

A chronological proposal for El Castillo Cave (Puente Viesgo, Cantabria) based on its iconographic stratigraphy

Una propuesta cronológica para la Cueva de El Castillo (Puente Viesgo, Cantabria), basada en su estratigrafía iconográfica

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Abstract: Some years ago, we began a review of the work done by E. Ripoll in 1953. During this time, we have examined not only each and every one of the figures discovered by him, but have also expanded the list, reaching nearly all the 450 new figures in the entire cave. This significant increase is thanks to the use of new technologies, such as a 3D scanner, digital filters, multispectral algorithms, giga images, or the newest innovation, the use, for the first time in our studies on cave art, of hyperspectral methodology. The latter gives us access to a much wider light spectrum than the one created by multispectral analysis.

Keywords: Historiographic study, new technologies, chronology, Upper Palaeolithic, cave art.

Resumen: Hace unos años empezamos la revisión de los trabajos llevados a cabo por E. Ripoll en el año 1953, durante este tiempo no sólo hemos revisado todas y cada una de las representaciones descubiertas por E. Ripoll sino que hemos ampliado ese elenco hasta llegar casi a las 450 figuras nuevas. Este significativo aumento se debe a la aplicación de las Nuevas Tecnologías como son el Escáner 3D, los filtros digitales, algoritmos multiespectrales, gígaimágenes o la última innovación que es la aplicación por primera vez en nuestros estudios de arte rupestre de la metodología hiperespectral que nos permite acceder a un espectro lumínico mucho más amplio que el que produce el análisis multiespectral.

Palabras clave: Estudio historiográfico, nuevas tecnologías, cronología, Paleolítico superior, arte rupestre

1. INTRODUCTION

The study carried out by E. Ripoll and L. López in 1953 was a renovation of the documentary work on cave art they had used previously and successfully in the nearby Las Monedas cave. Nevertheless, the scale of the work at El Castillo caused the studies to extend over several years, becoming the main campaign of 1953. This extension allowed them to locate new figures and define some of them better, reaching 250 new ones, but it also had a negative side.

In the case of E. Ripoll and his collaborators, over the years the criteria established by Abbé Breuil was expanded, correlating the main image with the adjoining ones to try to establish a figurative stratigraphy. But in the mid-1960s the concept changed, adopting a wider vision that included all that was considered as being the panel, that is, the more or less homogeneous surface delimited by speleothems, cracks, or natural protrusions that make up a stony surface for specific content.

This new system of reproduction conflicted with the work done up to that time by E. Ripoll, meaning that practically the entire study would have to be redone. This fact, along with other projects, such as campaigns at the La Cueva de Ambrosio site in Almeria or in Nubia, Egypt, or his responsibilities leading the Museo Arqueológico Provincial in Barcelona, left the study of El Castillo cave in a suitcase, which not long before his death in 2006 he solemnly handed over to me with instructions to publish it.

Meanwhile, along with Vicente Bayarri, who at the time was working on a research project with Roberto Ontañón to apply new technologies in the caves at Monte del Castillo, I was allowed to accompany Bayarri to do an initial evaluation in situ. From the first moment we could verify that, in addition to the figures analysed by my father, by using new digital technologies we were able to see a huge number of new images. Currently, the inventory of figures by E. Ripoll and the ones identified by us reaches 468 representations. In the following text, reference is made to a numbered sequence that corresponds to the figures we include in our study, which is currently underway (Ripoll et al., in preparation).

The Hands Panel has probably been one of the most researched decorated surfaces in Palaeolithic cave art. Many researchers have studied its figures (Breuil, H. 1911, Ripoll Perelló, E. 1956, 1971-72, González Echegaray, J. 1964, 1970, Moure, A. 1996, Gozález-Sainz, C. 2000, Ruiz, A. 2010, Sauvet, G. 2005, Pike, A.W.G. 2012, Gárate, D. 2010, García-Díez, M. 2015, Groenen, M. 2012, Ontanón, R. 2019, among many others). The majority have contributed new data – some of great importance – but few have dared to take on a new chronological proposal, restricting themselves to using what was already proposed by Breuil (1911).

2. NEW TECHNOLOGIES

In the study we are currently working on at El Castillo cave, we have advanced in documenting each of the panels using diverse advanced technologies, integrating different geomatic techniques such as digital photogrammetry and 3D laser scanning to achieve more detailed and precise information of the rock surface.

The company GIM Geomatics has developed a series of algorithms that provide multispectral and hyperspectral documentation for the retrieval of parietal art not visible to, or hidden from, the human eye, using non-intrusive techniques through giga images (Fig. 1) and high resolution panoramic images. The innovative hyperspectral technique (Bayarri, et al., 2019 and 2021) consists in that, when we take a photograph with a conventional camera, we get data

from three channels – red, green, and blue. But when we use Hyperspectral remote sensing such as Specim ImSpector V10E, up to 214 channels of 2.8nm spectral resolution are generated in the spectral range 400-1000 nm. The ability to detect colorimetric differences is surprising given that, while the ultraviolet beam stays on the surface, the infrared measurement penetrates the rocky surface and can detect what may lie beneath or behind a paint stain, soot, or the calcite flow itself that has been deposited throughout millennium on any of the panels studied in a cave. What is novel about this methodology lies not only in how more or less advanced the apparatus taking the images is – posing no risk to the figures – but in the way of processing the images, using various algorithmic mathematical calculations that today constitute the main differential value provided by GIM Geomatics, a company we have been actively collaborating with for many years. (Fig. 2) These images, having a resolution previously unknown in studies of cave art, have also allowed us to extract them and convert them into synthetic image representations of black pigments, ochres, image transformations, etc.



Fig. 1. Orthoimagery direct from the Hands Panel ensemble. (Photo V. Bayarri).

