore open new research perspectives on a European scale. This would perhaps enable us to understand the role of reliefs and certain representations within graphic arrangements, and to detect regional cultural and interregional tendencies and to perceive the interactions. These data will be integrated into a coherent procedure relative to research already conducted by other researchers on the structuring of the parietal space through images.



## THE MIDDLE-RANGE THEORY OF “SHARED SPACE”

José FERNÁNDEZ QUINTANO

Among the changes that arose from Neolithic production methods, there was a cultural shift in the perception of “time” and “space”.

The lives of prehistoric hunters were determined by their mastery of the natural environment, and security came from knowing their territory and knowing, at any given moment, the state of the fauna that they depended upon.

With the development of production economies and the spread of agriculture, people became sedentary and dependent upon seasonal cycles and good harvests for their food. Annual cycles, or time, therefore became factors that determined a successful economy.

The cultural tools that developed in each of these different spatial and temporal systems were, respectively, calendars and maps. In this context, the existence of Palaeolithic maps can be seen as a natural rather than an exceptional phenomenon. In turn, during the Neolithic, calendar, lunar, solar, and stellar systems were developed to manage seasonal changes.

Space was therefore the dimension that Palaeolithic hunters needed to know and control, and the mobility of the bands that painted the caves was greater than we might think. In fact, only extreme mobility can explain the existence of art forms showing influences from regions of France and the Iberian Peninsula that were very distant from each other.

### **What does the theory of “shared space” propose? Herbivorous predominance**

In Palaeolithic rock art, 90% of the naturalistic representations in which an animal species can be identified are of herbivores. This includes both herbivores that were hunted and eaten, and those that were not. While this may at first seem puzzling, the predominance of images of herbivores reflected the real world. Prehistoric groups needed to survive and focused their attention on that which might provide them with sustenance. In other words, regardless of whether the represented animals were found among the faunal remains in the cave or nearby camp, and therefore regardless of whether the animal that was depicted was an animal that was hunted, it was nonetheless an animal that could potentially be hunted.

### **“Shared space”**

Caves and nature both presented similar challenges for prehistoric groups: they were a territory to be explored, and explore them they did. These groups were nomadic in nature and equally “nomadic” in caves. They did not just stop at the entrances or in nearby chambers, and the long,

dark passages and slopes did not deter them. On the contrary, they were seasoned explorers and would paint in areas that were several miles away from the entrances. These paintings show us their “perspective” and tell us what was really important to them.

## **Annexe**

### **Abbé Breuil’s encounter with God (Tale)**

Abbé Breuil died and went up to heaven. Saint Peter came to greet him, and praising the many merits that he had shown during his life on Earth, he told Abbé Breuil that God would grant him a special favour: the favour of answering any one question that Abbé Breuil chose to ask Him. As they went along, Abbé Breuil mulled over what question he would like to ask God. God knew everything. So to begin with, he thought of all the great questions that had troubled him during his life on Earth: why was there war? why was there disease? Questions began to fill Abbé Breuil’s head, but as he reached the great door, he realized that there was only one question that he really wanted to ask. At the end of the day, what he really wanted to know was the truth about the great investigation that had been taking place across continents: the meaning of Palaeolithic art. Saint Peter told him that they had arrived and that Abbé Breuil should enter the room alone and once inside ask his question. Saint Peter smiled and reminded Abbé Breuil what he already knew: that God was going to answer the question that he chose to ask and that he would answer it truthfully. Abbé Breuil went into the room, and saw thousands of painting on the walls that he quickly noted were similar to human Palaeolithic art; similar to the paintings that were found in Palaeolithic caves in France and Spain. However there were more of them: it was as if this was all of the art that still existed on Earth, as well as all of the art that had been lost. He looked at the figures, the colours, and the scenes, and, of course, he looked at the ceiling and saw what he had already known deep down that he was going to see: many scenes like those at Altamira... Feeling overwhelmed, he asked his question:

“Lord, what is the meaning of Palaeolithic art?”

And God answered:

“It was already here when I arrived.”



## THROWING MORE LIGHT. STATIC LIGHTING IN PALAEOLITHIC “SANCTUARIES”:

the Example of Cueva de Nerja (Málaga, Spain)

**María Ángeles MEDINA, Araceli CRISTO  
Antonio ROMERO, José Luis SANCHIDRIÁN**

Here we present initial findings from a hypothetical approach to fixed lighting in Palaeolithic “sanctuaries” that was carried out in one of the chambers of Cueva de Nerja.

The difficulty of accessing the Upper Galleries from the Show Galleries in prehistoric times is a problem that has kept many of the cave’s researchers on tenterhooks. The only access point into the Upper Galleries is a tiny opening near the ceiling at the back of the *Sala del Cataclismo* at about 25 m above floor level. Reaching the opening is complicated as one must climb up a steep slope and cross several escarpments and ledges, continually struggling to keep one’s balance along the way. This is rendered all the more difficult when the limestone is wet.

As with the Show Galleries, the fact that large numbers of images are found in the Upper Galleries gives rise to many questions: how did people reach the opening? What lighting did they use? What technical resources did they have? How many individuals were there? How long did they remain?

Caves are, by definition, in total darkness, otherwise they would be classified as rock shelters or cave entries in which sunlight only enters during daylight hours. Therefore, in order for people to occupy the cave by night or to penetrate into its deepest chambers, they would first have required a source of light.

Numerous researchers have studied lighting in the underground areas of caves. The latest study on this subject was by S. A. de Beaune, who in several different articles defined three different types of cave lighting: stone lamps, torches, and hearths.

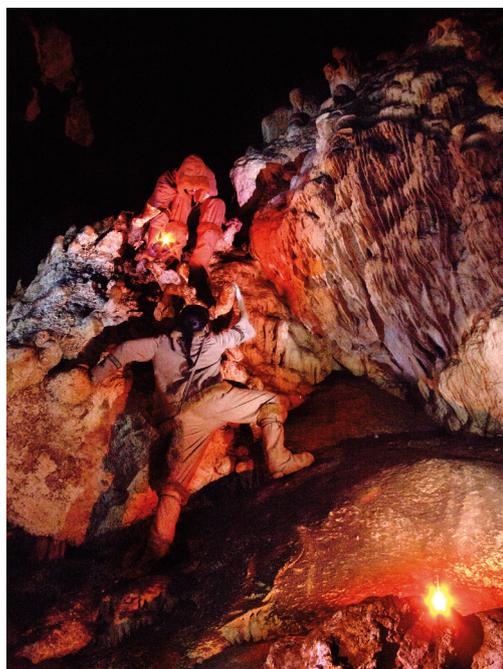
We focused our work on fixed light sources, as there is no evidence of mobile methods having been used in the cave, with the exception of a few *Pecten maximus* valves. For this reason, we looked for the existence of fires that may have been used to fuel other light sources and / or that may have been the basis of lighting in the cave. We also looked for other fixed light sources used along the way, containing the initial one from which the rest of the cave was lit. We then marked and recorded the route that was used, for as Beaune has stated, “... lamps must be accompanied by another source of fire, whether hearth, torch, or another lamp, so that they can be rapidly relit”.

At the same time, we identified a total of 58 objects that met the characteristics defined in the previous section. We nonetheless considered it appropriate to carry out a formal classification of each of them in order to gain better precision and draw conclusions. In this way, according

to their morphology, a first category corresponds to concavities at the top of stalagmites, some of which had clearly been artificially made using pecking and other techniques, while others may have developed naturally through corrosive processes that had taken place in parts of the cave (analysis in process). We then used a second category to designate natural and artificial concavities found in places other than at the top of stalagmites, whether on the floor, flowstones, boulders, etc. Finally, a third category designates truncated stalagmites that can be directly associated with Pleistocene rock art.

In summary, a large number of the identified concavities were found in a close radius to the images, and the scattered charcoal remains found in the cave were also close both to the possible fixed light sources and/or to the art motifs. At the same time, the concavities that did not correspond to these conditions were almost exclusively found in the passages that had to be taken to reach the Palaeolithic paintings and were in such locations as to be visible from other rooms, making them easier to see along the route through the cave. Furthermore, they were found in areas that signalled difficult or dangerous points along the route to the galleries where the images were found. This is similar to situations in which portable lamps are no longer used for their original purpose but are fixed in a particular place along the route. There are therefore two possibilities: a) a relationship between rock art, fires, and fixed light sources in a close radius, b) “streetlighting”. To conclude, we have now obtained the first absolute dates from charcoal found within the concavities (nos. 15 and 22) or in areas very close to them, as was the case in the *Los Órganos* chamber, in which a fixed concavity with a spillway in a flowstone allowed it to pour towards the ground, which was where all of the charcoal remains were found, and in the *Cabra-Bitriangulares* chamber where there is a goat protome and several red lines:

<b>Los Órganos (panels 111-156)</b>	Beta-277744	24 130 ± 140 BP
<b>Cabra-Bitriangulares (panel 220)</b>	Beta-271212	20 980 ± 100 BP
<b>Concavity number 15</b>	Beta-271211	23 800 ± 140 BP
<b>Concavity number 22</b>	Beta-277745	35 320 ± 360 BP



Photographic reconstruction of the Pleistocene route through the Cueva de Nerja (Málaga, Spain). The fixed light sources helped people to make their way through this very steep area and may have been used together with systems of moveable lighting (photo: A: Sanchidrián).



## TOWARD A DECORATIVE MODEL FOR THE CAVE OF PEÑA DE CANDAMO (ASTURIAS, NORTHERN SPAIN) IN THE LIGHT OF NEW DISCOVERIES

**María Soledad CORCHÓN, Diego GARATE  
Clara HERNANDO, Paula ORTEGA, Olivia RIVERO**

Peña de Candamo, discovered and explored at the very beginning of the 20<sup>th</sup> century, was recently designated as a UNESCO World Heritage Site. The latest research, since 2007, has revealed new decorated zones, as well as unknown paintings and engravings in the known zones. The other objectives of the interdisciplinary research are: an archaeological study of the floors, an analysis of the pigments (already begun by Raman spectroscopy), a 3D reconstruction of the entire cavity (achieved in 2009), and a study of the environmental and conservational parameters.

The new graphics include paired lines, vertical bars, spots and dots, all painted in red inside folds formed by stalagmitic flows and columns, as well as on the ceilings of small galleries and in narrow passages difficult to access. In parallel, in larger galleries – Galería de Entrada, Sala Baja de los Signos and Salón de los Grabados – we find the same motifs at the junctions of various small openings, in the entrances and near the large panels. For example, there are the accumulations of spots and red lines associated with speleothems in the Sala Baja de los Signos, around the panel of triangular and quadrangular signs, composed of painted linear red lines; we also find spots and paired lines in the access ramp to the gallery. In the Gran Salón, series of large red disks were painted on vast calcitic flows to the left of the access to the Camarín. On some of them, there are fingerprints, showing that the paint was applied by hand directly onto the stalagmitic column.

New figurative graphics were also discovered in unexplored zones. This is the case for the headless figure of El Hornito, a platform measuring barely 4 × 4 m and 50 cm high, overlooking a vertical gallery. This possible equid (33 × 13 cm) is engraved on the floor with a fine multiple line. On the right, it is partly superimposed with around six pecked marks. In other cases, zoomorphs, present on the periphery of the main panels, were until now not seen. For instance, on the right site of the Gran Salón, next to new, previously unknown, lines of dots, there is a possible outline of a red aurochs. Another example is found in the famous panel of the El Talud gallery, where new paintings have been identified, representing the horns of an aurochs or the antlers of a red deer, in a yellowish sienna color, and engravings (an aurochs and a red deer drawn with multiple thin grooves).

Finally, toward the end of the cave, in the Galería de Las Baticias, archaeological activities were revealed (ochre fragments, faunal remains and flaked quartzites) near red spots and blurred lines, and the hindquarters of a deeply engraved herbivore partially covered with calcite.



Red paired lines in the access to the Sala Baja de los Signos.

Our new vision of the parietal ensemble is in accordance with what we observe in other caves in the western Cantabria region. First of all, in the panels with numerous superimposed graphic horizons (Muro de los Grabados in the Gran Salón), some representations are comparable to the oldest known ones. The animals and red signs of this panel, similar to those recently found, correspond to the first phases of execution. Therefore, the traditional hypothesis of a gradual “conquest” of deep underground spaces loses its credibility and is replaced by a different model. The new data indicate that the cavities of the Cantabrian Cornice were explored and decorated in their main sectors, independently of the deeper zones.

The beginning of graphic activity in a number of caves goes back to at least the Gravettian, with a characteristic iconography composed mainly of specific red, and rarely black, motifs and signs. Caves like La Peña de Candamo, Llonín, Tito Bustillo, La Lloseta, El Castillo, La Pasiega and La Garma, among others, have an early phase of painting with characteristic ideomorphs (rows and clouds of dots, bars, paired lines, tracery signs, spots). Next to these, there are a few anthropomorphic figures (outlines, negative and positive hands, vulvae, ...) and zoomorphs (mainly profiles of bovids and equids). These representations underlie the rest of the large panels, which have numerous superimpositions and concentrations of images. In other zones in other caves, we find this same theme in an isolated manner, systematically associated with the support and with speleothem formations. Finally, in a few cases the available <sup>14</sup>C (AMS) dates seem to corroborate this interpretation, as at El Calero II, where the lower extremity of a black zoomorph, dated to approximately 25 200 BP, is associated with signs present on the speleothems (tracery lines, paired lines and rows of dots), which are analogous to those known at Tito Bustillo, La Lloseta and Cudón.



## REVIEW OF SEVEN YEARS OF RESEARCH IN THE DECORATED CAVE OF EL CASTILLO (CANTABRIA, SPAIN)

**Marc GROENEN, Marie-Christine GROENEN**  
**Jose Maria CEBALLOS del MORAL, Joaquín GONZÁLEZ ECHEGARAY**

With its impressive stratigraphic sequence, the hundreds of motifs that decorate its walls and the dozens of portable art works discovered there the cave of El Castillo is a major Upper Paleolithic site. Other than the first study realized by H. Alcalde del Río, H. Breuil and L. Sierra in 1912, and a few occasional works, there is no published work on this important parietal art site. It was thus urgent to conduct a new exhaustive study using the most modern research methods in this domain. Our study began in 2003 and consisted of two sessions per year. The cave was classified as a national heritage site in Spain and has been designated as a World Heritage Site by UNESCO since July 2008.

As of today, we have inventoried 2 497 painted, drawn, engraved or sculpted motifs, figurative and non-figurative, including 2 039 paintings and drawings and 458 engravings and sculptures. Among these, we have counted 1 553 signs, 450 animal figures, 226 colored areas, 85 stenciled hands, 138 torch marks, 138 color speckles, 22 humans (including 16 Protohistoric ones), 74 color smears, 2 composite animals and one composite human. Most of the figures discovered and recorded by researchers in the caves of the Cantabrian region have been corrected or reinterpreted. It is especially important that a large number of newly discovered motifs have enriched the corpus. In our current state of research, it appears that all of the space in the cave was decorated, down to even the most difficult to reach corners. In addition, numerous archaeological remains, until now unknown, are scattered throughout the cave despite the numerous modifications it has undergone since its discovery. These include the footprints of a child, a large number of objects, such as blades, teeth, fragments of concretions, and diverse stones found on the ground or in the fissures of the wall, as well as marks left by actions on the walls (clay removal, blows, breaks, ...).

The new motifs are numerous; repeated observations and the use of digital techniques obviously had a hand in these results. We would like to insist on the discoveries that have contributed elements to the interpretation of the parietal ensemble. The study of the paintings shows in particular that many representations were partially or totally reactivated, using the same colorant or a different color. The most striking example is the large painted horse on the Polychrome Panel. We were able to show that this was the second state of a purple horse punctured by a set of projectile weapons, and then repainted in red. Something curious is that there must have been several stages, since some of the purple projectiles were erased and are now visible only as “shadows”.

Concerning the engravings, it is important to note the abundance of figures that fit into each other. These nested figures often associate animals of the same species, such as hinds, as well as different species, such as horse and aurochs. The head is most often concerned, though there are a few whole nested animals in the cave as well. The analysis by macrophotography and the high definition 3D scanning of engraved motifs confirmed that multiple techniques were employed. Though incision was the most frequent, we also observed deep engraving close to carving (herbivore head at the entrance of the Disk Gallery), as well as the use of a “rubbing” technique (cervids Gallery A and on the Ceiling of Hands).



Engraved horse on the floor in the ground in the Depths. A bifurcated projectile was engraved at the level of the back. A burned twig (above, to the left) was left in place.

In Gallery A, the discovery of sculpted animal representations on a wall covered with a layer of calcite sediments is yet another original element in the site. These poorly preserved “mud sculptures” represent the hindquarters of herbivores with certain anatomical details emphasized by incision. Finally, we must report the discovery of two horses and deeply engraved lines on the clay floor in the last part of the cave, the “Depths”. These representations remind us that, as at Niaux, for example, not only the walls were decorated: like some of the ceilings, the ground was undoubtedly decorated by some groups. One of the horses in the Depths, other than being headless, has the particularity of having been pierced with blows by a pick.



