



Not only Chauvet: Dating Aurignacian rock art in Altxerri B Cave (northern Spain)



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ABSTRACT

The discovery and first dates of the paintings in Grotte Chauvet provoked a new debate on the origin and characteristics of the first figurative Palaeolithic art. Since then, other art ensembles in France and Italy (Aldène, Fumane, Arcy-sur-Cure and Castanet) have enlarged our knowledge of graphic activity in the early Upper Palaeolithic. This paper presents a chronological assessment of the Palaeolithic parietal ensemble in Altxerri B (northern Spain). When the study began in 2011, one of our main objectives was to determine the age of this pictorial phase in the cave. Archaeological, geological and stylistic evidence, together with radiometric dates, suggest an Aurignacian chronology for this art. The ensemble in Altxerri B can therefore be added to the small but growing number of sites dated in this period, corroborating the hypothesis of more complex and varied figurative art than had been supposed in the early Upper Palaeolithic.

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Introduction

In recent years, our understanding of the beginnings of Palaeolithic graphic activity has advanced considerably. Since the ‘shock’ produced by the first dates for Grotte Chauvet (Clottes et al., 1995), new discoveries and analytical methods have enlarged the repertoire of parietal art in the early Upper Palaeolithic, to include such sites as Aldène (Ambert et al., 2005), Fumane (Broglia and Dalmeri, 2005), Arcy-sur-Cure (Baffier and Girard, 1998), Coliboaia (Clottes et al., 2010/11), Castanet (White et al., 2012), Baume Latrone (Azéma et al., 2012) and Tito Bustillo, Altamira and Castillo (Pike et al., 2012). At the same time, the chronology of ‘exterior’ ensembles in Dordogne and Quercy (Delluc and Delluc, 2003; Lorblanchet, 2007) and Cantabrian Spain (González-Sainz, 1999; Garate, 2008; Ruiz-Redondo, 2011) have tended to set back the origin of this aspect of figurative expression.

The resistance of some researchers to accepting the paradigm shift suggested by the latest advances has fed a double debate that is still on-going. One of them is methodological, about the veracity and reliability of these dates (e.g., Züchner, 1996; Pettitt and Bahn, 2003; Combier and Jouve, 2012). The second debate is more

anthropological, cultural and evolutionary, and concerns the great complexity of graphic expression already existing in the Early Aurignacian (e.g., Conard, 2003; Sauvet et al., 2008; Moro-Abadía and Garate, 2010). This aspect is of key importance as it completely disrupts a chronological arrangement of Palaeolithic art from the simplest representations to the most complex (cf. Leroi-Gourhan, 1965). Ultimately, even the possibility of ‘Neanderthal art’ has been proposed (Tejero et al., 2005; Bednarik, 2007; Pike et al., 2012).

This paper summarises the main results of the study of rock art in Altxerri B Cave and its chronological context. Although it has not been possible to obtain direct dates for the representations (they are all painted with red ochre and are not covered by layers of calcite), the chrono-stylistic approach has been refined as far as possible (with clear parallels in Chauvet and Arcy-sur-Cure) and ¹⁴C-AMS dates have been obtained for their closest archaeological context. The results indicate an Aurignacian chronology for the graphic activity in Altxerri B, and they are in fact the oldest radiocarbon dates for the context of European Palaeolithic cave art.

Material and methods

Archaeological and historical context

Altxerri Cave is located in the east of the northern Spanish coast, in the town of Aia (Basque Country, Spain) (Fig. 1). The present

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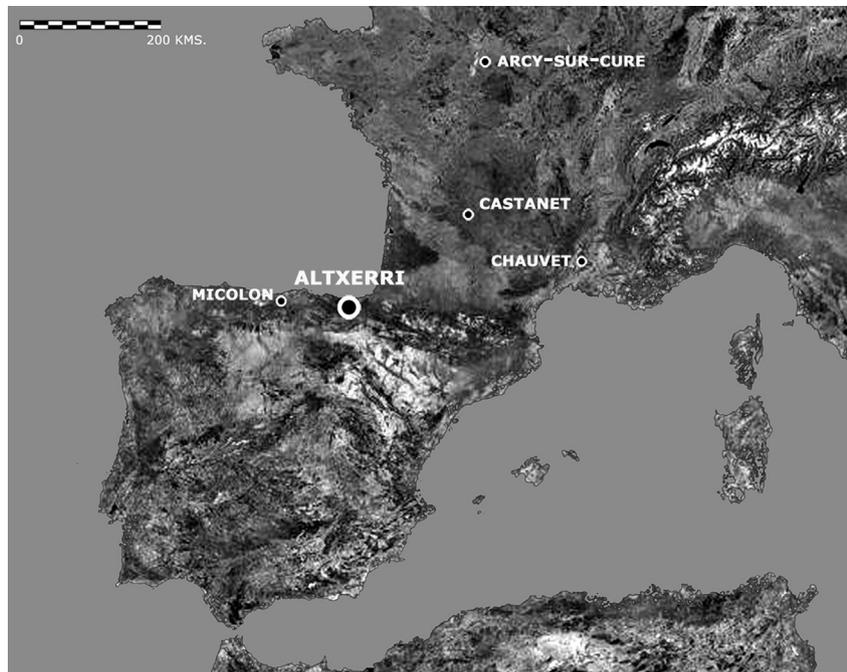


