

A new research program at Font de Gaume cave (Les Eyzies, Dordogne, France)

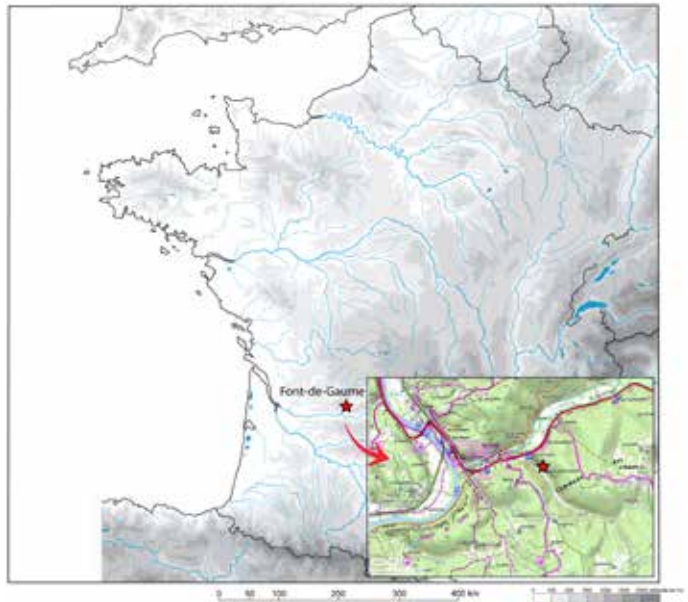
In the early 20th century, the Font-de-Gaume cave contributed to the official and definitive recognition of Paleolithic cave art. Its renown stems from the quality of its engraved, drawn and painted works, sometimes in polychrome, as well as the majesty and parietal integration of its bison, mammoths, horses, reindeer, deer, ibex, aurochs, rhinoceroses, indeterminate animals and more, arranged in long processions on the walls of the main gallery, after the Rubicon, and of the terminal diverticulum, amassed on the voussours of the bison cabinet, or scattered at the crossroads and in the first few metres of the side gallery. But have these images, made world-famous by the masterly monograph and large picture book by Louis Capitan, Henri Breuil and Denis Peyrony published in 1910, been hiding a forest of parietal symbols for over a century, the immensity and richness of which are still unsuspected? To answer this question, an interdisciplinary research program led by the author of these lines was launched in 2020. Little by little, it is revealing the unique and original personality of an ultimately unknown cave.

Geographic and geological context and description of the cave

The Font-de-Gaume cave, listed as a historic monument on July 3, 1902 and a UNESCO World Heritage site since 1979, is carved out of a Coniacian limestone massif that opens onto the left bank of the Beune valley, about 1 km upstream of Les Eyzies (fig.1).

The cave is dug along one of the 5 subvertical diaclases that cut through the limestone massif. Oriented north-west/south-east, this diaclase gave rise to the access gallery and the main gallery up to the final diverticulum 120 m from the entrance (fig.2). A second gallery, some 15 m long and once containing bear bones and Mousterian flints, opens

Figure 1: Geographical location of the Font-de-Gaume cave (Les Eyzies), extract from the IGN 1:25,000 map.



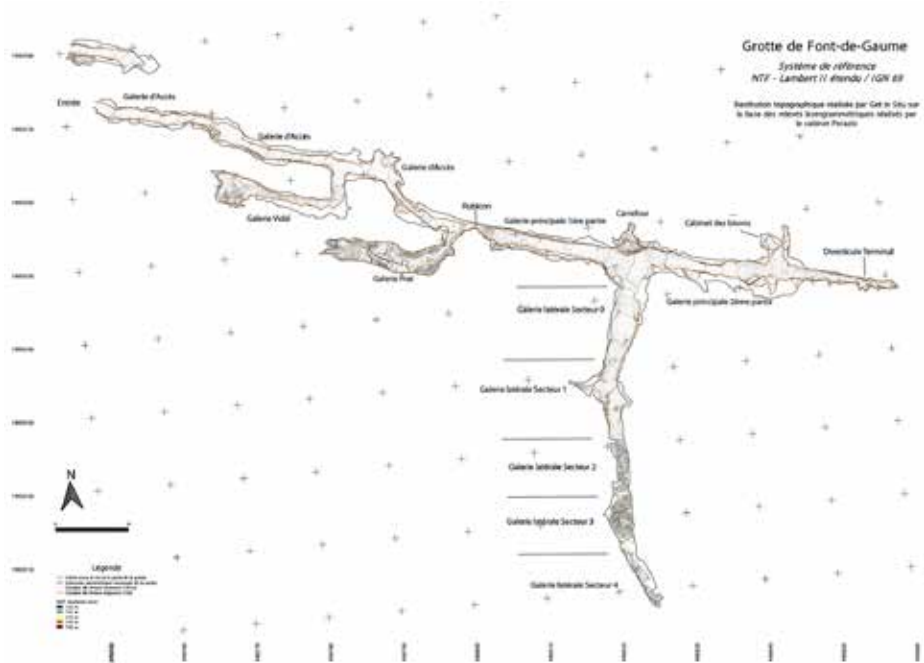


Figure 2: Topographic reconstruction of the Font-de-Gaume cave, produced by Get in Situ (X. Muth) on the basis of lasergrammetric surveys carried out by Perazio Engineering.

up to the left of the main network. The cave floor is relatively level. The vaults reach varying heights, from 1.60 to 3.80 m in the access gallery, up to a dozen meters in the main gallery. The width of the network also varies from 1.50 m to 3 m, with several narrowings due to concretions, including, 65 m from the entrance, the famous Rubicon that separates the access gallery from the main gallery. Three galleries open onto the right wall. The first (galerie Vidal), some 20 m long, opens out into the open on the cliff face bordering the valley. The second (Galerie Prat) starts from the Rubicon antechamber and is also around twenty metres long. The 3rd gallery (lateral gallery), almost 50 m long, runs perpendicular to the main gallery from the crossroads sector. On the left wall, at the end of the 2nd section of the main gallery, we can see the small alcove of the bison cabinet and a short, low-lying passage at ground level between the alcove and the terminal diverticulum.