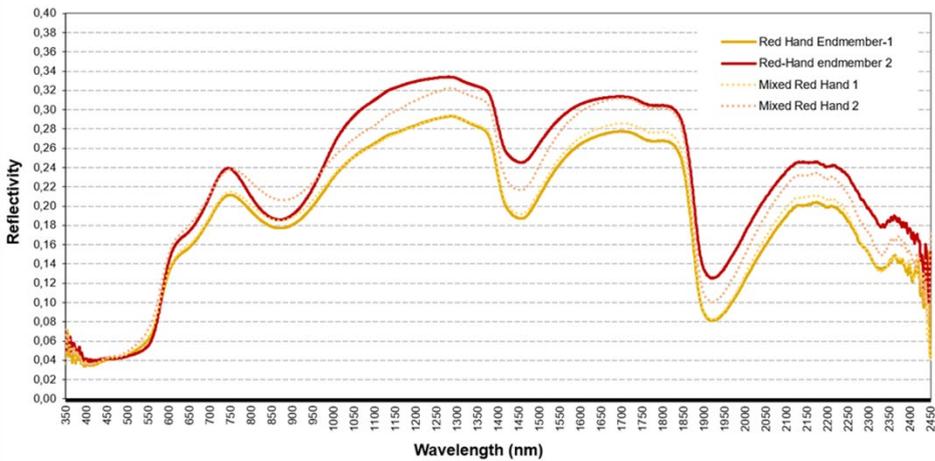


Fig. 2. The Spectral Signature allows us to differentiate between a panel's varying pigments.

3. THE HANDS PANEL

In this text we will look at the study of one of the most complex panels in El Castillo and possibly in Palaeolithic art in general. The various techniques applied to the different figures, as well as the diverse dyes used, allow us to establish clear differences between each group of figures and at the same time attempt to conFig. a chronological evolution based on the stratigraphy of the superimpositions.

On the Hands Panel, the Abbé Breuil identified a total of nine animals painted in yellow (including the large red bison that dominates the whole panel), 33 hand stencils, 13 painted signs and various series of red dots, and six engraved figures, essentially deer.

Applying a full array of the latest computer applications, explained in another section, we have identified a total of 35 zoomorphics, of which 23 are painted in yellow, two in red, 19 in black, and one in white. In total there are 56 hands distributed over the whole panel and we have increased the number of signs up to 22. And in addition to six figures recorded by Breuil, we have added another five, some of which were discovered by E. Ripoll and others that we have identified while doing our documentation (Fig. 3a & 3b).

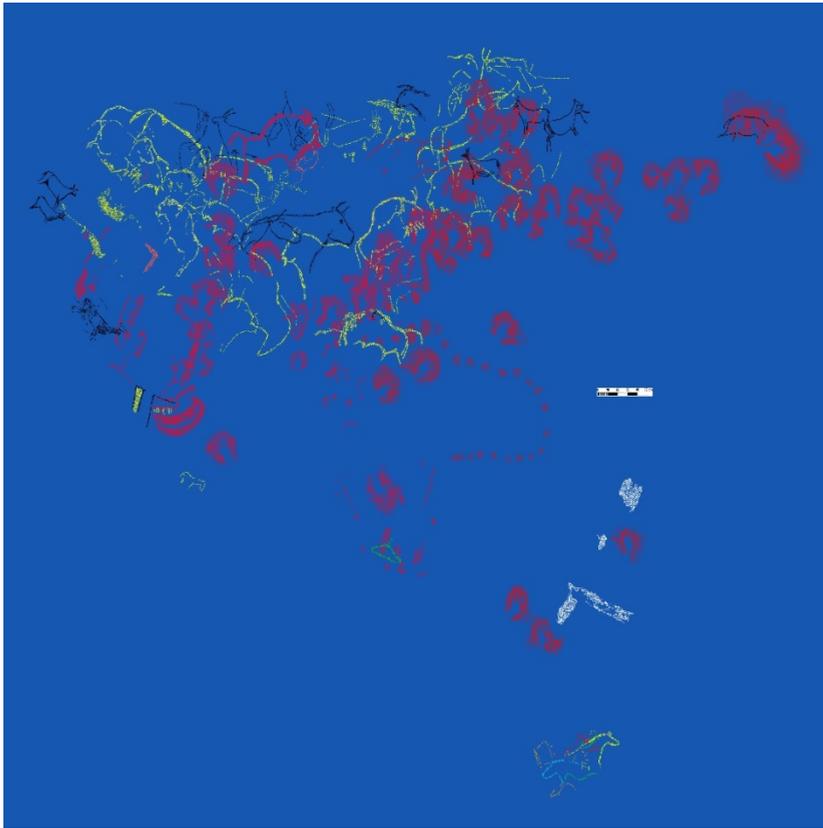


Fig. 3a. Complete tracing of all the figures described in the text, identified on the Hands Panel.

H. Alcalde del Río, H. Breuil and L. Sierra in Les Cavernes de la Region Cantabrique collected a total of 61 figures on the Hands Panel. We are continuing to work on this panel, but as of this writing we have increased the amount to 124 figures, that is, we have doubled the number.

Among the figures painted in yellow, 12 are clearly identifiable as bison, another two are four-legged animals that due to their fragmented state are difficult to identify, but we believe they could be parts of two other bison figures. There are also three other unidentifiable four-legged animals, three aurochs, and three horses.

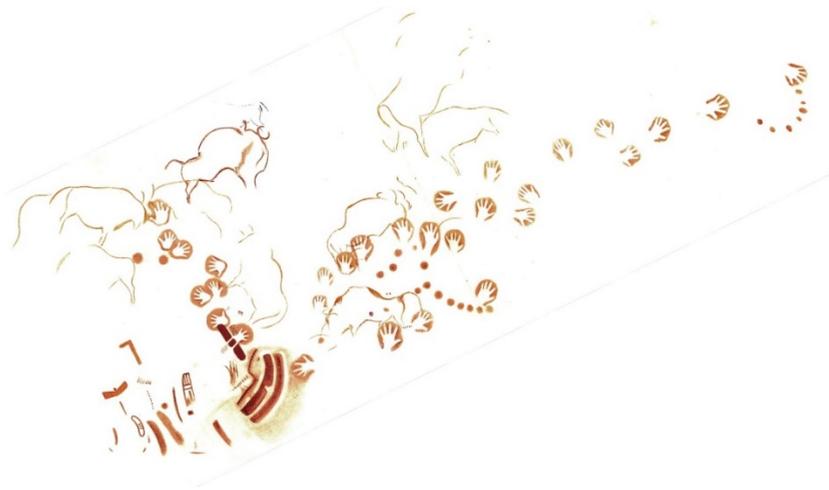


Fig. 3b. Drawing by Abbé Breuil of the same panel in Les Cavernes de la Région Cantabrique.

Among the animal figures painted in black, currently very faded, we have identified three aurochs, three horse protomes, two deer, a large goat, and an unidentifiable four-legged animal that could be the hind of another goat due to its short tail.