Figure 1. Map with the location of Altxerri Cave and other sites mentioned in the text.

entrance (the original entrances collapsed) was uncovered by quarrying in 1956, and the first graphic representations were found in 1962. The cave system consists of three levels, connected by shafts and chimneys, where the modern entrance leads to the intermediate level. The important Magdalenian art ensemble in this level has been published in two monographs (Barandiarán, 1964; Altuna and Apellániz, 1976) and warranted the inclusion of the site in UNESCO's World Heritage List in 2008.

However, neither of the monographs included the upper passage (Altxerri B), although the existence of paintings had been cited (Fernández-García, 1966). These have since been studied briefly (Altuna, 1996; Altuna and Mariezkurrena, 2010), confirming the existence of a large red bison and mentioning the remains of other red figures, which, according to the authors, were impossible to interpret. The authors also cited a bison vertebra inserted in a fissure and published the results of two ^{14}C -AMS dates (Table 1) for two chamois bones (*Rupicapra rupicapra*) deposited beneath the wall with the paintings.

The present study: objectives and methodology

In 2011, we began a new full study of the graphic activity in Altxerri, which included both ensembles: in the intermediate passage (Altxerri A) and the upper level (Altxerri B). The objectives for Altxerri A focused on updating our knowledge of the parietal representations, obtaining new photographs and copies, and assessing certain aspects not considered in previous studies (technical, spatial and

compositional analysis, possible absolute dates). In Altxerri B, in contrast, as the ensemble was practically unstudied, the work had to begin with basic exploration of the walls to determine the number and characteristics of the graphic units as well as the archaeological, chronological and stylistic context.

The study of parietal art in Altxerri B included several procedures. To identify and follow the graphic units we have used four types of illumination with different luminosity and colour temperature (Scurion[®] 900 headlamp, Petzl[®] Duo Led 14 Accu headlamp, Led Lenser[®] M7R hand torch and Peli[®] 9430 Rals portable light source). For the photography we used a Nikon[®] D90 camera with a Micro-Nikkor[®] AF60mm f/2.8 D AF-S macro lens to photograph details. We also used a Dino-lite[®] AD-7013MZT 30×–200× handheld microscope to identify superimpositions. The photographs were processed with the Dstretch[®] plug-in for the ImageJ[®] program, and the digital tracings were made with Adobe Photoshop[®] CS6. The graphic restitution of the paintings was performed with a methodology based on computer graphics (Fritz and Tosello, 2007). For the plan of the cave, we have used the incomplete 3D model made with the I-Site system (commissioned by the Regional Government of Gipuzkoa in 2009). This included a survey of the hillside in the surroundings of the original cave entrance. Finally, four samples taken from the archaeological context for ^{14}C -AMS dating (Table 1) were analysed by Beta Analytic Inc. Both the new date obtained and the previous ones (Altuna, 1996) were calibrated with the OxCal 4.2. program (Bronk Ramsey, 2001), using the IntCal09 curve (Reimer et al., 2009).

Table 1

Results of the determinations from Altxerri B archaeological context analysed in the laboratories at Uppsala and Beta Analytic Inc.

Sample	Material	Date, BP	±, BP	Cal. BP 1σ (68.2%)		Cal. BP 2σ (95.4%)	
				From	To	From	To
Ua-11145	<i>R. rupicapra</i> centrotarsal	29,940	745	35,190	33,498	36,389	32,990
Ua-11144	<i>R. rupicapra</i> centrotarsal	34,195	1235	40,690	37,770	41,765	36,649
Beta-340768	Burned mammal bone	34,370	280	39,893	38,840	40,269	38,689

The calibrated dates are given on the right.