## PALAEOLITHIC FINE AND STRIATED LINE TECHNIQUES AT THE ORIGINS OF THE LEVANTINE STYLE OF THE IBERIAN PENINSULA

Evidence for Further Thought

Ramon VIÑAS, Albert RUBIO, Juan F. RUIZ

The discovery of Levantine art in the early 20<sup>th</sup> century caused much debate over its chronological and cultural attributions. This century-old debate still lacks a satisfactory conclusion, despite becoming increasingly nuanced, and researchers remain divided between those who see an earlier Palaeolithic origin and those who see a Neolithic or subsequent horizon. Still others argue for its emergence in the intervening Epipaleolithic / Mesolithic periods and its continuation into later stages.

Unfortunately, no direct dates or comparable portable art are available for Levantine art with the exception of several Palaeolithic plaquettes engraved with animal figures that bear certain similarities. The recent discovery of small cervids and human figures engraved with fine and striated lines from rock shelters around the Mediterranean Basin of the Iberian Peninsula (Teruel, Castellón and Tarragona) is now forcing us to consider the continuation of these Palaeolithic techniques and the implications of this on the origins of the so-called Levantine style. These new zoomorphic figures include figurative and outlined elements that have been narrowed down to the final stages of the Palaeolithic, and some of them have been associated with the Levantine style.

### Levantine engravings

Since the first publications dedicated to Levantine art, references have been made to finely engraved figures in the rock shelters of Calapatá, Gascons, Albarracín, and Cogul which were not included in peninsular studies. All of these rock shelters contain outlines and engraved anatomical details of cervids and bulls that precede the paintings themselves.

Recent discoveries include engravings from Barranco Hondo (Castellote, Teruel), Abric d'en Melià (Serra d'en Galceran, Castellón), Abric del Cingle del Barranc de l'Espigolar (Serratella, Castellón), and Abric de Llaberia P-IV (Capçanes, Tarragona) which although not painted, were nonetheless created using the same fine-line techniques, suggesting a stage anterior to the development of more "classic" Levantine art styles.

### Thoughts and initial considerations

Among the animals (engraved with fine lines and filled with parallel, striated, or scraped incisions) there is a formal diversity that includes clear Palaeolithic forms and those which could just as easily be Palaeolithic as Levantine, and which can be dated to somewhere between the end of



Engraving of a deer made with fine and striated lines from the Llaberia P-IV shelter (Tarragona).

the Palaeolithic and the uncertain inception of Levantine art. Examples include Abric d'en Melià, la Roca dels Moros del Cogul, Barranco Hondo, and Abric de Llaberia P-IV.

As some authors have pointed out, there is no known link between Magdalenian and Levantine art. However, we believe that in the light of these new findings, this assumption needs to be reassessed, as summarized below:

- A. Fine engraving and striated line techniques of Palaeolithic age are not exclusive to representations located in deep caves or to portable art; they also appear among the naturalistic figurative representations engraved in open-air sites in the Levantine peninsular area. This technique exists in other peninsular areas such as in the Duero region, which for some researchers is evidence of a progressive evolution which confirms that Palaeolithic art continued until 9000 BP.
- B. Engravings made with fine and striated line techniques can be seen on the plaquettes from San Gregori (Tarragona) which include figures of cervids, a bovine, and what may be an equine. These examples appear to have been made during the final stages of the Palaeolithic or during the Epipaleolithic.
- C. Engravings made with fine and striated line techniques can be seen in the figures from the Levantine area (Bajo Aragón, Roca dels Moros, Barranco Hondo, and Llaberia P-IV). Several figures from Tarragona and Lleida have thin longitudinal parallel incisions within the bodies, as is also the case with the plaquettes from Cova del Parpalló in Foz Côa, Siega Verde and those at the perimeter of the Molí del Salt site. At Molí del Salt, figures of animals, primarily cervids, have been found engraved with fine lines and have been dated to  $10\,990 \pm 50$  BP.
- D. The fine line engravings at the shelters in Aragona and Lleida are also important as they predate Levantine paintings.

All of these findings indicate the continuation of faunal themes and styles using Palaeolithic techniques (fine and striated lines) culminating in a Style V that continued into the post-Palaeolithic. These techniques subsequently extended into Levantine paintings, imitating this infill with bands or variegated lines, and possibly enduring into the Neolithic, demonstrating the continuation of earlier Palaeolithic techniques and concepts into the post-Palaeolithic.

The discovery of engravings created using fine and striated lines not only raises new questions, but allow us to partially review older hypotheses concerning the continuation of Palaeolithic art techniques into early “Levantine art”. At the moment, we cannot rule out the possibility of an early stage of Levantine art focused exclusively on faunal themes, with human figures only introduced at a later stage. In our view, the new engravings from open-air sites in the Levantine area provide new evidence with which to address the techno-cultural links between Late Pleistocene groups and their Holocene successors.



## SYNTHESIS OF NEW PARIETAL AND PORTABLE ART DISCOVERIES IN THE CAVES OF ISTURITZ AND OXOCELHAYA (PYRÉNÉES-ATLANTIQUES): 1996 / 2009

**Aude LABARGE**

Located in the heart of the French Basque Country (Pyrénées-Atlantiques), 12 km from Hasparren, the group of three caves, Isturitz, Oxocelhaya and Erberua, constitutes a heritage site of utmost importance since the caves contain many remains of human activities attesting to an intensive daily life (hunting site and social gathering site), as well as abundant and diverse parietal and portable art production activities, spanning the entire Upper Paleolithic.

The main archaeological discoveries, starting in 1912, were completed by multiple excavations conducted throughout the 20<sup>th</sup> century under the direction of E. Passemard, the Count and Countess of Saint-Périer, G. Laplace, and finally, C. Normand.

With the aim of constituting a White Paper covering the entire hill on which the sites are located, test pits made in 1996 by C. Normand instigated a renewed interest in the archaeological potential of the site. The Archaic Aurignacian layers, the bits of Magdalenian layers, the ancient archaeological debris and finally, the human manifestations on the walls, drew great attention.

On the occasion of new observations of a decorated pillar in the center of Isturitz Cave (figure), the animals represented, first determined by E. Passemard and then corrected by G. Laplace, were once again discussed. The representation of a bear in bas-relief is in fact a Glutton, as is shown by its fluffy tail and other anatomical characteristics (gait, body posture). This work, realized by anamorphosis in a convexity opposite the panel of cervids, seems to relate an animal hunting scene at the moment of anticipation and full attention before the violent act. In front of the pillar, one of the largest fireplaces of the cave was uncovered. It is surrounded by stones used as seats and large serial art production workshops. Situated in the heart of the economic life, this artistic composition reveals the importance of the oral link between parietal art and daily, economic and artistic life, and suggests interrogations on the role of art in the society of Middle Magdalenian peoples, as well as the filiation and transmission between successive cultures.

The central pillar in the Great Hall of Isturitz, until now the only parietal manifestation in Isturitz Cave, has been gradually enriched by a multitude of artifacts in and on the walls. Bone fragments (most less than 1 cm<sup>3</sup>), four flint tools and flakes, a hematite crayon and one longitudinally cut bovid tooth were inserted into fissures. Today, these new discoveries raise questions concerning the dating of these various manifestations on the wall. Are they contemporary with each other? What is their relationship to the economic, social and daily life of the site?



Isturitz Cave, Great Hall, Central Pillar:  
panel of cervids and glutton (photo: A. Labarge).

During these surveys, programmed excavations begun in 1999 led to the discovery of four portable art objects. Dated to the Archaic Aurignacian (35 550-32 400), an ophite pebble displays a multitude of lines with a hierarchy in their thickness, forming the hindquarters of a probable cervid and a structural line for the background. This pebble was reused as a hammerstone, and thus broken. The second object is a diaphysis with deeply incised crosses in a row. These objects are among the oldest known artistic manifestations in the cave. Two discoveries in the Middle Magdalenian complete the already known assemblage of portable art objects from Isturitz. On a fragment of a *baton percé* in cervid antler, one bison head is placed horizontally and another vertically, using a graphic trick. They are somewhat realistic, showing stereotypical artistic conventions and skill. The plastic quality of the head of a grayish-yellow lion is seen essentially in its use of volume: it was intentionally cut at the neck, like the already known series of statuettes of horses and bison in sandstone.

A study of three graphic ensembles in Oxocelhaya Cave (the panel with a bridled horse, the bison on the ceiling and the horse on clay) revealed different plastic methods, such as the balance of elements or the association of full and empty spaces and their complementarity. In addition, the repetitive stylistic conventions from one gallery to the next suggest that certain works are contemporary with each other, while others are temporally and stylistically isolated.

Since 1996, a great quantity of new archaeological information has completed and modified the accepted and published artistic knowledge of Isturitz and Oxocelhaya Caves. This new knowledge raises fundamental questions: what was the role of parietal and portable art in Upper Paleolithic art in Upper Paleolithic societies, and what was the relationship between portable and parietal art?



## THE DECORATED CAVE OF ETXEBERRI (CAMOU-CIHIGUE, PYRÉNÉES-ATLANTIQUES): an Audacious Art

Diego GARATE, Raphaëlle BOURRILLON

The cave of Etxeberri or Kanpainaga Lezea (Camou-Cihigue commune) is located at 440 m altitude on the western slope of an urgonian limestone cirque of the eastern flank of the Arbailles massif. This cavity is composed of a long, north-south oriented joint, approximately 200 m long, which is difficult to access (three shafts, one small tunnel, an 8 m relief and an 18 m sink-hole).

Etxeberriko Karbia, already known before the discovery of its decorated parts, has been explored by speleologists since the beginning of the 20<sup>th</sup> century. It was during a visit lead by P. Boucher, in the company of G. Laplace, on May 1, 1950, that these latter discovered a small red horse on their way back out of the cave. In 1951, G. Laplace undertook a study of the parietal art and published the results, along with those of the cave of Sasiziloaga. Thirty years later, É. de Valicourt and M. Lauga identified new figures – an engraved horse and a painted horse. The last publication of the parietal art of Etxeberri, by P. Paillet, is based on bibliographic references.

The first decorated hall – The Hall of Paintings – accessible through a narrow tunnel 150 m from the current entrance contains more than half of the recorded graphic entities. The two decorated walls display horses, a bison and an ibex, all very large and composed of a simple



Tracing of a brown bison in the Hall of Paintings,  
Etxeberri – Camou-Cihigue, Pyrénées-Atlantiques (tracing: D. Garate).

outline. On the right hand wall, another manifestation consists of smaller, duotone (red and black) flat tint representations. At the end of the Hall of Paintings, a red dot located high up seems to indicate an abrupt change in altitude giving access to a ledge on which red smears and a well preserved black horse are visible. This ledge is about 4 m high in the second decorated hall of the cavity – the Hall of the Sink-Hole. Starting in this hall, and following the 18 m deep sink-hole, we reach a narrow promontory with a horse engraved on the clay floor, preserved due to its location close to the wall. The last chamber of the cavity – The Decorated Fissure – is currently accessible from the sink-hole. The first visitors reached the gallery through a relatively wide chimney, located 6 m above the fissure, and thus significantly damaged the figures. In this corridor, with a maximum width of 50 cm, there is a row of black painted and engraved horses, a black bison framed in a concavity, the remains of figures, and a red sign. Sometime between the work of G. Laplace (1950's) and today, one representation of a horse completely disappeared and others have been nearly erased.

The themes in Etxeberri Cave correspond well with those in the Magdalenian context of the Cantabria / Pyrenees band. The bison-horse pair is well represented and accompanied by a classic secondary species, ibex. We also observe a particular preference for horses over bison in the cavity. This is characteristic of the later Magdalenian, as is shown by the caves of Labastide, Montespan and, even more clearly, those of Ekain, Oxocelhaya and Erberua.

Concerning the techniques used at Etxeberri, we observe the presence of a horse engraved in clay, a typical technique in the Pyrenees region (Erberua, Oxocelhaya, Labastide, Montespan, Niaux, ...) but much less frequent in Cantabria.

In addition to the two isolated horses (ledge and promontory) and a few red lines, the figures are organized in a succession of small panels adapted to the available space, in two main halls. In both the Hall of Paintings and the Decorated Fissure, an identical scheme is repeated and consists of a frieze of aligned horses. In the first hall, there is also the bison-horse-ibex triad.

Chronologically, A. Leroi-Gourhan proposed several arguments to justify the attribution of Etxeberri to the Middle Magdalenian, including that of its sanctuary-like nature, being deep and difficult to access. It indeed appears that in decorated caves with this characteristic, some of the representations are attributable to the early style IV (Arcy-sur-Cure, Les Combarelles, La Cullalvera, Labastide, Montespan, La Mouthe, Niaux, Rouffignac, Santimamiñe, Les Trois-Frères and Le Tuc d'Audoubert). A second argument is the presence of the bison-horse + ibex association in caves attributed to this chronological period: Las Monedas, La Pasiega, Les Combarelles, Angles-sur-l'Anglin, Le Cap Blanc, Niaux, Le Portel (Camarin), Les Trois-Frères, Les Églises. Other stylistic comparisons and <sup>14</sup>C dates in other caves (Niaux, Le Portel, Monedas, ...) support this proposition but also correspond to the Upper Magdalenian. Awaiting <sup>14</sup>C dates at Etxeberri, it thus appears that it is attributable to the Middle to Upper Magdalenian.



## GARGAS CAVE (HAUTES-PYRÉNÉES, FRANCE):

### the Archaeological Context and the Interpretations of the Parietal Art

**Pascal FOUCHER, Cristina SAN JUAN-FOUCHER  
Carole VERCOUTÈRE, Catherine FERRIER**

A few years after the discovery of hand stencils at Gargas, É. Cartailhac and H. Breuil carried out two excavation sessions (1911 and 1913) in Hall I of the Lower Gallery. Their objective was to obtain archaeological elements that would enable them to date the parietal art in the cave. Nearly a century later, a new interdisciplinary research project has been undertaken with a global approach to the Paleolithic human occupations. One of the main topics addressed is the relationship between the habitat space, where daily activities took place, and the symbolic space, where parietal art was made. The first results of integrated studies of the archaeological artifacts recovered during the new and ancient excavations contribute to our understanding of the context in which the Gravettian parietal art was realized.



Gargas Cave (Hautes-Pyrénées, France), Hand Sanctuary:  
panel of the discovery (photo: J.-F. Peiré – DRAC Midi-Pyrénées).

According to the available radiocarbon dates, the Noailles burin facies of the Gravettian culture was present in the Pyrenees for at least 6 000 years. This observation is based on the typological analysis of lithic industries from reference sites (Isturitz, Gargas, La Tuto de Camalhot and Enlène). This apparent techno-cultural homogeneity can mask diachronic and / or territorial variability, however, which must be detected through the integration of different approaches. The interdisciplinary study of ancient and new assemblages contributes new information on classic sites with stratigraphic sequences that have disappeared forever, and helps us to orient new research perspectives, in particular on the fundamental questions of the status of sites. What are the chronological and / or functional relationships between decorated caves with hand stencils and those with female statuettes, though these two symbolic manifestations have never been found at the same site? Why did one of these two manifestations (hand stencils) crossed the Pyrenean mountains and not the other? Did the Pyrenees serve as a crossroads where communities with different territorial origins met?

Our work at Gargas, a decorated site with a strong symbolic meaning for Gravettian populations in the Pyrenees – shown by the more than 200 hand stencils and an abundance of engraved parietal and portable art – already contributes some answers. We identified technical sequences for the *in situ* manufacturing of personal ornaments on animal teeth corresponding to the hunted species, as well as those recovered from the skeletons of cave bears in the galleries or in the ancient clay filling of the cavity. Through a detailed description and comparative analysis of the bone / antler industry, we were able to show the existence of technical traditions that appear to be unique to the northern Pyrenees region, as well as others that extend over a larger scale, including the eastern part of the Iberian Cantabrian coast and the entire Aquitaine region of France. Finally, the discovery of new ornaments made from Atlantic and fossil shells, confirms the orientation of intra-regional movements already revealed by a preliminary study of flint provisioning sources.

All of these new elements inform us on the diversity of the activities carried out at the site, which clearly exceed those characteristic of a short duration occupation, while they nonetheless do not attain the intensity and volume of remains known at so-called Magdalenian “aggregation” sites. These data, integrated with those contributed by zooarchaeological analysis, indicate passages at different times of the year, the realization of hunting and butchery activities, and the exploitation of different parts of the carcass and antlers of cervids (Reindeer and Red Deer) to manufacture tools and personal ornaments.

We had already obtained some information on the composition of the Gravettian groups at Gargas through the observation and anthropometric study of the painted handprints. They indicate that human groups consisting of men and women of all ages, from adults to small children, were present at the site. Based on the new data, we can now postulate on other components of their occupation of the cave, in addition to their participation in this collective activity, which was highly meaningful in terms of identity and probably played a significant spiritual role. Even if it appears difficult today to precisely determine the size of the group and to identify other sites occupied at exactly the same time, these new data contribute to a better understanding of the social relations that were formed at the scale of the vast Pyrenean territory through economic and symbolic ties.



