The Altamira Cave is located in Santillana del Mar, Cantabria, in the north of Spain. It is aptly named Altamira (“High View”) for its panoramic high altitude view overlooking the surrounding sea and hills. It is within easy reach of the coast, the Saja River and its estuary, and the coastal hills. This variety of ecosystems supplied the Palaeolithic communities with sufficient resources for their food and other needs. It was an oft-visited site in the life of Upper Palaeolithic groups for over 9,000 years, as they formed part of a society including the groups who used other nearby caves like La Clotilde, El Linar, Las Aguas, Cualventi, La Meaza, Cudón, El Castillo, La Pasiega, Las Chimeneas, Las Monedas, Hornos de la Peña, Morin, El Pendo, Santián, El Juyo, Camargo, El Ruso, etc., which were occupied during all or some of the same cultural periods.

Altamira Cave is located in the upper part of the Santillana del Mar karst, formed in horizontal beds of calcarenites up to a metre thick which were separated by thin layers of clay. Collapse processes have shaped the cave, due to the fall of large orthogonal pieces of bedrock from the roof. A large collapse 13,000 years ago in the first metres of the cave blocked the entrance and sealed the cave off until its discovery in the nineteenth century.

The entrance is located in a gentle slope near the top of the hill and faces north. The cave is 270 metres long, and gently slopes down (Fig. 1). The Hall of the Paintings, (Chamber I on the plan) and other side passages are short appendices to a large single passage, dotted with engravings and paintings. Within this single linear cave, in the twentieth century thick walls were built to avoid the roof collapsing in places of greatest structural weakness. The largest of these walls was built to separate the archaeological deposit in the entrance from the chamber with the polychrome paintings, dividing up the original entrance hall. This construction work has given the cave a very different appearance from its original appearance. This Palaeolithic Altamira, however, has been recreated in the replica that can now be visited in Altamira Museum: “the New Cave” (la Neocueva).

1. Discovery and archaeology in Altamira: 1875-2003

The entrance hall conserves the remains of what was once a large archaeological deposit (Fig.

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*Figure 1. Plan of the Altamira Cave © IGN for Altamira Museum.*
2). It is now difficult to interpret owing to the natural collapse processes, the initial search for objects and the old excavations. Of these, no log books, inventories, drawings or photographs remain to document the original fieldwork. As such, only the published information remains.

In 1880, Marcelino Sanz de Sautuola published a booklet about the discovery of Altamira. In his descriptions, the floor of the entire entrance hall was covered by a large mass of animal remains, worked bones, stones and shells which extended as far as the Hall of the Paintings. He published an illustration with drawings of a stone pendant, several assegai points and some limpets, but his interest in the objects was limited to using them as a means to establish the age of the spectacular paintings he had just discovered. Sanz de Sautuola’s booklet contained some initial revelations for prehistorians of his time. When he examined the figures, he identified bison, which were extinct in the region. He also associated the mineral pigments found on the floor with the colours of the Altamira paintings. Sautuola even acknowledged the great artistic merit of the ensemble and its artists. For him there was no doubt: everything, artefacts and paintings both, belonged to the Palaeolithic as the first stage of humankind. For Sautuola, this was Art (Sautuola, 1880: 14).

What Sautuola had rightly deduced was unacceptable for most prehistorians of his time. In 1881, Edouard Harlé was sent to Altamira to inform his French colleagues about the paintings. He described the “trenches” dispersed in the cave entrance and took the opportunity to collect a large amount of objects: 140 teeth, 1,200 bones, 600 limpets, 130 periwinkles, and a number of flint implements, including two Solutrean points, which were then sent to various specialists. Harlé dated the occupations at Altamira in the Magdalenian and Solutrean periods according to the typology of the objects. However, he did not assess all of the archaeological information correctly and mistakenly denied the Palaeolithic age of the paintings, despite Sautuola’s impeccable analysis.