Results

Results of the exploration

The nature of the only modern access to Altxerri B, up a vertical chimney about 14 m high from the intermediate passage (Fig. 2), suggests that when the upper part of the cave was occupied, an entrance that has since collapsed must have reached this level directly. This entrance may have been where an alluvial cone now enters from above, in the chamber where the bison vertebra was found. This would once have been the entrance hall of the cave. The cone of limestone boulders is now covered by a thick layer of calcite on which active stalagmites have grown, in some cases to over 1 m in height.

During the exploration of the walls in Altxerri B, we have differentiated two decorated chambers. One of them contains a large panel with 14 graphic units and a further two separate representations, and the other has 14 isolated graphic units. They were all painted with red pigment, apart from some motifs in the Main Panel, which are violet. With the exception of this panel, which will be described below, the motifs are all very simple: series of dots or isolated dots, stains of colour on stalagmites, non-figurative lines, etc.

Finally, we examined the surface of the cave floors, where we located several interesting objects to contextualise the graphic activity in the cave. First, a large number of whole and fragmented bones of medium- to large-sized mammals (*Capra*, *Rupicapra*, *Bos/Bison*, *Cervidae*) were found on the floor or beneath the large blocks fallen from the roof and which cover much of the passage floor. In addition, a large concentration of charcoal, burnt bones and also remains of red ochre were documented next to the Main Panel.

The Main Panel

The Main Panel is on a vertical wall in the large chamber in Altxerri B, opposite the original entrance (Fig. 2). The painted area is 435 × 310 cm in size. The deficient state of conservation of the pigment and the palimpsest of intermingled representations hinders a precise identification of all the motifs in the panel. Even so, a minimum of 14 graphic units can be distinguished (Fig. 3). In addition to the large bison, they include a feline, a figure interpreted as a bear, a possible horse's head and three groups of lines and stains that probably belonged to figurative representations originally. The non-figurative motifs are abundant and very expressive: four series of dispersed lines, two groups of three finger marks, a series of eight paired and parallel marks, and the remains of a possible more complex sign.

The large bison articulates the whole ensemble (Fig. 3), as the other motifs are located inside the figure, except for the four series of isolated marks, which are above it, and some indeterminate stains of colour. This bison, painted in red and facing left, is unusually large (399 × 210 cm). It consists of at least a forelimb, the head, the cervical–dorsal line and a tail represented by a double line. Other details are the beard, eye, eyebrow, ear and one long horn. It was painted with a red outline, up to 15 cm wide, in proportion with the size of the figure. Below the cervical–dorsal line, and parallel to it, the figure of a spotted feline faces right. The belly and hind-limbs are very faded, but the buttocks, raised tail, back, with a marked shoulder, and an ear are much clearer. The head cannot be easily identified among all the lines accumulated in the area where it should be. To the right of the feline and below the bison's croup, an almost complete figure of a quadruped probably represents a bear facing left. It is a very simple figure with no