## HORSE FIGURES IN THE PARIETAL ART OF GARGAS (AVENTIGNAN, HAUTES-PYRÉNÉES):

### a Homogeneous Group?

**Olivier HUARD**

The Lower Gallery of Gargas, famous for its stenciled hands, is also known for its 145 engravings of animals classically attributed to the Gravettian. Nearly 30% of the figures are equids, and more precisely, horses. The objectives of my study of the latter were to understand modalities of their representation and to determine if this corpus is “coherent” from a graphic and chronological point of view. With this aim in mind, I recorded and analyzed the topographic distribution, techniques of realization, proportions, anatomy and the conventions of representation of these horses.

According to my analysis of these figures, 43 of them are attributable to horse and, in my opinion, none of them correspond to another equid type (*hydruntinus*). They are present in all of the decorated sectors, except in the Crevice zone, and are the dominant species in several sectors. They sometimes play a central role in the composition of a panel, as is true of the large, complete horses on the left wall of the Camarin Chamber (horses 12 and 13). Each one occupies all of the available space within a concavity where numerous other figures are juxtaposed in smaller dimensions.



Horse 7 in the Camarin Chamber. Detailed head: open mouth, eye, nostril, striated mane and beard (photo: O. Huard).

Nearly all of them are realized with the same technique: shallow to medium depth engraving, and little use of the natural reliefs. Engravings with much wider sections are found only on walls with a softer mineral density, due to a change in the tool used, passing from a flint tool to a finger (or stick or bone). The only original technique is seen in the back line of horse number 25; it is drawn with black pigment and recalls the techniques used in a distinct entrance to the cave, in what is called the Upper Gallery of Gargas.

Even if very few complete horses are represented (5 individuals), my analysis of the proportions adopted shows a certain liberty of choice by the artists since some are very exact and naturalistic, while others are more extravagant (body curved in the form of a banana, long, flat heads). These graphic extravagances are also seen in the details represented with, for example, the presence of bifurcated tails (Horse 5 of the Camarin Vestibule and Horse 2 Left in the Camarin Chamber). The heads show the most detail, with a high number of sensory organs (nostrils, eyes, ears and mouths (figure), while the extremities of the limbs and the coat (exception for the mane, which is almost always present) are less frequent.

Concerning the conventions of representation, my analysis of the horses shows great diversity, or even originality, as if the authors sought to distinguish themselves from that which already existed (see details in the full article). Despite this, the recurrence of certain conventions in different sectors of the cavity shows a degree of graphic unity in most of the works (except for Horse 4 in the Vestibule and figure 25). These sometimes strange (looped lines, with parallel and sinuous lines) recurring graphic conventions are associated with diverse perspectives of the limbs, suggesting that the latter were indifferently employed. This idea counters the preceding attempts to make chronological classifications of the Gargas figures, partly based on the choice of perspectives.

This new analysis shows recurring formal particularities indicating that there was only one phase of realization for the great majority of equid representations in Lower Gargas, thus reviving the debate concerning the presence of distinct styles or a succession of phases. While my analysis of the equids represented contributes its share arguments concerning the time interval involved in the realization of the animal figures, it should now be completed by a new study of the figurative art as a whole.



## OBJECTS DEPOSITED IN THE WALL CRACKS OF THE GARGAS CAVES (HAUTES-PYRÉNÉES, FRANCE):

### Analysis and Contextualization

**Magali PEYROUX**

Gargas is famous for its painted hands and figurative parietal art, which is classically attributed to the Gravettian. The caves also contain numerous deposits of objects in the walls (identified in this site in 1991 by J. Clottes, who sampled one in the *Lower Cave* and had it dated to  $26\,860 \pm 460$  BP).

In the context of my Doctoral research on such parietal acts in the decorated caves of the Upper Paleolithic, I conducted a study of these deposits (figure) at the site of Gargas (*Lower Cave* and *Upper Cave*). In each of these caves, my aim was to realize an exhaustive inventory of these deposits, to describe them (without touching or removing them), to study the construction of this parietal act, to propose a chrono-cultural attribution, to evaluate the articulation of this parietal intervention with the other types of human interventions observed in order to study its interrelation with the underground environment, and then to compare the acts observed in the two caves.



Fragmentary faunal remains deposited in the wall,  
Gargas, Lower Cave, Hall 1 (photo: M. Peyroux).

In addition to understanding this act, another objective was to evaluate how studying it in its context could contribute additional information on prehistoric human activities in each cave.

In the framework of my Doctoral research, the information obtained at Gargas will also permit comparisons of the acts observed in this site with those in other Upper Paleolithic decorated caves.

This work has shown, in the *Lower Cave* and *Upper Cave*, a construction of the acts based on shared characteristics that are fundamental and constant: the nearly exclusive selection of fragmentary faunal remains (mostly bone chips); the presence of small sized, mostly non-burned and undetermined elements; the probable presence of elements attributable to medium to large herbivores (including rib, long bone diaphysis and cervid long bone fragments); the presence of objects with a low economic value that are not worked or only slightly worked (in principle, mostly butchery / consumption waste and residues of worked bone materials); the selection of a preferential type of stone support for the deposits (walls densely covered with long, narrow fissures); a correlation between the morphometric attributes of the fissures and those of the objects deposited; no clearly identifiable evidence of modifications to the stone support; the insertion of remains more or less close to the wall surface; no preferential deposition of objects in the fissures; the importance of topographic factors in the location of the deposits; no observable tangible relationships with the parietal graphic context; no intention to produce a visual (and visible) result; no apparent utilitarian or technical reason for the deposition of objects in the wall.

These deposits appear to have been realized with a symbolic intention, the act itself probably having more meaning than the final result on the wall. These precise observations are shared, from the perspective of the fundamental construction of the act, by all of the caves of Gargas and those observed in other European Upper Paleolithic decorated caves. Nevertheless, this act is not homogeneous in the site. Clear differences exist between the two groups, and could indicate chrono-cultural differences in the realization of this act in the site. For instance, the density of the deposits is different: 230 for the *Lower Cave* and “only” 62 for the *Upper Cave*. The topographic distribution differs as well: the act is limited to the entrance halls (linked to the location of human occupations on the ground) in the *Lower Cave*, while it is distributed among remarkable topographic points in the *Upper Cave* (including in the deep zone among the parietal animal figures). Clear, albeit few, typological differences exist: the presence of possible spear points and “deposits” of a red colorant material only in the *Upper Cave*. These differences probably indicate the presence of different traditions of investment in the underground environment and the appropriation of this parietal act. They suggest the presence of several occupation phases in the site during the Upper Paleolithic (Gravettian and / or Magdalenian in the *Upper Cave*?). At Gargas, it appears that this was a particular parietal act consisting of a symbolic production closely linked with the occupation of the underground environment, which survived in European Upper Paleolithic societies regardless of geographic and chronological differences.



## THE CONTRIBUTION OF ENVIRONMENTAL MONITORING TO THE PRESERVATION OF DECORATED PALEOLITHIC CAVES IN THE MIDI-PYRÉNÉES REGION:

the Examples of Gargas (Hautes-Pyrénées)  
and Marsoulas (Haute-Garonne)

**François BOURGES, Éric MAUDUIT, Alain MANGIN  
Dominique d'HULST, Pierre GENTHON, Robert BÉGOUËN**

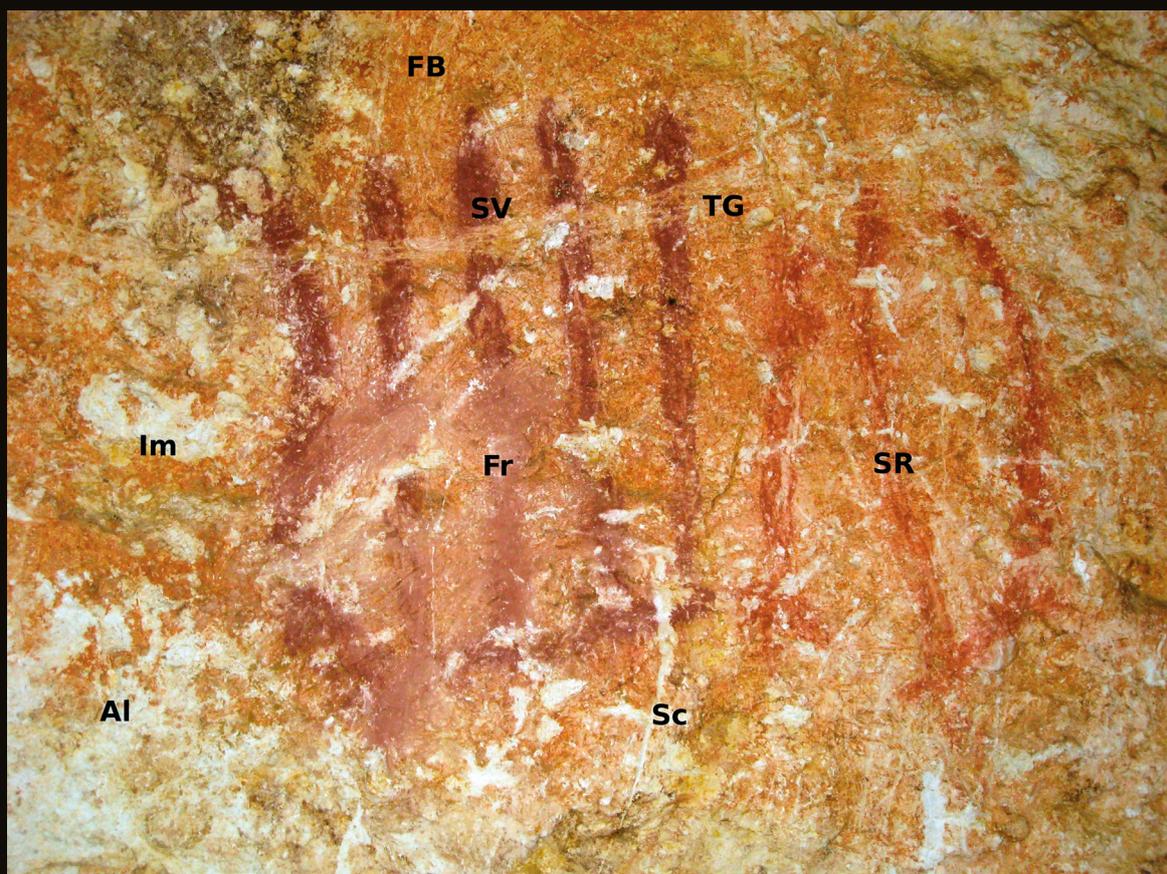
While the ambiance of a cave is clearly necessary to understanding its parietal art, the physical and chemical nature of the underground environment also plays an important role in the conservation of this art. Knowing how to preserve this heritage and how to best present it to the public are thus crucial issues in the context of particularly fragile artistic remains.

We show that through environmental monitoring it is possible to identify the specific balances and sensibilities of these sites based on a detailed description of the natural environment and the manner in which it functions. These operations constitute a quantitative reference base that can aid in both the conservation of parietal art and the management or development of these sites.

The measurements and analyses show that a cave is not a closed system with static features, but on the contrary, a complex environment in which dynamic internal and external exchanges take place. A systemic approach allows us to understand the global functioning of a complex natural system without having to describe the details of its internal phenomena: the functional properties of the environment are thus expressed in terms of an entrance / exit relationship. In this way, the relationships between the fluxes shed light on the conditions of the equilibrium of the system.

In karst and cave environments, the entrances are mainly zones of flux originating from the exterior climate (rain, pressure, temperature), while the exits are composed of the underground parameters (temperature, air or water composition and flow). The functioning of a karst system diminishes the variations of the entrances (climatic effects, anthropogenic influences), and thus regulates the flux of the exits. We suppose that this capacity to regulate the natural environment determines its stability and thus constitutes an essential criterion for the quality of the preservation of decorated caves. It is also possible to describe, at all time scales, the types of functioning of the environment, as well as the states of stability or instability.

Some phenomena (thermal impacts, physical modifications, aerodynamic effects, modifications to infiltration regimens) can alter this regulation and temporarily or definitively eliminate the dynamic balance that ensures the physical integrity of the environment (loss of stability). This destabilization can trigger secondary regulations associated with preservation risks (condensation, drying).



State of the wall of the large painted panel in Marsoulas. The prehistoric parietal decoration consists of a violet sign (SV) and a red sign (SR) on the ochre and black background of a bison (FB), whose outline goes beyond the limits of the photo and engraved lines (TG). The modern degradations consist of removed material (light zones), which are the result of scaling following the alteration of the stone support (Al), as well as impacts (Im) and diverse scarifications (Sc). The pigment was also spread by rubbing, degrading part of the violet sign (Fr).

In the Gargas Cave, which has been monitored since 1994, some modifications to the walls by microorganism pollutions have been observed, as well as physical instabilities leading to drying or condensation. An excessive number of tourist visits and unsuitable modifications (lighting or closings and communications) have been identified as responsible for these destabilizations. A collaborative intervention with the Museum National d'Histoire naturelle (Pr. A. Couté) identified and eliminated the biological pollutions. A complete overhaul of the site, including the elimination of the pollution sources, the identification of energy thresholds and preservation of the confinement level of the site, reestablished a stabilized functioning system and satisfying wall conditions. Continued parietal monitoring during and after this work enables us to quantify its effects over the long term and to correct residual problems.

The Marsoulas Cave was subjected to numerous excavations that disturbed the site. Recent research (Fritz *et al.*) has revealed a rich archaeological potential. Meanwhile, the parietal art and its stone support has suffered degradations whose rapid evolution motivated a rescue operation. Environmental monitoring shows that the part of the cave nearest the entrance was destabilized by its closure to the exterior, which acts as a hot point in summer and causes seasonal changes in condensation and drying on the walls. The internal parts of the cave are stable, on the other hand. The first sector of the cave acts as an active interface where most of the thermal and gaseous exchanges occur. We propose to transfer the active interface of the cave to the exterior by attaching a constructed airlock structure to the current entrance, which will create a thermal and atmospheric buffer between the underground environment and the exterior. The expected result is to protect the decorated parts from the alteration processes and to thus extend the regulation identified in the deep part of the cave to the rest of the site. This buffering structure, located completely outside of the decorated cave, will thus allow us to avoid any interventions inside. As it will be installed on part of the former location of the slope that closed the cave, it will have no effect on the natural environment.

In principle, a systemic approach enables us to make observations without formulating hypotheses on the nature and functioning of the environmental elements: in this way, it is possible to address the preservation of sites in a neutral and global manner. The procedure of intervention is largely self-limiting: the modifications or constructions realized with the aim of preserving the site are undertaken with a strict respect for the dynamic balance of caves. A permanent dialog must be established between archaeologists and underground environment specialists to adapt the research questions to the specificity of each site.



## THE APPLICATION OF MATHEMATICAL MODELS TO THE AUTHOR ATTRIBUTION OF THE TWO “TARPAN” HORSES AT NIAUX

**Juan María APELLANIZ, Imanol AMAYRA**

The aim of this study is to show the state of research on the utility of mathematical models for the analysis of the form and lines of two so-called “Tarpan” horses at Niaux (author identification).

The method consists of creating a model that enables us to analyze Paleolithic and experimental representations of horses by segmenting them, performing statistical analyses of them, and conducting a macroscopic analysis of the Paleolithic lines.

The Paleolithic sample was composed of 35 engraved horse figures and 35 drawn ones, without including the heads, hands and hooves (not always present), from sites in Cantabria, the Pyrenees and the Perigord region.

The experimental sample was composed of five groups:

- a. 35 copies of the “Chinese” horse from Lascaux by drawing and / or engraving specialists;
- b. 31 copies of the same horse drawn by unspecialized fine arts students;
- c. 30 figures based on 70 Paleolithic figures, drawn by psychology students (4 copies each);
- d. 164 figures of the same horse drawn by psychology students (4 copies each).

