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***Rock art, performance and Palaeolithic cognitive systems. The example of the Grand Panel  
palimpsest of Cussac Cave, Dordogne, France***

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**Abstract:**

This paper investigates the cognitive role of the palimpsest in cave art through the case of the Cussac Cave Grand Panel, the main engraved assemblage from this sepulchral and decorated site dated from the Middle Gravettian period (31,200-28,700 cal BP). The technical, thematic and formal unity of this monumental panel yields evidence of a short time-span for its creation. The accurate study of the superimpositions *in situ* and on a high resolution 3D model leads to the conception of a Harris matrix like model. It attests to a global structuring based on privileged themes interactions (taxa associations, animation and scale of depictions, relative chronology). Considering Cussac Cave Grand Panel palimpsest as a dynamic composition, the paper discusses agency and practice of accumulation in one place in Palaeolithic cave art. In the perspective of “art as action” the dynamic composition could be considered as a performance which raises the question of the audience. The monumentality of the depictions, the physical space of the chamber and the panel setting would suggest two agents: the engraver as primary agent acting towards a potential collective audience as a secondary agent. In this social context we assume that the palimpsest could have been used as a way to share and reinforce common concepts in the community. Whatever the particular semantic content of Cussac cave rock art, this study testifies to the collective dimension of cave art palimpsests, unlike most works so far which considered these specific compositions as the expression of an individual relationship to the parietal images. Thus it brings new elements of discussion on the socio-cultural functions of cave art production and cave art sites in the Palaeolithic societies of Western Europe.

**Keywords:** Cussac Cave; cave art; Middle Gravettian; palimpsest; cognitive systems; art performance

## **Introduction**

The presence of panels with intermingled engravings in many Paleolithic decorated caves raises questions regarding the manner in which they were perceived: how were they meant to be read and what was offered to be seen? They lie somewhere on the range between hidden panels and more ostensible ones. Even if these palimpsests are visible, it is difficult to individualize their figures. Was this intentional? Was it the result of a long process of successive single additions? What covers the practice of accumulating in one place? Or does one just perceive a reality that did not exist at the time of the realization due to the taphonomy and the effects of time?

Many authors have contemplated these questions. Some have made interpretations from a diachronic perspective, proposing ways to date the figures, such as a “parietal stratigraphy” (Breuil, 1952) that would have resulted from successive corrections or additions. Others view these palimpsests as synchronous, the different figures representing intentional thematic associations, perhaps forming mythographic assemblages (Raphaël, 1986; Laming-Empeaire, 1962; Vialou, 1986) that were most often dictated by a restricted space (Leroi-Gourhan, 1980). Still others refute the idea of a spatial constraint in favor of an intentional composition whose dynamics of execution were more important than the final result (Lorblanchet, 2010). The Grand Panel in Cussac Cave (Dordogne, France) is one example of such palimpsests. It is composed of dozens of figures that were superimposed while not completely obscuring each other, even if the surface available for decoration was large and easily visible. Where, therefore, does the realization of a panel of this nature lie along the dichotomous range of “doing” versus “offering something to see”? Considering that rock art can be basically

considered as a medium for information exchange both in the individual and collective spheres (Conkey, 1980; Gamble, 1991; McDonald and Veth, 2012), this paper investigates the context of production and reception through the notion of performance.

Indeed, the intermingling of figures on this large panel makes them difficult to individualize and study without long periods of observation. A dynamic approach to this composition seems the most effective for providing elements for its interpretation. Though such an approach has been applied to portable art for the study of re-engraved plaques or *scapulae* (Pales and Tassin de Saint-Péreuse, 1969; Delporte and Mons, 1975), it is less often applied to parietal art (Lorblanchet, 1981).

The recourse of a high resolution 3D model enable us to perform more accurately the analysis.

### *Cussac Cave*

Cussac Cave, discovered in 2000 by Marc Delluc is both a decorated and a sepulchral cave from the Middle Gravettian (Aujoulat et al., 2013). It is a long unique gallery (1.6 km) initially authenticated, and then followed by the publication of early observations (Aujoulat et al., 2001, 2002). It was then studied and published in a claimed heritage context (Fourment et al., 2012), before being presented in the framework of an ongoing multidisciplinary research program (Jaubert et al., 2012). The first publications of this latter research concern the human remains, which are unique in the funerary context of the European Gravettian (Henry-Gambier et al., 2013; Villotte et al., 2015). Radiocarbon dates and relative chronology observations lead to the unique Middle Gravettian chronological framework of the funerary deposits and the parietal art (Jaubert et al., 2017). The analysis of the activities marks (tracks,

inprints, torch smears...) confirms the short amount of human incursions and the more dense and more ancient animal presence (Ledoux et al., 2017).

The decorated portion of Cussac Cave is distributed across a total length of approximately 1 km on each side of the current entrance, in both the upstream and downstream branches (fig. 1) that look like the meanders of a river. The artwork is mainly engraved but black and red colors are also been applied for non-figurative motifs. Palimpsest panels (Panel of the Discovery, End Panel, Grand Panel, etc.) alternate with other types of panels (Triptych, Facing Animals, Imprint, etc.) with juxtaposed figures, and smaller isolated figures.