The figures painted in red, of which there are only two, are of a large bison that dominates the entire panel and a large deer head that, while not being new, we identified ourselves. In the centre of the panel, Abbé Breuil had described a series of red discs similar to those in the Discs Gallery, but our orthoimage has allowed us to see the rock surface as a whole and verify that it is a deer head made from dots to which the ear has been added.

On the lower right side of the panel we have identified a horse protome painted in white that relates to another spot of the same colour located a bit further up.

Of the 13 signs represented on Breuil's monograph, we have expanded them to 22, better defining some of them and including some unique ones, such as the engraved lines that frame each of the idiomorphs in the lower left area, as well as a series of dots both in red and yellow and some finger prints.

It would be very long to do a complete study here of the 56 hands we have identified. Suffice to say that the majority, 40, are left hands and 16 are right hands. We will soon present the complete study of these stencils, whose measurements indicate, at least to now, that nearly all are masculine and that two of them can be found in other parts of the cave, known as the Polychromes Panel, and in the large room at the entrance. Many of these hands, almost half,

were already studied by Breuil, but we have situated some of them in a different position and have defined them more completely.

During the long days spent in front of the decorated surface, we could ascertain that certain figures we had assumed were synchronous in reality posed numerous problems in regard to their stratigraphic position in the pictorial sequence.

A few years ago, in the Congressional Proceedings on the centenary of the discovery of the Cueva de la Peña de Candamo (Ripoll, et al., 2014), we published a chronologically-based series on the superimpositions of different panels at El Castillo, but primarily on the Hands Panel. In this publication, the first to appear are the figures painted in yellow and sienna. However, live analysis and a set of macrophotographs from every angle, in which these superimpositions can be observed, has shown us that some of the hands were underneath the yellow figures. In this situation, we must search for a methodology, or try to develop one, that lets us clarify the pictorial sequence of this vast rock surface.

Recently, our research group started using a technique based on integrating pigment Spectral signatures to Hyperspectral traditional workflow, which consists in the use of different algorithms and filters. With this methodology we can differentiate between the types of pigment used to create the different figures and, specifically, attempt to see if all the hand stencils were contemporaneous or if they could all really be part of the same chronological-cultural time, basing our work on the different shades of pigments used, or if they were from different phases.

4. CHRONOLOGICAL-CULTURAL FRAMING OF THE FIGURES

The parietal decoration of a cave or shelter is not normally produced in one single episode but is the result of a large process of accumulation that can happen over various millennia, or it could even have been done by one person at a specific time or over various days, weeks, or months.

When we look at the study of a cavernous space, clarifying the different phases of the decorative process is possibly one of the most complex tasks we have to face. This is why we rely on various methods, but they all must pass through an in-depth learning phase, or at least as complete as possible, by looking at the motifs, paintings, or sections of the rock surface.

When faced with the chronological evolution of the iconographic ensemble in El Castillo cave, one immediately stumbles on the lack of viable current data and discovers that, in the end, almost all researchers return to the sequence proposed by Abbé Breuil in *Les Cavernes de la Region Cantabrique* (1911).

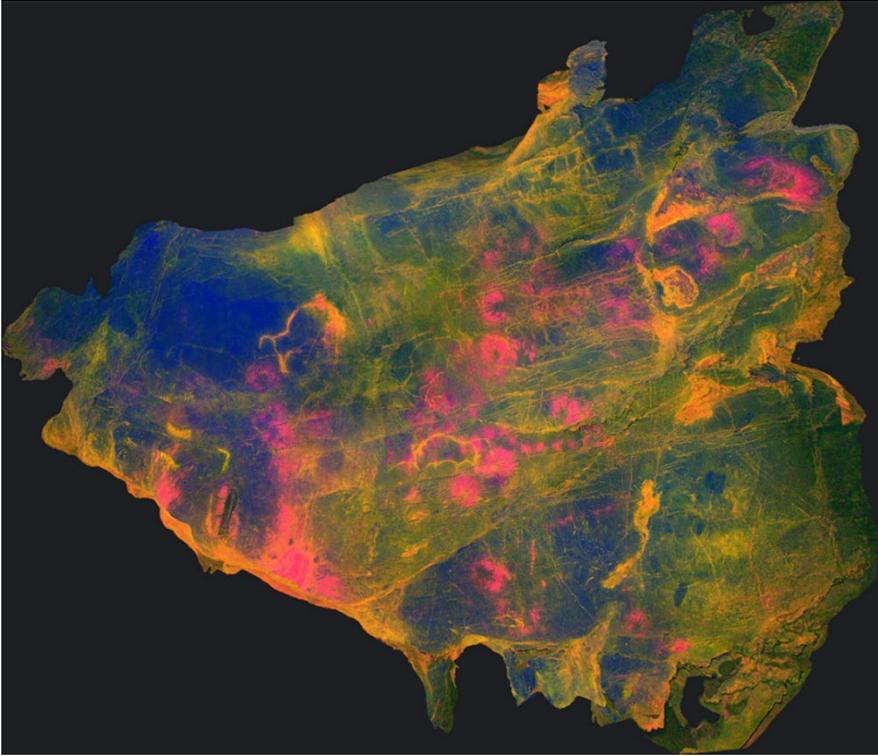


Fig. 4. Gigapixel image with one of the algorithms from GIM Geomatics that allows us to differentiate what we are calling the Spectral Signature as applied to the Hands Panel ensemble (Photo V. Bayarri.).

Although the majority of superimpositions are verified on the Hands Panel, the proposal we make here has need of the other panels in the cave in order to be consistent in establishing an iconographic stratigraphic sequence based on infrared images or the superimposition of figures. We also find them in this way on the Polychromes Panel and in the passage connecting the Second Room with the Third Room, among others. In any case, the presence of certain figures on the Hands Panel, found in other areas of the cave, allow the stratigraphy of certain figures to be analysed. (Fig. 5).



Fig. 5. Many of the superimpositions are verified on the lower part of the Hands Panel, above all the engraved striated lines found on top of all the other figures.

5. CHRONOLOGICAL PROPOSAL

The possibility exists in El Castillo cave to establish a pictorial sequence based on pictorial stratigraphy, and although it seems impossible more than 100 years after the publication by Abbé Breuil, we returned to the same methodology, supplemented with radiometric dating and the many studies done by different researchers. This sequence is constructed in 9 phases or series that we describe below, from the earliest figures to the most modern.