After 1881, Altamira was ostracized until it was finally recognised scientifically by Cartailhac in 1902. This is when Hermilio Alcalde del Río first visited the cave. He was the director of the Arts and Crafts School in Torrelavega, a town near Santillana del Mar, and he dug in the archaeological deposit between 1903 and 1905. He noted the changes in colour and texture and the greater or lesser presence of limesto-

Figure 2. Archaeological deposit in the entrance hall of the Altamira Cave © Pedro Saura for Altamira Museum.
ne rocks, bones, and marine shells. This allowed him to differentiate two levels, one Solutrean and the other Magdalenian (Alcalde del Río, 1906).

In 1924 and 1925, H. Obermaier excavated in the cave again, next to Alcalde del Río’s trench. To the levels already known, he added a new one he called Under the Solutrean, of which he only published a brief list of fauna which included Cervus elaphus, Equus caballus and Patella vulgata (Breuil and Obermaier, 1935). In 1929, he mentioned the finding of two Font-Robert points which were never published and are not conserved with the rest of the collection. These artefacts were at that time associated with the Upper Aurignacian (now with the Gravettian) and would have been of great interest for setting the chronology of the occupations and the art in the cave. The existence of a Gravettian level was proven by our archaeological re-examination of the deposit in 2006 (Lasheras et al., 2012).

There were no further excavations in Altamira until the Ministry of Culture created the Altamira National Museum and Research Centre in 1979, to which the cave was affiliated. Over the Christmas period of 1980-1981, J. González Echegaray, the first director of the Museum, and L. G. Freeman conducted fieldwork that only lasted a few days. Their work was interrupted by political tension in Santillana del Mar Town Council, which was concerned about the cave being closed to the public. Consequently, they were only able to excavate the upper part, measuring four square metres, above the stratigraphic section left by Obermaier. The first level with occupation remains is just beneath the pile of fallen rocks that blocked the cave and the calcite that covered them, and it is dated in the Lower Magdalenian. The Solutrean level begins beneath this, but the Echegaray and Freeman did not reach it. However, they differentiated several sub-layers by their colour, texture and composition of the archaeological content, which indicated a more complex archaeological deposit than was known until then (Freeman and González Echegaray, 1996, 2000).

In the Magdalenian level they found numerous pieces of ochre of different colours and sizes, thousands of limpet shells, abundant faunal remains with a large predominance of red deer, and the mandibles and vertebrae of salmon. They confirmed the small proportion of backed bladelets observed by Obermaier. The 106 Magdalenian tools they retrieved allowed the classification and comparison of these deposits and tools with Levels 8 and 9 at El Juuyo and Level 4 at El Rascaño, whose diagnostic indices were observed to be very similar (Freeman and González Echegaray, 2000: 126 and following).

During the following years, there was no further archaeological research in the Altamira Cave, but research into its conservation was promoted by the Museum and the Ministry of Culture, which signed an agreement with the Spanish National Research Council (CSIC in its Spanish acronym), under the direction of Manuel Hoyos. Under this programme, the calcite covering the collapse that had blocked the entrance was dated. Uranium-series and radiocarbon methodology was used (Labonne et al., 2002), and the results obtained were consistent with the known archaeological data. These findings showed that the calcite began to form 12,900 years ago over rocks covering the Middle Magdalenian level, a time period that coincides with the dates of one of the black bison in the Hall of the Paintings (Table 1). The deposition of the calcite ended approximately 10,700 years ago, according to the dating of the upper part of the layer.