### *The Grand Panel*

In the downstream branch, meanders 14 and 15 (M14 and 15-Av) constitute the second “bayonet” at 300 m from the current entrance. After crossing a low and narrow section here, there is a tall corridor that is called the gallery of the Grand Panel. The Panel of the Imprint (5G1) is located on the left wall of this gallery, 3 m above the path. It extends to the right toward a denser panel, appropriately called the Grand Panel (5G2) (Aujoulat et al., 2001, 2002). The available surface of this panel, 10 m long and a maximum of 4.5 wide (45 m<sup>2</sup>), is almost entirely covered with engravings (fig. 2), representing approximately one sixth of all the graphic entities (GE: 130) in the cave (preliminary count approx. 800, minus the End Panel 7D1, not yet inventoried). Its iconographic content is the same as in the rest of the cave, consisting of only engravings, which are often associated with earlier bear claw marks. These engravings include non-figurative finger-tracings and figurative representations of animals and human females. Among the animals depicted, bison outnumber horse and mammoth, and cervids are nearly absent. Many of the animals are represented by only segments of them (cf *infra*).

The Grand Panel is one of the most complex of the palimpsest panels in the cave. It occupies a large, mostly homogeneous surface that extends onto the ceiling. Today, it is viewed from the path below, or higher up from a metal platform that provides a closer view of the figures, but also deforms them due to its incidental position relative to the general orientation of the wall. The *in situ* study of the panel is therefore carried out from an average distance of 2 to 6 m from the engraved wall.

Large fissures separate the engraved panel from the limestone massif, which is dated to the Upper Campanian (Ferrier et al., 2017). The fissures predate the decoration and some are filled with compressed clay. In some areas, there are concentrations of cupules. The rock texture is sandy and loose. Its surface is flat, with only a few locally corroded areas, and calcitic coatings on limited areas on the left. There are a few desquamations in the central part, with limestone spalls present on the floor below. All the alterations, whether by corrosion, desquamation or erosion, predate the engravings. The calcitic coatings, on the other hand, were formed before and after the engravings.

The abundant bear claw marks are concentrated in a large lower band. They are particularly numerous in the right part of the panel where they form grids with lines that intersect two, or even three, times. A few of them have been obliterated by the graphic entities. The claw marks extend beyond the left part of the panel onto superficial deposits of ancient filling clays (Ledoux et al., 2017). A few claw marks are present in the central part of the panel among the engravings, all of which postdate the claw marks. These are more eroded than those concentrated in the lower band. Other than a probable change in the patina, the integrity of the panel seems to have been preserved since the Gravettian period (Ferrier et al., 2017).

The engravings occupy nearly all the parietal space accessible within arm's reach of a promontory composed of large collapsed blocks covered with clay (fig. 2b). The ground under

this panel is somewhat irregular and may have human or bear prints, or both, on its surface that are not yet studied.

The main feature of this panel is the monumental size of its figures and their diversity. Nearly all the themes found elsewhere in the cave are present here: figurative and abstract representations, and the most (bison, horse, mammoth, etc.) and least (birds, anthropomorphs, carnivores, etc.) frequent animals. The latter are sometimes represented by several individuals, which is also specific to this panel.

The figures vary in completeness, from the whole body to a single anatomical segment. As always, there are many incomplete and segmental figures, along with the exceptional presence of individuals depicted in their entirety. Though internal details are always rare, they are represented here much more often than elsewhere in the cave. These consist of sensory organs, and muscular and osseous reliefs. There are some disproportions (atrophied heads, small feet, elongated segments, etc.) (Aujoulat et al., 2002), and anatomical errors (mammoth tusk implanted in the trunk). The figures are stylistically very homogeneous on this panel, with formal conventions being shared by the different themes. They are also more naturalistic than elsewhere in the cave. The rendering of the legs is remarkable, for example, with modeled contours (shoulder, knee, and hock) even when the extremities are Y-shaped or left open. These different configurations are sometimes associated on a single figure. The hooves are often drawn with indications of the claws, fetlock and ergot. Nearly all the tails are depicted in the same position: hanging or oblique, and well separated from the buttocks. Though the eyes are seldom drawn, the relief of the orbit is almost always indicated by a slight convexity of the cephalic contours. Similarly, the lines of the chest are curved to depict the pectoral muscle before it extends behind the leg. It is also remarkable that the sexual elements of some of the animals are depicted (penile sheath, testicles). The bovids and horses of the Grand Panel also share a specific convention that is also seen on other panels: the line



of the muzzle-forehead continues into the first horn or mane hair, and the line of the second horn or last mane hair continues into the cervical-dorsal line, regardless of the abstraction of the contour. Conventions are also seen in the rendering of perspective: while the bodies and heads are drawn in profile, the feet are drawn facing frontwise. This frontal perspective is also responsible for a unique anatomical feature of these animals: the legs have individual outlines drawn with a single uninterrupted line, and are separated by a space representing the thickness of the chest. The hooves are twisted in the same manner; they are usually joined and more or less superimposed, while their outlines are nevertheless complete and continuous, as if partly seen in transparency.