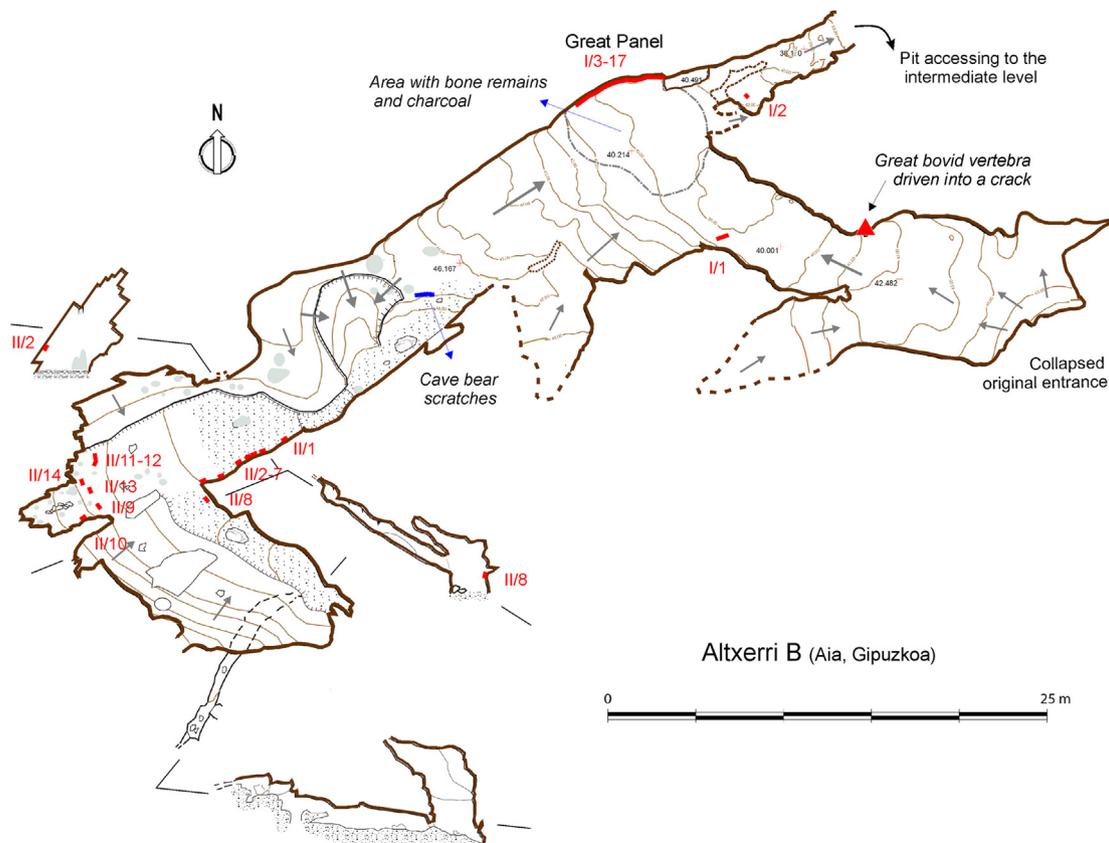


Figure 2. Plan of Altxerri B Cave, marking the position of the samples taken for radiocarbon dating.

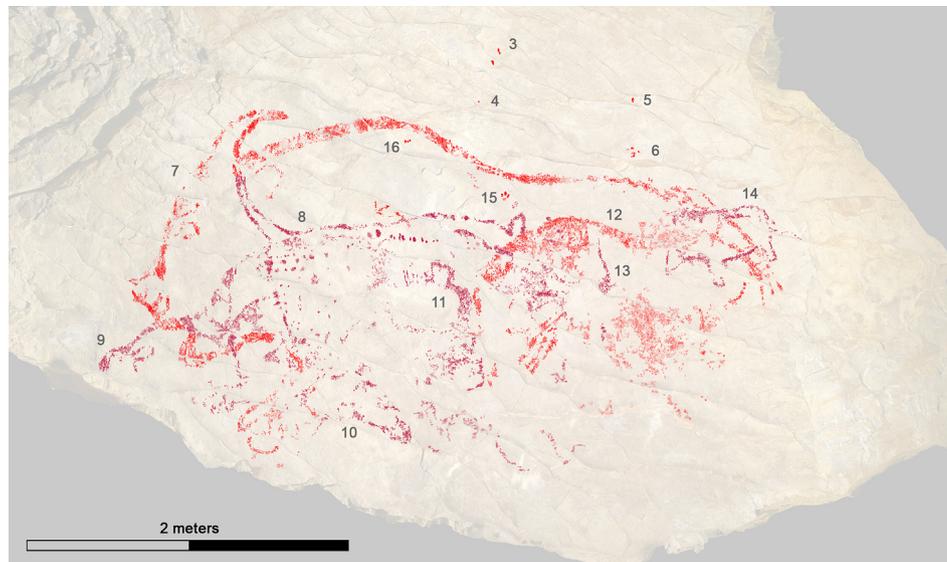


Figure 3. Relevé of the Main Panel in Altxerri B, after a photograph. Isolated finger marks (3, 4, 5, 6), a bison (7), a feline (8), a possible animal's head (10), a bear (14) and two groups of three finger marks (15, 16) are shown, as well as other motifs more difficult to interpret.

internal details and one fore and hind limb. Below the feline (where its forelimbs should be) there is an angular sign. Below this, a possible animal's head facing right can be recognised; fitted within a network of fissures, it may be a horse. All of these figures, except for the bison, are painted in violet.

Radiometric dates

Several organic samples were taken to be dated: a fragment that had broken from the vertebra inserted in the fissure and was collected on the floor beneath it, an ibex tibia, and two unidentifiable burnt bone fragments found on the floor beneath the Main Panel. However, the vertebra fragment and the tibia had not conserved enough collagen to be dated and only one of the two burnt bones contained enough burnt matter to be analysed. This date can be added to the others obtained on the two chamois bones 'deposited' at the foot of the Main Panel, analysed in the Uppsala laboratory and published previously (Altuna, 1996).

Of these three dates, two are very coherent (particularly considering that they are respectively unburnt and burnt matter and were analysed twenty years apart by different laboratories) at about 34,000 BP (38,000–40,000 cal. BP [calibrated years before present]). The third result is a little more recent, about 30,000 BP (ca. 33,000–35,000 cal. BP).