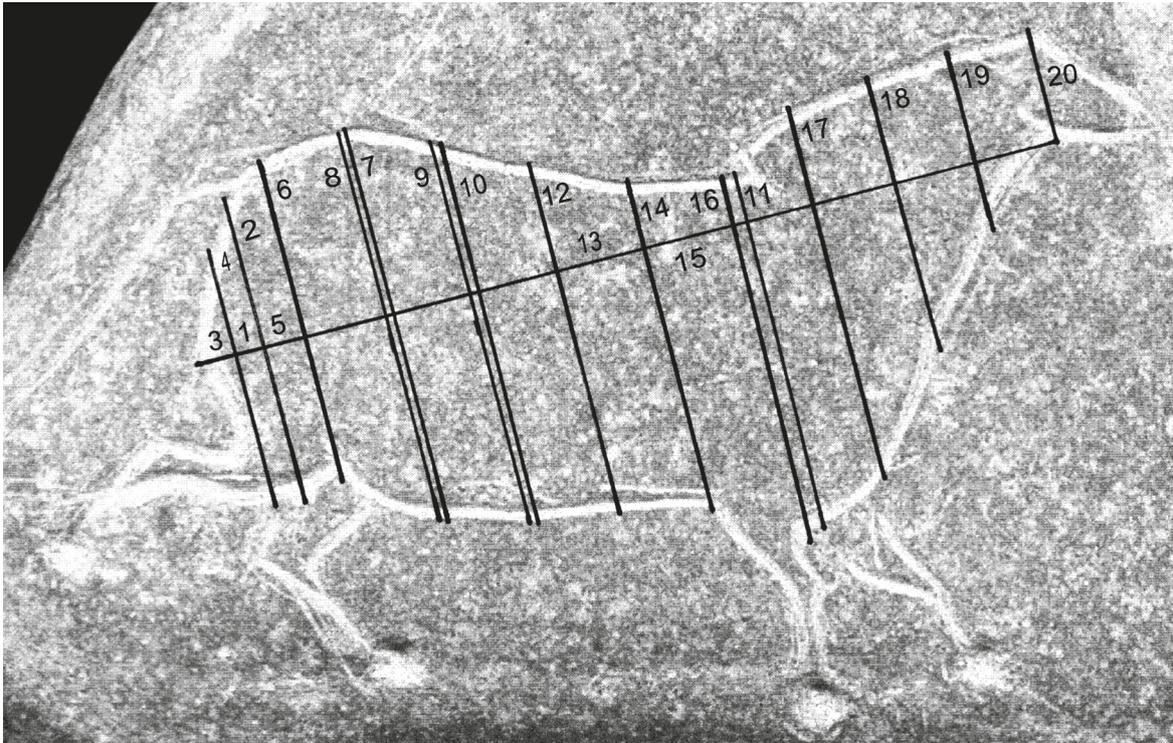
All efforts were made to reproduce the different conditions of realization of the Paleolithic images, to wit:

- a. type of material (bone, flint, charcoal);
- b. type of production (copy or invention);
- c. degree of competence (experts, psychology students with no experience, fine arts students with more experience in art);
- d. number of copies per artist (1, series of 4, 6 and 10);
- e. number of models used for the copy / invention (copies for one model, invention 70 models).

To analyze the form and outline, the figures were segmented by a model with 20 variables: 5 in plan view and fifteen in width, orthogonal to a longitudinal axis (figure). The 20 variables originate from anatomical folds, at the points of maximum and minimum curvature, and at the points where the neck and torso are divisible into four equal parts. The validity of the method was verified by a factor analysis of the major components (MCP), while the predictive validity of the attribution was verified by Escalade Multidimensionnelle (EMM).

In the joint sample of experimental and Paleolithic figures, the MCP identified 5 segments, implying a variance of 77.47%:

- a. neck and edge of the chest;
- b. chest;
- c. internal face of the hindquarters;
- d. external face of the forequarters;
- e. length until the beginning of the neck.



The model of twenty variables  
(Apellániz, Amayra 2008).

This analysis indicates that the Paleolithic figures correspond to an analytical model, which is sequential through the use of several criteria, while the experimental drawings correspond to a more abstract model, the form resulting from the proportions of the five segments of the figure.

Author attribution would be based on the proportion between the variables of at least one of the segments and the correlation with those of other segments.

According to these statistical results, these proportions, which determine the resemblances and differences in form, may or may not be identified through macroscopic observation. In the case of the “Tarpan” horses, the resemblance, which exists between all but one of the segments, is also observed macroscopically.

To study the lines, two samples were selected: one composed of 51 engraved figures by 6 experts (8 each) and the other of 40 figures drawn by the psychology students (4 each).

In all cases, we analyzed 15 points corresponding to all parts of the outline (maximum and minimum curvature lines). For each one, we analyzed 13 simple variables and 8 composed ones, the latter resulting from the calculation of the zone and perimeter of the groove.

The variables were measured with the aid of digital models and virtual sections with a 3D scanner (Handyscan Revscan from Creaform). That of the drawing was measured with the Linux Typography Ruler.

The statistical analyses of the engravings show an adequate validity, explained by four factors. The EMD-m enabled us to accurately attribute 78% of the figures to their authors.

The analysis of the groove width being insignificant, we performed a macroscopic analysis of the lines of the “Tarpans”.

The lines of the two “Tarpans” are very similar in terms of the choices and movements of the hand. The main similarities are:

- a. the same parts are unfinished;
- b. many parts are shortened by repetition, crossed lines;
- c. the outline is drawn with short lines that are straight, oblique and parallel, with a less regular length, slightly turned toward the front, partially crossed and always very full of pigment;
- d. medium width lines are made from the other outlines with lines ordered in series as in the short parallel lines;
- e. fewer crossed lines among the shortest ones;
- f. tracing the interior model with longer lines that are oblique, straight and slightly curved at the extremities, and very full of pigment.

Through the application of statistical models to the analysis of forms and macroscopic observations of lines, we can deduct the great resemblance of these two figures, and thus the high probability that the “Tarpans” were made by the same author.



## THE COLLECTIVE RESEARCH PROJECT "CUSSAC CAVE" (DORDOGNE, FRANCE):

### Study of a Decorated Cavern with Gravettian Human Remains

**Jacques JAUBERT, Norbert AUJOULAT†, Patrice COURTAUD, Marie-France DEGUILLOUX, Marc DELLUC, Alain DENIS, Henri DUDAY, Bruno DUTAILLY, Catherine FERRIER, Valérie FERUGLIO, Nathalie FOURMENT, Jean-Michel GENESTE, Dominique GENTY, Nejma GOUTAS, Dominique HENRY-GAMBIER, Bertrand KERVAZO, Laurent KLARIC, Roland LASTENNET, François LÉVÊQUE, Philippe MALAURENT, Jean-Baptiste MALLYE, Pascal MORA, Marie-Hélène PEMONGE, Nicolas PEYRAUBE, Magali PEYROUX, Hugues PLISSON, Jean-Christophe PORTAIS, Hélène VALLADAS, Robert VERGNIEUX, Sébastien VILLOTTE**

Following the discovery of Cussac Cave (Le Buisson-de-Cadouin, Dordogne) in 2000 and its expertise by a first group of researchers (N. Aujoulat and collaborators), the services of the Ministry of Culture adopted a rigorous heritage policy to protect the cave, ensure its security and to acquire the property on which it is located in order to create an archaeological reserve that would be the property of the State. Environmental studies of the entire massif (climatic, hydrogeological, microbiological, CO<sub>2</sub>, ...) and the equipment of the main sectors of decorated galleries then followed. This phase, requiring nearly ten years to complete, was an indispensable prerequisite to the scientific archaeological research program.

In 2008, a group of researchers was constituted to develop a collective research project in order to program the multi- and inter-disciplinary study of the cave. Let us recall a few of the factors that make this cave exceptional in many ways:

- the first is the good fortune of both the heritage services and the scientific community to be able to work with the main discoverer, M. Delluc, a passionate and rigorous speleologist who is attentive and altruistic, and who offered us an ideal situation. He is now associated with the research team;
- the known length of the gallery is more than 1.6 km. Currently, only a sub-horizontal path, close to the first path of the discoverers, has been walked upon; the discoverers did not attempt to explore the parts of the galleries adjacent to the untouched ground. This is one of the great advantages of Cussac;
- the existence of a complex external (resurgence, travertine) and internal environment with an aquifer, clay deposits, calcitic floors, and diverse speleothems that will be studied by a team of geoscience specialists from the universities of Bordeaux 1, Bordeaux 3 and Paris Sud. In addition, inside the cave there are impressive remains of its occupation by cave bears (dozens of hibernation nests and millions of claw marks in the clay and on the walls), all anterior to its occupation by humans;



Cussac Cave (Dordogne), Downstream sector, panel of the discovery (close-up): engravings of a bison and a mammoth. Graphic trick where the stomach of the bison is melded with the tusk of the mammoth (photo: V. Feruglio).

- the parietal art, which is mostly engraved and sometimes monumental (Great Panel), places Cussac among the major sanctuaries of European Pleistocene art. In this art, rare associations, a style of representing animals and known conventions (deformed bodies, limbs with few details, rarity or absence of fur, anatomical details, “twisted” perspective) assimilate Cussac with sites attributed or dated to the Gravettian period (34 500-25 000 cal BP). A preliminary inventory by one of us (N. Aujoulat 2001-04) permitted the identification of 150 graphic entities. The animals (bison, mammoths, horses, cervids, ibex, aurochs and rhinoceros) represent two thirds of the provisional corpus, followed by undetermined lines, most made with fingers, and an equal number of anthropomorphic signs and representations, each of which equals approximately 9%. Among these, there are several female profiles that are isolated or associated with animals – especially mammoths – and the Great Panel recalls a theme present in the iconography of the cave of Pech Merle (Lot), also attributed to the Gravettian. Finally, there are a few representations of geese, a theme that is very rare in Paleolithic art.

Using 3D photography, a test recording was begun in 2009 on the Panel of the Discovery and this method will be applied to the entire site.

In 2009, we began an inventory of the remains left by anthropogenic activities preserved in the sectors of the gallery that are sometimes very far from the decorated panels (Upstream branch). These included deposits of a red colorant material on the wall or the floor, torch smears, charcoal marks made when passing, footprints, and broken stalagmites and stalactites. On the floors, which have not been touched since the last full glacial period, there are a few objects left there by the Gravettians: a worked reindeer antler fragment, a possible lamp and flint blades.

Finally, and this is what has already made Cussac an exceptional site, in the same gallery as the parietal art, there are several bear hibernation nests (Loci 1 and 3) that contain the human remains of at least six individuals, including 2 adolescents. A <sup>14</sup>C date of a bone sample from Locus 1 (25 120 ± 120 BP, Beta-156643) indicates that these remains may be contemporary with the parietal engravings. The state of preservation of the human remains, as well as their location and the supposed presence of ochre, support the hypothesis that they were intentionally deposited by the Gravettians. A team of physical anthropologists has been constituted to begin a non-invasive study using appropriate methods (photogrammetric recording), including DNA identification.

At the same time as the first field sessions in the winter of 2009-2010, we sought to further develop the project and add to its scientific team or open it to other disciplines (topography, new generation 3D recording/photogrammetry, magnetic survey of the ground, the application of diverse dating methods, paleogenetic isotopic analyses of the cave bears, ...). There is no doubt that in the coming years Cussac will become a fascinating research laboratory in an exceptionally well preserved site.



## CUSSAC CAVE (LE BUISSON-DE-CADOUIN, DORDOGNE, FRANCE):

### Application of the Principles of Preventative Conservation to the Case of a Recent Discovery

**Nathalie FOURMENT, Dany BARRAUD  
Muriel KAZMIERCZAK, Alain RIEU**

Cussac Cave was discovered on September 30, 2000 by a speleologist, Marc Delluc. On October 8, when he returned to the cave with Hervé Durif and Fabrice Massoulier, they found several engraved panels on the walls and human remains in bear hibernation nests on the ground. The cave is composed of a long gallery with an entrance in the middle delimiting an upstream sector and a downstream sector (figure). After Norbert Aujoulat and the Direction Régionale des Affaires Culturelles d'Aquitaine (DRAC) were informed of the discovery, the most urgent task was to secure the entrance (artificial tunnel and security gate). The procedure for classification as a Historical Monument was immediately initiated (preliminary classification on November 23, 2000, definitive classification on July 3, 2002). The official expertise, work by N. Aujoulat on the parietal art (Gravettian), and the dates obtained from bones collected from the same loci as the human remains ( $25\,120 \pm 120$  BP), all showed the exceptional nature of this site associating large engravings with human remains.

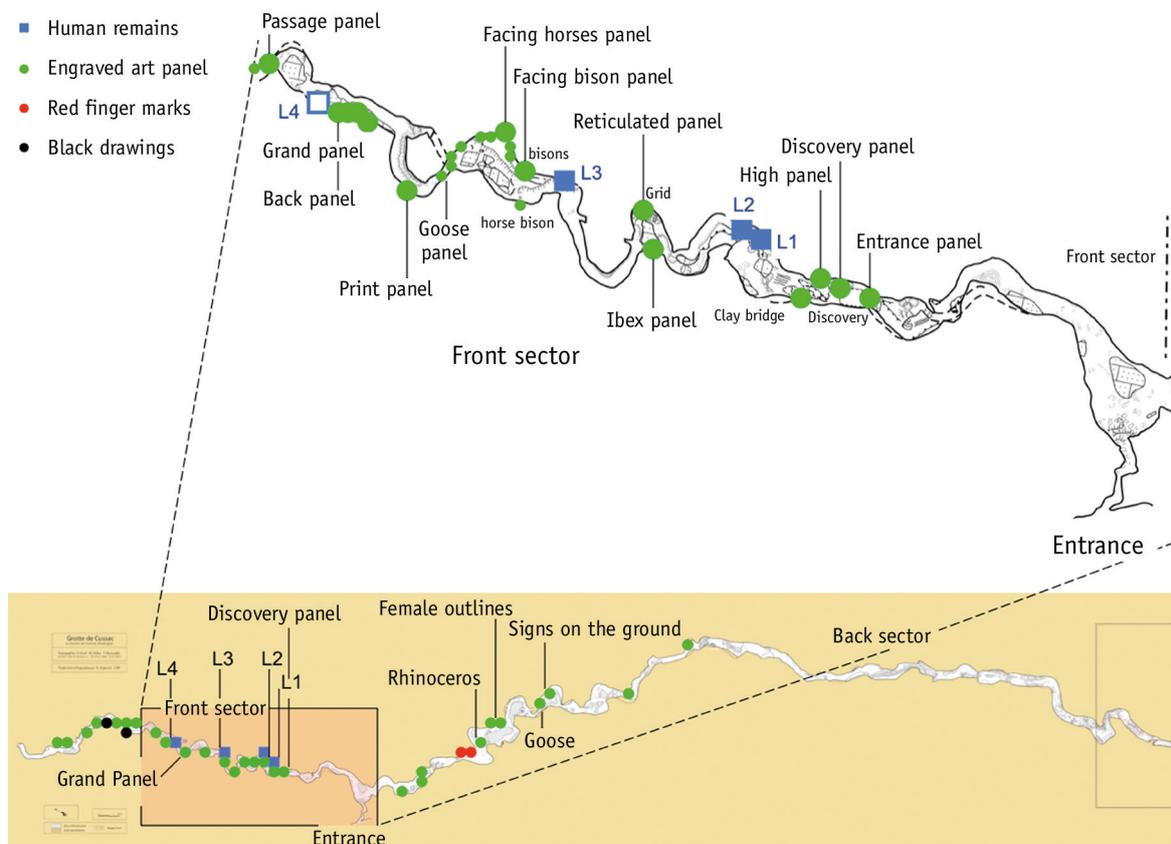
The land title investigation showed that the land was divided among thirteen owners and the municipality: land acquisition and management thus became a high priority. Continual relationships maintained by the DRAC with the owners facilitated sales propositions through friendly negotiations from 2007 to 2010. Aided by discussions with the France-Domaine service, in charge of property evaluations, estimations acceptable to the different parties were obtained. In mid-2011, with the acquisition of two additional properties, the State will own the entire downstream sector in addition to the sectors already acquired in January 2010 in the upstream sector. This land acquisition is the only way to legally realize the modifications to the cave and analyses necessary for the preventative conservation of the site, and to guarantee that the research data will be useable.

For conservation purposes, it is also necessary to regulate the human presence in the cave, which is inaccessible during half of the year anyway due to high CO<sub>2</sub> levels. The decision to close the site to the public was made immediately after its discovery due to the particularly fragile nature of the archeological remains and parietal art, as well as to the difficulty of access and circulation within the cave. Most human incursions are limited to the downstream sector, up to the "Grand Panel" (a dozen incursions upstream), and must respect a strict protocol. Visitors circulate on a path, the same as that of the discoverers, which is protected by stainless steel walkways or delimited by bilateral markings. Access to the cave is strictly limited to personnel of the Ministry of Culture and Communication, designated enterprises or laboratories (to perform installations or analyses), scientific experts (archaeologists, physical anthropologists, curators), the owners, and, of course,

the Research Team since 2009, equaling a total of 162 persons since the discovery. During the visits, all “incidents” are recorded in order to ensure knowledge of all current anthropogenic factors so that they may be distinguished from past anthropogenic phenomena.

Some material modifications must still be made to the cave in the entrance and the upstream sector. Furthermore, we still do not know the impact of human presence in this cavity with often imposing volumes, nor the resting time necessary for the cavity after each of our incursions. It is thus essential to obtain this information through the development of climatic recording methods.

Understanding the environmental conditions that regulate Cussac Cave at the scale of the massif has been a priority since the discovery (recording of climatic conditions since 2003). Knowledge concerning the hydrogeological functioning of the cavity acquired in 2006 in the framework of its classification as a Site has allowed us to monitor the elements that influence the environment in a perimeter defined based on criteria adapted to the object being protected. A research program (funded by DIREN / DREAL, DRAC, FEDER) was developed in the framework of a Doctoral dissertation allocated by the University of Bordeaux 1 and realized in the GHYMAC laboratory (Nicolas Peyraube, defense June 24, 2011). While the main goal was to define the “watershed” of the cavity, the results are much broader; they include a geomorphological approach to a vast sector, and the recording of several annual cycles of measurements of flow rates and analyses of the waters inside the cave and neighboring springs, in association with the climatic records.



General plan of the cave and the locations of the main archaeological remains (topography: Delluc, Durif, Massoulier, Aujoulat).

