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Cussac Cave Gravettian Parietal Art (Dordogne, France): updated inventories and new insights into Noaillian rock art

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Abstract

In 2008, the Collective Research Project funded by the French Ministry of Culture undertook the study of the decorated sepulchral cave of Cussac (Dordogne), discovered by Marc Delluc in 2000. In this paper, we present an update of Norbert Aujoulat's inventory (2001-2005), along with the results of a number of technical, thematic, stylistic and iconographic analyses. This examination confirmed that the rock art assemblage was both homogenous and consistent with the graphic repertoire of the Middle Gravettian (30,500-28,000 calBP), and more precisely the

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Noaillian facies. Specific thematic and stylistic commonalities with Gargas (French central Pyrenees) and the Basque Country were highlighted.

For reasons of conservation and administrative restrictions, the study did not cover the entire cave, but what is referred to as the 'Downstream Branch' (the most densely decorated part of the cavity with most of the major panels, such as the Discovery Panel and the Grand Panel) and a long but incomplete portion of the 'Upstream Branch'. Rich as the site is, this analysis can provide archaeologists with important clues about the meaning of this exceptional site.

Keywords: Parietal art; Cussac cave; Middle Gravettian; Noaillian; graphic conventions

1. Introduction

Cussac cave (Le Buisson-de-Cadouin, Dordogne) (Fig. 1) consists of a single meandering gallery that is nearly 1.6 km long, located on the right side of the B. lingou river (a left-bank tributary of the Dordogne). The current cave entrance gives access to the 'Upstream branch' (ca. 1,050 meters long) on the left and the 'Downstream Branch' (ca. 500 meters long, see Fig. 2) on the right. This distinction between the upstream and downstream branches is of relevance both hydrologically and archaeologically.

The discovery of the cave in 2000 by Marc Delluc (Delluc, 2006), who was familiar with archaeological and conservation issues, generated a great many new avenues of research and investigation, and the site is exceptional in a number of different ways. First, this is one of the rare occasions where archaeologists have been able to document the association of artistic depiction with several burials located in different parts of the cave (Aujoulat et al., 2013, Henry-Gambier et al., 2013 - see Fig. 3). Second, the extraordinary conservation conditions of the site allow archaeologists to study the different phases of animal and human occupation through different kinds of material remains, including traces, prints, speleothem fracturing, rubbings, and other traces of anthropogenic actions (Ledoux et al., 2017; Ledoux, 2018). We have suggested elsewhere that most of the archaeological remains can be safely attributed to the Middle Gravettian – i.e. 30,500-28,000 calBP (Jaubert et al., 2016).

Due to a number of conservation issues, access to the cave is limited and restricted (to selective walkways and footpaths). The study was therefore limited A) to the analysis of the 'Downstream Branch' from the current cave entrance to the End Panel (not included), i.e. nearly 500 meters, and B) to the examination of the first 800 meters of the 'Upstream Branch'. Additionally, we undertook an archaeological survey that indicated the absence of archaeological remains at the end of these two branches, as well as a number of isolated and non-figurative graphic units. To conclude this presentation, it is worth mentioning that most of the archaeological evidence is located in the **Downstream Branch**. The first monumental panel (known as the Discovery Panel) is located about 130 meters from the current entrance, along with the first sepulchral deposits (L1, L2) nearby. We then find a combination of panels with a small number of representations and other panels that are profusely decorated. Areas with almost no images then alternate with others that are profusely decorated through to the end of this branch. Additionally, we were able to prospect the first 800 meters of the **Upstream Branch** during the 2019 campaign. Besides the well-known rhinos, Venus and goose, we can underline the rare evidence of paintings and a small number of engravings on the ground in this section.

2. Material and methods

The French State has acquired the majority of the plots of land in which this cave is located (Fourment et al., 2012), thereby facilitating our research. A part of the Upstream Branch (nearly 140m) remains privately owned, however, and unstudied by decision of the owner. This part represents a few dozen graphic units.

Except for the abovementioned sections, we were able to adopt a holistic and interdisciplinary approach to the rock art. In addition to a number of shared-used technologies (topography, GIS and 3D), we worked together (Jaubert et al., 2012; 2018) with geoscientists for taphonomy and natural determinism issues, and with anthropologists on Gravettian physical and social behavior.

2.1. High-resolution topographic documentation

We began by undertaking a number of topographical analyses (H. Camus, Protée, unpublished). In addition to the structure of the ''tube'', these methods enabled us to distinguish the nature of the different components of the cave (limestone bedding, collapse blocks, etc.) and the various

rock surfaces (calcite, clay, alluvium, etc. Fig. 2). Concerning the rock art, this high-resolution topographic documentation was used to survey and map the different panels. It also served as a basis for global GIS. Each graphic unit was geo-referenced (X. Muth, *GetinSitu*) and captured in 3D by laser-scanning (Perazio Engineering), white light (Scanner e Patrimonio) and photogrammetry (P. Mora, Archeovision, FSAB), the latter two techniques also being used to document archaeological remains requiring high-resolution recording (such as traces, prints or remarkable remains).

2.2 Inventory of graphic units

The inventory was limited to the accessible areas, with the use of binoculars and long focal lenses when necessary. We developed two complementary descriptive sheets: one for each panel (or decorated area), and one for each graphic unit (Aujoulat et al., 2013). A large number of parameters were recorded, including a detailed description of the nature and taphonomy of the support, the environment of the panel, the technological, formal and taphonomic traits of the graphic units, and the superimpositions and spatial relationships between the different motifs. Such a broad collection of data provided a rich database allowing multiple queries.

2.3. Three-dimensional tracing

From the very beginning, researchers have noted the difficulty of conducting a global study of this long, rich cave (Aujoulat et al., 2001, 2002), and new tools have been required, especially for examining the cave art. Faced with such monumental engravings, Norbert Aujoulat considered 3D recording devices to be the best suited. The nature of the wide, deep engravings, due to the particular texture of the limestone (Ferrier et al., 2016), makes three-dimensional recording by photogrammetry particularly appropriate. Since we were completing his work (2009) to some extent, we followed on from his initial project and sought to capture all the rock art in a 3D format. The process is still in progress and is being conducted section by section.

A preliminary testing phase served to determine the most appropriate technologies. Laser scanning (flight time recording) has proved useful for considering cave art distribution and studying and modeling animal and human circulation, and access to the panels (Jouteau et al., 2019). Photogrammetry (rather than white light) is probably the best available way of acquiring

high-resolution details of the graphic units and walls for taphonomic and technological analysis, as well as of traces of activity (hereafter TrAc) that will not be discussed in this paper (Ledoux et al., 2017). A combination of these two methods could therefore provide the most complete results in scientific and dissemination terms. As a matter of fact, the current examination of the walls is determined by the path and in many cases does not offer the right conditions for a precise observation of the decorated panels (distance, non-orthogonal view, difficulty of adequate lighting, etc.). The 3D models were manipulated within the cave on a graphic tablet using MeshLab software and the ArTaPOC plug-in (Feruglio et al., 2015) which allows the user to select the faces or vertices of the engraved tracings and/or the corresponding surfaces. This results in an annotated model that combines geoscience observations and examination of graphical features, while remaining within the volume coordinates and the same geo-referencing. These models can therefore be replicated by other disciplines and continue to be enhanced by new observations as research progresses.