Within these broadly shared stylistic codes, there is some diversity in the rendering of other anatomical elements, such as the bison chignons (tuft of hair between the horns) and horse manes. Some of these conventions are even unique to this cave (“cap” chignons, with a striated contour), perhaps indicating the participation of several artists in the realization of the Grand Panel as it is seen in its final state. Though they are characteristic of the Gravettian, “duck beak” muzzles (Capitan et al., 1910; Leroi-Gourhan, 1965) or nissocephalic horses (Dauvois and Vézian, 1984) — characterized by a pinched, curved and drooping muzzle — are not the rule at Cussac. Several variations coexist, including the particularly realistic one of the last large horse on the left (5G2-104).

### *Research questions*

The Grand Panel was thoroughly photographed by Norbert Aujoulat with a short focal length and mono-directional lighting, and the individual photographs were assembled together in a mosaic fashion (16 photos of 12 million pixels each, Aujoulat et al., 2013). In 2013, this document has been used *in situ* to inventory the graphic entities and to conduct a preliminary analysis of the parietal stratigraphy. The complete panel is composed of a minimum of 127

graphic entities consisting of 52 non-figurative motifs and finger-tracings, 27 bison, 11 bovids, 9 horses, 5 mammoths, 4 anthropomorphs, 2 carnivores, 2 birds, 1 aurochs, and 3 indented circles. These proportions are the same as in the rest of the cave, as if the Grand Panel constitutes a sort of statistic projection, or summary, of the cave as a whole. Many marks whose precise interpretation awaits a more detailed analytical recording are currently included in the category of “motifs” (true signs being rare), though they may be complementary elements of the figurative entities. It seems unlikely that new figures will be identified.

During our first analyses, two main categories of figures have been identified. The most striking are the deepest engravings and those with the most prominent interior features (e.g. the fleece of one of the mammoths), numbering a dozen at most. One of these, a monumental bison nearly 3.5 m long, may rival the painted bulls at Lascaux, or at least comes close. These represent only 10% of all the graphic entities, however. The second category consists of smaller, more lightly engraved figures that are intermingled with each other. These are superimposed to the point of being distinguishable only after many hours of observation and painstakingly following the continuity of each line (fig. 3).

Is there a logic to be discovered in this palimpsest? Was it created through some sort of opportunistic anarchy, with the small engravings “filling in” the spaces left between the large ones? Or on the contrary, was there a guiding principle that dictated the addition of the different figures? Does the dominance of bison (23) and horse (9) offer a clue? Are the dimensions or animations of the depictions significant? Their left/right orientations do not show preferences other than the representations of back-to-back couples and a small difference with the bison more often turned to the right (tab. 1). Determining how this

composition was constructed appears to be the most effective means to obtain useful information, and an analysis of the superimpositions seems to be most promising approach from this perspective.

## **Materials and methods**

Due to its specific observation conditions (average distance of 5 m, oblique axis of observation, lighting difficulties, etc.), this panel can be analyzed only through photographic documents. It quickly became apparent that a three-dimensional reproduction would be necessary. It would enable us to multiply the axes of observation, and the lighting directions and intensity, in order to untangle the superimpositions, technical stigmata, etc. One of us (PM) has produced a 3D model by dense correlation photogrammetry, which is to be integrated into a more global 3D model of the cave that is still in progress. Based on this document, the *in situ* observations have been completed and the analysis presented here has been carried out. One half-day was necessary to achieve all the photographs needed for a complete coverage of the engraved panel at a distance varying between 2.5 and 5.5 m. A ring flash was used to produce a shadowless lighting, two high-quality lenses were used: a Nikkor 24-70 mm, f2.8 and a Micro Nikkor 105 mm, f2.8, in order to preserve a nearly constant resolution for all the engraved parts of the wall. 306 photographs have been selected for the panel alone. The raw 3D model contained about 520 million points when calculated at maximum density. After 3D data cleaning and sampling at a resolution of 2 mm; the points cloud was meshed in a resulting 30 million triangles model which was a good compromise between preservation of details and heaviness of the data. Local recalculation at full resolution can still be done if needed. Several orthoimages with different applied 3D shaders have been extracted from the 3D data at a resolution of 0.5 pixel per millimeter.

The resolution of this first model was good enough to read the engraved superimpositions and all the other technical elements. Only a few inconsistencies were revealed relative to our past observations concerning the superimpositions, but now all the needed measurements are possible with a very good precision and without the limitations imposed by the field constraints.