Three concentric zones, delimited based on a scale of vulnerability, have been established. The most distant one is that retained as the perimeter for the future classified site. The official classification is expected in early 2012 and will be supported by a management plan that is already effective and whose recommendations cover several domains. Some are the object of productive collaborations between the State, the public services of local governments and the individuals concerned (sanitation, agricultural practices, ...). This work has already set an example, which should be communicated and followed, of how an important heritage site can be integrated into its modern territory.

The tenth anniversary of the discovery corresponds to the end of a period marked by the development of a collective research project (Jaubert *et al.*, this volume). The challenge is now to reconcile demanding heritage conservation policies with the progressive acquisition of scientific knowledge.



## CHRONOLOGY OF THE REALIZATION OF A FRIEZE OF MAMMOTHS IN ROUFFIGNAC CAVE (DORDOGNE, FRANCE)

Jannu IGARASHI

In the Small Frieze of mammoths 20-24 in Rouffignac Cave, several engraved lines that cross each other enable the formulation of hypotheses concerning the realization of the lines on the left part of the panel (M20-21). Its chronology depends on the realization of two snake-like forms, either almost simultaneously, or at different times.

According to the first hypothesis, two snake-like forms would have been drawn simultaneously and the body parts of mammoth 21, except for the “ear”, would have been realized at the same time:

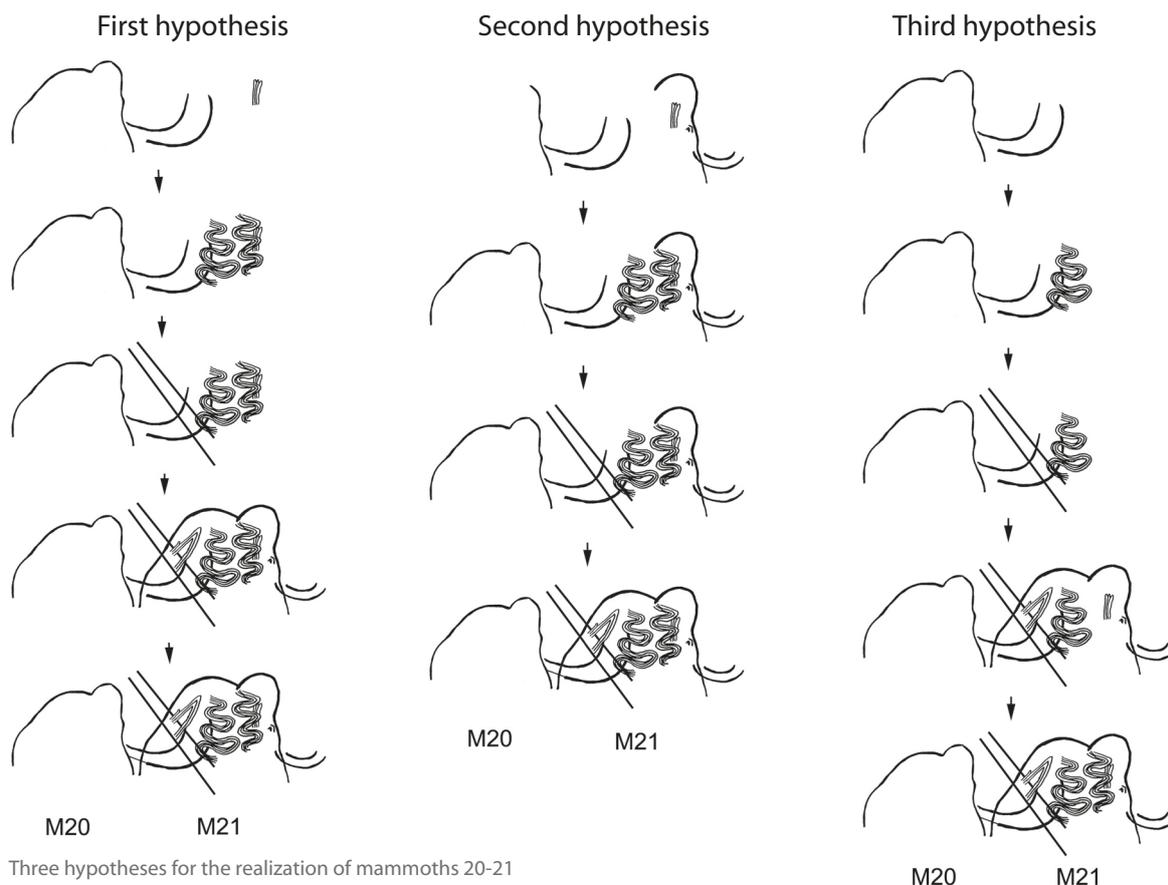
1. mammoth 20 and the “ear” lines of mammoth 21;
2. two snake-like forms;
3. two oblique parallel lines;
4. mammoth 21 (all body parts except the “ear” and one V-shaped sign);
5. engraved retouching of the lower tusk of mammoth 20 (and a V-shaped sign).

In this hypothesis, the “ear” of mammoth 21 would have been made earlier than the rest of the body. After several other interventions, such as the realization of snake-like forms and the two oblique lines, the Paleolithic artist would have used these short lines for the “ear”. In addition, if we consider the nape of mammoth 21, the outline of the nape to the trunk was made before the dorsal line.

According to the second hypothesis, the mammoth’s head and dorsal line would have been realized as follows:

1. mammoth 20 and the head of mammoth 21 (frontal line, “ear”, eye and tusks);
2. two snake-like forms;
3. two oblique parallel lines;
4. dorsal line of mammoth 21 (and a V-shaped sign);
5. engraved retouch of the lower tusk of mammoth 20 (and a V-shaped sign).

The manner in which the mammoths are drawn in the cave would indicate a certain order to realize a figure. Two mammoths (M144 and M145) are represented with only the frontal line and the ear. They support the second hypothesis. The artist began to draw the front and the ear and then left them without continuing. To realize mammoth 21, he would have drawn the front with a single line, engraved the eye with a burin and drawn the “ear” with four fingers, and then later, he would have drawn the dorsal line to complete the figure.



Three hypotheses for the realization of mammoths 20-21 and the signs on the left part of the Small Frieze of Rouffignac Cave.

According to the third hypothesis, two snake-like forms would have been drawn separately:

1. mammoth 20;
2. left snake-like sign;
3. two oblique parallel lines;
4. mammoth 21 (and a V-shaped sign);
5. right snake-like form (and a V-shaped sign);
6. engraved retouch of the lower tusk of mammoth 20 (and a V-shaped sign).

To examine these three hypotheses and the realization of the whole panel in a comparative manner, I analyzed the four types of signs: snake-like, pair of long lines, V-shaped sign and the series of vertical lines. The chronological analysis shows that the snake-like form was made after mammoths 20, 21 and, and was obliterated by mammoth 55.

The pair of long lines, consisting of two oblique parallel lines, rather distant from each other and long, are located on the tusks of mammoth 20 and under the dorsal line of mammoth 21. Similar to this pair of long lines are the vertical lines on mammoths 28 and 34, the oblique lines under mammoth 158, and the long lines on mammoth 19, though these latter are not parallel, but crossed. The posterior execution of these lines relative to the mammoth and their location on the tusks are repeated with mammoths 19 and 20, as is the posterior execution of the pairs of vertical lines and their location on the dorsal line of mammoths 28 and 34. In contrast, the anterior execution of the pairs of oblique lines relative to mammoths 21 and 158, and their location at the croup, are also repetitive.

There are only three V-shaped signs: M21, M51, and M146, always on the back of the mammoths.

The two series of vertical lines as long as the height of the body of the mammoth, of which there are only two, were always drawn after the mammoths.

I studied the mammoths in succession in the cave. On the first ones, the eye is drawn, while on the following ones it is not represented. The chronology of the mammoths in a line is not always the same. A comparison of the panels in the cave and the friezes near the Intersection shows great similarities between the panels M20-24 and M43-47.

The chronological and internal analysis of the figurative representations and the signs shows two distinct behavioral acts consisting of adding signs to an animal figure and obliterating signs with an animal figure. Perhaps the repetition of these acts corresponds to a sort of convention among the Paleolithic artists, or shows that these repetitive acts on the two panels were realized by the same artist.



## TEN YEARS IN ROUFFIGNAC CAVE:

### a Collective Report on Findings from a Decade of Finger Flutings Research

**Leslie Van GELDER**

Finger flutings are found in caves throughout southwestern Europe, southern Australia, and New Guinea and were presumably made over a considerable time span within the Upper Paleolithic. Approximately 500 m<sup>2</sup> of flutings exist in Rouffignac Cave. Given the number, variety, and condition, Rouffignac became a valuable site for embarking on an indepth investigation into the field of finger flutings which now marks its first decade with this paper.

In 2000, Kevin Sharpe began researching in Rouffignac and later teamed with the author of this paper in 2001 to start an annual series of field work to the cave followed by laboratory experimentation to follow up on suppositions on the physical manufacture of the flutings which could then be tested against that which was investigated in the field. The initial work proposed examining the method and manufacture of flutings and bracketing the question of meaning.

Among the most important elements of method developed was the application of Marshack's "internal analysis" method which, though developed primarily to examine portable artefacts, proved equally valuable when applied to fluted lines on cave walls. Internal analysis examines the junctions, cross-sections, depth, width, and shape of lines as they intersect to determine the temporal sequencing of their manufacture, as well as the potential identity of the artist.

Laboratory work in this period helped to yield increasingly more reliable method for determining not only temporal sequencing of fluted lines, but also replicable evidence for determining *in situ* the use of right hand versus left hand (based on the distinctive lines a thumb makes vs the fifth finger); directionality of fluting based on buildup of material and striations within lines; further distinctions between animal made lines, stick lines, and finger fluted lines; and the manner in which the production of certain shapes such as full circles require specific lower body movement which other fluted units do not and might offer explanations as to their prevalence or absence in cave art.

An important methodological outgrowth of the laboratory and field work of this period was the acceptance of the use of the measure of width of three fingers in a fluted unit as a means for beginning to identify and determine individuals. For one or two lines in a unit, there is ambiguity as to the fingers used and which finger's fluted width is being measured. As such, a determination to focus on three fingered widths became central to this work. Further fine tunings were made to this method in terms of developing specific places on a unit to measure, such as measuring at the place where there is the least amount of space and buildup between the fingers, and consistently measuring at a space a few millimeters below the finger profile.

Once the three fingered unit was established as the primary means for establishing unique individuals, two significant areas of deeper research developed as an outgrowth. The first was a series of studies focused on the means to determine the age of fluters and the second focusing on means by which to establish the gender of fluters.

Studies were conducted from 2002-2004 in crosscultural, cross-age groups to determine if there were any significant differences in the three fingered measured width with regard to age of individuals. Result showed that though there were no significant differences in measures of adults and adolescents across cultures, there was a significant difference in the measure of a child's hand as opposed to an adult's. No adult / adolescent hands were recorded at a measure of 30 mm or smaller and very few were recorded below 34 mm. Experiments with young children suggested that children at age 3 were able to have the motor control to do small stream flutings, however by age 5 they were capable of far more significant capacity to create and sustain the drawing of longer and more complex lines. Implications of the scientific determination of children through the examination of flutings is discussed in a further section of this paper with regard to the creation of symbolic images by children and the geographical distribution of fluted lines by particular fluters in Rouffignac.



Finger fluters of Rouffignac: 44 mm female; chambers G, J  
(found in conjunction with the Horse, Lion, and Patriarch Panels).

In the finer tuning of a method to determine individuals through flutings, the authors applied research in sexual dimorphism in hands and finger length to the profiles of hands found within the cave. Though imperfect, it offered for the first time a means for approaching the question of the determination of gender of an individual from a more scientifically derived basis.

Further work into determining more precisely the individuals within the cave has evolved throughout the decade and has moved from not only the three fingered width but to focusing on other aspects of uniqueness including: relative finger heights within the finger profile; heights and locations of flutings; depth and build-up in fluted units; propensity towards finger splay vs tight fluting; choice of location; idiosyncratic fluting shapes.

Recent research has looked to develop method for studying figurative fluted images in the hope of determining more accurately the identities of the artists and also in the hope of learning more with regard to the relationship between fluted panels and figurative images. At present seven unique individuals, three of whom are children, and five are likely female, have been identified.



## PICTORIAL ART AT LE ROC-AUX-SORCIERS (ANGLES-SUR-L'ANGLIN, VIENNE): the "Language" of a Cultural Group?

**Aurélié ABGRALL**

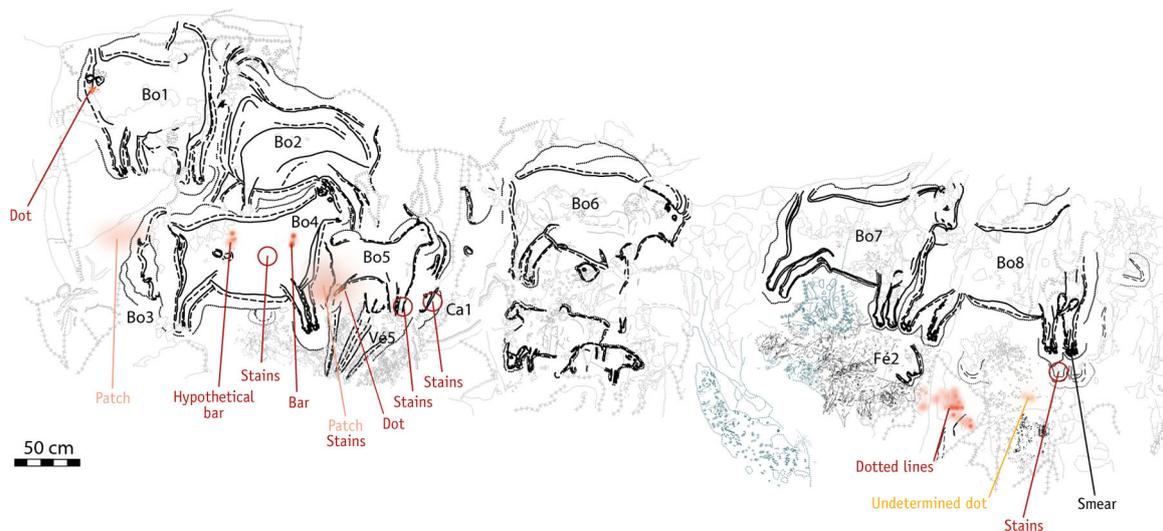
Located in the Vienne Department and in the commune of Angles-sur-l'Anglin, the Le Roc-aux-Sorciers rock shelter is famous for its monumental parietal sculptures attributed to the Middle Magdalenian. It is less known, however, for its pictorial art, whose remains are inconspicuous compared to the sculpted and engraved images that compose the 18 meter long frieze preserved *in situ* in the Abri Bourdois (downstream part of the site) and the numerous blocks that composed the ancient decorated ceiling in the Cave Taillebourg (upstream part).

Though the traces of paintings were observed at the time of the discovery of the parietal art in the site by Saint-Mathurin and Dorothy Garrod, at the end of the 1940's, they were long interpreted as the remains of ancient coloring of the sculptures and engravings. However, their intermittence and location relative to the sculpted and engraved images, as well as their appearance, do not support this hypothesis, which is still accepted by many researchers. A detailed analysis of these remains thus appeared necessary.

I began this work during my Master's research and am now continuing with it in the framework of my Doctoral research. My study of the traces of color, today concentrated in the Abri Bourdois – the analysis of the decorated blocks in the Cave Taillebourg being in progress – is based on a methodology aimed at making them more visible through multiple explorations of the wall using different light sources and varied angles of incidence of the light rays on the stone surface. Each pictorial remain observed was then recorded by digital photography with a white light; these photos were processed with an image processing software program to enhance the outlines of the paint traces. Finally, based on these two types of photos, I proposed a graphic reconstruction for each of the traces and integrated these into a complete analytical recording of the frieze in order to study their distribution on the wall (figure).

It thus appears that, in contrast to the mainly figurative sculptures and engravings, painting was used by the Magdalenian artists of Roc-aux-Sorciers to add abstract touches to the frieze. The use of colors and their different shades obeys strict rules that depend on both the technique and the associated theme.

While the color black is always closely associated with figurative images, emphasizing the particular volumes of the sculpted and engraved subjects, the color red plays a more complex role.



Abri Bourdois (Le Roc-aux-Sorciers): mapping color on the ibex panel  
 (© G. Pinçon, ministère de la Culture ; tracing: G. Pinçon, L. Iakovleva ;  
 vectorisation: O. Fuentes; integration of color: A. Abgrall).

Light red, which is integrated with the parietal animal sculptures, is applied in flat zones peripheral to the sculptures, while dark red is used to draw simple signs (dots and bars) and more complex signs (parallel dotted lines) superimposed on the figures. Black was smeared onto the bottom of the hooves of some male ibexes and bison.

When associated with fine animal engravings, on the other hand, light red is applied in zones superimposed on the engravings, anterior and/or posterior to them. Dark red was used to draw large quadrangular signs composed of solid and dotted lines, while black was used to emphasize a particular volume of the engraved figures; for those identified and recorded, this volume was the ventral line of the bison.