History of research

Long before the official discovery of the cave paintings, the Font-de-Gaume cave had long been known, as evidenced by the countless graffiti, often dating from the 19th century, that cover its walls. Open since time immemorial, its entrance was used as a sheepfold from the Middle Ages until the end of the 19th century. Numerous traces of troglodytic settlements can be seen in the entrance porch.

The discovery of the first cave paintings on September 12, 1901 by Denis Peyrony, just four days after the Combarelles I cave, brought cave art into our prehistoric heritage. Font-de-Gaume, its engravings, drawings and monochrome and polychrome paintings, were inventoried on September 15 and made public on September 23 of the same year in a note by Louis Capitan and Henri Breuil addressed to, and presented at, a session of the Académie des Sciences (Capitan, Breuil, 1901).

After the first discoveries of caves such as Altamira (1879) and La Mouthe (1895), it wasn't until the Combarelles and Font-de-Gaume caves (1901) that the scientific community became certain of the Paleolithic authenticity of the cave paintings.

It was at the 31st congress of the Association Française pour l'Avancement des Sciences in Montauban on August 9, 1902, that L. Capitan and H. Breuil had the opportunity to present their findings. Breuil had the opportunity to present their work in the two recently-revealed caves at Les Eyzies, and to present their first surveys.

Émile Cartailhac took a keen interest in these new facts and launched a rehabilitation campaign, which he concretized in his famous article "Les cavernes ornées de dessins. The Altamira cave, Spain. "Mea culpa" d'un sceptique" published in *L'Anthropologie* (1902, p.348-354). The excursion of the Anthropology section of the congress, chaired by Émile Rivière, on August 14 and 15 to the La Mouthe cave, Font-de-Gaume and Combarelles was a seminal moment in the recognition of Paleolithic cave art.

Several short notes were published as early as 1901, but it wasn't until 1910 that the prestigious monograph on the cave was published (Capitan et al., 1910), co-authored by L. Capitan, H. Breuil and D. Peyrony. This work is still the most detailed and valuable source of information on this major cave in the landscape of Paleolithic cave art in Europe.

A recent inventory of the written resources devoted to the cave lists almost 300 publications mentioning Font-de-Gaume. Most of them concern research, expert appraisal or monitoring programs on the conservation of the cave, which was opened to the public early on and has been redeveloped several times since its discovery. They include health assessments and summaries of conservation and restoration work, accompanied by environmental, microclimatic, microbiological, geological and hydrogeological analyses, as well as analyses of atmospheric pollution, carbon dioxide levels and origins. This work, recorded in dozens of pages of reports and more

rarely presented in books (Daubisse et al., 1994; Brunet, Vouvé, 1997), was mainly carried out by engineers or researchers from the Laboratoire de Recherche des Monuments Historiques in Champs-sur-Marne (France) and the University of Bordeaux.

More recently, taphonomic studies have been undertaken, notably on the morphological, chromatic and chemical characterization of the vermiculations that affect certain paintings (Konik et al., 2014), and on the non-destructive analysis of pigments (Beck et al., 2014; Gay, 2015; Reiche et al., 2020; Trosseau, 2021; Trosseau et al., 2021), following the pioneering work of Henri Moissan (1902).

Finally, apart from these countless works on active and preventive conservation, little has been done on cave art. The 1910 monograph lists 198 figures (80 bison, 40 horses, 23 mammoths, 17 reindeers or deers, 8 cattles, 4 goats, 2 rhinoceroses, one or two felines, one bear, one wolf, one human, 4 negative hands, 19 tectiform signs and 5 or 6 miscellaneous signs). Richly illustrated with color plates (reproductions of pastel drawings made from Henri Breuil's direct tracings... it is stated in the book that the colors of the original frescoes have been significantly enhanced to give a more intelligible image, corresponding more or less to the values of the paintings when they were executed), it included geology, ground archaeology, wall studies and conservation issues (fig.3). This old monograph is still the standard reference work on Font-de-Gaume cave art.

The cave's archaeological context has been the subject of slightly greater interest. In the monograph, a long chapter presents the archaeological material collected on the surface in the cave's various galleries. It has been re-examined by Denise de Sonneville-Bordes (1960, 1965). A few lines are also devoted to the bear bones discovered throughout the cave and in the clay fill of the second side gallery (now Galerie Prat) during a 1.50 m-deep excavation. These remains were studied by Édouard Harlé. It was in this gallery, opened shortly before the Rubicon, that François Prat undertook excavations between 1958 and 1964.

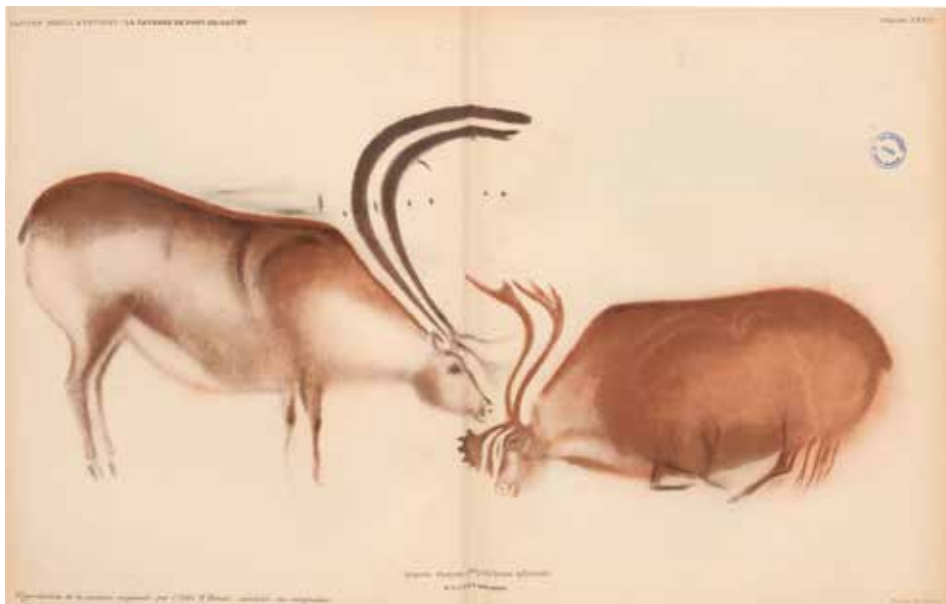


Figure 3: Drawing of the pair of polychrome and engraved reindeer in the first part of the main gallery, tracing by Henri Breuil (1910).