Based on our *in situ* and *ex situ* observations, the relationships between each graphic entity have been represented with a diagram (fig. 4) inspired by the temporal succession model known as the Harris Matrix (1975), showing the positions of the graphic entities when a superimposition link exists between them (Chippindale and Taçon, 1993; Loubser, 1993; Aubry et al., 2014). The largest figures generated the greatest number of links and thus created epicenters. Our interpretive reasoning is mostly based on these, the secondary superimpositions requiring verification and more detailed statistical tools which will be applied after the definitive recording. Similarly, the juxtapositions that fill-in the empty spaces have not been analyzed, even if they also orient the diachronic analysis since, as pointed out by D. Vialou, in the construction of a panel, “the avoided and intended superimpositions” are equally significant (Vialou, 1987: 47). Our aim was to make the main stages in the construction of the panel visible in order to identify the fundamental rules that could confirm that this is indeed a composition rather than a random accumulation.

## **Results**

### *Themes*

Different thematic groups have been observed. Bison (21.2%) are present in the all the locations and configurations, while the horses are located in the left half and the mammoths in the right half. The female representations are concentrated in the lower part of the panel. As

N. Aujoulat observed during his first visits to the cave (Aujoulat et al., 2001), the association of women and mammoths, well known at the Pech Merle (Lorblanchet, 1989: 85), is also present here on the Grand Panel, and both are attributed to the Gravettian.

### *Size classes*

Two size classes can be distinguished: one monumental, and one smaller (fig. 5). Bison, horses, and canids are included in both classes. The figures (complete or partial) in the monumental class measure from 1.85 to 3.45 m, and in the smaller class, from .8 to 1.4 m. The mammoths fall within the smaller category, measuring between .8 m and 1.2 m, along with the anthropomorphs, measuring from 0.35 to 0.78 m. The nine large figures occupy the entire panel: these are 4 bison, 4 horses, and 1 canid. The most inconspicuous entities are concentrated in the middle and lower parts of the panel. Some of these, proportionally scaled, are set in friezes or back-to-back.

### *Animation*

The animation rendering is as remarkable as the variability in the rendering of the animals. The intention to express specific positions is obvious, but the result was not always fortunate; in several cases, one senses that the artist did not succeed at this task and the anatomical segments do not articulate together as they should (fig. 6).

### *Groups*

The topographic distribution of the figures validated by our analysis of the superimpositions enables us to distinguish three main groups: one in the upper left quarter (Group A), a second one lower down and more central (Group B), and a third one isolated to the right (Group C). Because the latter group is isolated, it cannot be situated chronologically relative to the others

(fig. 7). A single small bison head in profile enables us to determine the chronology of the realization of the first two groups: it links the head of a rearing horse (68) to the hooves of a large horse (93). This detailed depiction shows that the upper group was realized before the central one. Groups A and B include monumental figures, unlike Group C, which will not be included in this first study

If one considers the largest figures within the two main groups (A and B), which thus represent the largest number of interactions with other graphic entities, interesting constructions can be observed.

In the first group (A), horses are the most prominent, with two large figures positioned back-to-back. The subject in right profile (93), the most visually striking of the two, was drawn first and is thus superimposed by a large horse in left profile (104). Its long back legs intersect a group of smaller figures, including another horse that is kicking (108). A complete bison in left profile (95) links the two first horses together by superimposing one of them at the withers and the other at the rump. This theme continues in the next phase with the addition of the dorsal line of a bison turned in the other direction (88). Finally, among the main figures in this composition, there is a large, complete galloping bison in right profile (87) superimposed on the preceding horses and bison. Both themes are present in the form of back-to-back individuals (fig. 8).

In the second group (B), the two main figures (or least the largest ones, thus generating most superimpositions) are a bison and a horse, both very animated. This construction is a bit different but in the same spirit.

There is a first group of small complete and incomplete animal figures with varying orientations: turned to the right or left, horizontal, oblique or vertical, and leaving large unoccupied spaces. Bovids are dominant in this case (there is a single small horse protome), and mammoths appear for the first time. Superimposed over these is a large bison, (38) which

is the largest figure on this panel, and in all of Cussac Cave. It is followed by a series of engravings made on the contours of the large bison: these are a group of bovids, including the forequarters of a monumental bison (36) and a female figure (56), topographically juxtaposed with a mammoth. This “female figure + mammoth” theme is also found on the right part of the central register, but it is impossible to situate it in the relative chronology of the first one because it is isolated and does not intersect with other figures. A large horse in a particularly dynamic vertical position (68) is then superimposed on the hind-quarters of the large bison. The composition ends with the addition of small animals: bison, horses, and mammoths (fig. 9).

The main figure in this composition therefore appears to be bison rather than horse, but it is added to themes drawn before it, such as the mammoth associated with a female figure, which are absent from Group A.

In the same way that bison are superimposed over the story of the horses in Group A, here it is horses that appear later to complete the story of the bison. The themes in this group are richer than those of Group A.

This study of the superimpositions demonstrates that the additions of different animal taxa were intentional and that the two groups were constructed in opposite orders.

Our reasoning is based on our supposition that the additions were made within a short span of time. Even if the parameter of time is inaccessible to us, the stylistic and technical unity of the panel supports our impression of a relatively homogeneous composition made by a single generation of authors. From this synchronous perspective, two other elements raise questions: the presence of two size classes for all the taxa, except mammoths, and the very dynamic positions of some of the animals, shown rearing, galloping and jumping.