3. Results

3.1 Inventory of graphic units

Our inventory includes 825 graphic units distributed between 72 decorated areas (or panels) (see Tab. 1, Fig. 3). These graphic units range from simple lines to complex figurative images and include more or less elaborate and/or constructed patterns. Graphic units can sometimes be ambiguous and may have been classified both as 'traces of activity' and art. Our definition of 'decorated panels' includes areas with a single graphic unit or a group of them, which may be delimited by natural rock features (such as rock lobes, cracks, breaks, etc.), but not necessarily. This classification is strictly conventional and holds no interpretative dimension (Fig. 4).

72% of the total number of graphic units are classified as 'patterns', a class that should be divided into abstract images, non-identified sections of depictions, 'incomplete' images and, for those that are sufficiently elaborate, 'symbols'. This work is yet to be done, however.

Figurative depictions (N = 228) represent 28% of the graphic units (Fig. 5). Most of them (25%) remain undetermined, i.e. images that can be identified as 'animals' but for which concrete taxon diagnosis cannot be performed. This is partly the consequence of our methodological rigor and

partly due to the specificity of Cussac art (a cave in which the figurative art is not particularly descriptive). This class will vary according to the tracing progress which may clarify the taxon attributions. We are tempted to consider some of these 'undetermined images' as 'fantastic' or 'unreal' animals (within the meaning of Bégouën in GRAPP, 1993).

Among Middle Gravettian fauna, a selective choice was made for the bestiary of the walls. The representation that largely dominates in the animal imagery is the bison (N = 71), accounting for almost one-third of the depictions (31%). We have also identified other animals, such as mammoths (N = 24 - 10%, Feruglio et al., 2018), humans (silhouettes or sexual graphics - 9%), bovids and horses (8% each). The bison/horse pair commonly found in Paleolithic cave art (Leroi-Gourhan, 1965) is rare in Cussac, while the special place given to rhinos, birds and carnivores, which are usually scarce in European Pleistocene art, should be highlighted. The small number of representations of ibex and deer is exceptional for a Gravettian site. This probably reflects an environmental specificity of the region, as caprine faunal remains are scarce in the Aquitaine Basin (Delpech, 1999).

In addition to this frequency of depiction, the distribution of the main themes within the cave is also relevant, and will be the subject of the next section.

3.2. Thematic distributions and compositions

The distribution of graphic units is uneven between the different sectors. Broadly speaking, about 75% of the images are located in the Downstream Branch and 25% in the Upstream Branch. The compositions also change, with palimpsest or multiple figures panels typically located in the Downstream Branch, whereas isolated figures or motifs are found in the Upstream Branch. The geomorphology of the cave does not explain such a difference, although there are some (rare) ceiling collapses in the Upstream Branch that may have included decorated panels. As previously mentioned, there are also some significant technical differences between these two sections, with painted motifs restricted to the Upstream sector. This does not seem to be due to taphonomic factors. The engraving techniques are the same throughout the cave and include digital tracing, clear line, and modelled incisions.

The distribution of the themes is also informative. For instance, we observe broad variety in the Downstream Branch (probably linked to a greater number of units). Additionally, a number of themes, including patterns, are found throughout the entire cave, such as a meander fluting motif encountered several times within 900 meters, bison, mammoths and women (fig. 6), while other themes are restricted to the Downstream Branch, such as indented circles, horses, caprids carnivores or unreal animals. Although such differences can be noted, however, there is nothing to counter the impression of a single, homogenous iconographic program for the whole cave.

The compositions can be monothematic or multi-thematic, with animals confronted face to face or back to back. The same animals can be represented in a variety of accumulations or juxtapositions (see, for instance, the bison in the Discovery Panel - Aujoulat et al., 2013 - or the Passage Panel). Without being defined as what art historians call ‘friezes’, the chronological analyses of the tracings show that they were added in linear order (bison from the Discovery Panel). Whatever the case, analysis of the superimpositions reveals that the palimpsests are genuine compositions and not mere accumulations of single figures. The themes are combined in a dynamic structure that may be analogous to a kind of artistic performance, and may relate to an oral narrative (Feruglio et al., 2019). Some locations in Cussac, especially those where palimpsests are found, are particularly suitable for "performance" and accommodating an audience, as can easily be highlighted by 3D models (Jouteau et al., 2019). Within the compositions, we documented a relevant relationship between the bison and the horse on the one hand, and between the mammoth and human female silhouettes on the other hand (Fig. 6 and Aujoulat et al., 2013; Feruglio et al., 2018). The association of the mammoth and female human silhouettes is found three times at the Grand Panel and seems to embody a specific symbolism. Moreover, it must be noted that the mammoth is also found very close to the female figures in the Upstream Branch, although not in direct association. Humans, whether present in complete anthropomorphic silhouettes or reduced to their sex (male or female), are as widely distributed as the mammoth throughout the cave. Thus, although the association between the two is not concrete, except on the Grand Panel, this is a hypothesis to be explored in the future.

3.3 Technical and formal conventions

A significant part of Cussac art consists of engraving (75% of the graphic units). The use of pigments is generally limited to dots, lines, digital traces and non-figurative marks. On account

of the nature of the limestone, a large range of tools were used to engrave, from soft (finger) to hard (stone artefacts) with more or less sharp fronts (fig. 7). We have even recorded traces left by inadvertent hand pressure during the making of the engravings. These traces follow the engraved lines a few centimeters apart and appear as bands that are 3 to 5 cm wide, lighter and more superficial, like on the Discovery Panel (Aujoulat et al., 2013; Ferrier et al., 2016) or the Facing Animals Panel. Surprisingly, these superficial imprints have been preserved to the present day. They demonstrate the particularly good conditions of preservation of the rock surface. These marks also inform us about the position of the engraver's hand, as well as about the different tools that were used.

What we notice at first glance is the mastery displayed by the engravers. The animals in particular are engraved in a way that can be described as a clear line without interruptions. The lines of the front and rear parts of the animals converge towards the top of the head, but without joining.

Only 15% of the animals and humans are represented in full, but individuals missing only their front or hind legs represent nearly one-quarter of the representations. However, the vast majority is only partially depicted, with a focus on single body elements, especially the head. One might wonder if an equal value can be assigned to these incomplete drawings if we still recognize the taxon perfectly. The profile of the animals seems indifferent: 51% are turned to the left.

While the texture of the walls allows technical freedom, we have identified a number of strong formal conventions. The first is a void left between the horns (bison), or between the hairs or the ear and the mane (horses – see Fig. 8). Other figures include very well mastered arabesques, meanwhile, like a deer head on the Clay Bridge Panel made up of just three sinuous lines (Fig. 9). It is also obvious that although it is impossible nowadays to identify an animal if one of these lines is isolated, it might have been perfectly recognizable to a Gravettian audience (for instance, line #2 in Figure 9).

It would appear that naturalism was not the engravers' main goal. This explains, for instance, why the anatomical proportions are not necessarily respected (atrophied heads, shortened, thin legs, elongated anatomical segments, etc. - Aujoulat *et al.*, 2002) and details are rare. A single line for the mouth or a comma or curve as a nose can be traced inside the muzzle, while a round

or triangular eye may occasionally be added. In contrast, the relief of the eye socket is often mentioned as a convexity along the head contour. The pectoral muscle is shown ahead of the front leg by a curved line. Few animals are sexualized, some of them by a penile sheath and two with the exceptional depiction of the testicles.