Dubbed Font-de-Gaume I (fig.4), this site yielded a wealth of faunal material, including bear and ibex. It is as yet unpublished. During the winter of 1967-1968, F. Prat carried out a new, large-scale excavation in the second part of the main gallery between the crossroads and the bison chamber (Locus Font-de-Gaume III), during work to lower the cave floor. The excavation covered an area of around 50m², i.e. 17 m long, 2 to 3 m wide and up to 1.20 m deep at the bottom. The paleontological and archaeological material is published (Prat and Sonnevile-Bordes, 1969). Eight layers were revealed in this sector, including two main archaeological levels, layer 3 attributed to a typical Aurignacian and layers 4-5 probably Châtelperronian. A review of the faunal series, particularly the bear remains, was undertaken and published in 2000 (Armand et al., 2003 and 2004). Middle Bronze Age remains (bone arrowhead, bronze pin and ceramics) were also identified in this deep sector of the cave.

The sedimentary and stratigraphic context was also studied and published by

Henri Laville (Laville, 1975). In 2014, a new geological and geomorphological study of the different sectors of the cave, its fillings and speleothems was proposed by Laurent Bruxelles and Virginie Le Fillâtre (Cretin dir., 2014). This is an initial approach that opens up new perspectives in chronostratigraphy, both from the point of view of karstogenesis and human and animal frequentation. A petrographic study of the massif's various limestone beds was also undertaken in 2015 (Cretin dir., 2015).

Strictly in terms of cave art, there has been little work of note since 1910, even though the cave is mentioned in all monographic summaries of Paleolithic cave art, one of which, very recently for the general public, was devoted entirely to the cave (Cleyet-Merle, 2014). Of particular note among published works are André Leroi-Gourhan's structural analysis published in "Préhistoire de l'Art occidental" (1971), the study of tectiform signs undertaken by Denis and Agueda Vialou between 1982 and 1990, partially published (Vialou, Vilhena-Vialou, 2014), then taken up again



Figure 4: Location of François Prat's excavation in the Prat gallery, photo by E. Paillet.

and updated by Éric Robert (2006, 2009), and the academic work of the author of these lines (1993, 1999) on Magdalenian bison representations, of Isabelle Penvern (1997, 2004) on tectiform cave mammoths and of Frédéric Plassard on tectiforms and mammoths (2000) and on the analysis of the archaeological context, themes and styles of the representations (2005). A number of new figures have been discovered or deciphered, notably by Paulette Daubisse, who was in charge of Font-de-Gaume for many years. More recently, Norbert Aujoulat and Olivier Huard have produced a photographic coverage and inventory of the representations. Alain Roussot also wrote several notes, including the well-documented "Atlas des grottes ornées" (1984). With N. Aujoulat and P. Daubisse, he re-read the paintings in the access gallery (Roussot et al., 1983) and the engravings in the gut near the Bison cabinet (Roussot et al., 1984), following a new interpretation by Robin Frost and the analysis previously published by A. Leroi-Gourhan (1965). The corpus of graphic entities in the Rubicon entrance gallery was

updated in 1998 by N. Aujoulat, Christian and Claude Archambeau and Philippe Jugie and published in a confidential report (Aujoulat et al., 1998). No fewer than 143 figurative or schematic graphic entities were inventoried (80 on the left wall and 63 on the right), including 71 engravings, 62 paintings (41 in red, 44 in black and one in yellow), 21 charcoal deposits and 2 griffades. But these are residual decorations on heavily weathered walls.

A reassessment and contextualization of Font-de-Gaume cave art

The 1910 monograph failed to meet the methodological and scientific requirements of contemporary research, both in terms of the reliability of the records and their lack of completeness and objectivity. H. Breuil's techniques and methods for reading, analyzing, interpreting and recording figures were outdated. In addition, many other vestiges remained to be studied and recorded, in the main galleries of course, but

also in the lesser-known parts outside the public sectors, such as the Prat gallery, the deep parts of the side gallery, where nearly 40 years ago, Rousset reported "... several curious paintings, kinds of heads or masks using columns or pendants completed with dots, bars and black lines... [and] numerous punctuations, isolated or grouped, [of] numerous lines and sticks existing on all the walls of this room..." (Rousset, 1984, p.131-132), but also the bison cabinet and the terminal diverticulum.

In the image of the archaeology of decorated caves as practised for at least three decades in numerous caves in France (Chauvet, Cussac, La Mairie, La Mouthe, Marsoulas, etc.) or Spain (La Garma, El Castillo, La Nerja, etc.), the situation at Font-de-Gaume seemed somewhat anachronistic. In 2020, following authorizations from the Direction Régionale des Affaires Culturelles - Service Régional de l'Archéologie de la région Nouvelle-Aquitaine and the Centre des Monuments Nationaux, the site manager, we set up an interdisciplinary, integrated research program, totally unprecedented in this cave. A scientific team was formed, representing the diversity and complementarity of disciplines in the social sciences, humanities and geosciences. The cave, its graphic expressions and its environmental and archaeological contexts had to be approached as a whole, jointly and not segmented into disjointed or incomplete disciplinary approaches. Aware that interdisciplinary approaches are indispensable today, and should be a prerequisite for any study of the natural, artistic and heritage object that is Font-de-Gaume, we have promoted the latest developments in recording, spatialization and survey methods. A better understanding of the cave's complex parietal features, seen in their geological, geomorphological and archaeological context, was expected and necessary, despite the difficulties inherent in the specific context of this ancient, heavily anthropized and tourist-used cave.