5.1. Phase 1

New technologies allow us to see that there are two phases of hand figures. An initial phase, which starts the pictorial sequence, encompasses a total of 20 negative hand stencils and is the starting point for this palimpsest. It is likely that Phase 1, given the date of one of the hands, should be placed in the Aurignacian cultural period or at the start of the Gravettian. This panel has other U-Th dating, one of which dates back to 37630 ± 340 BP (O-82) (Pike, et al., 2012). Although we know the work done on U-Th dating quite well as we have also published in other journals (White, et al., 2019), the methodology and results obtained are not conclusive and the dating you get with this method ages both excessively and unnecessarily. The problem is not the methodology but rather the samples that are being dated, given that, as they are very superficial, the uranium contribution remains constant and, thus, the dates are very old. The

sample is on top of one of the hands and below one of the yellow aurochs, meaning that the hand Fig. would be earlier. (Fig. 6).



Fig. 6. In this hyperspectral image, the superimpositions from Phases 1, 2, and 3, and even Phase 6, can be clearly seen. Three hand silhouettes can be observed to the right, over which is superimposed one of the yellow bison. And to the left of the image another yellow bison can be discerned, over which a goat from Phase 3 is superimposed. And on top of all of them is the large red bison from Phase 6.

5.2. Phase 2

Next, we find a series of figures, most of them painted with a very muted yellow or sienna pigment and primarily found in the ensemble of bison and other figures on the Hands Panel, except for the large red bison which due to its coloration and morphology we believe belongs to a later period. Next to these zoomorphic representations there are also two quadrangular or tectiform signs also painted in yellow. Included in this series is also the well-known elephant or mammoth in the Discs Gallery, also painted in a similar colour. No superimpositions exist on this last Fig., but on the Hands Panel all the mentioned figures appear on top, that is, superimposed on some of the hand stencils. As we mentioned earlier, there is a U-Th dating whose sample is superimposed on a negative hand stencil and is underneath a yellow Fig., and has given a result of 37630 ± 340 BP (O-82) (Pike, et al., 2012). In the adjoining room we identified a horse, also painted in yellow (no. 260), which not only has

red figures superimposed but also some in black. To the right of these representations another can be found, traditionally described as a deer but which is actually a yellow equine oriented to the right (no. 256), on which is superimposed an oval idiomorph in red ochre (Fig. 7).



Fig. 7. Photograph of a part of the Hands Panel with digital treatment by the GIM Geomatics company, where superimposition of the hands and the yellow bison can be seen clearly.

It is likely that this phase should be placed at the start of the Gravettian period. Some investigators (Gárate, 2006) believe that these types of auroch figures painted in yellow are closely related to the ensemble of deep engravings at outdoor sanctuaries such as Chufin, Hornos de la Peña, Torneiros or La Pasiega D. (Fig. 8).

5.3. Phase 3

Very faded black paintings. This phase corresponds to the zoomorphic ensemble painted in black, which in many cases is superimposed on the yellow figures that, in turn, are underneath the rest of the hand stencils of the Panel's Phase 4 and which are totally new.

GRAVETTIAN	NEGATIVE HAND STENCILS OF THE SECOND PHASE.	Discs Gallery Red pigment 35720±260 (O-81)		PHASE 4
	DISCS OF THE HANDS PANEL.			
	DISCS OF THE DISCS GALLERY & LITOPHONE.			
	BLACK PAINTED FIGURES VERY FADED UNDER THE HAND STENCILS & ABOVE THE YELLOW BISONS			PHASE 3
	YELLOW & SIENA PAINTINGS.			PHASE 2
GRAVETTIAN-AURIGNACIAN	NEGATIVE HAND STENCILS OF THE FIRST PHASE.	Red hand stencil n 162 Hands Panel 37630±340 (O-82)		PHASE 1

Fig. 8. Table with chronological proposal of the first decorative phases in El Castillo cave.

5.4. Phase 4

Probably contemporary with the previous phase, as there are numerous superimpositions not found within the entire series of discs, in total 151 (98 in the Discs Gallery and 43 in what is called the Lithophone). If we pay attention to the U-Th chronology it would take us to a date between 41400 ± 570 BP (O-83) and 34250 ± 170 BP (O-69) (Pike, et al., 2012), that is, in a transitional phase between the Aurignacian and Gravettian periods. In this large series there is only one superimposition of a different Fig., which belongs to the unidentified outlines, no. 447, that undoubtedly should not be included in this first phase. There are other dots throughout the cave, but due to their size, colour, and morphology we can differentiate them from the ones we describe here.

The set of hands, differentiated by their different response to computer processing, form Phase 4 of the decoration of the rock surface and include the 36 remaining hands. The main problem was that at least three hands from the first phase are “repeated” in the fourth phase. It is almost certain that these hand stencils belong to two men (at least) who in different moments depicted their hands on this rocky canvas, using a colouring with a basic ochre composition coming from diverse sources. So, even though on first sight they seem to be of

the same type of ochre, there is in fact a subtle difference, possibly due to their extraction from different outcrops or the use of a different binding agent. (Fig. 9).

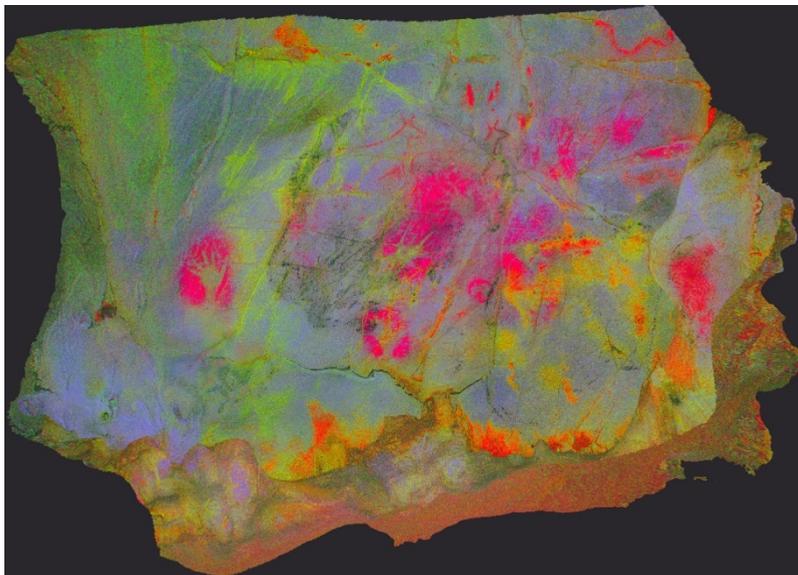


Fig. 9. Orthoimage with digital processing from what is called the Polychromes Panel, where superimposition of the bison from Phase 8 over the rest of the figures found underneath can be clearly observed.