2. Rediscovering Altamira: research from 2003 to 2014

One hundred and twenty years after its discovery, the archaeological understanding of Altamira was insufficient. In order to update the information, further work was required that would not affect the conservation of the cave, which had again been closed to the public in 2002 at the Museum’s request. The research programme “The Times of Altamira”, which the Museum carried out after 2003, promoted and coordinated the work of specialists from universities and research centres in Spain and abroad. Some of the findings are presented below.

a. Dispersed Altamira

One of the first aspects addressed was the reconstruction of the history of the cave and the documentation of its collections scattered across different museums in Spain, Europe and America. This dispersal of Altamira artefacts was the consequence of the multiple collections after its initial discovery, the acquisition of pieces by various research centres and colleagues for reference purposes, and in some cases even the direct sale of artefacts themselves. The reappraisal of the old dispersed collections has proceeded with some

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1 The authors would like to acknowledge the assistance in this research of all the people and institutions that have supported it over the years. There is currently further ongoing research that is not described in this text.

2 This information coincides partly with the publication Lasheras et al., 2005/2006.
Table 1. ABSOLUTE DATES OBTAINED AT CUEVA DE ALTAMIRA

<table>
<thead>
<tr>
<th>Year</th>
<th>Reference</th>
<th>Material</th>
<th>Lab Ref.</th>
<th>Location</th>
<th>Result 14C BP (2 sigma)</th>
<th>Result 14C cal BP (2 sigma)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>Heras et al., 2012</td>
<td>Bone</td>
<td>Beta – 25700</td>
<td>Interior deposit</td>
<td>15.000 ± 12.630</td>
<td>12.740 ± 12.630</td>
</tr>
<tr>
<td>2006</td>
<td>Lasheras et al., 2012</td>
<td>Bone</td>
<td>GrA – 44924</td>
<td>Interior deposit</td>
<td>15.160 ± 12.630</td>
<td>12.530 ± 12.630</td>
</tr>
<tr>
<td>2009</td>
<td>Lasheras et al., 2012</td>
<td>Bone</td>
<td>GrA – 44926</td>
<td>Interior deposit</td>
<td>15.160 ± 12.630</td>
<td>12.530 ± 12.630</td>
</tr>
<tr>
<td>2006</td>
<td>Heras et al., 2012</td>
<td>Bone</td>
<td>GifA – 90547</td>
<td>Interior deposit</td>
<td>15.160 ± 12.630</td>
<td>12.530 ± 12.630</td>
</tr>
</tbody>
</table>

The C14 AMS dates were calibrated with the INTCAL13 curve using the OxCal Program, version 4.2 at 14.3% probability (2 sigma).
success. For example, researchers have identified some tools of a very old typology, such as unpublished cleavers, and also some exceptional artefacts, the “airbrushes”, which had gone unnoticed because they were initially catalogued as pendants by Hermilio Alcalde del Río. These airbrushes were made from three segments of bones from the leg or wing of a large bird (a raptor or a wading-bird) and display defleshing and cut marks in the form of transverse grooves. Two of the pieces are now understood to fit together because they are part of the same bone, and the three of them measure between 5 and 6mm. They exhibit remains of pigment on both outer and inner surfaces of the tubes, which has led to their identification as tools used to apply red liquid paint. These bone pieces were placed at right angles to each other; by blowing through one section, the other section would absorb the paint and spray it outwards (Fig. 3). Alcalde del Río found these artefacts between some rocks in the passage. The lack of further stratigraphic context prevents any precise dating at this time.

b. Stratigraphic reappraisal and new dates for the deposit in the cave

The stratigraphy that has been conserved is 4 metres long and 1 metre thick. At the base it is bounded by a uniform bed of rock and a roof collapse, and at its top by the layer of calcite. The sedimentological study confirmed the existence of eight structurally independent levels, which are heterogeneous in their composition and physical-chemical characteristics. The column of AMS radiocarbon dates is also coherent, with no chronological inversions. The absence of any severe alterations to the archaeological deposit meant that the following chrono-cultural sequence could be established:

1. The Lower Magdalenian is represented by Levels 1 to 5, between 14,070 ± 70 BP (GrA-27777) and 15,580 ± 90 BP (GrA-30326).
2. Level 6 exhibits a layer of crushed bones with an erosive contact with Level 5. Its date, 17,200 ± 70 BP (GrA-32760), corresponds to the Upper Solutrean.
3. Level 7 is the thickest layer, and has provided three coherent dates: 18,750 ± 100 BP (GrA-30324), 19,060 ± 90 BP (GrA-30325) and 19,630 ± 80 BP (GrA-32761), which situates it in the Solutrean.
4. Level 8 has been dated twice, to either 21,930 ± 100 BP (GrA-32765) and 21,910 ± 90 BP (GrA-27739) which places it in the late Gravettian.