A request for a probationary year of "prospecting with rock art survey" was therefore submitted in 2020. It was necessary to test the feasibility of this transdis-

ciplinary project, in what we described as the "unknown Font-de-Gaume", which we wanted to extend gradually, step by step, to the whole cave. Despite the constraints associated with the conservation and public use of part of the cave, and of course the unexpected sanitary constraints of the Covid crisis, we were able to carry out our research under satisfactory conditions. The very encouraging results and the positive reception given by the scientific community and the research administration at the end of this probationary year have enabled us to lay the foundations for a first three-year operation scheduled from 2021 to 2023, with the successive study of the Prat gallery, sectors 1 to 4 of the side gallery, the terminal diverticulum and the bison chamber, i.e. all sectors outside the current public route, and currently of a first Collective Research Project (2024 to 2026), progressively extended to sectors open to the public.

A program structured around four scientific and methodological axes

The first, entitled "The cave as a natural object", includes all geomorphological and karstological analyses and dating programs (U/Th and 14c) on speleothems, parietal traces and furniture. The 2nd axis, "The cave as an archaeological object", concerns the geoarchaeological approach to soils, the analysis of traces of frequentation, in particular concretion breakages, and the study of movable series (fauna, industries, etc.), excluding artistic manifestations. The 3rd axis, "The cave as an artistic object", focuses on the analysis of parietal graphic expressions, the geoarchaeology and taphonomy of walls, as well as the physico-chemical micro-analysis of coloring materials and parietal imaging of decorated walls. This area also includes digital photographic, photogrammetric and 3D acquisitions. The 4th axis, "The cave as a historical object", brings together the study of medieval and modern troglodytic settlements and the recent history of the cave since the 19th century. This axis works with the historiographic and archival approach. Finally, a transversal axis groups together



Figure 5: Topographical reconstruction of the Prat gallery, Get in Situ (X. Muth) based on laser-grammetric surveys carried out by Perazio Engineering.

all the “common supports”, i.e. the data produced, progressively transferred to a sharing platform (Google 1 storage system - drive) to ensure their accessibility and durability.

Initial work and discoveries in the Prat gallery, the three deep sectors of the side gallery and the terminal diverticulum

We present here a brief summary of the initial results obtained during the first two years of research (Paillet dir., 2020, 2021). The data presented must therefore be considered as partial, reflecting a state of research that is constantly evolving as field missions continue.

The karstogenetic and geoarchaeological aspects defined in the first part of the program are aimed at reconstructing the cave’s formation processes, identifying and sequencing filling and/or emptying phases and speleothem development episodes. Following initial surveys in 2020, three priority themes were identified: ghosting, phreatic evolution and biocorrosion. To this end, detailed observations of the morphology of the cave’s various galleries (walls and vaults) were carried out. A systematic survey and inventory of shapes has been undertaken to clarify the evolution of the cave, using photogrammetric surveys of the

walls and vault. Morpho-karstic mapping, as well as mapping of detrital and chemical sedimentary formations (stalagmites, floors, gours) is currently being finalized. The inventory of shapes, the location and precise mapping of walls are currently being drawn up, and will be used to superimpose the record of parietal works in order to assess their degree of conservation (differential conservation of works, execution on walls retouched by biocorrosion).

Detailed geo-referenced topography of the network has been completed using the digital terrain model developed as part of the cave digitization project. High-resolution topographic restitutions are now available, providing a useful georeferenced support for GIS (Geographic Information System). The study of the cave system is one that is resolutely part of a long-term research project. To date, we have read, documented, inventoried and recorded the wall features in the Prat gallery (fig.5) and the three deep sectors of the side gallery (fig.6). Although H. Breuil and his successors had not taken a major interest in these two galleries, which are difficult or even impossible to access (with a cat-flap passage between sectors 2 and 3 of the side gallery), their walls have revealed a wealth of iconography. For the sake of information and comparison, while the 1910 monograph mentions some 200 representations

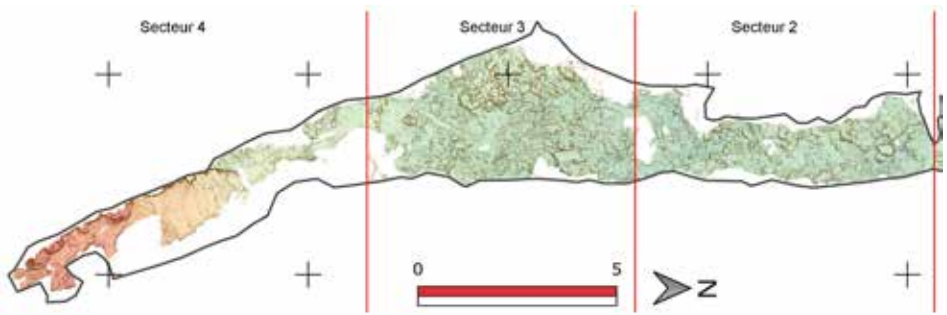


Figure 6: Topographical reconstruction of sectors 2, 3 and 4 of the lateral gallery, Get in Situ (X. Muth) based on lasergrammetric surveys carried out by Perazio Engineering.

scattered throughout the cave, nearly 550 entities and graphic vestiges (animals, motifs, signs, isolated lines, speckles, discreet engraved and/or painted marks, vestiges of coloured material, etc.) have been recorded to date in these two sectors and in the access gallery alone. To these can be added the 189 graphic features already identified in the terminal diverticulum, another sector to be studied in 2023. These entities will be integrated into a GIS created in 2021 on QGIS software, version 3.16 Hannover, using topographic supports. This common support, designed as a true multi-scale information and data management tool, has been fully populated for the parietal data acquired in the Prat gallery, sectors 2 to 4 of the lateral gallery and the terminal diverticulum. As our program develops, it will naturally be updated with data from other areas of the cave. It will also be able to incorporate all the information obtained from the various field surveys (karstology, taphonomy of the walls, location of features, remarkable elements on the ground, etc.), as well as consolidated data relating to the conservation of the cave.