There is another dating from 24340 ± 120 BP (O-58) (Pike, et al., 2012) of another red hand stencil on the Hands Panel. Thus, this pictorial horizon is situated between the Gravettian period and the start of the Solutrean period. Traditionally, hand stencils are always at the base of pictorial stratigraphy and, additionally, those that have absolute dating are located within a similar range. (Fig. 5). An interesting study was published recently about these types of figures, both in El Castillo and those in La Garma, which from our point of view deserve further review in light of our analysis with new technologies (Pettitt, et al. 2014).

Despite the abundant evidence of hands in cave art, we only have two direct radiocarbon dates for one of these figures. This is one of the black hand stencils at the Grotte Cosquer (Clottes & Courtin, 1994). The carbon sample mentioned earlier was analysed by dividing it into two parts, which provided the dates 27110 ± 390 BP (GifA 92409) for the first half and 27110 ± 350 bp (GifA 92491) for the second half, which coherently places us in a Gravettian cultural period.

Throughout the history of research on the Grotte de Gargas, various authors hypothesised that the hands and the series of engravings could be contemporaneous, considering the engraved figures had been framed, due to their similarities, in portable art objects in an Upper Perigordian or Gravettian cultural period (Nougier, 1984). But this cave has become part of the different sites with cave paintings dated by physicochemical methods. Although some negative hands are painted with a black halo, pigment analysis showed that these had been made with manganese (Clot, Menu, and Walter, 1995) and thus could not be dated. But following discovery of the underwater cave at Cap Morgiou, and with the goal of comparing the hands found there, the Pyrenean cave was analysed again. This allowed J. Clottes to make the sensational discovery of small bone chips in one of the cracks of a cave very close to one of the hands found on panel IV in room I. Once these bone remains were analysed using a particle accelerator, they were given a dating of 26860 ± 460 BP (GifA 92369) (Clottes, et al., 1992).

We have obtained other radiometric dating indirectly, in this case for the cave of La Fuente del Salín. This cave has thematic unity, restricted to representations of hands, and the site found inside the cave has only one archaeological level. Precisely in this stratum a home was found that dates back to $22340 \pm 510/480$ BP (GrN18574) (Moure & Gonzalez, 1992). Considering that this is a closed ensemble, it can be concluded that the home was lit up when the hands were painted and therefore their date should be similar to that of the home.

As we can see, the dates gradually began to be specified, confirming the assumptions of Abbé H. Breuil (1952), which already placed the hand stencils among the oldest manifestations of Pleistocene art. In their cultural classification, based on analysis of the superimpositions, the hands fell under the cycle known as the Aurignacian-Perigordian period.

Next to the hand stencils, as we mentioned earlier, there are a series of dots, barely twenty, which are smaller and closely related to the hands. We believe that these dots can be chronologically placed in this decorative phase. All the series of red dots (earlier dots from the Hands Panel) should be included in this phase, with some of them now forming a large deer head.

5.5. Phase 5

This is focused on a very characteristic set of figures whose morphological traits provide us with a very clear chronological framing in a Solutrean period *sensu lato*. It is curious that in the chronology proposed by Abbé Breuil there is not a single reference to this period in regard to the painted representations, and

the striated surface engravings only fit within a final moment of the Solutrean and Magdalenian III periods. Nevertheless, we believe there is a large set of figures, basically painted in black and generally represented in side profile with almost no anatomical detail, which only show one of the paired elements, such as the limbs, ears, or horns, that can fit into this period. There is a Fig., the horse's head, no. 402 in our series and no. 54 according to Breuil, that shows various chrono-stylistic conventions of this period and which we could possibly even specify is from the Middle Solutrean period. We refer to the step mane where it meets the ear, the droopy lower lip although without reaching the typical duckbill appearance, and a protruding jawbone that pierces the head, practically reaching the eye. This head is also represented in a side profile. We believe the rest of the zoomorphs that are found in a lower position (nos. 398-401) should also be included in this phase as they present similar characteristics.

The bison found nearby that we have identified with nos. 403 and 404, and as no. 55 according to Abbé Breuil, should also possibly be added to this decorative phase, as well as the supposed bison no. 406, but not the limbs of no. 405.

The headless horse, no. 405 of our series and no. 65 of Breuil's, or with the name of Gr 25-27, has two dates, 19140 ± 230 BP (GifA 98154) and 16980 ± 180 BP (GifA 98153) (Moure & González, 2000). Other dates exist for the goat, which is located once the lower passage is crossed, above which the earlier mentioned bison can be found. This is Fig. no. 407 and, in Breuil's numbering, set 56-57. The dates are a little later, 14740 ± 140 BP (GifA 98156) and 13900 ± 130 BP (GifA 98155) (Moure & González, 2000). Despite the dating, the two figures located (not the six published by Abbé Breuil) show the previously mentioned morphological characteristics. Therefore, we should also classify them in this fifth phase.

But there are not only painted figures. We also find a wide range of outlined representations. These engravings are also side profiles with little detail overall, with only one element of the pairs. Almost all the new figures identified in the area known as Slide or Descending West Gallery correspond to Phase 4, like other isolated figures, such as nos. 284 and 285 of the Chaos of Blocks, or the small horse with an exaggerated tail in the area of the Bison-man column or goat no. 395 in the Third Room. (Fig. 10).

5.6. Phase 6

This phase covers a large quantity of figures that are distributed throughout different rooms in the cave. There are zoomorphic figures painted in intense red ochre as well as the set of idiomorphs in the Tectiforms Alcove and the

ensemble of vulvae or scutiforms at the entrance of the area known as Slide. These are generally stencils, that is, contoured figures lacking excessive detail. Almost all are presented in a semi-twisted perspective, as in the majority we can distinguish two ears, two horns, hand prints, or two legs.