The contacts between Levels 6, 7 and 8 correspond to erosive processes but a chronology has been definitively established going back to at least 22,000 BP. The discovery of a Gravettian level has supported the correct assignment of the technical and stylistic characteristics of a series of red figures which, until now, had not been precisely dated. This series of figures had originally been attributed as Solutrean as the oldest period known in the deposit. Recently, a Uranium-series date has confirmed their link with the Aurignacian (Pike et al., 2102 and 2013; García Diez et al., 2013), a period that remains yet to be discovered in the deposit (Fig. 4).

c. Excavations outside the cave

In 2008-2009, an excavation was conducted in the modern entrance of the cave to determine whether part of the archaeological deposit existed in the area that is now outside the entrance beneath the collapse that blocked it. The end of an archaeological level measuring 20cm thick was located in the outer limit of the collapse, preserved from the erosive processes that had removed the level in the area next to it (Fig. 5). It yielded numerous shells, faunal remains, lithic and bone objects, and a red deer scapula with

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3 This information coincides partly with the publication Lasheras et al., 2012.

4 For further information about the Gravettian level and the oldest art in Altamira, see Heras, Montes and Lasheras, 2013.
Figure 4. Stratigraphic, chronological and artistic sequence in the Altamira Cave © Altamira Museum.

Figure 5. Deposit outside the Altamira Cave, buried beneath the collapse of the external part of the entrance at the start of the Middle Magdalenian © Pedro Saura for Altamira Museum.
an engraving of a hind’s head, of the same type as those found by Alcalde del Rio from 1903 to 1905. The three dates for this level under the collapse place it between 15,370 ± 60 (GrA-44927) and 15,610 ± 80 BP (Beta-257006), coinciding with Levels 2 to 4 in the interior deposit, in the Lower Magdalenian (Table 1).

d. New data for the chronology of engravings with multiple lines in Altamira and Cantabrian Spain

The discovery of the decorated scapula in the level under the collapse has succeeded in reinforcing the chronology attributed to the parietal engravings with multiple lines in Altamira and, therefore, in all Cantabrian Spain (Fig. 6).

Alcalde del Rio had found seven scapulae engraved with fine, intermingled lines that represented silhouettes and heads of hinds. In his writings, Alcalde del Rio noted that he had found them “in the upper layer [Magdalenian] although in direct contact with typical Solutrean points” (Alcalde del Rio in Cartailhac and Breuil, 1906, p. 267). These depictions displayed the same conventionalism as the hinds he had seen engraved in the passages and on the ceiling in the Hall of the Paintings, which caused him to affirm that the parietal and portable ensembles belonged to the same time period. However, doubts remained about the exact stratigraphic position of the scapulae. Later, in the 1924 excavations, Obermaier found engraved scapulae in the Lower Magdalenian level and in the Magdalenian-Solutrean transition layer (Breuil and Obermaier, 1935: 94), but Obermaier decided not to publish them. A note written by Freeman and González Echegaray (2001: 142) now locates them in the Chicago Field Museum. Other objects of this kind have been found in Lower Magdalenian levels (in the caves of El Castillo, Juyo, Cierro and Mirón) and similar engravings on the walls of such caves as El Castillo, Las Aguas, etc.

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Figure 6. Engraved scapula found in the level under the collapse outside the cave. It displays two finely-engraved superimposed heads of hinds © Altamira Museum / A. Prada.