Within these stylistic trends, other anatomical elements show some diversity in their form. The legs are sometimes modelled (shoulder, knee, hock) and the hooves outlined with an indication of claws, fetlocks or ergots, while the end of the legs can be realistic, left open or Y-shaped, with these different renderings sometimes associated in the same figure. The bisons' chignons can also vary: high and rounded, elongated and flat (in a 'banana' bun), formed in a single outline, striated or combining the two. Such variable forms and techniques are also found in the horses' manes which are usually striated but may also be outlined as a crest, with some individuals combining both (Fig. 10). They are usually arched but may also be straight and directed either forwards or backwards, notably when the animals are drawn in motion.

The perspective treatment can also be read as a convention. The rear planes are shown in oblique bi-angular perspective for the horns (C- and S-shaped, straight or mirror) and straight bi-angular perspective for the limbs (the inter-pectoral and pelvic zones are drawn). Such twisting also affects the legs, including the hooves on bovids. All in all, there is a constant intention to represent the two planes: the first never hides the second, they are either juxtaposed or superimposed with a transparency effect (Feruglio et al., 2019).

The legs do not seem to be in contact with the ground, except for some mammoths with widened, pad-like paws. We also observe a desire to represent animals in motion, whether discrete or complex. When complex, the rendering is never realistic, as if were not well mastered: the continuity of the outline is often broken, which artificially creates a shift between the body parts (fig. 11). However, such artistic tricks do boost expressiveness, however.

The bison is a main actor in the palimpsest panels where it appears animated, ''staged'', endowed with anatomical details and sometimes larger than life-size (Grand Panel). When isolated, it often interacts with a congener. It can just as easily be alone, however, to the point of being very discreet and only suggested by a calligraphic arabesque showing its facial profile. This theme therefore also dominates by the message it conveys. The mammoth is rather abundant in Cussac

and is the only taxon to benefit from very detailed graphic treatment (#5G2-20). However, like the bison, it can also be reduced to a single curve (cervico-dorsal line).

4. Discussion

The rock art features of Cussac are typical of the Middle Gravettian (30,500-28,000 calBP), and more specifically of the so-called Noaillian, but they are expressed with greater variability.

The primacy of the bison-mammoth pairing and depictions of women link Cussac to the Gravettian parietal features of the Quercy region (Pech-Merle), as was highlighted right from the expertise stage (Aujoulat et al., 2002). Other analogies in the bestiary have also confirmed this relationship through two other cave art sites (Roucadour, even Pergouset for the final panel – Fig. 1). The indented circles that were discovered later strengthened the links with the Quercy group in the abstract register, as did the flutings (sometimes called 'macaroni') including meander motifs, which are also documented on the Ceiling of the Hieroglyphs in the Pech-Merle Cave (Lorblanchet, 2010) and are found throughout the length of the Cussac cave. The Cussac thematic repertoire is also very similar to the central Pyrenean site of Gargas (Barrière, 1976), except for the female representations, but with the addition of birds which are absent from Quercy assemblages. The birds in Cussac are all *anatidae*, one of which is also engraved on the left wall of the Camarin in Gargas (Barrière, 1976).

In addition, complex compositions (including palimpsests) are typical of the structuring of rock art assemblage in other Middle-Gravettian cave art sites, whether painted or engraved (Black Frieze, Ceiling of the Hieroglyphs in Pech-Merle, Camarin and Baldaquin in Gargas, Diaclase in Roucadour).

The essential formal traits mentioned above are common to the other Gravettian parietal assemblages: bodies reduced to their main lines, continuous but frequently partial contours, with anatomical disproportions (atrophic heads with "duckbill" snouts, thin legs) and a lack of internal details (Jaubert, 2008; Jaubert & Feruglio, 2013). Within this general framework, specific links with Pech-Merle can be established, particularly through their very similar female figures with reduced heads, enlarged buttocks and breasts, and apodal figures with spindle-shaped legs (Aujoulat et al., 2004). However, the position and shape of their breasts differ. The transparency

effect on the animals' legs and hooves in Cussac, an essential formal code of this graphic ensemble, is also applied to some of the figures in Pech-Merle (Ossuaire) and to the breast of a woman on the Ceiling of the Hieroglyphs. The formal rendering of the mammoths is also alike (Ceiling of the Hieroglyphs and Black Frieze), with one line contouring the tusk and the forehead, inducing a non-realistic implantation of the tusks along the trunk; divergent tusks; the trunk curved inwards with individualized fingers; an angular mouth; legs with pad-like paws, juxtaposed on the same plane (Lorblanchet, 1981). Some of these characteristics are also found on the rare Gargas individuals (tusk continuing on from the forehead, planted in the trunk; angular mouth). The particular location of the tusks has also been noted in the Early Gravettian context of Arcy-sur-Cure (Baffier & Girard, 1998).

Concerning other herbivores, specific connections can be spotted with Gargas and Roucadour, such as a bulging of the pectoral muscle and a rectangular entablature between the front legs (on a megaloceros at Roucadour; on bison and aurochs at Gargas). The horses' heads at Cussac and Roucadour show many similarities: "duck's beak" muzzles, arched manes oriented backwards, and a single pointed ear raised on the top of the head when drawn (Lorblanchet et al., 2009; Lorblanchet, 2010). However, the Roucadour horses are very uniform and much more expressive, if not caricatural, and all the graphic richness found in Cussac is missing there. Just for the mane, the hatched contours are completely absent. The rendering of the bodies is also quite different, with very schematic legs that may be open or Y-shaped, almost always seen in absolute profile. The most striking analogies are with the Gargas horses (Feruglio et al., 2011) depicted with an arched, usually hatched, mane and muzzles of various shapes including "duck's beaks", with a modelled trough, a mouth line and a curve-shaped nostril. Some of the legs are very detailed with modelled joints and rounded hooves.

The closest similarities with Gargas lie in the representation of bison (Aujoulat et al., 2001; Feruglio et al., 2011), notably through the same graphic process of forming the head with two lines: a sinuous one for the frontal contour, from the snout to the tip of the front horn, and a second for the rear horn, neck and start of the dorsal line; a void can be left between the two horns or filled by a series of hatches. These sites also share figurations that are reduced to the maximum, with a single sinuous line reproducing the curves and counter-curves of the beard, muzzle, convex-concave muzzle and anterior horn. The shape of the head is also alike, with a

rounded snout followed by a double convexity for the forehead, a C-shaped frontal horn and an S-shaped posterior horn, or converging C-shaped horns, with the beard separated from the dewlap. The morphotype most commonly found in the Grand Panel - with hatched beard and dewlap - is used for some individuals at Gargas and also at Pech-Merle, but with a different graphic rendering (a very tight series of short, vertical, straight lines). However, it is interesting to note that the "banana" bun morphotype of some bison on the Cussac Grand Panel is not found in Gargas, while it is one of the essential attributes of the Pech-Merle bison (Lorblanchet, 2010). Finally, some formal elements of the Cussac cave are absent from the Quercy ensembles, but can be observed in the engraved register of Gargas. This is the case of the sexual organs, and in particular the testicles of at least two animals identified as ibexes in Gargas (Barrière, op. cit.). Recent rock art survey projects in northern Spain have revealed occurrences of Gravettian formal conventions at Aitzbitarte III and IX in the Basque Country (Garate et al., 2016) and at Alkerdi 2 (Álvarez et al., 2016) notably for the bison (Garate, 2018) with the C- and S-shaped horns prolonged in the forehead for one, and for the tracing of the back line for the other. The convention that draws the legs on the same plane is also similar (fig. 12).