In the Main Entrance Hall we have various representations of this phase, among which a large deer positioned toward the left (no.53) stands out. In the Descending Gallery we find the set of the large bison, horse, auroch, etc. (nos. 116-121), which show the same characteristics as the rest of the figures. A little further down, on the Polychromes Panel, there are two red-painted deer that are superimposed on the hands and are underneath the bison bichrome, as well as a circular sign, possibly a female vulva, no. 133.

On the Cantabrian coast there are a number of figures made by juxtaposing small dots or fingerprints, representing mainly deer and horses, although there are other animals painted. The study by D. Garate (2010) puts these types of images in a wide time frame, but always earlier than the Magdalenian period. R. Ontañón believes this type of Fig. has a Solutrean chronology (Ontañón, 2006). We have found a singular representation of this type (no. 64) in El Castillo, located to the right in a rampant position. Up to now this Fig. had been described as a series of isolated dots. Its inclusion in this phase responds not only to the colour but also to the morphology and its semi-twisted perspective, since both ears can be distinguished.

Standing out in this series is the large red bison in the central area of the Hands Panel as well as the majority of signs on this large panel, which always appear underlying the figures in the next phase. The similarity between some of the idiomorphs from nos. 169 to 182 with some from the Tectiforms Alcove is what makes us believe they have a similar chronology. On the other hand, in this nook there are also striated engravings that are superimposed on some of the idiomorphs. Very close to this area, in what is known as the Annex Room, we find a red-painted deer positioned towards the right that we can align perfectly with those that are located on top of the hands on the Polychrome Panel, which would also be from this phase.

Further into the interior, in a small gallery in the Second Room, we find the set of vulvae or scutiforms painted in red ochre, which are underneath an arboriform sign in black and an engraving with traces of the striated technique. Further towards the back of the cave, we find a deer head and an auroch with both horns projected forward in a semi-twisted perspective. Now in the Discs Gallery, some of the idiomorphs, such as the two juxtaposed diamonds, the semi-circular outline, or the blade that are superimposed on the discs, should also be assigned

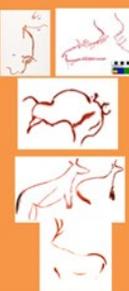
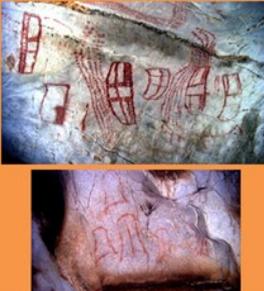
<p>LOWER MAGDALENIAN</p>	<p>RED PAINTED FIGURES.</p> 		<p>TECTIPHORMS & RED PAINTED SIGNS.</p> 	<p>PHASE 6</p>
<p>SOLUTREAN</p>	<p>SIMPLE BLACK PAINTINGS WITH 1 LEG PER PAIR, RARE DETAILS IN THE HEAD.</p> 	<p>Hands Panel, indeterminate animal 22880±270 (0-80)</p> <p>Caprid gr. 56-57 14740±140 13900±130</p> <p>Horse gr.25-27 19140±230 (GifA98154) 16980±180 (GifA98153)</p>	<p>SIMPLE ENGRAVINGS IN SIMPLE PERSPECTIVE. 1 LEG PER PAIR. RARE DETAILS IN HEAD. ALL THE FIGURES OF THE TOBOGÁN EXCEPT SOME SPECIFIC FIGURES.</p> 	<p>PHASE 5</p>

Fig. 10. Table explaining the intermediate stages of the parietal decoration at El Castillo.

to this period, whose morphological characteristics bring us to a Lower Magdalenian period.

5.7. Phase 7

Possibly bearing a close relationship to the previous phase, we identified a set of figures we have differentiated not only by colour, as they are all black, but also through a much more refined technique, as many representations show anatomical details. These are extremely realistic figures of medium-large size in respect to the rest of the ensemble. (Fig. 11).

In the Main Entrance Hall we find various equine figures that, apart from showing some movement in the limbs, have much detail in the coat, legs, hooves, head, etc. There are a couple of goats painted in black that are very similar, referring to no. 59 of the Main Entrance Hall and to no. 373 in the Second Room, which in spite of the numbering have spatial proximity. On the Hands Panel, the leaping goat, no. 155, has the characteristics mentioned. In addition to numerous engraved figures, some with striated outlines are superimposed on this image.

BRONZE AGE	ANTROPOMORPHS PAINTED IN BLACK &/OR RED.			PHASE 9
UPPER & FINAL MAGDALENIAN	BICROME FIGURES, ELABORATE TECTIPHORMES OUTSIDE DE CHAMBER & OVALE SIGNS. 	Bison n 18c HB 136 SR 10510±100 10740±100 11270±110 12390±190 Bison n 18b HB 128 SR 12910±180 Bison n 18a HB 112 SR 13060±200 12620±110 13520±130	COMPLEX ENGRAVINGS IN TWISTED PERSPECTIVE & 2 LEGS PER PAIR. 	PHASE 8
LOWER & MIDDLE MAGDALENIAN	BLACK PAINTED ELABORATE FIGURES WITH SHADED PARTS & 2 LEGS PER PAIR & DETAILS ON THE HEAD. 	Bison n 19 HB 134 SR 14090±150 13710±140 13570±130 13520±120 13510±190	ZOOMORPHIC FIGURES IN STRIATED ENGRAVING. 	PHASE 7

Fig. 11. Table with final phases of the pictorial figures and engravings in the Cantabrian cave.

The arboriform on the Vulvae Panel also fits into Phase 5. The most notable Fig. found in this phase is the Shaman-Bison stencilled in black, with a number of details from the Second Room. Masks nos. 392 and 303 as well as the round-shaped auroch head, no. 410, the goat protome, and the black idiomorph from the small room in the Second Room are also from this phase. As a novel Fig., it is worth noting the large deer painted in black found underneath idiomorph no. 384. Another important grouping in this pictorial period is the one located in what is known as the Goat's Cornice, discovered by E. Ripoll in 1953, the content of which we have modified considerably. All these figures, and others too numerous to describe, show common features that lead us to believe they can be included in a Lower-Middle Magdalenian cultural period.

There is a series of dates for this set of black paintings that only corresponds to a bison painted in black and pointing to the left and that we identify as no. 134, no. 19 for Breuil, in the Descending Gallery, which has provided various dates between 14090±150 BP (GifA 98151) and 13510±190 BP (GifA 98159) (Moure & González, 2000). Keep in mind that some investigators (Bernaldo de Quirós, 1991) think the figures from the black series, at least those in the Cola de Caballo gallery at Altamira cave, could form part of the beginning of the Cantabrian Lower Magdalenian period, as indicated by the

date 15440±200 BP (GifA 91185) (Moure, et al. 1996), just like the deer in striated outline that can also be included in the same period.