The means and methods implemented since 2020 have radically changed the iconographic landscape of the cave, both quantitatively and qualitatively.

The wall paintings in the Prat gallery and the three deep sectors of the side gallery, to which we can also add those in the terminal diverticulum, stretching from a few decimeters above ground level to a height of over 3 m, are dominated by sim-

ple tracings that are difficult to characterize typologically (spots, lines, isolated lines or dots, alignments of dots, etc.), numerous black flecks (charcoal flecks?) whose nature, status and age deserve to be questioned (physico-chemical analyses and possible C14 dating), and lastly, rarer figurative representations that are never treated in true solid (except in the terminal diverticulum) or modelled (horses, ibex, reindeer, mammoths, bear, bison, undetermined animals). The outline strokes, painted in red or black, rarely combined, are mostly quite broad, but a few animals with fine lines are worth noting.

Fine engraving is also present in all three galleries, in an autonomous form and sometimes even in a different style (ibexes, masks, indeterminate or segmental representations, curved lines in the shape of a rachis, horse, etc.) in sectors 3 and 4 of the side gallery, and seems to have come after the drawings and paintings, or as a complement to figures painted or drawn in the Prat gallery.

In addition, the good state of preservation of the parietal traces, including those engraved on speleothems, also raises questions about the evolution of wall conditions since the Upper Pleistocene, and thus supports taphonomic studies of the walls.

Finally, despite the repeated use of the cave since the Tardiglacial period, the study of ground remains (speleothems in particular) is another avenue worth exploring. The sectors presented here are characterized by an intense, thick covering of concretions of

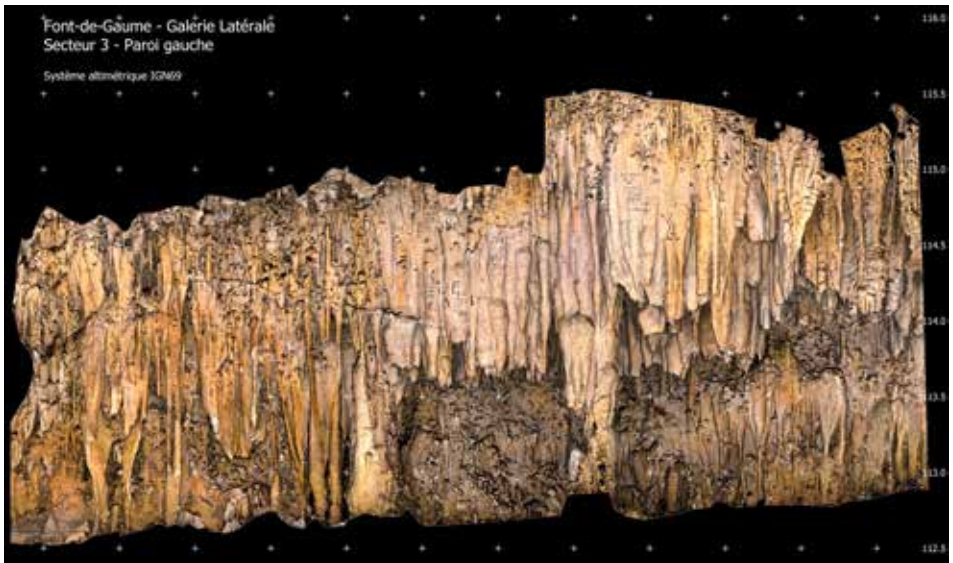


Figure 7 : Morphology of sector 3 of the side gallery, photo by P. Paillet.

varying ages (fig.7), in the form of opaque or translucent, white to yellow-ochre glazes or concretion coatings, and numerous sta-

lagmites, stalactites, draperies, columns and pillars, most of which have been fractured, fragmented or impacted (figs.8). Some of

Figure 8: Photogrammetry of the left wall of sector 3 of the side gallery, Get in Situ (X. Muth).



these formations show traces of red flat areas between their growth sheets, at depths of between 0.5 and 1.5 cm. Concretion is still very active (numerous regrowths, active fistulas, etc.). A survey and analysis of these concretion breaks on the walls and floor (natural and/or man-made) was undertaken in sector 3 of the side gallery. The intentionality and age of these phenomena, as well as their function and *modus operandi*, are specifically examined and studied. Emphasis is also being placed on the chronological approach to these breakages, through the use of U/Th dating based on the principle of chronological demarcation between the last calcite layer formed before fracturing and the first layer of regrowth on fractured elements. We have already sampled a number of speleothems in the deep sectors of the side gallery, both on the ground and outside the decorated field, in order to give a minimum age to these structures or

artefacts of human origin. Some regrowths dated to the end of the Pleistocene suggest ancient (Palaeolithic?) breakage. These three sectors have been visited many times since the prehistoric era, despite the difficulties of access. The floor, littered with broken speleothems (stalactites, stalagmites), is the intentional result of the actions of those who have penetrated it, whose purpose remains largely enigmatic. The stalactites on the ceiling have been sheared off.

An update on iconographic devices

The Galerie Prat, in which H. Breuil had counted and recorded some twenty representations, there are now 173 entities and graphic remains, including 95 in black (80 indeterminable signs and motifs and 15 figurative), 51 in red (40 signs and motifs and 11 figurative), 4 combining black and red and 23 engraved (20 signs and 3 figura-

Figure 9: New engraved tectiforme in the Prat gallery, photo and tracing by P. Paillet.