Finally, despite all these formal links, Cussac does remain original in some respects, for example in the very detailed rendering of the legs and hooves. These first stylistic comparisons reveal a complex set of influences and correspondences with several Gravettian parietal features of the Aquitaine basin and Pyrenees (Basque Country included), and notably the strong relationship with the Gargas cave noted in the very first publications. It should also be noted that human remains were unearthed during recent excavations at Gargas (Foucher et al., 2012; 2019): even if not strictly alike, we cannot help but see closer links with Cussac. Old and recent excavations have also provided mobile art that is well attributed chrono-culturally to the Noaillian (Breuil & Cheynier, 1958; San Juan-Foucher & Foucher, 2014) and for which figurative representations are comparable to the depictions on the walls. Some authors have also noted strong affinities recently with the mobile art of Isturitz cave in the same chrono-culural context (Rivero & Garate, 2014).

5. Conclusion

The great formal, thematic and technical unity of the Cussac graphic system is remarkable and contributes to further formalizing the aesthetic and symbolic conventions of the Noaillian Middle

Gravettian (30,500-28,000 calBP). Middle Gravettian parietal art is typically characterized by a number of conventions applied in technique, style and compositions, and Cussac matches them. The lithic and bone industries of this culture, where stereotypes of some kind are established, reflect significant changes that are likely to be due to environmental stresses (Feruglio et al., 2011; Delpech & Texier, 2007). If the art is also so stereotypical, this may reflect a more rigid structure of society. At least, these stereotypes unify a particular set where Cussac plays a major role. The concepts are still to be defined more precisely, but the studies carried out at Cussac are already opening up new perspectives. The geographical area defined by the convergences stated above is restricted to the South of the Dordogne River and western Pyrenees, while the Noaillian facies covers a broader area (from the Charente River to the North, Cantabria to the West and the Tyrrhenian Coast to the East – Djindjian et al., 1999). Are we facing a particular moment of this facies, one that was restricted to a small western area? Is it due to the lack of artwork elsewhere in the Noaillian facies? Further comparisons and more (and also more accurate) radiocarbon dating should be carried out.

Inventories and the study of certain graphic constructions have enabled us to demonstrate that simple taxon frequency counts alone do not allow us to establish a profile or cultural attribution to a particular symbolic system. For example, the counts do not highlight the buffalo/horse pair, and yet their relationship seems very strong inside the complex compositions or the structured panels. The association of mammoths and human female silhouettes or sexual sign images constitutes a major symbolic concept within Cussac, whether in direct juxtaposition or located in the same sectors of the cave. Do the Gravettian female statuettes on mammoth ivory reflect the same concept to some extent?

The association of graphic expressions and human bodies located in the same place is not an exception to this period (Henry-Gambier, 2008) but gives the cave a very special status in which spiritual appropriation is strengthened.

Cussac has already contributed to clarifying the vision of Middle Gravettian graphic output, which will be enriched by more in-depth studies of the various panels in search of symbolic constructions, probably dealing with the worlds of both the living and the dead.

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35- San Juan-Foucher & Foucher, 2014,

36- Rivero & Garate, 2014,

37- Delpech & Texier, 2007,

38- Djindjian et al., 1999,

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Legends of the figures

Figure 1: Location of Cussac cave (Le Buisson-de-Cadouin, Dordogne) and of the sites cited 1: Roucadour, 2: Pech Merle, 3: Gargas, 4: Isturitz, 5: Alkerdi 2, 6: Aitzbitarte III and IX (© Google Earth & ® GéoAtlas revised)

Figure 2: Simplified general topography of Cussac cave and location of the inventoried rock art panels and locus with human remains (Topography H. Camus, Protée, DAO F. Lacrampe-Cuyaubère, Archéosphère)

Figure 3: Distribution of the inventoried rock art panels. Blue triangles: the panels with isolated figures; green boxes: the panels with juxtaposed entities; red dots: the palimpsest panels (Topographic background F. Lacrampe/Archéosphère)

Figure 4: Example a: of an isolated figure panel; b: of a palimpsest panel (ph. V. Feruglio & C. Bourdier/ Ministry of Culture)

Figure 5: Frequencies diagram of the different figurative themes of Cussac art.

Figure 6: Distribution of the major taxa in Cussac cave rock art, a: bison; b: mammoths; c: horses; d: human figures (Topographic background F. Lacrampe/Archéosphère)

Figure 7: Two examples of technical aspects given by the natural texture of the rock surface, a: fluting crossing a clay inclusion, showing the direction of the motion; b: sharp tool incisions and striations of a sharp tool with a multiple front inside the larger incision (Ph. V. Feruglio & C. Bourdier/ Ministry of Culture)

Figure 8: Examples of the graphic process of making taxa bison and horses in two lines, one for the front outline and a second for the back and rear (doc. V. Feruglio & C. Bourdier/ Ministry of Culture)

Figure 9: Example taken from the photogrammetry of a layout realized by adding arabesques, the Cervid of the Clay Bridge Panel made in three curves. The order is that of the numbers (doc. photogram. P. Mora/MC & scheme V. Feruglio & C. Bourdier/ Ministry of Culture)

Figure 10: Detailed representation of a horse's mane on the Cussac cave Grand Panel (Ph. V. Feruglio & C. Bourdier/ Ministry of Culture)

Figure 11: Examples of discrete motion of a mammoth, and complex motions for a horse and a bison - Cussac cave Grand Panel (Ph. V. Feruglio & C. Bourdier/ Ministry of Culture)

Figure 12: Comparisons of some major convergences with the artwork of the main French sites cited; 1: Gargas (from Barrière, 1976), 2: Isturitz mobile art (from Rivero & Garate, 2014), 3: Roucadour (from A. Glory *in* Coussy, 2005), 4: Cussac, a: Ibex Panel, b: Grand Panel, c, d: Facing Animals Panel, e: Discovery Panel, f: Grand Panel – scale = 50 cm

Table 1: Cussac cave graphic entity inventory by theme and distribution.

Cussac Cave Gravettian Parietal Art (Dordogne, France): updated inventories and new insights into Noaillian rock art