Figure 7. Engraved hind in Passage III/IV with the characteristic multiple lines of these figures.

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This information coincides partly with the publication Heras et al., 2012.
The three dates obtained directly for these characteristic engravings of Cantabrian Spain (Cantabria and Asturias), both on cave walls and on scapulae, come from Altamira. The first engraved scapula to be dated was one found by Alcalde del Río, and gave a result of 14,480 ± 250 BP (GifA-90057) (Valladas et al., 1992). The second date was for a black line over which one of these characteristic hinds was engraved, on a wall inside Altamira, and the result of 14,650 ± 140 BP (GifA-96059) (Moure et al., 1996) is a post quem date for the engraving. These first two dates are very close to those of the decorated scapulae (Fig. 7). The third date, 14,830 ± 60 BP (GrA-44928), corresponds to the scapula found in 2009 in the level under the collapse (Heras et al., 2012). These dates refer to a very precise time, and are of special interest for Altamira as they make the striated engravings of hinds in the cave passages contemporaneous with the polychrome bison on the ceiling in the Hall of the Paintings. It is not possible to determine in which order the two kinds of depictions were produced (Table 1).

3. Altamira and its cave art

The first art of humankind, cave art, was discovered, identified and published with scientific rigour at Altamira by Marcelino Sanz de Sautuola, a member of the gentry who owned a mansion in a nearby town. He possessed a degree in law, but his interest in science led him to the fields of archaeology, history and botany. In 1878, at the Universal Exhibition in Paris, he observed collections of prehistoric objects discovered in France and he decided to search for the same kind of objects in his region. After visiting several caves, he returned to Altamira in 1879 and explored it carefully. It was his seven-year-old daughter, María, the first one to see the paintings. “Papa, oxen!” were her words.

It is in the ceiling of the Hall of the Paintings that Altamira truly becomes spectacular (Fig. 8). It is a large canvas on which Upper Palaeolithic artists expressed their transcendent concerns. For H. Breuil (1935), the art in Altamira was the result of

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6 This information coincides partly with the publication Lasheras J.A., 2010.
a graphic tradition beginning in the Aurignacian/Perigordian periods and concluding in the Upper Magdalenian, the period to which he attributed the polychrome figures.

Leroi-Gourhan (1965) proposed a shorter chronological framework, as he included all the representations in Styles III and IV, from the Solutrean to the Lower Magdalenian.

In the 1990s, the first absolute AMS radiocarbon dates were obtained for some polychrome bison (Figs. 14 and 15) and other figures painted in black (Figs. 7 and 12, among others) (Table 1). All the results corresponded to the Magdalenian period, between 13,130 ± 120 BP (GifA-96067) and 16,480 ± 210 BP (GifA-96061) (Valladas et al., 1992; Moure et al., 1996). These results coincided with Leroi-Gourhan’s proposal, and related the artistic ensembles to the periods of occupation documented in the stratigraphy in the deposit (Bernaldo de Quirós, 1994; Moure, 1994; Lasheras, 2002).

The discovery of the Gravettian level in the recent research meant that the technical and stylistic characteristics of many red and engraved figures, whose direct dating was previously unobtainable, received the coherent support of the longer archaeological sequence. Since then, the application of Uranium-series analysis to figures that could not be dated previously (Fig. 9) lengthened the chronological framework to the Aurignacian period (Table 1).

a. The ceiling of the red horses

The oldest stage in the decoration of the main ceiling is represented by animals painted in red, engraved signs, hands and several series of dots.