Discussion

The results of the research provide arguments to propose an Aurignacian chronology for the parietal ensemble in Altxerri B.

Chrono-stylistic parallels

For a long time, chrono-stylistic parallels were the main factors used to date Palaeolithic parietal art. This meant that they were often used abusively. This type of relative approach is still in use due to the small number of sites that have been dated directly, which is about 5% of the total number of sites (Pettitt and Pike, 2007), although the analysis has become much more refined (Fortea-Pérez et al., 2004). First, the analogies should be established with unusual motifs within Palaeolithic graphic activity as a whole

or which display some specific distinctive trait. Secondly, other evidence suggesting the same chronology should support them.

In the case of Altxerri B, the representations fulfil the following requirements to be the object of a valid analogy (Fig. 4):

- Two aspects differentiate the site from other Palaeolithic ensembles in northern Spain. One is the large size of at least one of the figures and the other is the choice of zoomorphs (with a bear and a feline – the latter is practically unknown in the regional Palaeolithic art) and ideomorphs (triads of points and lines).
- Felines are unusual in Palaeolithic art, but are found most often in early Upper Palaeolithic ensembles, together with such animals as mammoth, bear and rhinoceros. This association has led some authors to suggest a specific theme in Aurignacian art, with a larger role for so-called 'dangerous animals' (Clottes, 1996). The feline in Altxerri B, with its body filled with spots and a long tail painted with a double line, is very similar to another, also in red, in the panneau de la Panthère at Chauvet (Clottes, 2001; Clottes and Azéma, 2005). Variations on the spotted fill are seen in two ivory figurines from Level IV at Vogelherd (Swabian Jura, Germany; Conard, 2003).
- The bear, reduced to its outline, with a pointed snout and one fore and hind limb, is similar to the figure in Micolón Cave (Cantabria, Spain; Garate and González-Sainz, 2009); and, above all, to the bears in Grande Grotte de Arcy-sur-Cure (Bourgogne, France), which have been dated by the radiometric determinations of its archaeological context in the transition from the Aurignacian to the Gravettian (ca. 29,000 BP) (Baffier and Girard, 1998). The identification of this bear is based on the general proportions of the animal silhouette and its legs shape. The general outline could correspond to a bear or a wild boar. However, those legs cannot belong to a wild boar, as one of the main features of that species is the different proportion between forequarter and hindquarter. As that difference does not exist in this figure and, at the same time, there are no certain representations of wild boar in Palaeolithic rock art (Sacchi, 1993), we would rather identify it as a bear.
- Graphic Unit 10 (Fig. 3) has been interpreted as a horse's head, due to its similarity with the type known as bec du canard. It is a characteristic type in archaic art ensembles, mainly