Though their meaning remains inaccessible, this study reveals that rules of construction were followed in the order of the addition of different taxa and their representation in two size classes. Could these rules be part of a story? This hypothesis appears to be supported by the animation given to the animals, which could also add to the narration of a story. The apparent visual confusion of this composition, created by the multiple superimpositions, suggests that the narrative was understandable only *via* the dynamics of its construction, rather than being transmitted by the final visual product. This same interpretation was proposed by M.

Lorblanchet for Panel II (the Frieze of Lions and Mammoths) at Roucadour (Lot, France):

“the meaning of this scene is to be found in its construction, its fabrication, as much as, if not more than, in its final state” (Lorblanchet, 2010: 358).

Though it is very difficult today, it was perhaps easier to read this panel in the past, during the Gravettian period, because what one sees today is influenced by a uniform patina that was perhaps more variable in the past, making some elements more visible than others. We exclude the idea proposed early on by Max Bégouën for the palimpsests in the cave of Trois-Frères (Bégouën, 1926), and often repeated, whereby a first group of engravings would have been intentionally masked by the application of a perishable colorant to prepare the wall to receive new engravings, because the wall in Cussac Cave would not have permitted this.

Though we do not know its exact nature, the effect of shadows and movement of the lighting at the time probably also played a role in making some lines more visible than others. Despite these nuances, the final palimpsest that is the Grand Panel in Cussac Cave must always have been difficult to read.

### *Discussion*

This dynamic study of the Grand Panel composition yields evidence of an intentional and multiple palimpsest in which “addition is made selectively, close to the one which they wish



to support or respond to, so art makers pay close attention to the position of their image” (Sapwell, 2017: 362) It shows that it is an accumulation of interacting images which make sense through their association and chronology of realization. We assume that such rules of composition underlie a narrative (in the sense of illustrating a speech). In this perspective one can wonder for which audience it would have been intended.

Replacing the panel in its context, one can contemplate two points of view: that of the engraver(s) who stood on the promontory formed by a fallen, clay-covered corbel just below the engraved surface (at 1.3 to 2 m distance), and that of the observer(s) standing farther below on the path around 4.5 m away. From this latter location, the panel extending onto the ceiling can be perceived from an orthogonal perspective, with no deformation, and with a view of the entire surface (fig. 10). The size of the panel, the monumentality of the motifs, and the space of viewing available on the path would be consistent with a potential large audience.

The engravers, on the other hand, who stood very close to the panel would not be able to back up for greater perspective, and had only a very partial view of their work. One can estimate that their regard covered no more than an oval-shaped area around 1.2 m in diameter, corresponding to the distance of their reach. If this dimension is compared to the figures, the visible zone when moving the head would correspond to only the head of the Great Bison, for example. But the zone clearly visible to the artists as they worked, this time not moving their head, would have been even further limited to the muzzle (fig. 11). To realize the large figures, it would have been necessary to move the manual field (the area accessible to the artist without having to change position) several times, and in doing this, one can imagine the difficulty of realizing the very clear and precise lines that make up these figures, especially given the uneven surface on which the artists stood. It is therefore not from their working

position that the authors could have appreciated any sort of narrative, nor even the associations of figures that they added to the composition.

For Cussac cave Grand Panel, the rock art production would have included two distinct agents: the engraver(s) as primary agent(s), and a collective audience as secondary agent. Regarding the lack of final legibility of the motifs within the palimpsest, the two agents must have been gathered simultaneously at least during the image-making process (still subsequent viewing of the panel remains unknown). Thus we assume we are facing the final result of a collective image-making performance in which ideas and concepts materialized by the images are shared by both the performer(s) and the audience, and transmitted during the making process, as underlined by H. Morphy (2010) and A. Gell (1998) in the theoretical field of “art as action”. In the previously assumed context of a collective reception, this act of creation would have been an act of collective cohesion through the iconographic expression of a common system of knowledge. Despite the current studies on human tracks and traces of activity, thanks to the exceptional quality of preservation of the grounds (Ledoux et al., 2017), evidences in this room are too few to precise the number and characteristics (age notably) of the people that formed this collective audience. Complementary on-going studies to qualify the audience on viewing criteria will hopefully provide more insights in the future (Jouteau et al., 2019).

## **Conclusion**

The homogeneity of the skills and conventions observed in the figures of the Grand Panel indicate that it was created within a short time span, even if it is now impossible to determine if it was realized by one or a small group of individuals. Hence, within Palaeolithic cave art, Cussac cave appears as an exceptional testimony for it allows small-scale temporal resolution issues (Bailey, 2007). This study has shown that the panel constitutes a true composition

whose additions were always intentional, as previously assumed in other caves (Raphaël, 1986; Laming-Empeire, 1962; Leroi-Gourhan, 1980; Vialou, 1986; Lorblanchet, 2010). It also refutes the idea that any artist here intended to create a work of art for its own sake. The significant additions (back-to-back bison on top of back-to-back horses, or bison superimposed by a horse), as well as the animations, support the notion of a narrative. At the same time, their partial obliteration during a final reading of the panel suggests that it was intended to be read at the time of the realization. Cussac cave Grand Panel can be considered as a performance, an action instead of a final visual result as one perceives it nowadays. In a semantic perspective the core of the meaning would not have been the motifs themselves but their association through accumulation process and their interacting temporality.