These rules of use are not unique to Le Roc-aux-Sorciers. They seem to exist as well at other sites attributed to the Middle Magdalenian with Lussac-Angles spear points, such as at the cave of La Marche (Lussac-les-Châteaux, Vienne), where a block with an engraved and sculpted hind paw of a feline has red and black paintings that “seem to have had well defined outlines” according to L. Pales and M. Tassin de Saint-Péreuse. Further away, in the Pyrenean cave of Marsoulas (Marsoulas, Haute-Garonne), C. Fritz and G. Tosello observed in 2004 that in the lower part of group of engraved figures, “the Magdalenians used duotone painting in a very particular manner: red was employed to cover the surfaces and black pigment to delimit the volumes (lower-stomach, limbs, fetlock) and to portray an expression (head)”.

Could the use of color in parietal art enable us to identify human groups, or even communities? Through my doctoral research, I hope to contribute some elements of response to this question.



## ROCK SCULPTURE AND SYMBOLIC GEOGRAPHY IN THE MIDDLE MAGDALENIAN

Camille BOURDIER

My PhD research investigates the spatio-temporal structuring of the Middle Magdalenian, from a rock art angle. How is this graphic / symbolic expression involved in the double process of unification and/or regionalization that characterizes this chrono-cultural entity? To ensure the archaeological context of the images, I decided to study decorated and occupied sites, with a focus on sculpted sites. I worked on a corpus of four rock-shelters: Roc-aux-Sorciers (Angles-sur-l'Anglin, Vienne), Chaire-à-Calvin (Mouthiers-sur-Boëme, Charente), Reverdit (Sergeac, Dordogne) and Cap Blanc (Marquay, Dordogne). My work is based on a comparative techno-stylistic analysis, that takes into account several criteria concerning techniques, themes, formal conventions and composition. The selected variables were analysed both in the qualitative and quantitative modes, with the help of simple statistics tools (elementary statistics, factorial analyses).

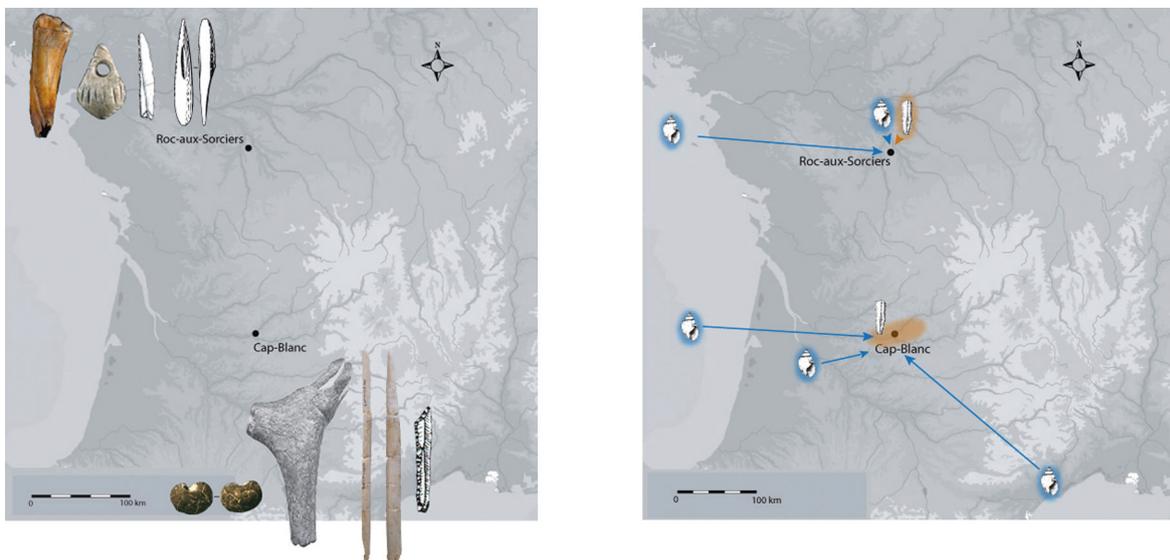
This study shows a rock sculpture tradition in the Middle Magdalenian. The technique is completely mastered, with the highlighting of certain anatomical elements (head, chest, buttock). The designs are monumental, strictly figurative. Abstract patterns, painted and/or engraved, are associated in Roc-aux-Sorciers, Reverdit and Cap Blanc (?). The representation fits two essential formal concepts: a realistic trend (complete, well proportioned and shapely outlines; profusion of internal details) and the assertion of the animal strength (emphasis of the chest; reproduction of the muscular volumes, modelled or stylised). These sculpted sets are structured in friezes, made of one or two figurative sets separated by rings which precise role remains indeterminate. They show renewals aiming at thematic changes with the introduction of a new taxon (horse in Chaire-à-Calvin and Cap Blanc, ibex in Roc-aux-Sorciers) and/or the redistribution of the themes (bison in Cap Blanc).

Inside this tradition, a graphic / symbolic group gathers Roc-aux-Sorciers and Chaire-à-Calvin friezes as well as a part of Reverdit rock art. Their thin reliefs are very detailed, with the precise and refined mention of the main organs, the osseous and the muscular volumes. The animals are very dynamic, drawn in stereotyped attitudes. The ibex has a major place. Inside this group, Chaire-à-Calvin and Roc-aux-Sorciers sculptures have such strong similarities that it arises the question of their(s) author(s). Cap Blanc rock art stands out with its very thick sculptures, showing a more schematic trend: linear and incomplete outlines with few internal details (no mane, no sexual attribute) that go well with the fixity of the animals.

This research modifies and complicates our vision of rock art geography in the Middle Magdalenian, connecting Vienne, Charente and Périgord in a large regional symbolic group. Until then, Vienne decorated sites seemed to form an isolated group, closed to the Southern influences. This study yields evidence of a symbolic community extending as far as Périgord. But for all that, particularities still individualize local identities (the realistic human representation in Vienne, the cupuled designs in Reverdit). Reverdit is at the interface with this group and Cap Blanc

which seems to illustrate another group. The chronological relations of these two groups are still problematic. In a synchronic hypothesis, was Reverdit a meeting place, or was it alternatively occupied by different populations? In a diachronic hypothesis, two graphic / symbolic groups followed one another during the Middle Magdalenian.

This differentiation between Roc-aux-Sorciers and Cap Blanc rock art also occurs in the archaeological material. The symbolic and technical artefacts as well as the origins of the raw materials reveal that Roc-aux-Sorciers and Cap Blanc could have been part of different socio-economic networks, organized on a North-South main road (Vienne-Périgord) for Roc-aux-Sorciers and on an East-West main road (Corrèze-Gironde) for Cap Blanc (figure). Could the two symbolic groups illustrated by the rock friezes correspond to two socio-economic groups? From this hypothesis, the study of the chrono-spatial dynamics of rock art could give the opportunity to tackle more generally the chrono-spatial dynamics of the Middle Magdalenian.



Differentiation between the technical and symbolic artefacts of Roc-aux-Sorciers and Cap Blanc, and their supply territories. (Roc-aux-Sorciers: figure in Mazière 2009; Chehmana, Beyries 2010; Sacchi 1986 – Cap Blanc: photo: C. Bourdier, J.-M. Pétilon; figure in Rousot 1994).



## THE IDENTIFICATION OF THE FIRST PALEOLITHIC ANIMAL SCULPTURE IN THE ILE-DE-FRANCE:

### the Ségognole 3 Bison and its Ramifications

**Duncan CALDWELL**

This article unveils imagery that seems intended to be recognized in phases from such sites as Font-de-Gaume, Laugerie-Basse, Isturitz, Saint-Cirq-du-Bugue, and Guy-Martin, after describing the first Paleolithic sculpture of an animal reported in the Ile-de-France. These include:

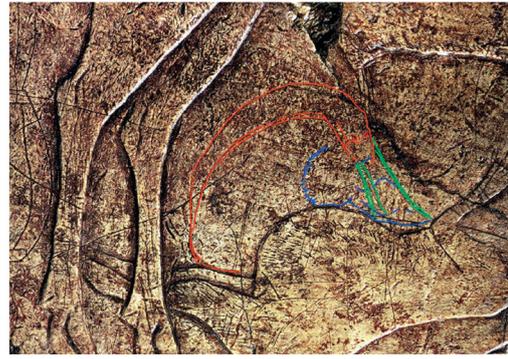
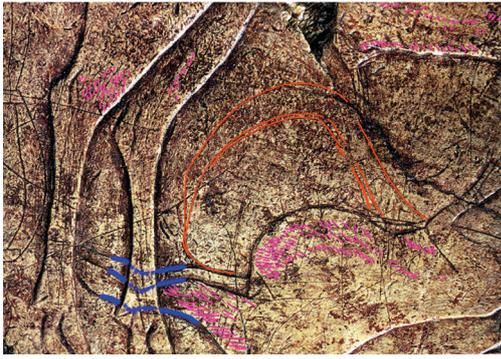
1. The extended panel of Ségognole 3. The grotto is known for a vulva between 2 faint horses, but its largest graphic element is a groove that has been explained away as a “border”. The groove is actually the caudal line of a 1.9 m-long bas-relief of a bison that has been overlooked because of the failure to apply the same conventions of the vulva – figurative realism, monumentality, and the use of natural forms – to the engraved line, although it is identical in manufacture. The wisent composed by natural relief accentuated by incising, flaking, and polishing confirms that the ensemble is Paleolithic.

2. A survey of Paleolithic parietal images whose contours are defined like the Ségognole bison by natural relief uncovered over 120 examples. This revealed that mammoths and bison were illustrated far more commonly this way than other species. Such statistical analyses of how imagery relates to rock morphology provides a new way of grouping Paleolithic art and opens another window into its makers’ intentions. It also raises the related phenomenon of imagery that played upon similarities between the contours of bison and mammoths.

3. The “mammoth” on the Grotte de Canecaude spearthrower, which has one eye above a crescent that makes it read as a tusk and another eye below the same crescent that makes it read as a bison’s horn. The sculpture is one of several images that combine mammoths and bison in some of the oldest known figure-ground illusions.

4. The art of Font-de-Gaume. Numerous paintings blend aspects of mammoths and bison, extending the theme of Paleolithic figure-ground illusions and making the relationship between the “armor-headed” herbivores the cave’s leitmotif.

5. The Roc-aux-Sorciers. The juxtaposition of the generative portion of a woman’s body with one of the two herbivores identified as having some equivalency in Magdalenian art turns out to be a re-current theme in northern France, where it is also seen at Guy-Martin and Ségognole 3. Links are established between these northern friezes and the Grotte des Fieux, Grotte du Sorcier, and Abri Reverdit.



Combined Laugerie-Basse *Femme au Renne*, hocks, fur, inflations, snake, baby and 4 parallel lines slanting from the herbivore's penal sheath to the top of the snake's head.

6. Guy-Martin's "obstetric" frieze. The panel uses a compositional technique similar to Cubism – building a "decomposed" horse, for example, out of figurative, natural and schematic elements. Another example of the panel's "interactive" technique involves a single crescent that is positioned to be read 4 ways: as one horse's tail, another horse's mane, an ibex's backward horn, and an auroch's forward horn.

7. The *Femme au Renne*. Several Magdalenian engravings of "women" are re-examined in light of such findings of polysemic density, leading to the discovery of more secondary imagery. This re-examination shows that the *Femme au Renne* contains at least 4 degrees of engraving, ranging from the pregnant female under the herbivore to such lightly incised details as hocks that transform the figure into a therianthropomorph, 2 outer "pregnancies", an umbilical snake within the over-arching external pregnancies, and even a "spectral" baby whose head is formed by a circle of light crosses.

8. Similarly, the "women" and bison on a wand from Isturitz share such traits as hooves and hackles.

9. The Grotte du Sorcier "anthropomorph". The "sorcerer" turns out to have both short hoofed and longer human legs and rounded buttocks enclosed within a herbivore's rectilinear rump. The figure can also be read as being juvenile or female, rather than just as an ithyphallic male.

These analyses coalesce into a new interpretation of the relationship between some Paleolithic feminine imagery and symbolically important prey species: a "prey-mother" hypothesis. Although the theory is based on internal evidence that "women" were repeatedly associated with herbivores through shared traits and connections, it is also in keeping with female roles in glacial subsistence systems where there is little for women to gather for much of the year and fitted clothing is essential.

Frequently, one female role in such "huntersewer" economies is to increase the chance of a hunter's success by providing him with animal qualities. Several polar cultures believe women do this while sewing clothing and camouflage by synthesizing the powers of the species whose hides compose the garments, thereby imbuing hunters with qualities needed for success. Another common role is for wives to enter trances in which they "become" prey and lull it into coming within range. A third is to reconcile hunters with animals they have killed by "feeding" dead animals like guests and inviting them upon their "departure" to return home as living creatures.

“Whale-wife-mothers” among the Koryaks and Nootka, for example, do this by initiating the regeneration of whales. All three roles involve beliefs in a woman’s maternal capacity not only to give birth to humans but also to morph into, control and generate socially important prey.

At the heart of the polysemic Paleolithic imagery examined here there probably lay equally layered beliefs concerning the relationship between women and animals. The repeated association of the generative portion of women’s bodies with large herbivores suggests that some Paleolithic societies believed that women had the capacity to generate and intercede among humans and their prey – making them the sex that spiritually controlled the food supply.



## LIFE DRAWING AND THE CHAUVET LIONS

John CLEGG

This paper explores how insights from observing the processes of drawing in the present help to elucidate ancient rock art. The idea is applied to two puzzling lion drawings in Chauvet Cave, presently the oldest authenticated rock art in Europe, using observations from recent life drawing classes in Australia.

Recently and without controversy, it has been assumed that *Homo sapiens* brains of 30000 years ago were much like our brains now and that what we understand of the workings of our brains, at least for characteristics not acquired by learning, are true for the species. Similarly, the fundamentals of both making and seeing drawing and sculpture may also be similar, then and now.

In the 1950's and 60's, art historians Rudolph Arnheim and Ernst Gombrich drew on the psychology of perception to inform their work. People see with their brains, not (only) their eyes, and a basic element in seeing things is recognition. Gombrich uses the key word "schema" to refer to a combination of what people recognise and see when they try to draw. Drawing and seeing are linked, but not quite the same. Most people can bring to mind an image of a human head and may be able to do much the same for a cat, elephant, fish or car. If we try to make a depiction, it is probably these images or "schemata" that we draw. When we have to draw something unfamiliar for which we have no schema, it is likely that we modify a schema that seems close, for example, drawing a horse and adding stripes to it to depict a zebra.

A simple experiment with a seven year old child and his parents, asking them to draw a fish, car or elephant in three-quarter view demonstrated that the task of drawing three-quarter views without readily available schemata is usually difficult.

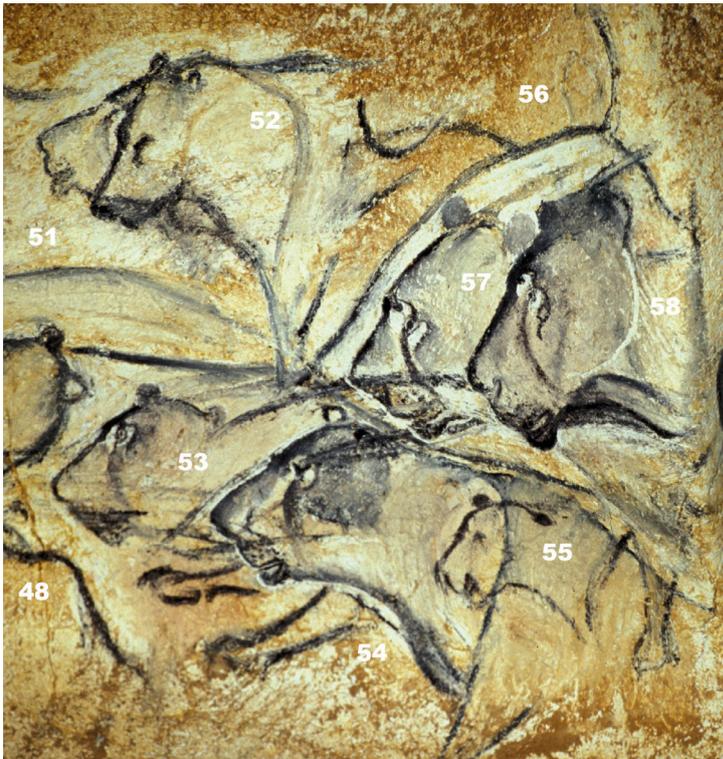
In life drawing, a student is expected to look at the model, then make marks on paper intended to represent the model. Although looking at the model should take priority, in practice students often spend much more time looking at their paper than at the model, erasing, redrawing and erasing again several times before looking again at the model. An observer may notice that the drawn, erased and redrawn versions are pretty much the same. The basis of this behaviour seems to be an eternal conflict between what a thing is known to be, and what it looks like. If you draw what you know is there, it looks wrong. If instead you manage to draw what the model actually looks like, it again looks wrong.

### The lion drawings of Chauvet Cave

The drawings of Chauvet are the oldest major series of animal paintings in Palaeolithic art and are reliably dated to between 30340 and 32410 BP. There are some 74 drawings of lions in Chauvet Cave; most show the heads in detail and most are superb (such as numbers 52, 53, 54, 57, 58).