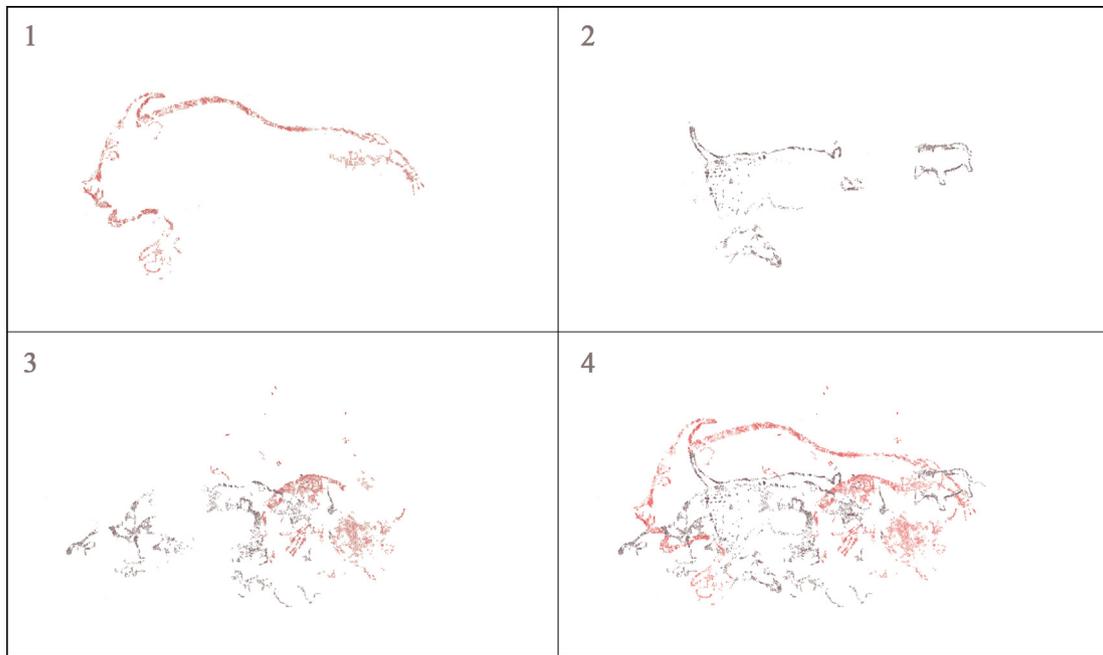


Figure 4. Relevé of the graphic elements of the Main Panel in Altxerri B, differentiated in the text. (1) Bison; (2) feline, bear and possible horse head; (3) non-figurative and unidentifiable graphic elements; (4) whole Main Panel.

Gravettian but also Aurignacian, like Chauvet, Baume Latrone, Bouil-Bleu and Vogelherd, among others (Sauvet et al., 2007).

- Paired lines are a constant in Palaeolithic art in northern Spain, although more frequent in earlier periods (González-Sainz, 1999). At Altxerri B, there are also some less common groups of three fingerprints (index, middle and ring fingers). The same

motif can be seen in a panel in the Galerie du Cactus at Chauvet, which also has large-sized bears and felines and series of dots (Clottes, 2001), painted in red and violet, as in Altxerri. In addition, in both caves the marks are located next to the back of a bison and inside the animal in one case, and of a bear and outside it in the other.

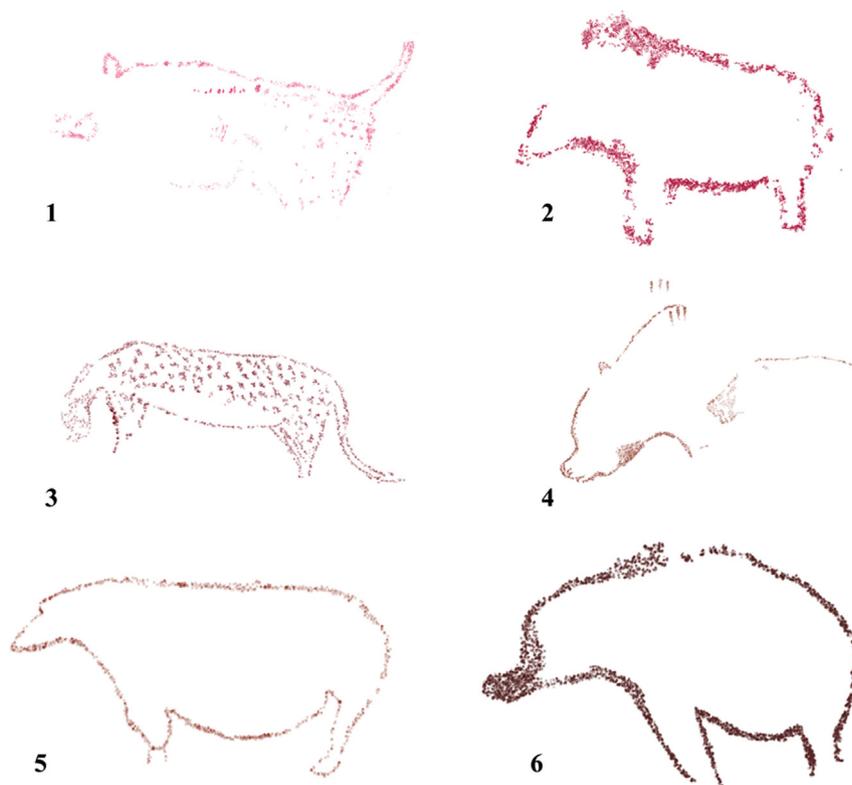


Figure 5. Stylistic comparison. (1) Feline from Altxerri B; (2) bear from Altxerri B; (3) 'leopard' from Chauvet (from Clottes, 2001); (4) a panel from Chauvet with an association of a bear, a feline and two groups of three fingerprints, the same thematic as Altxerri B (from Clottes, 2001); (5) bear from Micolón (from Garate and González-Sainz, 2009); (6) bear from Arcy-sur-Cure (from Baffier and Girard, 1998).