Not only are there painted representations, but there are also engraved figures as well as the characteristic figures made using engraved striated lines. In El Castillo there are many parietal representations that compare perfectly with those documented on scapulae, not only at this site but also at nearby Altamira cave, whose archaeological environment allows a very precise chronological framing in the Lower Magdalenian period. These figures superimpose a large part of the representations. They can be found on the Hands Panel on top of all the images. Even in the large set of stencils in Slide, there are various figures aside from the two known deer that are made with this technique. In some others, the striated line is not so evident or completely filled in as in others, but in general an intention to express the Fig. giving it volume through this multiple engraving can be observed. One of the most characteristic figures exemplifying this is bison no. 272-273, which we have reinterpreted from the Annex Room. (Fig. 12).



Fig. 12. In this image of the large tectiform in the passage between the Second Room and the Third Room, the idiomorph from Phase 8 that superimposes a large deer painted in Black from Phase 3 can be seen perfectly.

5.8. Phase 8

This is possibly the most spectacular phase due to its similarities to the paintings on the ceiling at Altamira, however the quality of the bison at El

Castillo is considerably inferior. In truth, there are only three figures that have a certain degree of bichrome, not polychrome, and which superimpose various hand stencils from Phase 2, red deer from Phase 5, and which are grouped together in a very specific area at the beginning of the Descending Gallery, corresponding to our numbers 112, 128 and 136 and the numbers 18a, 18b, 18c, and 19 of Abbé Breuil. According to the study by B. Ochoa (2011) on the status of the issue of absolute dating of Cantabrian cave art, he says, and I quote: "In El Castillo cave a large amount of dating was done on the bison 18a, 18b, 18c, and 19 that can be found on the Polychromes Panel (Valladas, et al., 1992; Moure, et al., 1996; Moure & González, 2000). The results are very dispersed, not only among the figures but also in the dating of one same Fig., giving a range that goes from the Middle Magdalenian period to the Azilian on what was thought to be a synchronous panel. According to González-Sainz (2005), three phases can be distinguished: a first one, represented by bison 19, belonging to an earlier time of the Middle Magdalenian. A second phase, made up of bison 18a and 18b at the beginning of the Upper Magdalenian period; and a final phase, if the humic fraction is taken, which would place bison 18c in the Final Magdalenian period. Nevertheless, the problems observed in this grouping, probably caused by contamination, cannot be ignored, forcing us to take the dating with caution."

For the first two figures on the Polychromes Panel there are several radiocarbon dates, made in two different stages. For the back leg of bison no. 112, Breuil's no. 18a, the dates obtained are from 13060±200 BP (GifA 91004) (Valladas, et al., 1992), 13520±130 BP (GifA 96068) and 12620±110 BP (GifA 96079) (Moure & González, 2000).

Meanwhile, for Breuil's bison no. 18b and our no. 128, the date is from 12910±180 BP (GifA 91172) (Valladas, et al., 1992). Finally, for bison no. 136, Breuil's no. 18c, which is the one furthest to right on the panel, the first one found when visiting, the dates are from 10510±100 BP (GifA 95136), 11270±110 BP (GifA 95146), 12390±190 BP (GifA 95375), 10720±100 BP (GifA 96077) and 10710±100 BP (GifA 96078) (Moure & González, 2000). (Fig. 13).

Superimpositions showing various complex idiomorphs have also been added to this phase, as they differ completely from those distributed around the cave. Two of them are the most notable, one located in the Annex Room and identified by no. 263 and the other, no. 384, superimposed on the novel black deer. Along with these complicated and difficult to interpret figures are a series of ovals, distributed around the entire cave, some of them with appendages whose simplicity contrasts with the earlier ones.

But these paintings show up linked with engravings that outline them and highlight some details. They are truly complex and, in some cases, it is difficult

to distinguish whether they underlie or overlay the pigment. But not only do they appear linked with pictorial remains, there is also a broad range of complex engravings in a semi-twisted perspective, which let the two paired elements in each one be represented. The difference with the previous phase is the absence of striated lines and essentially a much more pronounced realism.

5.9. Phase 9

In the iconographic ensemble in El Castillo cave we have found a small number of anthropomorphic paintings, forming the end of the pictorial stratigraphy, painted in both black and red paint. There is a clear concentration in the Main Entrance Hall, with two differentiated groups. The first of five stencils painted in black on the left wall of this vast space, and two others painted in red on the right wall. In the Descending Gallery is found the last of these anthropomorphs, painted in a red ochre colour that seems to be holding a spear or stick. This type of Fig. is generally associated with the Bronze Age, but in any case, its schematisation leads us to a period that is clearly post-Palaeolithic.

6. COLOPHON

Breuil assumed that if a painting or engraving covered another, this one had to be earlier. A Fig. cannot be covered by another if it has not already been made. As such, the superimpositions could be considered as a type of stratigraphy in which the different figures correspond to different cultural periods.

This new approach to the different pictorial phases in El Castillo cave has in no way intended to be extensive, given that the number of figures that make up each of the nine established phases would exceed the space of this text. (Fig. 14).

All the information provided in this text is based on in-depth research of each of the panels in the cave, in which the use of new technologies and long hours in front of the computer are supported by the indisputable review *de visu* and *in situ* of each one of them. These superimpositions, along with stylistic analyses and the chrono-stylistic conventions of some figures – legs in Y, step manes, dotted figures, etc. – as well as the range of existing radiocarbon dating, are what back us up and sustain the proposal for chronological seriation we present here. What we have called the Spectral Signature has only been used – to date – on the hands of the Hands Panel, in hopes of soon having new authorisation from the Regional Governmental Department of Culture of

Cantabria that will allow us to use it on other surfaces in the cave. Clearly, it is not possible to develop all the evidence needed for a complete monograph in an article.