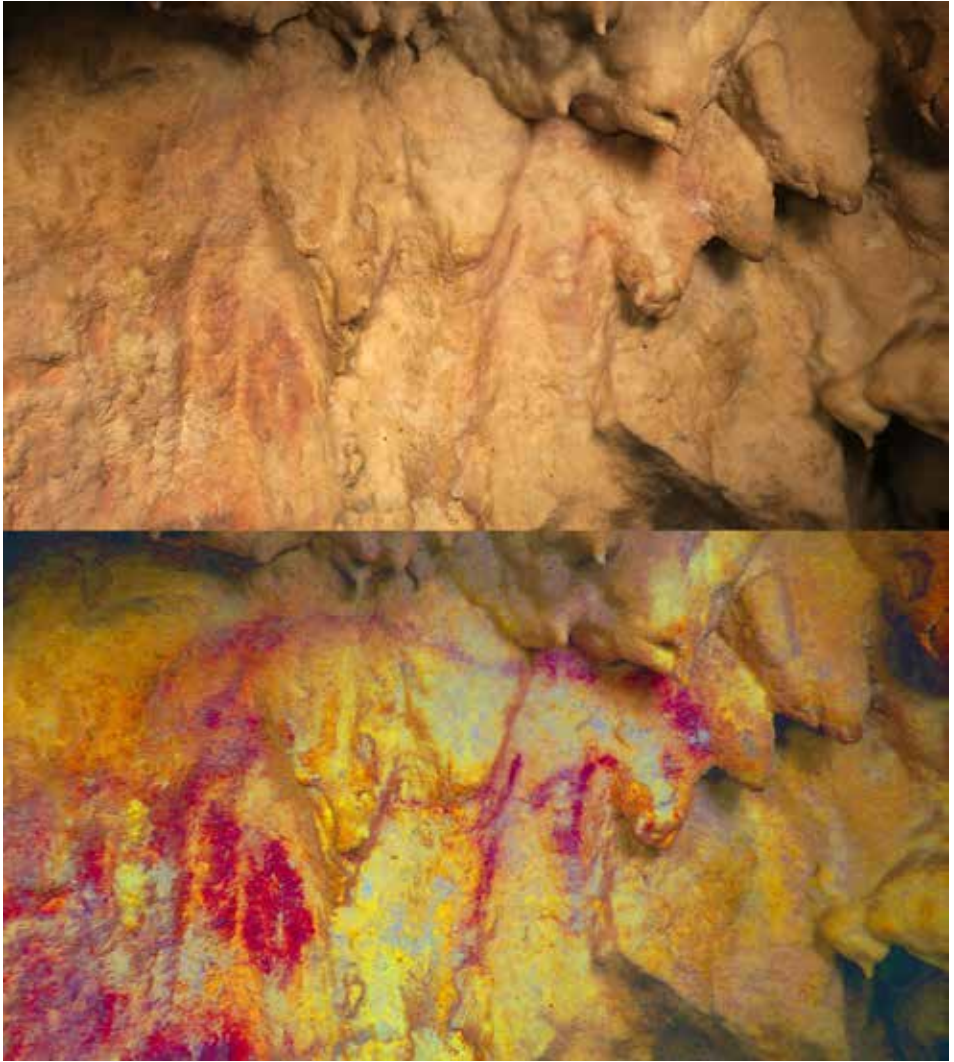


Figure 10: Horse drawn in red on natural relief in the Prat gallery, photo and DStretch processing (ybk filter) by P. Paillet.

tive). Among the remarkable new features are two engraved tectiform signs (fig.9), two ibexes, one engraved and one drawn in black, a bison and a horse in red (fig.10), as well as seven "masks", or human or animal faces, set in evocative natural reliefs and characterized by the economy of the means of representation used (fig.11).

Eyes, nostrils, sometimes ears or cephalic appendages, are expressed only by simple dots, black, red or engraved lines, adding the human touch to the natural pendants of stalactites, pendants or columns on the protruding wall. As in the main gallery, where rows of bison, mammoths, horses and deer seem to emerge from the participating rock, the use of reliefs and natural,

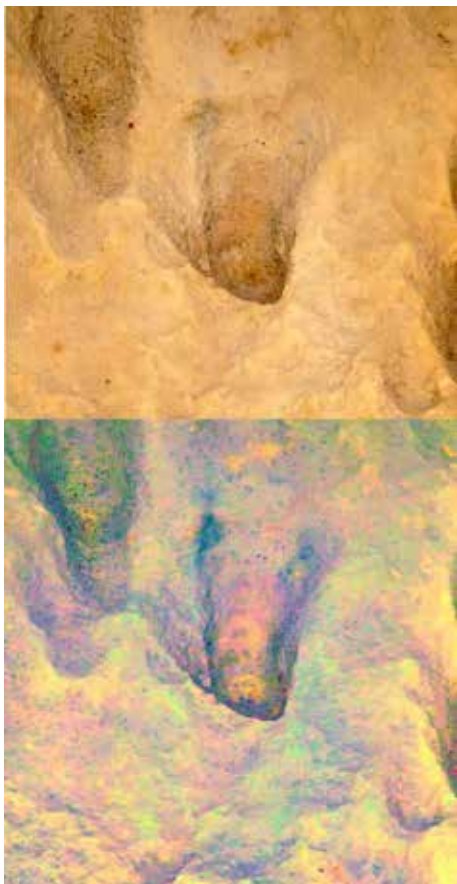


Figure 11: 'Mask' or face (animal or human?) with a black line on a natural relief in the Prat gallery, photo and DStretch processing (YBK filter) by P. Paillet.

and sometimes evocative, accidents in the supports is very frequent in the galleries studied, and skilfully integrated into the construction of the representations. This relationship between image and support is remarkable for its recurrence, but also for its relative discretion. Most of the figurative representations in red or black linear lines, supposedly more archaic or at least older than the flat, bichromatic or polychromatic figures in the main gallery, have been inserted into the wall in a highly sophisticated and perfectly researched way, attesting to the high level of elaboration and integra-

tion of these wall devices, as shown by the original "masks", which are quite rare in Paleolithic cave art.

In the three deepest and most inaccessible sectors of the side gallery (Sectors 2 to 4), where H. Breuil reported half a dozen black figures, we identified and recorded a total of 229 entities and graphic remains (89 in sector 2, 126 in sector 3 and 14 in sector 4). In all of these deep sectors, black features are the most numerous (134, including 98 signs or related and 36 figurative). There are 64 red features (mostly geometric, and only found in sectors 2 and 3) and 24 engraved figures (16 signs and 8 figurative), evenly distributed across the 3 sectors. Notable discoveries include two ibexes finely engraved in a very realistic style on a stalagmitic drapery (fig.12), two horses and two vulvas also engraved, a bird (probably Strigidae?) painted in black (fig.13) and an engraved tectiforme. Finally, as in the Prat gallery, we counted almost forty "masks" arranged on natural reliefs, mostly drawn in black, apart from one engraved and one drawn in red. These representations, almost unnoticed until now, will be the subject of a special publication (figs.14-15-16).