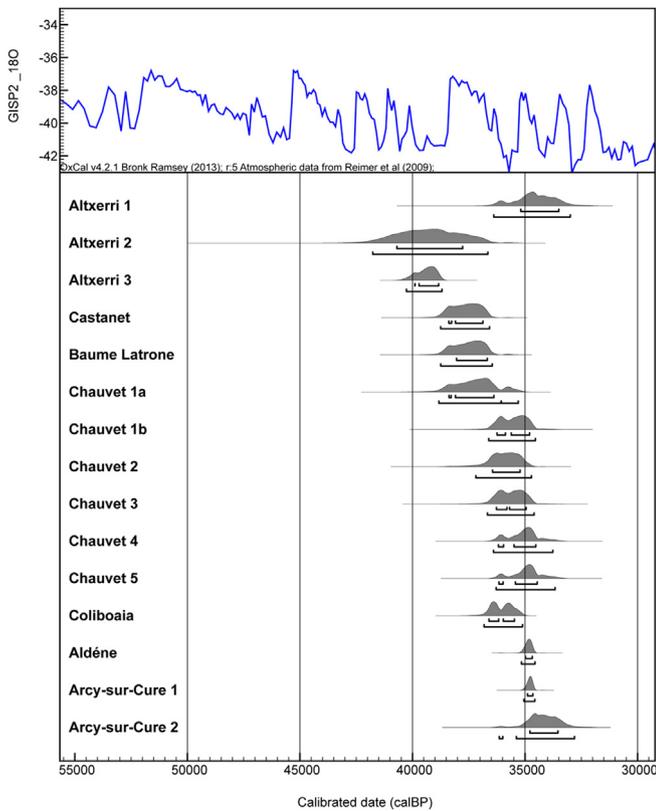


Figure 6. Aurignacian radiocarbon determinations associated with parietal art. Direct samples of paintings, uncal. BP: Chauvet 1a: $32,410 \pm 720$, Chauvet 1b: $30,790 \pm 600$, Chauvet 2: $31,350 \pm 620$, Chauvet 3: $30,940 \pm 610$, Chauvet 4: $30,340 \pm 570$, Chauvet 5: $30,230 \pm 530$ (Clottes, 2001). Samples from the geoarchaeological context, uncal. BP: Altxerri 1: $29,940 \pm 745$, Altxerri 2: $34,195 \pm 1235$ (Altuna, 1996), Altxerri 3: $34,370 \pm 280$, Castanet: $32,900 \pm 500$ (White et al., 2012), Baume Latrone: $32,740 \pm 530$ (Azéma et al., 2012), Coliboaia: $31,640 \pm 390$ (Clottes et al., 2012), Aldène: $30,260 \pm 220$ (Ambert et al., 2005), Arcy-sur-Cure 1: $30,160 \pm 140$, Arcy-sur-Cure 2: $29,640 \pm 590$ (Baffier and Girard, 1998). For Grotte Chauvet, we have chosen the dates directly dating the paintings, although another series of determinations dated the archaeological context. At Abri Castanet, there are 18 extremely coherent dates for the stratigraphic context of engraved and painted boulders, and we have therefore selected the result from the engraved surface. At Coliboaia, a result of $27,870 \pm 250$ BP (uncalibrated) was obtained for one of the black animal paintings. At Arcy-sur-Cure, another ten determinations for the archaeological context were dated between 26,000 and 28,000 BP (uncalibrated).

Altxerri B displays few similarities with other decorated caves in northern Spain, but the new study of the Main Panel has succeeded in identifying a series of representations with unexpected parallels. The themes and their treatment are also found among the oldest examples of Palaeolithic art in Europe, in total consonance with the radiocarbon determinations obtained for the remains found at the foot of the panel. These dates are among the oldest for Aurignacian parietal art ensembles (Fig. 5).

The geoarchaeological context

It has already been suggested (Altuna and Marizkurrena, 2010) that Altxerri B must have had its own entrance, as it was unlikely that Palaeolithic visitors reached the cave the way we do today, up a 14 m-high vertical chimney from the intermediate passage. This hypothesis is supported by the remains of large animals on the passage floor and cave bear scratches on the walls in Altxerri B, which can only be explained by the existence of a different entrance.

The only possible place for this is on the south-east side of the Upper Chamber or Vestibule. This is the nearest point to the surface,

and the shaly–limestone roof is less than 6 m thick. A cone of debris almost 15 m long descends along the passage nearly to the Large Chamber (Fig. 6). The cone consists of large collapsed limestone blocks covering ancient fossil speleothems and which are in turn covered by a thick layer of calcite and active stalagmites up to 1 m tall. These may well represent the latest speleogenesis phase in northern Spain, in the late Pleistocene and Holocene (McDermott et al., 2011; Rudzka et al., 2011). This would indicate that the old entrance to Altxerri B collapsed before the end of the Upper Palaeolithic, in the time between the Aurignacian and the Magdalenian.