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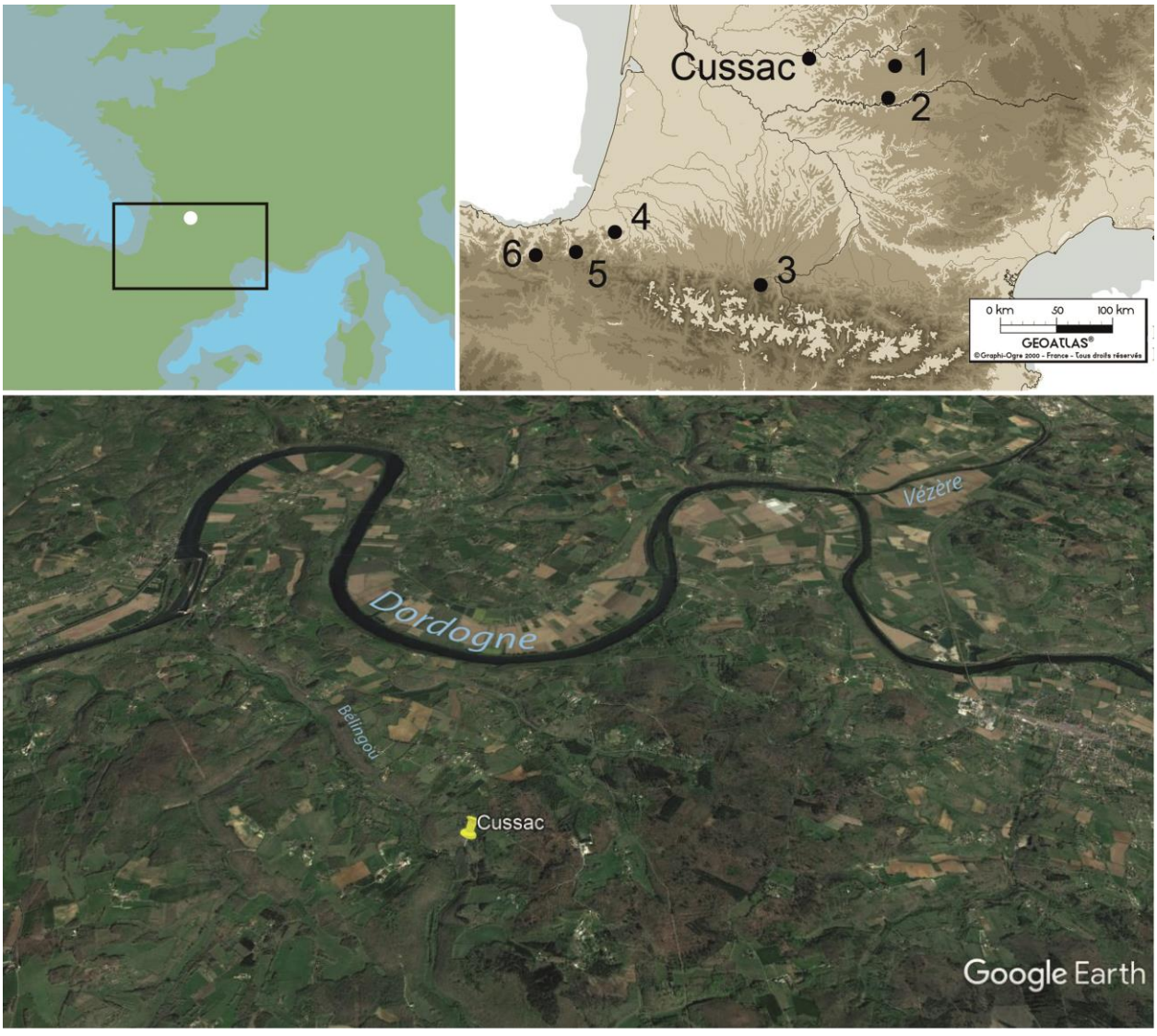
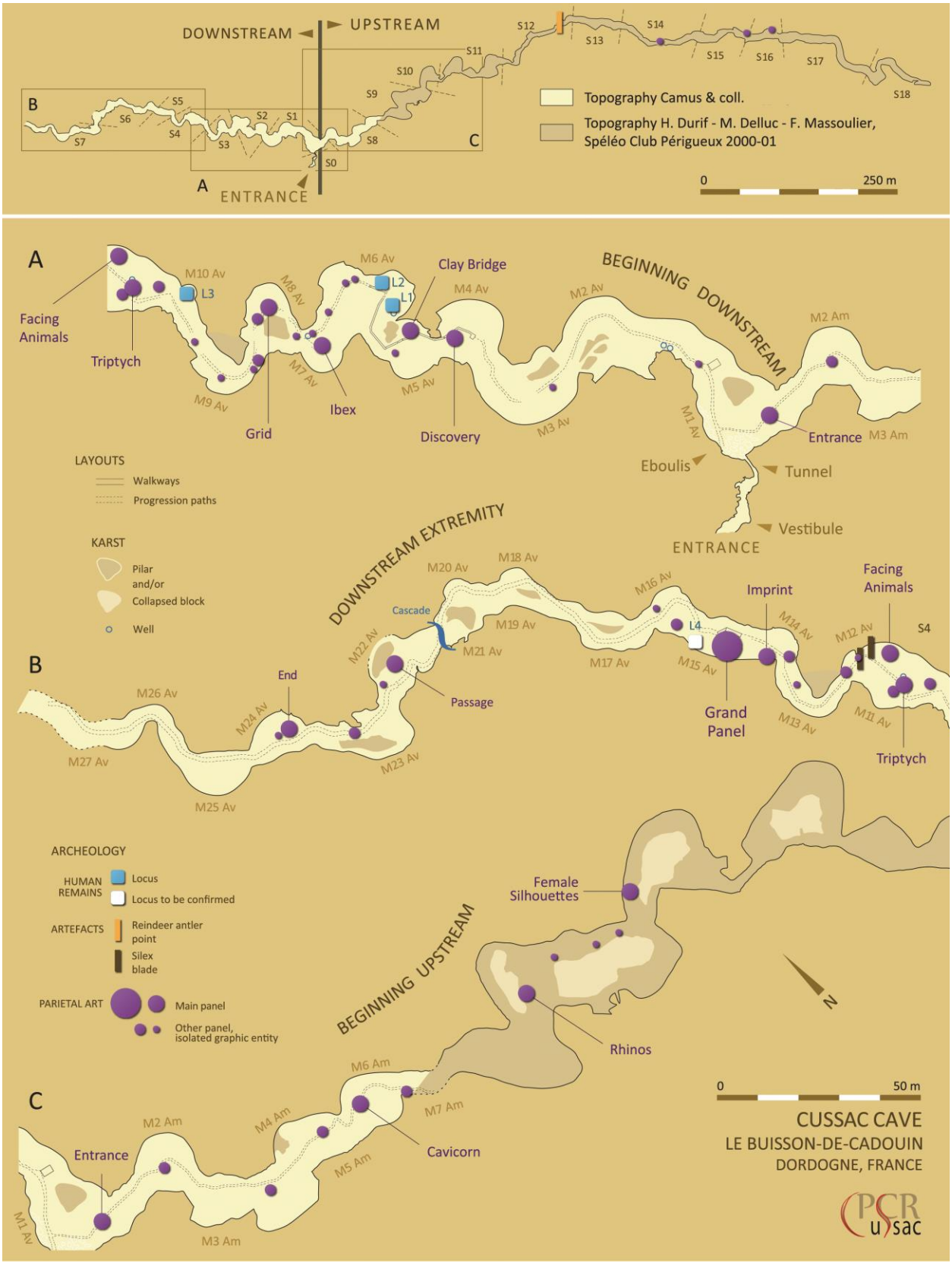
AUTHORS STATEMENT

The descriptions, data and results of the submitted manuscript are agreed by all authors.