The monumentality of the figures and the position(s) of the engraver(s) attest to an intended narrative directed toward a collective audience. The topography, with the possible positioning of several observers at appropriate axes and distances, supports this observation. Thus the Grand Panel palimpsest would result from a collective performance. As such it would illustrate a collective form of action to connect people, images and related concepts and system of knowledge (Sapwell, 2017) through a direct and simultaneous experience and exchange whether it be oral or strictly spiritual. It could have contributed to create or reinforce a kind of community perhaps through the expression of common stories either trivial, historical, legendary or mythical. The remote location of the panel in the depths of the cave would *a priori* reject the first assumption in favor of a spiritual dimension. Indeed the sepulchral dimension of Cussac cave is no commonplace, and could help the qualification of the semantic field covered by the rock art. Unfortunately even if related to the same culture the chronological relation to the body deposits – prior, simultaneous, after – remains unknown at present especially that these two testimonies are set in different locations within the cave. Indeed a funeral dimension of the rock art symbolism (Dead World, cycle of Life and Death

etc.) that directly comes to mind remains highly speculative. Notwithstanding, the essential contextual elements of the panel, such as the lighting, the visual contrasts of the engravings, and, especially, the gestures of the artists, would certainly nuance these results, the latter remaining forever inaccessible.

Whatever the particular semantic content of Cussac cave rock art, this study yields evidence of the collective dimension of cave art palimpsests, globally seen as the expression of an individual relationship to the parietal images in most works so far. Our analysis of the Grand Panel enhances the art performance revealing the instantaneity of the art action, a short-lived event that has encapsulated a moment in time with no return (attested also by the few traces of incursions) of either the performer(s) or the audience. Even though European Palaeolithic cave art in its entirety probably does not embrace a collective vocation, these large compositions testify to collective uses which could be one of the motives behind the production of rock art, a collective role given to the visual productions, different and complementary to the one(s) played by graphic production on artefacts (*'art mobilier'*). As argued by scholars both in the Australian and European contexts, rock art could have actively participated in past social networks and territorial structuring as a medium for information exchanges to negotiate social identity and part of the settlement behaviour whether to aggregate groups and/or as territorial marker (Conkey, 1980; Lewis, 1988; Gamble, 1991; Flood, 1997; McDonald and Veth, 2012; Bourdier, 2013). Unlike the open-air sites, the remote subterranean location of the Grand Panel – and of most of Cussac cave panels – would better fit with a collective intra-group role whatever the number and characteristics of individuals it directly deals with. We can also consider that the performer/engraver here plays the role of medium in the communication and assumes then a specific status inside the group (Feruglio et al. 2011). It illustrates another social dimension of Palaeolithic cave art and as so

comes to complicate, qualify and enhance the socio-cultural functions of cave art production and cave art sites in the Palaeolithic societies of Western Europe.

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## Legends

Figure 1 – Topography of Cussac Cave with the locations of the decorated panels and the loci with human remains and the few artefacts (doc. H. Camus, Protée, CAD Fr. Lacrampe-Cuyaubère)

Figure 2 – a: General view of the gallery of the Grand Panel (ph. V. Feruglio/MC); b: a 3D rendering of the panel and the collapsed blocks underneath (photogrammetry P. Mora/PCR Cussac/MC); c: photograph of the engraved panel (ph. V. Feruglio/MC); d: the engraved panel reconstructed through an assembled mosaic of photos (N. Aujoulat/MC)

Figure 3 – a: The most visible figures; b: all of the figures (photogrammetry P. Mora/PCR Cussac/MC, recording V. Feruglio and C. Bourdier/MC)

Figure 4 – Extract of the diagram based on Harris matrix showing the chronological relationships between the different figures. Each number represents a graphic entity. The curves represent the contacts between figures. The lower a number is located in the matrix, the more it has been previously engraved

Figure 5 – Depiction of the two main taxa at two scales: horse and bison (recording V. Feruglio and C. Bourdier/MC)

Figure 6 – Example of animation in which the position of the segments is incorrect (recording V. Feruglio and C. Bourdier/MC)

Figure 7 – Distribution of the three groups of graphic entities: groups A, B, and C  
(photogrammetry P. Mora/PCR Cussac/MC, recording V. Feruglio and C. Bourdier/MC)

Figure 8 – Construction of Group A (photogrammetry P. Mora/PCR Cussac/MC, recording V. Feruglio and C. Bourdier/MC)

Figure 9 – Construction of Group B (photogrammetry P. Mora/PCR Cussac/MC, recording V. Feruglio and C. Bourdier/MC)