The results of the radiocarbon determinations for bones taken from the archaeological context were given in the previous section. All three dates are undeniably Aurignacian; it is striking that two of them overlap almost exactly, while the third is slightly different. This difference may be explained with two hypotheses. Either the cave was visited over a relatively long period of time (within the Aurignacian) or Sample Ua-11145 had been rejuvenated. This seems more likely than the ageing of the other two samples (Valladas and Clottes, 2003), or that such ageing affected a deposited bone and a burnt bone to the same degree (they provided almost identical dates). In addition, the association of the two bones dated by J. Altuna (both of chamois and found together) does not appear to be coherent with a difference in age of 4000 years, and therefore the second hypothesis seems to be the most likely.

To assess the validity of an association between these results and the time when the representations were painted, it is necessary to describe the archaeological context briefly. First the spatial relationship is evident. The samples taken by Altuna (1996) had been deposited at the foot of the Main Panel and the latest sample was found on the cave floor, 30 cm from the panel. In this area, an accumulation of ash, charcoal, burnt bones and remains of red ochre can be seen (Fig. 7).

The association and position of the archaeological remains indicate they are in their primary emplacement. This is attested by the remains of ochre (probably connected with the graphic activity) together with pieces of bones (some of which were sampled for the radiocarbon determinations), with no signs of transport or disturbance. In addition, the decoration in the panel is on a slight slope, perfectly parallel with the present cave floor (Fig. 7), which would not be the case if the deposit had been disturbed after the production of the paintings (Fig. 8).

The geological and archaeological data, in conjunction with the stylistic parallels with other Aurignacian ensembles as described above, are evidence for a human occupation in the cave in the Aurignacian, which, among other actions, included the graphic activity.

Conclusion

Although it could not be dated directly (which has only been possible in Grotte Chauvet for the Aurignacian), the parietal art in Altxerri B displays technical, iconographic and stylistic characteristics that are typical of graphic activity in the Aurignacian. As they were found in a closed system, currently only accessible by a 14 m-high chimney from Altxerri A, and are clearly different from the Magdalenian art identified in that intermediate passage, it may be inferred that the ensemble is older. The determinations for three herbivore bones, one of which displays evidence of anthropic impact (burning), confirms human presence in the upper passage in the Aurignacian (ca. 39,000 cal BP). These dates are very similar to the ones obtained in Grotte Chauvet, with which the iconographic repertoire in Altxerri B bears similarities. This suggests that the graphic representations in Altxerri B are Aurignacian in age, a possibility already suggested (Garate, 2008).

The existence of Aurignacian parietal graphic activity of certain complexity is a theory that is being confirmed with every new find



Figure 7. Photograph of the cone of debris blocking the original Palaeolithic entrance.

and which complements earlier finds of portable art, above all in the Swabian Jura (Conard, 2003). In recent years, the chronological isolation of Grotte Chauvet has ceased to exist, through the chronological attribution of ensembles like Aldène, Fumane, Coliboaia, Castanet, La Garma, Tito Bustillo, Altamira and Castillo. Thus, each new date reaffirms the idea that the French cave is not an 'anomaly' within the evolution and development of graphic activity in the Upper Palaeolithic.

In northern Spain, attributing the paintings in Altxerri B to the Aurignacian introduces a new artistic variant in graphic activity in the early Upper Palaeolithic, more directly related to parietal assemblages like Chauvet and Arcy-sur-Cure. However, the paintings in Altxerri B do not constitute the only Aurignacian figurative art in the region. The existence of figurative art in this period has long

been vindicated, in both portable (Tejero et al., 2008) and parietal modes (González-Sainz, 1999, 2012; Bicho et al., 2007; Garate, 2008; Ruiz-Redondo, 2011).

We should not forget that the appearance of graphic and symbolic activity represents a great leap forward in cultural evolution. The determinations from Altxerri B are the oldest known dates associated with parietal graphic activity (Fig. 5), together with the U/Th date obtained in El Castillo Cave (Pike et al., 2012), a result which has been questioned (Clottes, 2012; Bednarik, 2012). This evidence indicates that at a very early date (ca. 39,000 cal BP), graphic activity was fully developed and spread across a wide area from Germany to the north of the Iberian Peninsula. As these dates are not long after the first *Homo sapiens* reached this area, two alternative hypotheses can be proposed: first, that graphic activity



Figure 8. Main Panel, with the position of some objects on the surface of the cave floor (ochre, charcoal and bones) where the samples were taken for radiocarbon dating.

originated outside Europe and, second, that our species reached Europe with incipient symbolic activity, which developed rapidly in the new social reality imposed by the colonisation of such a large territory.

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