Valérie Feruglio: conceptualization, methodology, acquisition of data, analysis and interpretation, writing, reviewing and editing, **Camille Bourdier**: conceptualization, methodology, acquisition of data, analysis and interpretation, writing, reviewing and editing, **Norbert Aujoulat**: methodology, acquisition of data, **Marc Delluc**: investigations, acquisition of data, **Jacques Jaubert**: conceptualization, methodology, acquisition of data, analysis and interpretation, writing, reviewing and editing, funding acquisition

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Progression paths
KARST
Pilar and/or Collapsed block
Well
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Cascade
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Passage
Imprint
Grand Panel
Facing Animals
Triptych
BEGINNING UPSTREAM
Female Silhouettes
Rhinos
Cavicorn
Entrance
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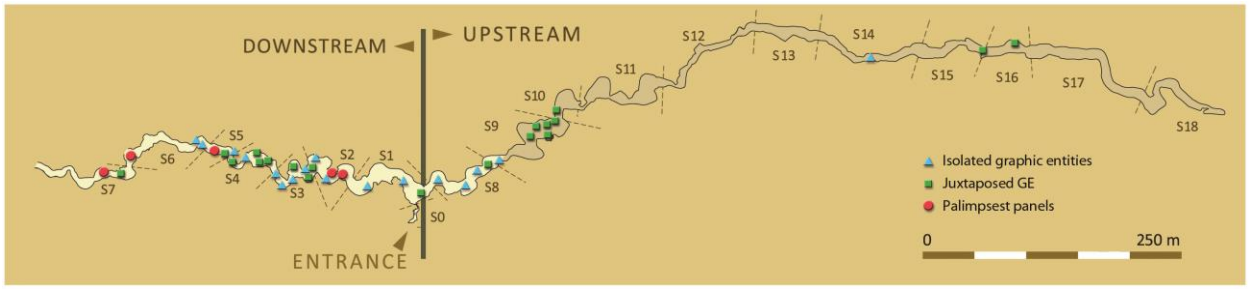
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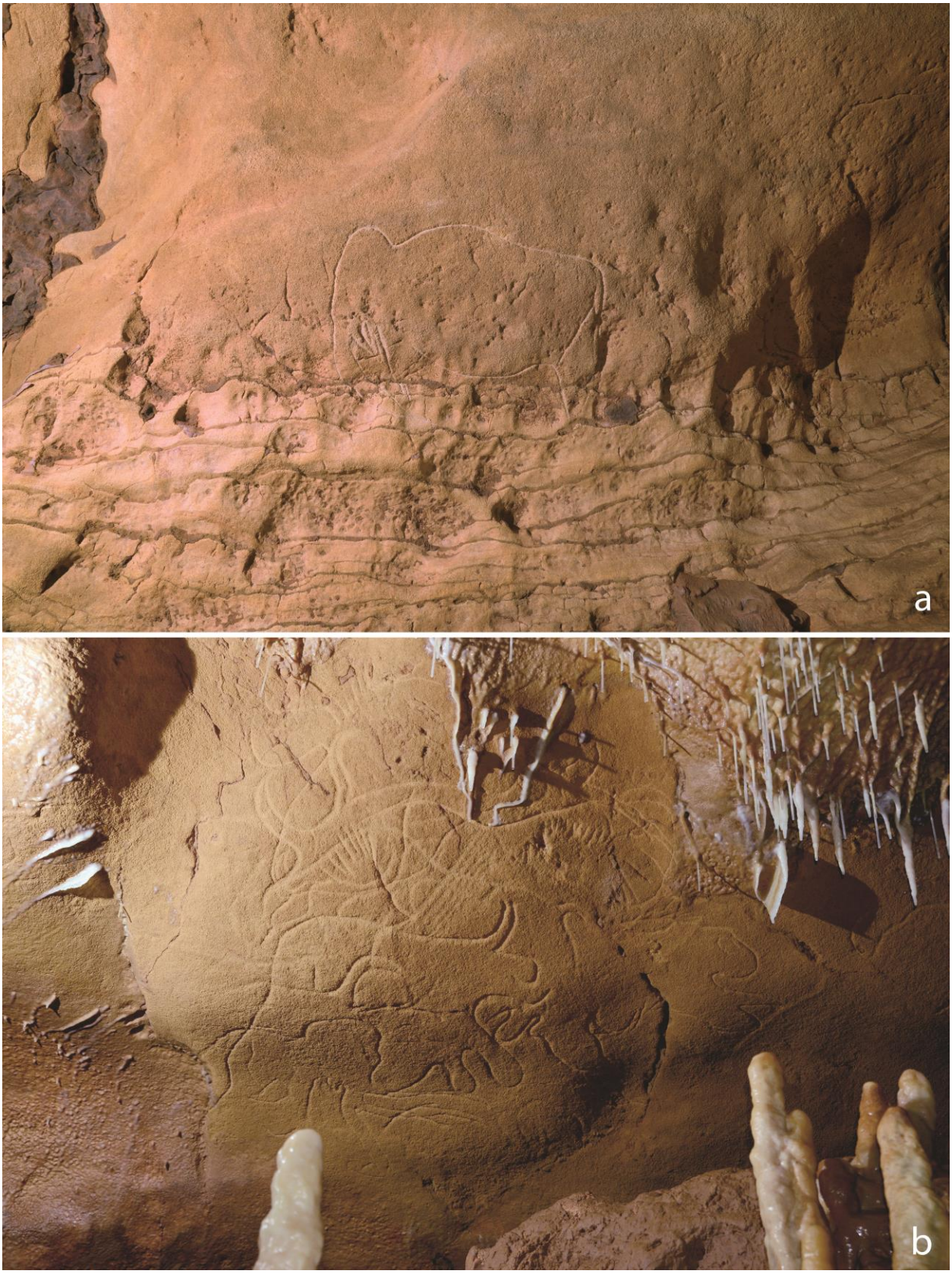
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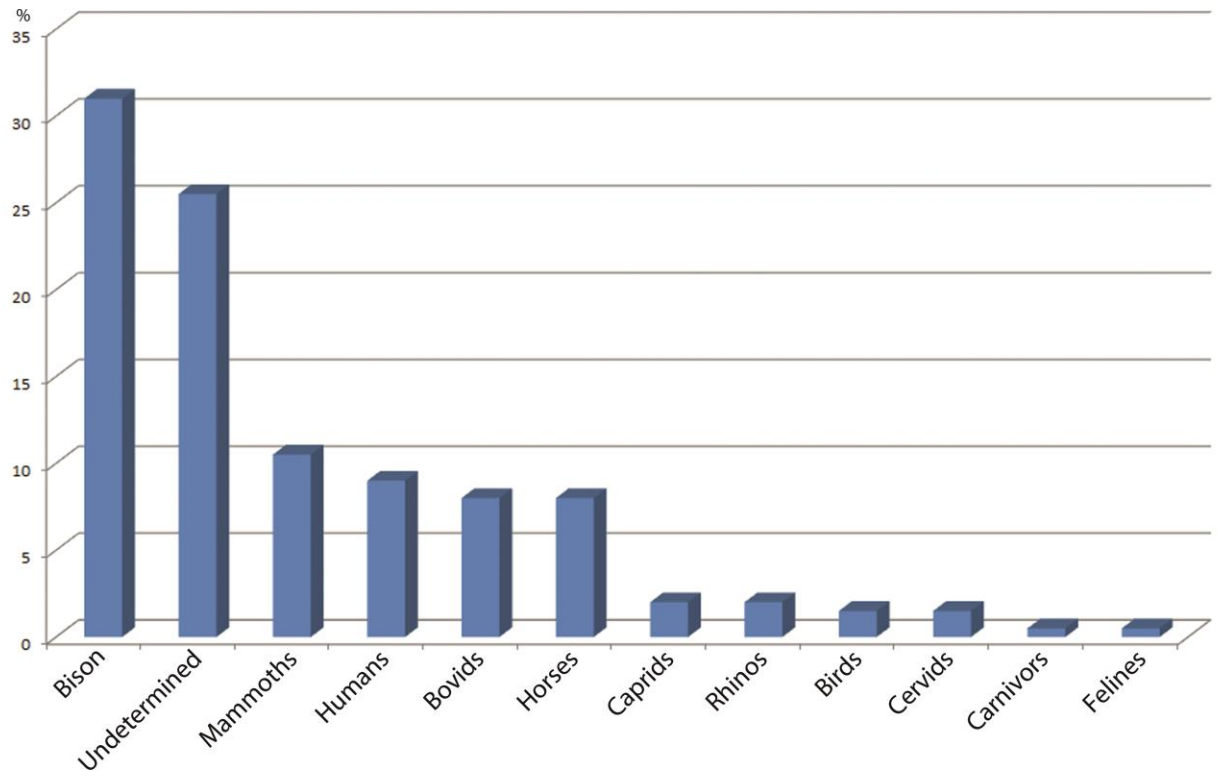
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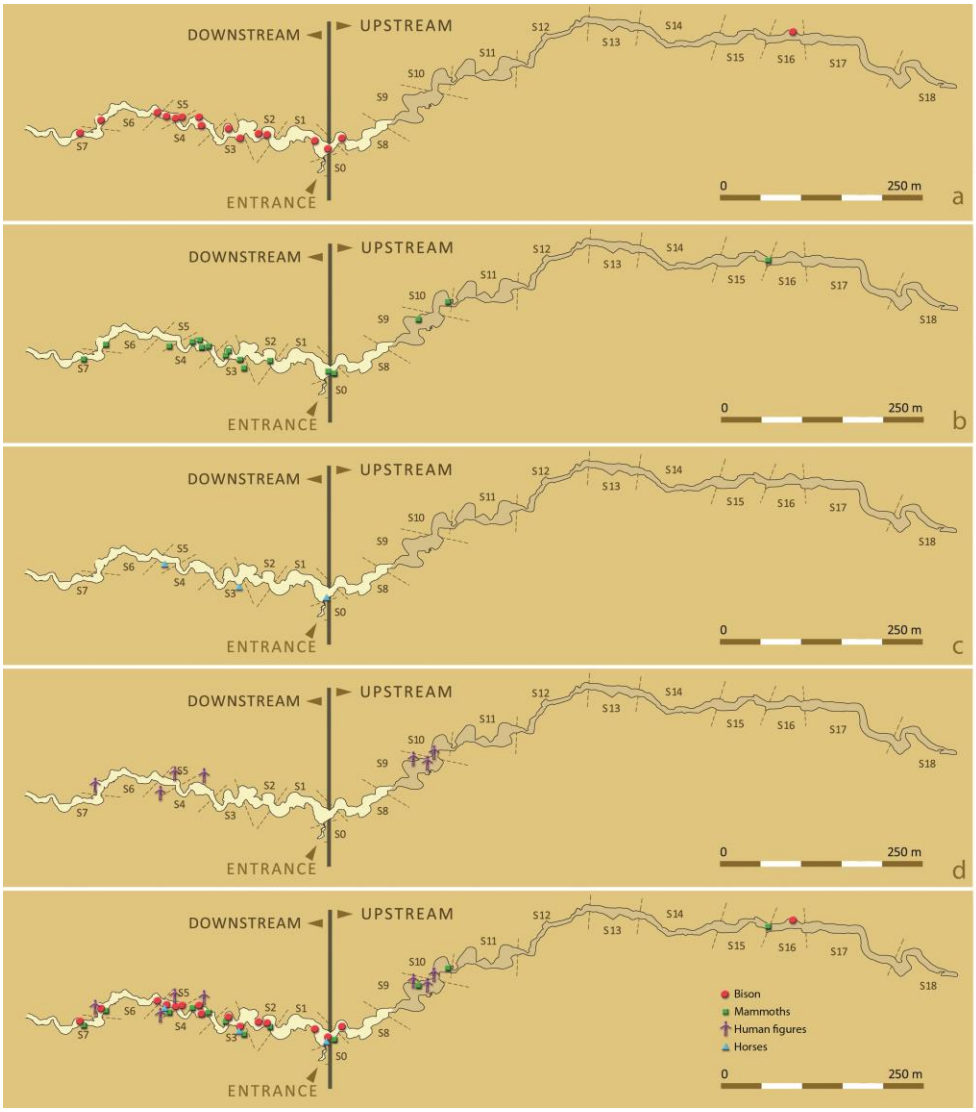
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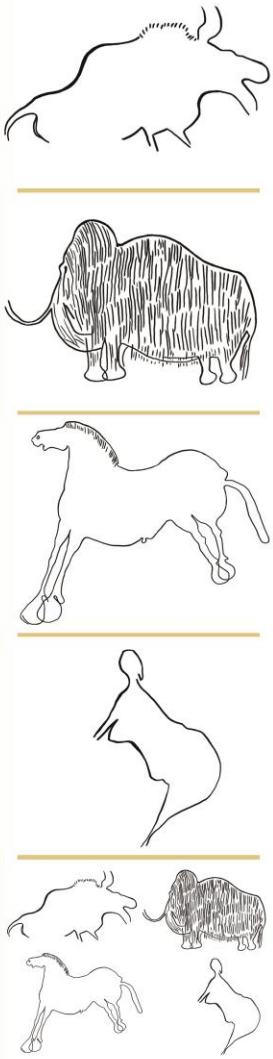