On the right-hand side, juxtaposed curved lines form a large complex red sign. It has been classified as a “claviform sign” but its appearance differs from that of the typical claviform signs in Altamira and other Cantabrian and Pyrenean caves. Indeterminate red stains and the faint partial remains of two large horses of pre-Magdalenian age can be seen around the sign. Breuil (1935, Lamina VI) also included in this area a violet stencilled hand and a foot-shaped sign, equally in violet, which are no longer visible. This complex sign (Fig. 9) was dated by Uranium-series, and the result was older than expected: 36,164 ± 0.605 years (BIG-Uth-O-50) and therefore Aurignacian (Pike et al., 2012 and 2013; García Díez et al., 2013). Currently, only this sign and some large dots in El Castillo Cave have been dated to such an old time period.

Eleven large red figures, mostly horses (similar to Number 1, 2, 3, 4 and 5 on the plan in Figure 10) were originally dispersed across a large part of the ceiling. They were between 150 and 180cm long. Some of them are partially covered by the later superimposed polychrome figures and they have generally reached the present time with their colours faded by the natural processes that occurred before the discovery of the cave. It should be noted that none of these red figures include any relief or other natural forms of the ceiling.

The largest of these horses projects its fore-legs perpendicular to its chest, its neck is contracted and its head raised. Its back is also contracted, while its belly is stretched and its back legs are open like a pair of compasses; it is a galloping horse, raised on its back legs while its tail hangs from the croup. It is 182cm long, painted in red with a continuous line around its outline and with some large dots in its belly. The head is filled with red colour-wash without any details. The layer of calcite formed over its belly was dated to 22,108 ± 0.132 BP (BIG-Uth-O-53), an ante quem date for the drawing of the horse, which means that it must correspond at least to the early Solutrean or, as is thought more likely, to the Gravettian (No. 3 on the plan) (Fig. 11).
Another point to bear in mind is the existence of two stencilled hands superimposed on the forelegs of one of these horses (No. 5 on the plan). As most of the stencilled hands that have been dated in other caves are Gravettian in age, the same date may be extrapolated to these hands and, owing to the superimposition, extended to the other red figures in the ceiling. In this way, they would all be placed in the Gravettian period.

Several series of dots dabbed with a finger tip, aligned in straight and curved lines, as well as a red hand near the two horses facing each other can also be included in this oldest group of representations.

Further inside the cave, 65m from the entrance, a small side-passage measuring little more than one metre wide and five metres long is full of red signs. At the top, a sign consists of four irregular ovals divided up internally. A large red sign measuring three metres long and up to 50cm wide can be found on the under face of a rock prominence, one metre above the floor. It is formed by long bands of parallel lines crossed by small transversal lines. To see this sign, it is necessary to crouch or even lie on the floor to appreciate the whole figure. The narrowness of the space makes it difficult to see this and other signs on one of the walls, and there is not enough room for more than two people at any one time. This should stimulate a reflection on the original function and use of the representations.

On a large flowstone in Gallery II, three large figures were engraved in line, with wide and deep lines. Only the central figure can be identified: it is a stationary horse, over 150cm long.

b. Magdalenian black and engraved figures

All the black figures in the Altamira Cave were drawn with charcoal, which has allowed some of them to be dated by AMS radiocarbon (Table 1). The resulting age, Lower Magdalenian, together with
certain stylistic and technical uniformity –charcoal as the pigment and a linear style– means that they are regarded as belonging to the same ensemble. However, their uniformity is relative and they were produced at different times and over a wide span of time.

A group of black horses in the Hall of the Paintings and in Gallery III could not be dated by AMS radiocarbon. Nevertheless, their proportions, the form of their manes and the shape of their muzzle are clearly similar to figures attributed to the Solutrean at other sites in the Iberian Peninsula.