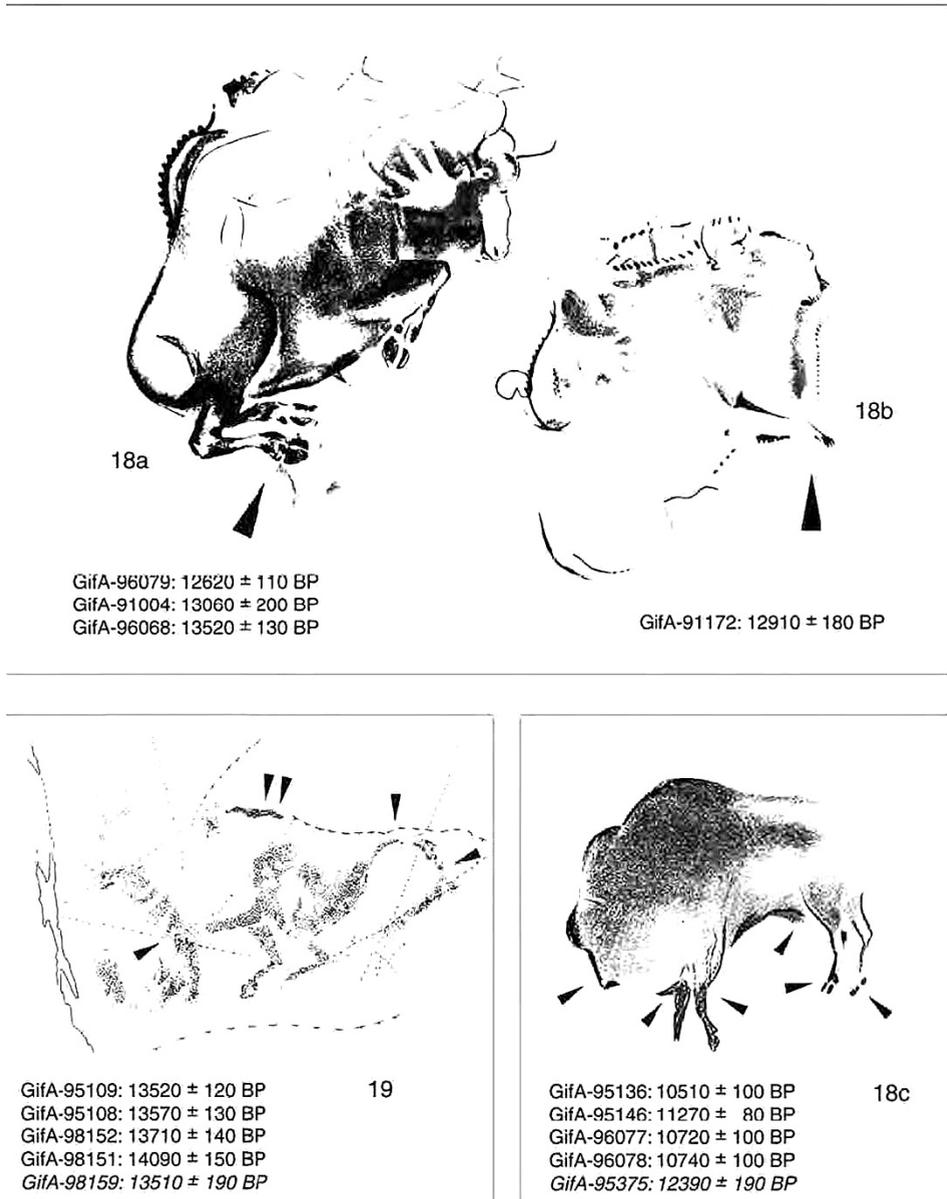


Fig. 13. Diagram showing the different radiometric dates obtained in the area of the polychromes and of those referenced in the text.

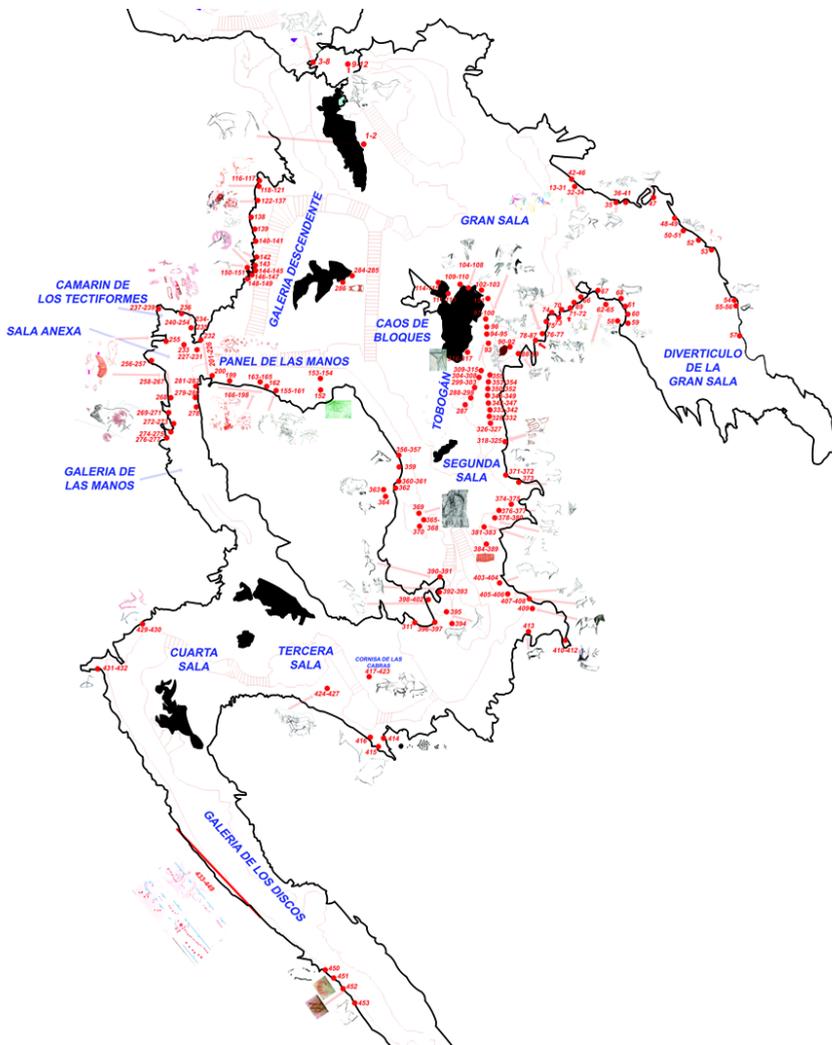


Fig. 14. Plan of El Castillo cave with the location of all the figures identified by E. Ripoll and by the team that has written this article.

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