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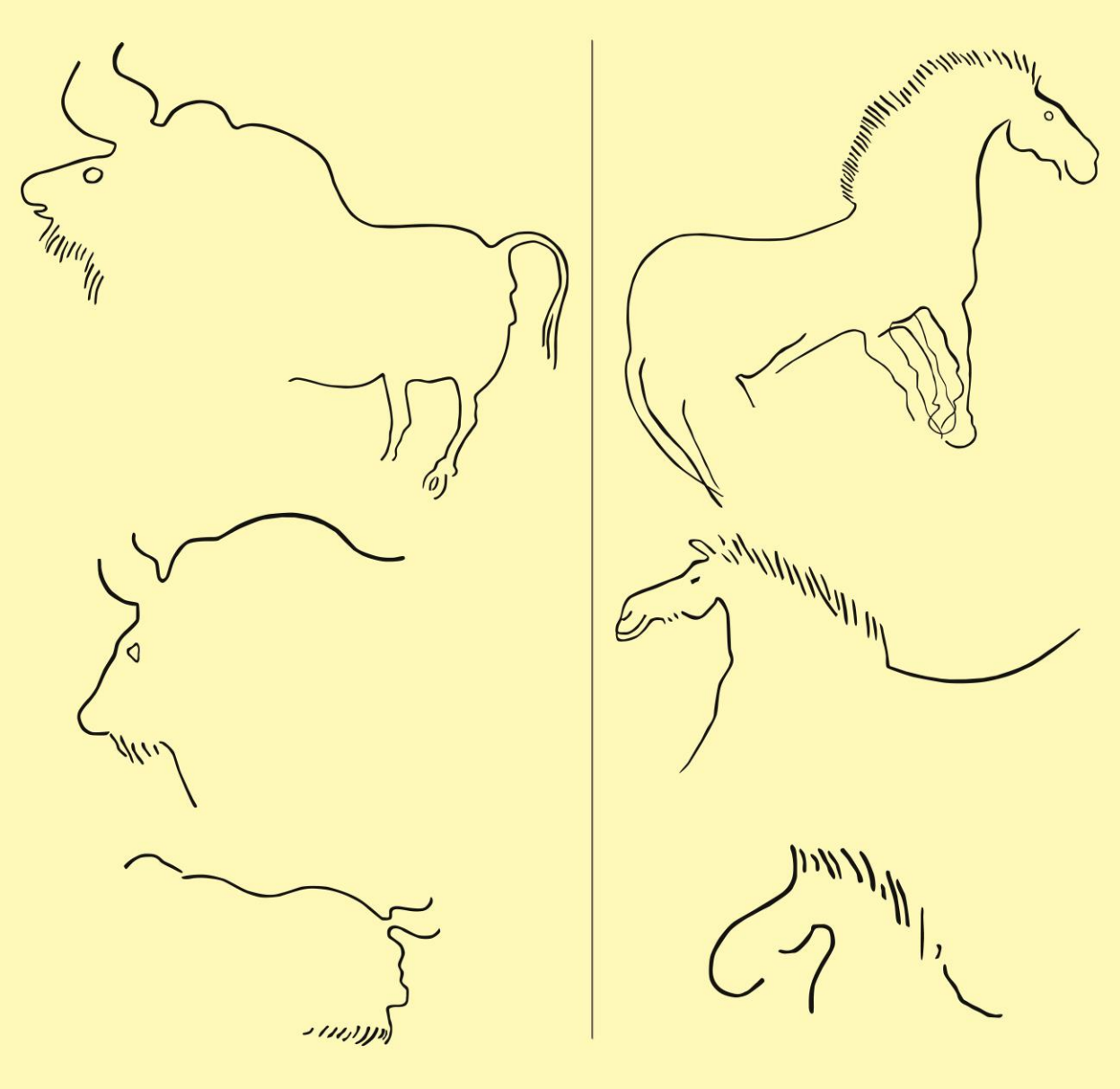