During the Magdalenian, the themes are more varied. Together with the horses, there are aurochs, bison, ibices, red deer stags and hinds, semi-human faces and signs. There are only four aurochs in the whole cave and they all display singular techniques or formal characteristics. On the main ceiling, an enormous bull measuring 270cm long is partially perceptible under a polychrome bison. The head is clearly visible, and its forehead was outlined with a black line that highlights a natural crack. Its dorsal line is a wide band with multiple engravings, almost sgraffito. The belly is made to coincide with a natural crack and it is marked by black lines that also indicate the sex. The ceiling in Gallery II was engraved with lines made by the index finger, forefinger and third finger of a hand in soft clay. Within these lines, the head of a horse nearly a metre long is easily discerned. Near the head, on the face of a bed of rock, fitting between irregularities, a 50-cm-long bull was drawn in black. One last bull, engraved with considerable detail at the start of Gallery V, raises its head, exhibiting its muscular neck.

The bison now begin to populate the cave. On the ceiling there is a huge head drawn with a black line which continues the profile of its hunch, but the rest of the animal is not perceivable (No. 24 on the plan). To outline the horn, a pre-existing strip of calcite was marked in black, while a second parallel black line represents the other horn. The whole figure was conceived around this small natural relief. The other black bison on the ceiling (No. 2, 15, 16, 17 and 25 on the plan) cannot be associated with this series and, because of their technical and stylistic characteristics, they will be studied below in connection with the polychrome figures.

A group of quadrilateral black signs in the final passage were placed by means of AMS-C14 in the Lower Magdalenian (15,440 ± 200 BP GifA-91185) (Fig. 12). Some natural forms of the rock near these signs, in virtually the deepest part of the cave, were made into human-like faces. They are known as “masks”, and belong to the same Magdalenian time. Just a few marks were needed to suggest eyes, eyebrows and mouth. The light alone reveals their sha-
enough to make some uncertain faces appear in places where nobody was present before (Fig. 13).

c. The engraved cave

Engraved representations are found in all the galleries and sectors of the cave. The red deer is the species most often represented with this technique in Altamira. There is one large group of engravings whose all members seem to belong to the same family. The interior of many of their bodies, heads and necks is either filled with striated lines or shaded. They are comparable with the engravings made on red deer scapulae whose age was discussed above (Fig. 7). On the ceiling, a large stag measuring 70 cm long is roaring, opposite a hind’s head drawn with the same technique.

Over twenty hinds are engraved on the ceiling, while others on the wall of the same hall have recently been discovered. There are thirteen of them in Galleries III, IV and V, and nearly the same number in Gallery X, of which six are grouped together in a small panel. This latter grouping is the deepest artistic representation in the cave, and it is located in a place that is so narrow and low that it is necessary to crawl to see them.

d. The great ceiling with the polychrome bison

The main attraction and interest of Altamira is the large group of figures painted on this ceiling. The paintings, known as polychromes, form an outstanding work of art that makes a profound impression on anyone who observes them.

These 25 large figures represent bison, a hind and two horses. They are between 125 and 170 cm long, while the hind (No. 50 on the plan) reaches two metres. The figures were produced by engraving and drawing the outline, the forelegs, hair on the chest and the hunch in black. The engraved lines are wide, with multiple parallel lines defining the outline. By means of deeper lines, further details such as the eyes, the horns and the hair on the neck are engraved. Most of the figures were then filled with red paint, except the bison No. 42 and 48, which were painted with yellow or brown ochre. In some figures, black pigments induce a change of colour in their bellies, and on their legs from the dock to the elbow, representing with naturalistic faithfulness the darker colour of the wet or mud-stained coat of an animal that has been resting on the ground while chewing the cud (No. 33, 34, 43 and 48). Certain lines made by reserving colour separate the legs from the chest, the haunches from the belly or one leg from another.

The natural protuberances on the ceiling, up to 30 cm lower than its flat parts, were used to give volume to the figures in their chest (No. 34 on the plan) or in their whole body, as in the case of the bison that seem to be at rest (No. 35, 36 and 39). The belly of the large hind (No. 50) is also over a gentle relief that may have been used to suggest it was pregnant. Cracks were also used to represent the outlines (No. 34). The repeated and constant use of relief and other natural rock forms was not by chance, nor did it only seek the effect of volume. It undoubtedly obeys other symbolic and perhaps transcendental reasons.