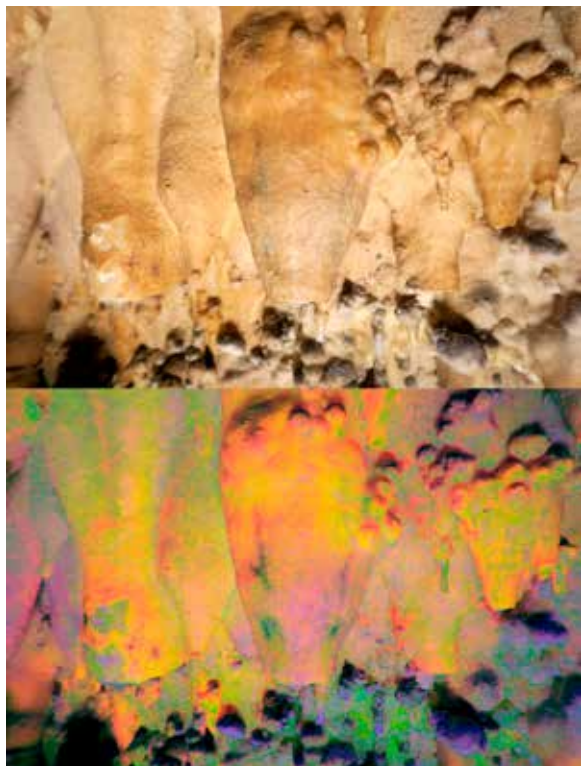
In the terminal diverticulum (fig.17), where H. Breuil reported 34 graphic entities (28 on the left wall and 6 on the right) in 1910, we have counted 189 engraved and painted figures, including 109 on the right wall, 77 on the left and 3 on the ceiling. Thematically, they are divided into 43 figurative entities (animals and humans), 110 non-figurative entities (signs) and 36 vestigial graphic elements (figs.18-19). The considerable number of new entities should come as no surprise, as it is the consequence of a methodological requirement that now prevails in documentary practice. An active reading of the walls, as objective as possible, has been carried out progressively, with at least two people and therefore two different points of view. While in his day H. Breuil worked alone, or almost so, in the Font-de-Gaume cave, we decided to put our differences to the test, while respecting the cave's strict conservation conditions, which limit our daily presence to 6 people for a maximum of 3 hours. Observations



Figure 12: New ibex and undetermined animal head engraved on a stalagmitic drapery in sector 3 of the lateral gallery, photo and drawing by P. Paillet.

Figure 13: Bird (probably Strigidae?) drawn in black on a stalagmite in sector 3 of the side gallery, photo and DStretch processing (YBK filter) by P. Paillet.





and readings are carried out simultaneously, or sometimes double-blind, and are systematically monitored. Moreover, contrary to common practice at H. Breuil, no motif, no sign, however simple, no vestige of painting or engraving, no trace, no mark is ignored. Everything is scrupulously recorded, photographed, surveyed, measured and situated in its topo-morphological space. And as soon as it offers a certain organization and bears witness to intentionality or not, it is inventoried as a graphic entity. The totality of traces left by prehistoric people on floors, walls and vaults is methodically recorded. This disciplined approach has enabled us, in a very short space of time, to completely rethink the nature and organization of the devices in the galleries studied since 2020, and to confirm, if confirmation were still needed, the extreme richness of Font-de-Gaume's cave art, its techno-

Figure 14: 'Mask' or animal face with black dots and lines on a natural relief in sector 3 of the side gallery, photo and DStretch processing (YBK filter) by P. Paillet.



Figure 15: 'Mask' or animal face with black dots and lines on a natural relief in sector 3 of the side gallery, photo and DStretch processing (YBK filter) by P. Paillet.