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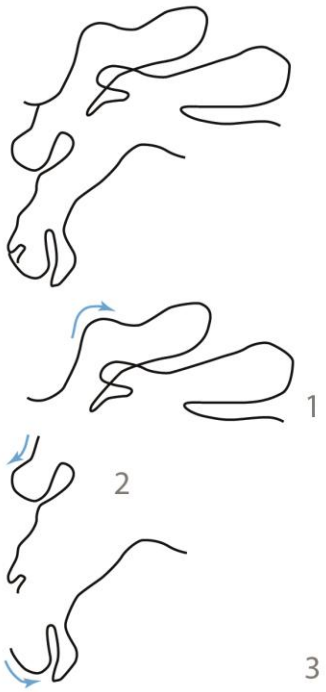
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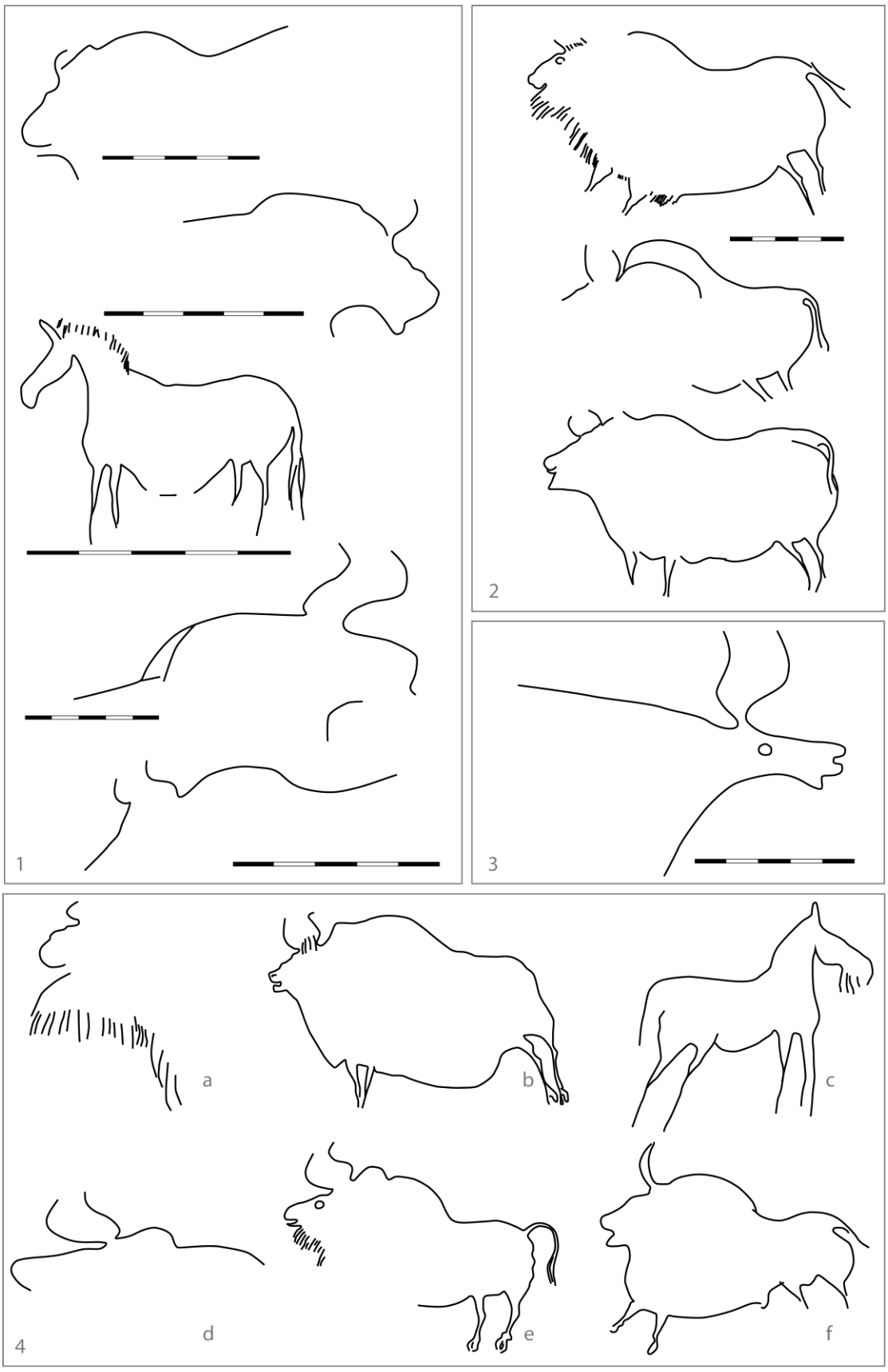
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Cussac Cave Gravettian Parietal Art (Dordogne, France): updated inventories and new insights into Noaillian rock art

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HIGHLIGHTS

- The Paleolithic artwork of Cussac provides new insights into Gravettian culture
- The updated inventories of the bestiary are presented in terms of species frequency but also in terms of location
- Technical, thematic, stylistic and iconographic analyses are presented
- The rock art is both homogenous and consistent with the graphic repertoire of the Middle Gravettian (30,500-28,000 calBP) and more precisely the Noaillian facies
- Specific thematic and stylistic commonalities with sites from the Pyrenees and Basque Country are highlighted
- This specific artistic expression, particularly legible at Cussac, reveals a particular aspect of Noaillian culture in a restricted area of its general extension.