Figure 10 – a: Oblique view of the panel seen from the collapsed blocks underneath it; b: orthogonal view seen from the ground below it (photogrammetry P. Mora/PCR Cussac/MC)

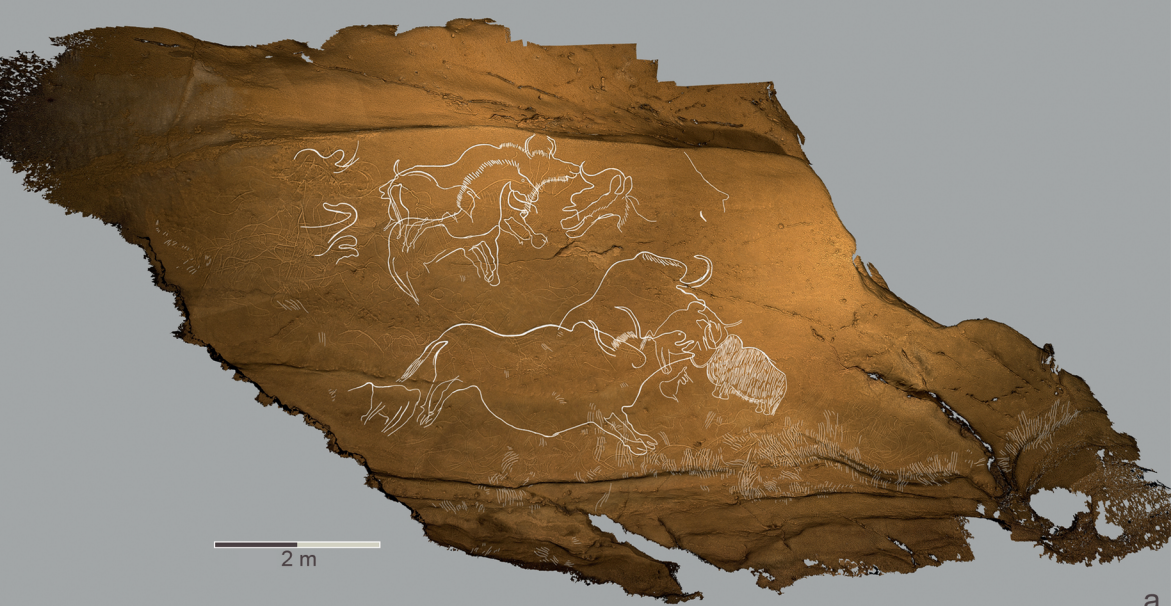
Figure 11 – a: The engraver’s field of vision when moving his/her head without moving his/her body; b: the zone that is clearly visible while engraving (photogrammetry P. Mora/PCR Cussac/MC)

**Table**

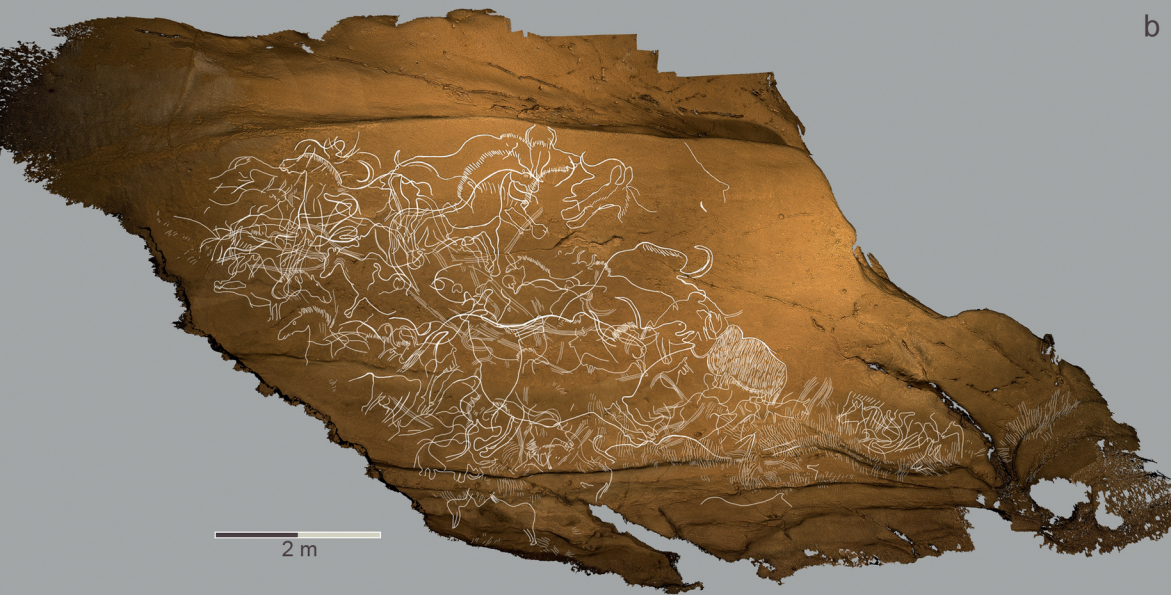
Taxa	left profile	right profile
horse	5	4
bison	9	14
bovid	6	6
mammoth	2	3
cervid	0	1