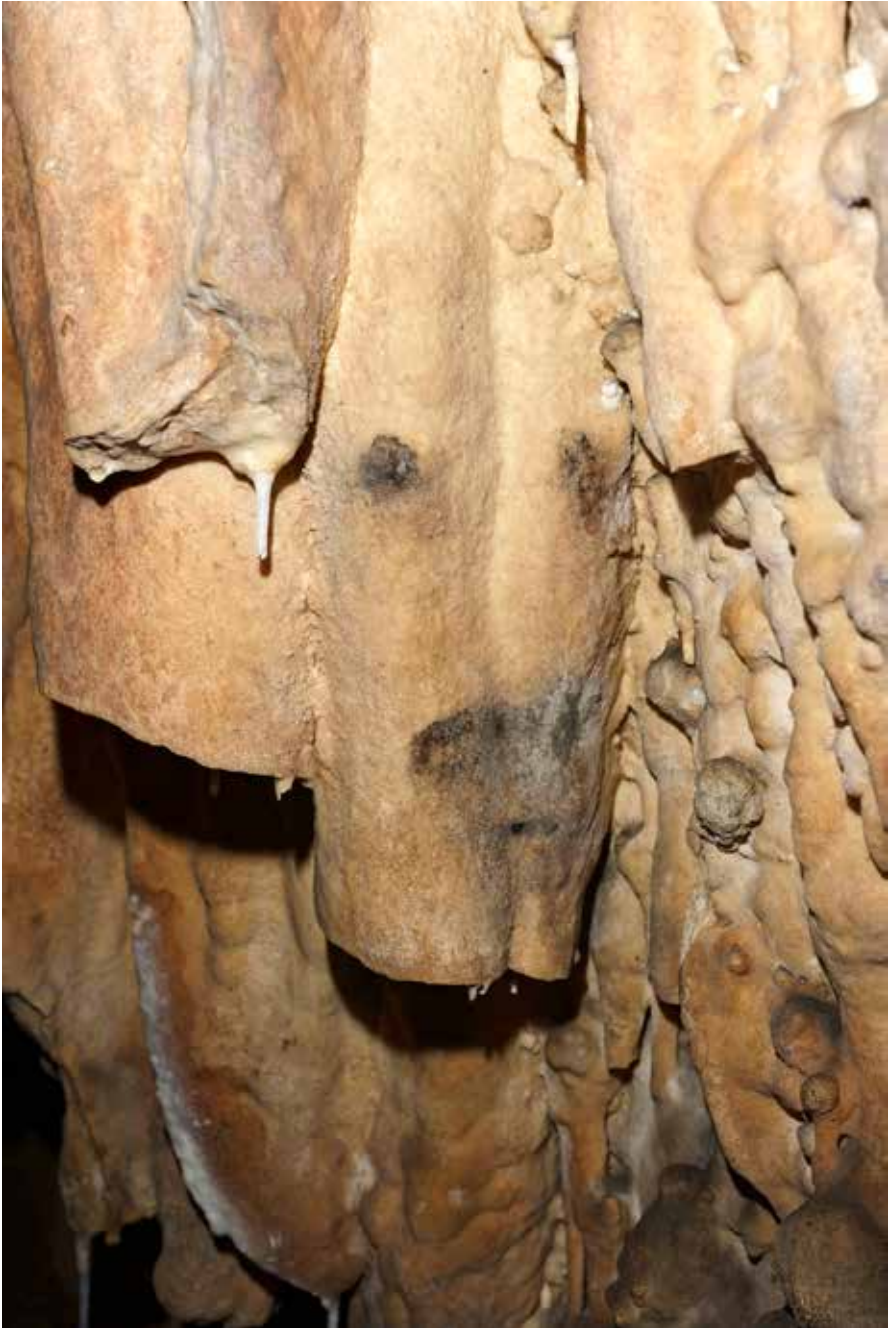


Figure 16: 'Mask' with black dots and lines on a natural relief in sector 3 of the side gallery, photo by P. Paillet.



Figure 17: General view of the terminal gallery, photo by P. Paillet.

Figure 18: Horses painted black, anthropomorph drawn in black, rhinoceros head drawn in red and bison engraved on the left wall of the terminal gallery, tracing by P. Paillet



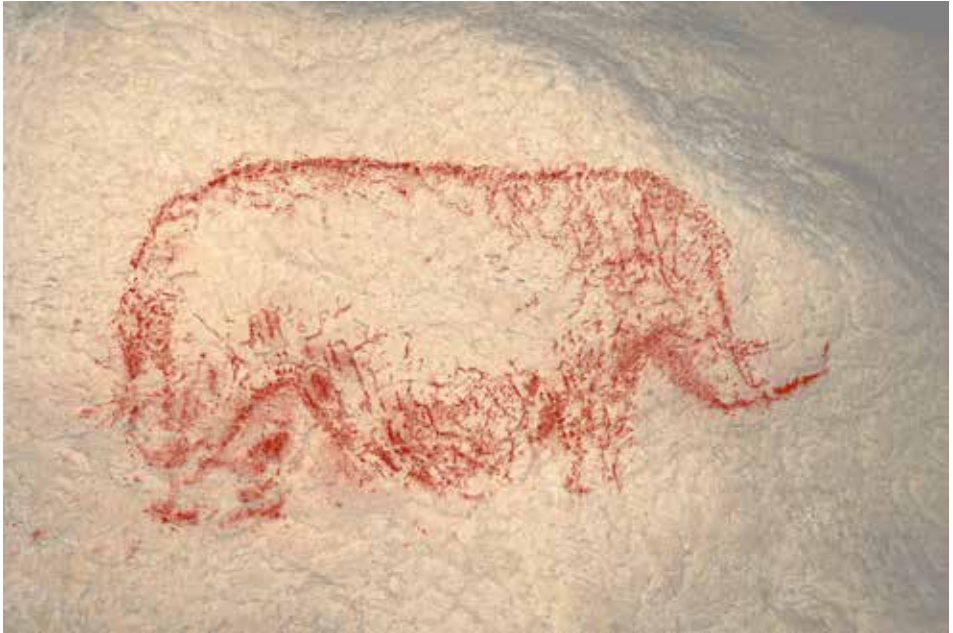


Figure 19: Woolly rhinoceros painted red on the left wall of the terminal diverticulum, tracing by P. Paillet

stylistic and certainly chronological heterogeneity, already highlighted by H. Breuil in his day, and the central place of color.

Provisional conclusion

The Font-de-Gaume cave has been irrevocably marked by the passage of time and, above all, by human activity. The medieval occupation of its vestibular section and entrance porch, its use as a sheepfold, probably since the Middle Ages, its long-standing and regular use right down to its depths, and then, since the official discovery of its cave paintings, the successive and particularly invasive installations and developments to enable mass tourism, could have definitively invalidated or rendered impossible any interdisciplinary study. We made the ambitious and risky choice to devote ourselves to this area, and we are reaping the benefits today, even if we are aware that certain analyses will never be possible given the anthropization of the entire network and, in particular, the destruction of a very

large part of the soil. But the results already achieved in just two years of research, to which must be added those still unpublished (2022 fieldwork), show that the reappraisal of previously discovered, extensively explored and published decorated caves is not a hopeless or uninteresting act. The informative potential of Font-de-Gaume is enormous and still very much unknown. So every time we cast our new, demanding, almost surgical gaze over its walls, along with that afforded by modern technologies or certain computer applications, we discover new drawings, new engravings, entities that had gone completely unnoticed, discreet tracings of varying degrees of elaboration, animal and/or human figures, unprecedented uses of the walls, unexpected coloring materials, but also alterations, accidents or corrosive phenomena in progress. All this calls for a collective discipline and a strict conceptual, methodological and scientific approach, not only in the service of an ever-expanding count or inventory, but also for conservation reasons, because if we con-

sider this work as a heritage and scientific tool, it is also an act of rescue.

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