The term polychrome used to describe these figures is inexact. Indeed, these figures transmit that impression; nevertheless, no more than two pigments were used in any of them. These pigments were charcoal black and ochre red or brown. The polychrome appearance is the result of both the addition of pigment to the rock and the transparency and glazes of the rock through the pigment. However, this transparency was not a technique employed by the Palaeolithic artists, but a consequence of time, of the subtle alteration occurring over millennia due to filtration or condensation of water on the ceiling, which washes away the pigment and re-deposits it or makes it fall to the floor. The interior of these “polychrome” figures was filled with red colour-wash, as can be observed, for example, in the chest and neck of the bison resting on the ground and turning its head round, without the colour of the rock being visible through it (Fig. 14).

The crack dividing up the ceiling longitudinally influenced the work of the Palaeolithic artists. It seems likely that the four bison similar to the other polychrome figures on the right-hand side were the first to be produced. It is also conceivable that the immediately following discovery of the natural rock volumes transferred the location of the symbolic creation to the other part of the ceiling. Neither the forms or techniques, or any other details make them different from the rest of the herd (No. 27 to 30 on the plan).

The group of polychrome animals is completed with a huge horse’s head (No. 41) and the figure of a foal (no. 46) identified in that way by Freeman and González Echegaray (2001).

e. The last bison, the last artists

The date of the monochrome bison Number 16 is the most recent of those obtained so far (13,130 ± 120 BP GifA96067) (Fig. 15). It displays the technique of spreading the charcoal, a direct and firm application in some lines, and a softer touch to achieve grey tones, by using the hand to spread or fade the colour. Thus, particular shades were achie-
ved. This helped to create volumes, as if it was a modern charcoal drawing. Certain characteristics relate these figures to the polychrome paintings and thus they become part of its ceiling, whereas others are similar to later types characteristic of the Middle Magdalenian. The collapse that took place at the entrance soon afterwards and the impossibility of re-entering the cave meant that these bison were the epilogue of a masterpiece.

4. Conclusions

Research on the archaeological deposit and new dates for the art have contributed towards a new understanding of the Altamira Cave, as can be summarised in the following points:

- The archaeological deposit covers a long period of time, from 13,000 BP to 22,000 BP. Its surface area covers the whole original entrance hall, even the area that was covered by the collapse and that is currently outside the cave, which measures approximately 300m².
- The stratigraphic sequence is coherent from the geological, chronological and cultural points of view. However, low intensity post-depositional processes may have caused an occasional movement of the archaeological record, over short distances, from its original place (now beneath the collapse that blocked the cave) to its current position.
- The graphic ensemble, the art, was produced over a long period of 20,000 years, between 35,559 and 15,204 cal BP. This means that the cave was reused, sometimes respecting existing depictions or adding them and using them in new figures. In this way a palimpsest or accumulation of culture and symbolism was formed, suggesting a shrine or, better, a place of discontinuous symbology, given different meanings at different times.
- Paintings and engravings were produced at Altamira from the Aurignacian, in the first stages of Upper Palaeolithic art in Europe.
- Painters, engravers... artists? The answer is undoubtedly yes. Somebody created all these figures out of nothing, with artistic elements like paint and lines, and they were achieved with great ability and skill. Not all the figures are masterpieces, but it is difficult to find evidence of clumsiness or incompetence. There are no mistakes and few corrections. The people who painted and engraved in the cave were quite confident in themselves, as a result of their practice and training. The ability of the people who, in these circumstances and with these "canvases", achieved figures that nearly always convey some message cannot be questioned. Current proposals agree on interpreting the symbiosis between art and nature, between the created figures and the natural surface they are on, as described above, in terms of the animism underlying ancient religious systems and, in general, with the animism in all mythical and pre-philosophical thought.