anthro	1	3
bird	1	1
canid	1	0
ind	6	4
total	31	36

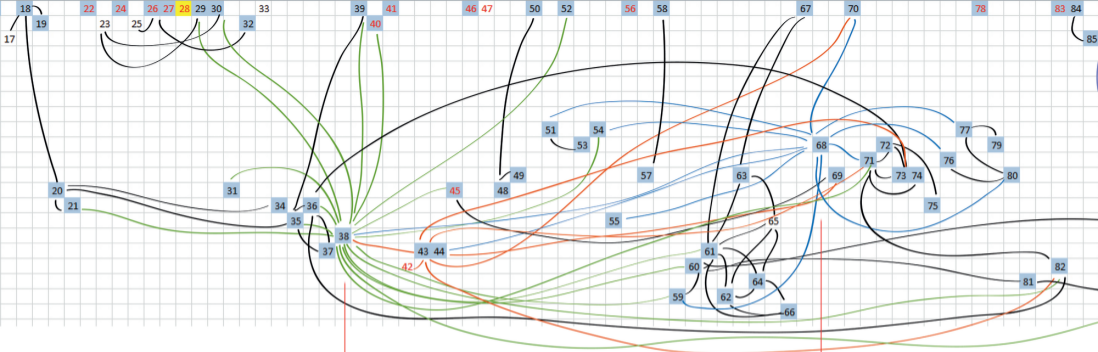
Tab. Left/right orientations of the main figures of the Grand Panel



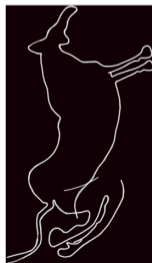
a



b

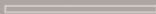


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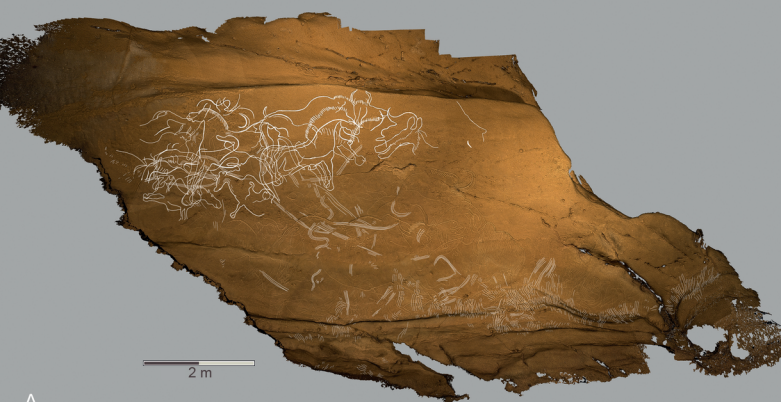
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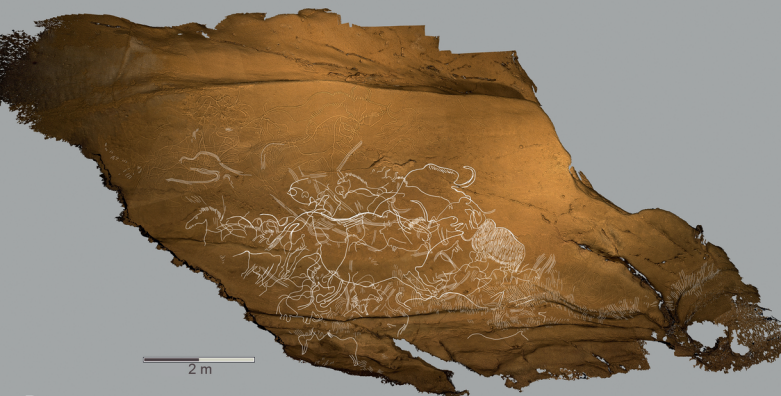


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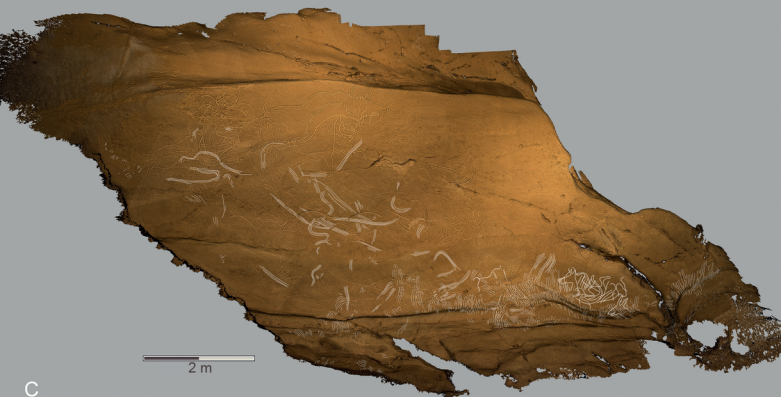




A



B



C