As Christopher Chippendale observed to me, they are seen from the side with the face in repose, offering a perspective from which “we – both the viewers now, and artists then – expect a lion to be depicted”.

Two of the drawings, numbers 43 and 50, are anomalous in that they don’t work. They seem to depict lions’ heads in left profile with peculiarly open mouths. These two are poorly drawn and very similar. It is as if the artist tried to draw something beyond their capacity and repeated the attempted but unsatisfactory solution, somewhat like the students in the life class. The Chauvet artist could not turn from the cave wall to look again at posing lions alongside; the artist must have depended on memory.



Lion pictures in Chauvet Cave  
(photo: J. Clottes).

Jean Clottes and Marc Azéma suggest that two of the lion assemblages at Chauvet depict a hunting pack of lions and lionesses, some about to spring. Perhaps these strange pictures were an attempt to represent lions with their mouths open, tongues out and fangs bared at the moment before contact with their prey?

The drawings made by the family in my experiment support my notion that at least one adult without a model found it difficult to draw a three-quarter view.

This exercise of looking at Palaeolithic pictures in Chauvet Cave from a perspective of 21<sup>st</sup> century drawing demonstrates new insights and potential hypotheses. Chauvet Lions 43 and 50 seem to have been repeated attempts to draw something for which the artist had inadequate resources; the failure of these drawings suggests that the artist did not have an effective schema of an attacking lion to make the drawing.



## POWER OF SEEING:

### High Quality and Diversity of Parietal Art in Chauvet

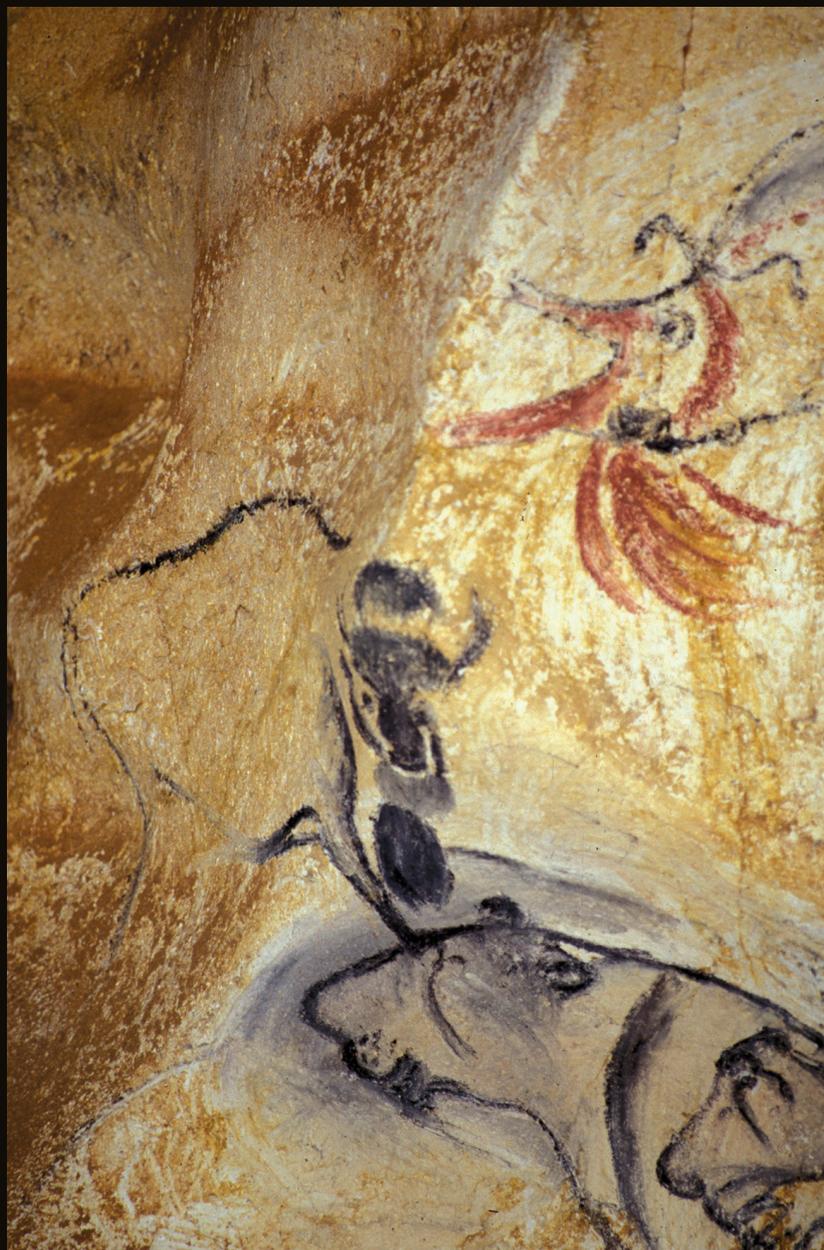
Masaru OGAWA

I consider the high quality and diversity of art from the Chauvet Cave. The bear in red is outlined with a very strong “will to art” without any hesitation. Its lines have rhythmical movements to depict the characteristics of this ferocious animal. Its tiny ears and shallow red stain in the front seem to emphasize the vividness of bear. Another example is the owl with many incised lines, maybe made with fingers. The accumulation of strokes in its trunk shows the rich volume of feathers of this nocturnal bird. This figure could be made only in a few minutes with a determined application of fingers to the soft medium. Now we need to explain this realistic phenomenon of human nature’s abilities.

I present a concept of art in order to think about the high quality of art from 32 000 years ago, i.e. the Big Bang of art might have happened in that age, depending on my premise of Integration. Integration means here a coincidence of two forms, by nature and mankind. The artists accepted natural shapes to paint or engrave animals in the caves at all periods of the Upper Palaeolithic. From the evidence we have now, Chauvet appeared suddenly without any advance symptoms.

I refer to the diverse manners to depict animals in the darkness, of which we have so many examples. There is an animal that might be a bison only made with dots. In all the history of art, such a method to make figure only with dots has been rare. On the other hand, ordinarily, human beings have used contour lines to determine the shapes of objects. This is common sense for all people. Why is it that we can find such an isolated method only in the first stage of art? Another example is the renowned confronting rhinoceroses, from which an absolute date of 32 000 BP has been obtained. In the legendary theory of hunting magic in cave art, all animal figures were depicted only as isolated images, and such a composition should not exist in parietal art. Two rhinoceroses seem to be fighting with intense tension, which shows incredible maturity of mastery in the first art. There are also other famous art works in Chauvet. For the rhinoceros with multiple contour lines, two different interpretations have been presented. One holds that such multiple lines should indicate a very profound space that contains seven or more rhinoceros in narrow width. The other, challenging proposition for this remarkable panel is invention of the depiction of movement in fine art. Time is an impossible motif for fine art, which captures immediate reality. Why is it only in earliest representations that one can find such an exceptional artistic phenomenon?

How can we understand such variable manners found 32 000 years ago? For several years, I have proposed the significance of seeing to making art in the darkness. This is my theory of integration between natural shapes of rock surface and forms of animal figures by human artists. After arriving in Western Europe around 40 000 years ago, what did they do in the caves? My speculative hypothesis is that, in the darkness, with simple torches, they might have been looking



Bison on two planes  
(Chauvet *et al.* 1995).

for the forms of animals on the undulated surfaces of the rock walls. Now, I emphasize the power of seeing in order to make the origin of art making clear. The people might have entered the darkness with simple torches with the purpose of seeking the forms of the animals in the shapes of natural rock reliefs. For thousands of years before Chauvet, people would have developed the ability of looking out for the forms of animals. Human eyes just catch the accidental shapes to integrate the realistic forms of animals.

The most important point is that seeing pre-existing real animals should be determinant in making animal figures in the caves. Before Chauvet, people may have visited the caves to see the hidden animals without any manual action. Then, about 32 000 years ago, in Chauvet, some people might have begun to trace what they had seen on the rock surface in the darkness. They could have reconfirmed the animal figures with lines and dots. This is one of the origins of art. After developing means of seeing in the darkness, they could look for what they would like to see, real figures, but they had no definitive manner to make traces to represent figures, so now we can find various methods to depict animal figures. The earliest artists had to invent the various methods to trace what they were seeing on the rock surfaces. Thus, we find many manners of art making only in Chauvet, and later, even in the same parietal art, we can find animal figures captured only with contour lines and colors.



## COSMOPOLITAN AND LOCAL ASPECTS OF EPIGRAVETTIAN ART IN ITALY

**Fabio MARTINI**

In Italy, figurative art in the varied cultural context of the Epigravettian (19 000-10 000 BP) is characterized by complex systems of expression. There is a strong regional component in the iconography, iconology and technical solutions of this period, as well as a large-scale system of communication that encompasses technologically and typologically different manifestations. The Epigravettian province developed its own original language, while at the same time remaining receptive to outside influences. It is from this dual perspective that we should consider the transformations of artistic productions, from both a formal and conceptual point of view.

There are four main elements of Epigravettian art in Italy:

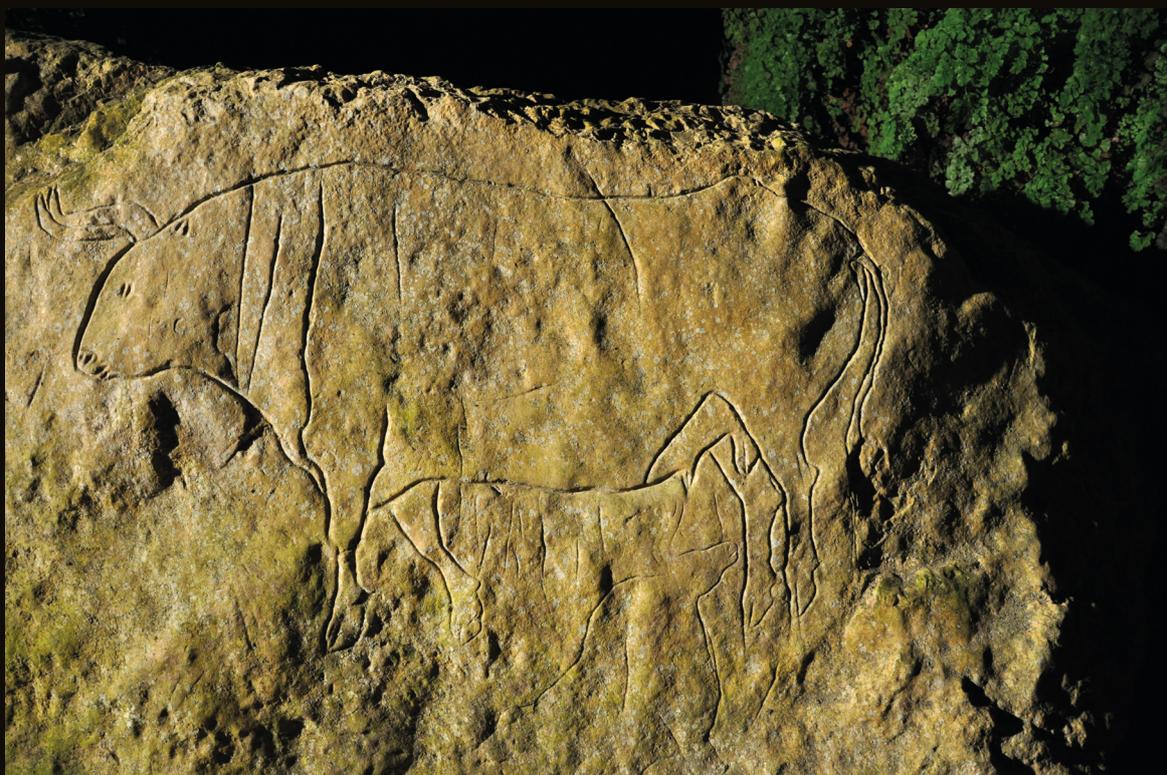
1. a diffusion with a Franco-Cantabrian influence on the Italian peninsula, which through time became limited to the central and northern zone of Italy, until the end of the Tardiglacial period;
2. an essential naturalistic style (“Mediterranean” in the sense of Graziosi), with zoomorphic themes and less often anthropomorphic ones, which is found on peninsulas and in inland zones. Its language is autonomous, codified and gradually become more rigid. It was enriched by geometric-linear forms starting in the second phase of the Final Epigravettian;
3. a schematic style, which lead to the representation of volumes using bidimensional schematic lines;
4. a specialized production with a western origin: Azilian pebbles.

The scarce evidence currently available indicates that the figurative production of the Early Epigravettian is characterized by the presence of a single model: the Franco-Cantabrian model.

In the final Epigravettian, the figurative system becomes much more complex. In the second phase, around 12 000 BP, there is a break with the Franco-Cantabrian inspired western tradition, as well as with the first “Mediterranean” style, as is shown by the original productions and a non-naturalistic vision of reality. During this time, the tendency toward abstraction and symbolism becomes stronger, in relationship with funerary rituals. In these contexts, the grave goods are pared down, though they still maintain a strong symbolic meaning.

This panorama appears to be relatively homogeneous and unitary. If we consider the lithic assemblages, the situation changes and the regional specificities are more apparent. This reveals the existence of a visual culture arising from a shared symbolic behavior, which is not strictly tied to the technical systems. The thematic and formal analogies, concerning the graphic expressions, can be explained only by the diffusion of a transcultural ideology imparted by a shared cultural substratum that groups together different European techno-complexes (Epigravettian, Azilian, Federmesser groups, Tarnow, ...). This homogeneity constitutes a true Epigravettian cultural province that extends from the French Provence region to the Balkans, and on to the Black Sea.





Engraving of a *Bos primigenius* in the Abri Romito (Calabria).

## GROTTICELLA BLANC-CARDINI AT BALZI ROSSI (VENTIMIGLIA, ITALY)

Giuseppe VICINO, Margherita MUSSI

In the caves of Balzi Rossi, the parietal art includes engravings in the following cavities and shelters: Grotte des Enfants, Grotta di Florestano, niche in the wall near Riparo Mochi, Grotticella Blanc-Cardini, Grotta del Caviglione and Barma Grande (figure). We present here the Grotticella Blanc-Cardini (2.80 m high, 0.55 m wide and 2.60 m deep). There are no traces of sediment indicating an archaeological layer. An adult can slide into the cave with difficulty by hoisting themselves up 2 m from the trail that runs along the foot of the cliff. Ancient documents indicate that the same was true in the 19<sup>th</sup> century.

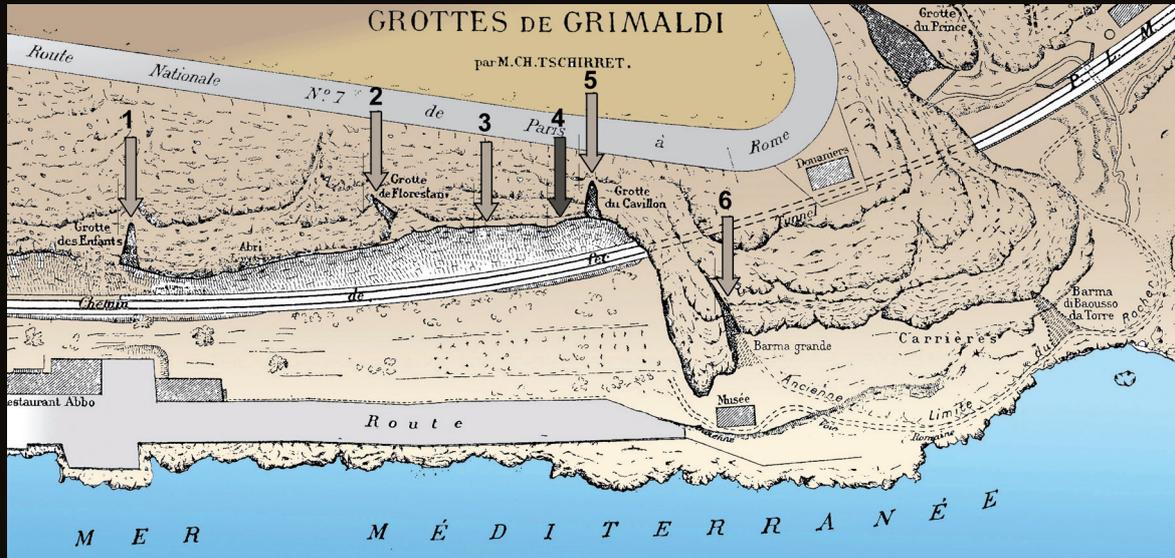
### Description

East wall: the panel in the entrance (1 × 1.5 m) has 300 linear signs up to more than 20 cm long, surrounding a dozen small niches and irregularities in the wall. An elongated, vertical figurative motif, 23 cm long, is formed by two sub-parallel lines that meet at the top. The axis is emphasized by a slightly undulating line that continues lower down. On the left, a small oblong figure is formed by half-circle lines that meet in a point and frame a central hole. These two figures compose a probable phallus or a possible vulva.

West wall: on the panel in the entrance (0.80 × 0.50 m), the signs are more numerous, longer and usually deeper. The only figurative element (around 10 cm high) is similar to that on the other wall, consisting of two parallel lines that converge at the top. Next to this, a second motif is delimited by two half-circle lines, with a third line in the same axis that divides the figure in two. This could be a second phallus next to a second vulva.

### Comparisons and dating

The borders of the niches and fissures that are emphasized by incisions, as well as the linear engravings, are found in the Grotte des Enfants (unpublished), Grotta di Florestano, Grotta del Caviglione and Barma Grande. Their dating is approximate because the excavations are too ancient. At the Grotte des Enfants, it would have been difficult to realize them before the formation of the layer designated as “fireplace” D, and thus before the Final Epigravettian. This layer is located below the eponymous burial of “children”, dated to 11 130 ± 100 BP. The Final Epigravettian is found in layer A at Riparo Mochi, from which it would have been rather easy to climb into the Grotticella. At Grotta del Caviglione, the engravings are 5-6 m above the Gravettian burial: we can only suspect the presence of a Final Epigravettian in the upper part of the stratigraphy, which is no longer present. Finally, at Barma Grande, they are located at the height of a witness section that yielded a few Microgravettes. Based on different sources, it is possible to affirm that a Gravettian layer, known from the famous Triple Burial, was located 3 or 4 meters below the engravings. The highest part of this stratigraphy contained Ancient and Final Gravettian artifacts.



Plan of the Balzi Rossi caves (after Villeneuve *et al.*), with an indication of the points where engravings and other traces of parietal art are found:

1. Grotte des Enfants;
2. Grotta di Florestano;
3. Niche;
4. Grotticella Blanc-Cardini;
5. Grotta del Caviglione;
6. Barma Grande.



Grotta del Caviglione at the time of the excavations by Albert 1<sup>st</sup> of Monaco, after the monography of the caves of Grimaldi, with the Grotticella Blanc-Cardini.



Grotticella Blanc-Cardini, east wall with probable phalluses and vulvas (photo: A. Todero).



Grotticella Blanc-Cardini, west wall with deep incisions, included a phallus next to a possible vulva (photo: A. Todero).

Outside of the Balzi Rossi caves, we find fissure edges and holes, or angles in the wall, emphasized by engravings at Caverna delle Arene Candide, Grotta Paglicci and Grotta Armetta, indicating a chronology between 15 500 BP uncalibrated and the end of the Tardiglacial. Phallus representations, on the other hand, are completely absent from the Italian art. Vulvas are known at Grotta Romanelli and Grotta di Pozzo, where they are engraved on the walls. These are dated respectively to approximately 10 000-12 000 BP and 12 000-13 000 BP.

## **Discussion and conclusion**

It was possible to climb up the walls from the Gravettian and Early Epigravettian layers to reach the part where the engravings were made. Nonetheless, the access to the Grotticella Blanc-Cardini did not become easy until the end of the Tardiglacial, when the Final Epigravettian layers were formed. At most, an advanced phase of the Early Epigravettian could also be a candidate. This same chronological framework is indicated by comparisons made with other decorated caves in Italy, suggesting an age between 10 000 and 16 000 BP uncalibrated, and thus 12 000 and 19 000 BP.

This tiny cave that is difficult to access had very little to offer since its small dimensions would have permitted only two to three adults to stand upright and extend an arm to realize the engravings. The function of the site was thus not domestic. At the end of the Pleistocene, the Balzi Rossi cliff face contained a series of caves and shelters that were used and inhabited (Grotte des Enfants, Grotte de Florestan, Riparo Mochi, Grotta del Caviglione, Barma Grande and Baouso da Torre). The Grotticella Blanc-Cardini stands out as it was a sort camarin to the Balzi Rossi caves. Here it is difficult not to remark the remains of specialized activities associated with rituals and linked to a very clear sexual symbolism, reinforced by the form itself of the Grotticella, whose opening evokes that of a gaping vulva in the cliff face.



## THE ITALIAN GRAVETTIAN AND EPIGRAVETTIAN “VENUSES” IN A EUROPEAN CONTEXT

Margherita MUSSI

Twenty female statuettes, known as Gravettian “venuses”, are currently known in Italy (figure A). This is the highest concentration in Western Europe, with pieces found in both open-air sites and caves, especially at Balzi Rossi (Barma Grande and Grotte du Prince). For the Epigravettian, we retain seven localities with portable and parietal art (figure B). This second phase of artistic production, attributed to the last millennia of the Tardiglacial period, is not continuous from the preceding one.

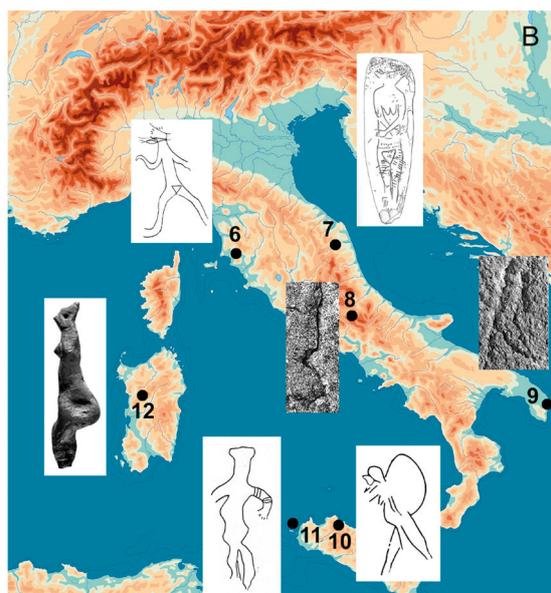
### The Gravettian venuses

We describe here the venuses that can be compared across long distances. Some have a well-defined typology, such as the Yellow Venus of Balzi Rossi. From the Russian Plains (Kostenki, Avdevo, Gagarino, Khotylevo, Zaraysk) to the Danube (Willendorf), to the Mediterranean (Yellow Venus) and the Pyrenees (Lespugue), we find the same representation: tilted head on small shoulders; breasts forming a single mass with the abdomen; flat buttocks; tapered legs; sometimes small folded arms. The available dates indicate a late phase of the Gravettian.

A detailed analysis is possible. A triangular appendage extends from the nape to the shoulders on the Yellow Venus and on that of La Marmotta, as on the figures of Laussel and Cussac. The double skin fold on the back of La Marmotta is also present at Willendorf and Dolní Věstonice.



A – Gravettian: 1. Balzi Rossi, only the pieces mentioned in the text (From right to left: The Woman with Two Heads, The Beauty and the Beast, The Bust, The Losange, Yellow Venus, Dame Ocrée); 2. Savignano; 3. Trasimeno; 4. La Marmotta; 5. Parabita.



B – Epigravettian: 6. Vado all'Arancio; 7. Tolentino; 8. Grotta di Pozzo; 9. Grotta Romanelli; 10. Grotta dell'Addaura; 11. Grotta dei Cervi.

“The Beauty and the Beast” from Balzi Rossi, composed of two back-to-back creatures (a woman and a chimera, part snake, with horns and arms), corresponds to an engraved figure from Předmostí (a single syncretic female creature with a triangular head with small horns).

Other comparisons exist beyond the Gravettian context. The lower part of the Losange Venus of Balzi Rossi is a perforated V-shaped roll of fat framing the pubis. This same perforated fat roll is found on two pieces from Mal'ta. In Siberia, however, the face is in a vertical position, framed by a bonnet, like the one on the Bust from Balzi Rossi. The Dame Ocrée also resembles a piece from Mal'ta, with its smooth, vertical and slightly rounded face surrounded by a mass of hair with horizontal bangs. Behind the head, two long, undulating curls. This cannot be the result of accidental convergences.

### The Epigravettian venuses

At Vado all'Arancio, dated to 11 500 BP, a figure engraved on bone, with an equilateral pubic triangle, has the same posture as the anthropomorph on a disk from Le Mas-d'Azil, with its arms open and legs separated. We find this same, clearly delimited pubic triangle on the Venus of Tolentino, with an elk head, engraved on a pebble. This is similar to the many triangles from Gouy, dated to 12 000-13 000 BP.

At two sites in Sicily, female figures compose part of the engraved panels. At Addaura, a minimum of 16 anthropomorphs, some with a sort of elongated beak and large headgear, mostly male individuals, often with raised arms, recall the engravings from La Marche. There are also two female images, one of which is recognizable by its small breast, and a probable second one with no sexual attributes and a very thin body. Crude engravings, dated to the beginning of the Holocene, are superimposed on this panel. A chronology similar to that of Vado all'Arancio can be proposed based on an engraved male head with headgear identical to those from Addaura.

The engravings from the Grotta dei Cervi form a panel with 37 animal and human figures, including one with a mushroom-shaped head that has a bump on the torso suggesting breasts. At the entrance to the cave, the archaeological sequence begins with layers dated to 10 000-11 000 BP, which probably correspond to these panels.

Two female representations of the Gönnersdorf type are present at the Grotta Romanelli and Grotta di Pozzo, and perhaps at Macomer. At Romanelli, this is a 2 cm long engraving, while the age of the Tardiglacial deposit is 10 000-12 000 BP. At Grotta di Pozzo, there is a silhouette on a stone ridge at the height of a man relative to the Final Epigravettian layers dated to 12 000-13 000 BP. Finally, at Macomer, one statuette represents a theriogyne with the head of a *Prolagus sardus* (a Pleistocene lagomorph). Other than the animal head, and even if it is not proven that Sardinia was colonized during the Mesolithic, the general form of this figure resembles the Gönnersdorf type.

In conclusion, it is possible to establish relationships both within archaeological cultures and beyond their arbitrary limits. This is the case for the Gravettian as a whole and Siberia. The Epigravettian is closely linked with the Magdalenian and Azilian contexts. At two or more stages in their development, hunter-gatherers developed behavioral models and a network of ideas and symbols at the scale of the European continent and beyond.



## THE DISCOVERY OF A NEW PALEOLITHIC DECORATED CAVE IN ROMANIA (BIHOR DEPARTMENT)

**Jean CLOTTE**, **Mihaï BESESEK**, **Bernard GÉLY**, **Călin GHEMIȘ**  
**Marius KENESZ**, **Viorel Traian LASCU**, **Marcel MEYSSONNIER**  
**Michel PHILIPPE**, **Valérie PLICHON**, **Françoise PRUD'HOMME**  
**Valentin Alexandru RADU**, **Tudor RUS**, **Roxana Laura TOCIU**

The cave of Coliboaia, where parietal drawings were discovered on September 20, 2009 by five Romanian speleologists, is located in the Apuseni Mountains (Western Carpathians of Romania). Upper Paleolithic occupations are also known in the region.

In May 2010, during a mission coordinated by Viorel Lascu, president of the Romanian Federation of Speleology, a French team composed of Jean Cottés and Bernard Gély (parietal art), Michel Philippe (bear specialist), Marcel Meyssonier and Valérie Plichon (French Federation of Speleology), and Françoise Prud'homme (Musée de Préhistoire d'Orgnac, Ardèche) went into the cave to make first observations. They were accompanied by Romanian speleologists, including some of the discoverers of the paintings.

Once all of the physical and administrative protection measures had been put into place, the discovery was officially announced on June 11, 2010.

### **Evidence of bears in the cave**

Skulls and other bone remains are visible in many places in the cave, along with remains of activities showing that Ursids occupied the cavity over a long time period, mostly in the upstream part, beyond the passage with a submerged ceiling.

All of the remains are attributed to cave bears (adults, juveniles and very young cubs). Most are covered with a blackish film (manganese bioxyde and or organic material), indicating that they have been in the river bed for a long time.

Bears thus used the cave for a long time as a hibernation den. This explains the presence of many wall surfaces with claw marks or polish resulting from plantigrades rubbing on them, such as in the decorated gallery and in the chaotic chamber at the upstream extremity of the main gallery. This must be taken into account when the site is studied in order to differentiate the traces left by humans and bears and to determine if there is evidence of interactions between them.



Rhinoceros head in right profile (around 30 cm long). If it is not due to erosion, the very long nasal horn was left "open" (photo: A. Posmosanu / Romanian Federation of Speleology).

## The decorated gallery

The drawings are preserved in a high gallery, 6 or 7 meters above the current river bed. Many others may have been destroyed by water flow in the lower parts. We access the gallery by climbing a small stalagmite waterfall that probably covers clay ledges. The entrance to the gallery is slightly lower than the ground of the decorated zone.

On the two walls, there is bear polish and a few claw marks, some of which traverse the art, while only a few bones are directly visible. The right wall upon entering, which is mostly vertical, appears to be better adapted to decoration and is indeed that on which there is a greater number of drawings. No artifacts have been found so far.

## Description of the art works

The black drawings, made with a wood charcoal crayon, represent a bison, a horse, an undetermined figure (horse or feline), one, or perhaps two, bear heads, two rhinoceros heads, other undetermined lines and a few engravings. They are located on the two walls of the gallery with no intended symmetry, except perhaps in the deep part (horse and rhinoceros facing each other).

The homogeneity of the decoration is evident: black linear lines, animals reduced to protomes in right profile, the use of natural reliefs (outlines integrating the faults in the wall or framed on recesses, ...).

Our first hypothesis, based on stylistic and thematic analyses, and in particular the clear dominance of “dangerous” animals, is that these images were made during an early phase of Paleolithic art. This opinion was confirmed by two radiocarbon dates:  $27\,870 \pm 250$  BP (GifA11002) for an undetermined animal and  $31\,640 \pm 390$  BP (GifA11001) for a sample of charcoal collected below.

## Research, education and development

The study of this cave will be coordinated by the Tarii Crisurilor museum in Oradea and the archaeologist, Călin Ghemiș, under the scientific supervision of Jean Clottes, in collaboration with Romanian scientists and speleologists, and in agreement with the Apuseni Natural Park. A collaboration agreement between the Museum and Orgnac – Grand Site de France®, Prehistoric cave and Museum, signed in April 2010, will permit a French-Romanian collaboration for the karstological, paleontological and archeological studies of Coliboaia and its context.

The main objective of this global study is to identify the remains of Paleolithic human activities and to establish the chronological and paleoenvironmental framework of the site. In parallel, studies of the traces and bone remains left by Ursids will be conducted. All of these new data will serve as the basis for a comparative approach to other sites in the region.

This is the first time that parietal art this old has been indisputably identified in central or eastern Europe.



## CATALOGING OF KAPOVA CAVE ROCK ART

Alexey SOLODEYNIKOV

Our team prepares the first catalogue of the ancient paintings of Kapova cave to be published. This edition is not just a list of the images, but it aims at summing up 50 years of studies in Kapova cave.

We accept as a general idea that the book should only consist of facts. There should be no interpretations, no private opinions, even if those of famous specialists. We understand it seems hardly possible for some reason or other. But at least we are going to exclude from the book all the unproved hypotheses and theories, all the thinking about “what is painted there” and “what the painting could mean”. We do not deny the necessity of interpretations and attempts to understand rock art subjects. We just believe that any interpretation and any theory should be based on a strong factual foundation. If we don’t have such factual basis published, there could be no theories suggested. This book is an attempt to create such a basis.



Kapova Cave, Hall of Paintings: panel of the procession of mammoths  
(photo: V. Kotov).

The second point we pay attention to is that we invite to take a part in the publication any researcher who has any factual – not speculative – information about Kapova cave. Thus our book is not going to be a work having one author or a “scientific editor”, I mean it is not a book that has a general idea, which often becomes a kind of blinkers and makes other ideas and points of view impossible. Every author will have his own part of investigation and his own place in the book. And every section can be led by an editor or a leader.

Now let’s envision my part of the job – cataloging Kapova cave paintings, with some methods differing from other similar attempts. The first one is about selecting the material to be described. I think that being remiss in so doing is the first of the ways to render the whole enterprise useless for investigation. In my opinion, researching a site should start with the most detailed description of each picture. And each one must be described in its wider context of the wall, of the hall and of the cave.

It is impossible to date all the spots of pigment in a cave by using a direct dating method. And if we keep the method of direct dating aside, the only criterion we have to know for sure that an image is not Pleistocene is when we have an inscription in some modern language. If not, I am not certain any picture or spot of pigment should be taken out of the description.

And there are some examples of the opposite. Some pictures look like ochre painting when you use your bare eyes. Anyone – especially an investigator with insufficient experience but a strong desire to discover something – could think it to be an ancient picture, but digitally processed, those pictures turn out to be modern inscriptions. I think that such samples must be included into the catalogue at least to prevent future researchers from discovering them in their turn and being misled.

And of course, all this holds for any spot of pigment that cannot be ascribed to the present. For example, there are lots of ochre paintings in the cave which cannot still be read. But they have their position in the cave and their location itself could be meaningful for future investigation. So, we have to describe them.

It is not an easy question to deal with the third dimension in our cave, as there is no real sculpture such as the ones in Le Tuc-d’Audoubert. But many natural forms have sometimes been worked up for some purposes. And those showing traces of human interference – with ochre remains or being worked up, look like being part of the painted context and should be embodied in our list.

To visualize the paintings we are working with digital methods. Some of the results can be printed, others cannot. That is why we mean to prepare an electronic version of the catalogue on a CD.





 **P@LETHNOLOGY**  
*Bilingual review of prehistory*