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Cova Eirós archaeo-palaeontological site, Triacastela, Lugo

1. Cova Eirós site. Location and background

The few limestone formations in north-western Spain and the primary focus of research on river terraces and rock shelters have resulted in a small number of documented cave sites in this area, amongst which Cova Eirós (Eirós Cave) ranks amongst the most important in palaeontological and archaeological terms.

The Cova Eirós site is located in a village, Cancelo, in the Triacastela municipality (Lugo) (UTM X: 646.855; UTM Y: 4.736.428). The cave entrance is on the NNW slope of Monte Penedo in Serra do Ouribio, 780 metres asl and 25 metres above a stream, Arroyo de Bezcos. The Cova Eirós karst system is part of the Cándana limestone Series, formed during the Lower Cambrian. The cave is 104 metres long, with a mouth that currently measures 2 metres high by 3.5 metres wide. The entrance narrows after the first 7 metres into a 15 metre long neck, followed by the cave's largest space, the "Main –or Mammoth– Hall", 15 metres long, 6 metres wide at the most and up to about 5 metres high. The cave then continues inwards in a NNW direction in a series of three overlapping levels of galleries (Grandal, 1993) which are almost entirely clogged by clayey sediment interspersed with stalagmitic crusts or floors.

From the outset Cova Eirós became renowned as an outstanding palaeontological site due to the presence of bear remains. In the late 1980s, UDC conducted several digs in the middle and end sections of the cave (1988, 1989 and 1991), which recovered approx. 4,000 bones from at least 43 bears (Grandal, 1993). Based on these findings, Cova Eirós became one of the most important sites on the Iberian Peninsula for *Ursus spelaeus* remains.

AMS 14C analysis dated a bear bone at 24,090 ± 440 BP (Grandal and Vidal, 1997), consistent with the dating of a stalagmitic crust below the fertile level in the final gallery of the cave, (25,233 ± 5,027 BP) (U series) (Grandal, 1993). The most recent datings on bear bones extend the time range to a period between 24,000 and 31,000 BP (Pérez *et al.*, 2011). In addition, two datings of the stalagmite crusts in the central corridor and the final gallery have yielded 117,252 ± 75,438 BP and 97,051 ± 15,426 BP respectively, although caution is advised due to their wide standard deviation (Grandal and Vidal, 1997).

In 1993, the first archaeological dig in Cova Eirós was a 1 m^2 test pit at the cave entrance, in which five archaeological levels were identified and 550 lithic tools were recovered, all initially attributed to the Middle and Upper Palaeolithic.

Following these reports, in 2008 a new phase in the exploration of the Cova Eirós occupations was begun (Fábregas *et al.*, 2009). Initially, two test pits were dug at the mouth: Pit A at the entrance (4 m^2), which included the 1993 pit in one of its survey squares, and a second pit on the outer embankment (Cata B). The quantity and quality of the recovered material and the stratigraphic potential of the sediment led to the extension of the excavation area to nearly half the inhabitable space of the entrance sector (21 m^2) (Fig. 1).

2. The Pleistocene sequence in Cova Eirós

The 16 metre long entrance sector decreases in height to 0.8 m at the neck that leads to the interior part of the complex. A steep embankment coincides with the vertex of the mouth. The in-

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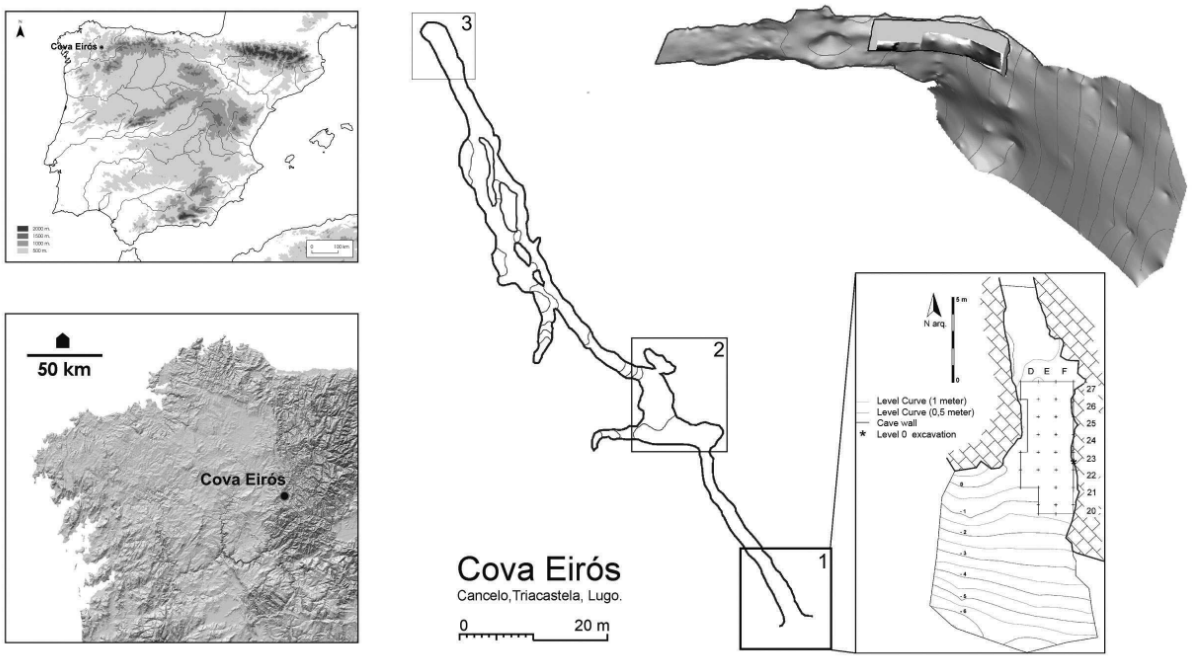

Figure 1. Location of the Cova Eirós site. Plan of the cave and the current archaeological dig with a topographic reconstruction of the entrance sector (2009). 1) Entrance sector 2) Great Hall 3) Final Gallery, Palaeontological interventions.

habitable space is thus reduced to this vertical between the ledge and the interior neck. On the west wall, however, eroded remains of a cave wall mark the former entrance area. Geophysical surveys using Georadar in this sector have detected a 3.4 m deep stratigraphic infill. Excavation has only reached the –120/140 cm level below the present floor, and occupations prior to the currently identified may thus be expected to appear in the future.

Six archaeological levels have been identified in the stratigraphic sequence, with two types of sedimentary dynamics. The lower levels are associated with *in situ* sedimentation, basically linked to gravitational input (Levels 4, 3 and 2), while the upper levels are from wind-borne matter (Levels 1A and 1B). Levels B and C levels are linked to the dynamics underway outside the cave (the slope) (Rodríguez *et al.*, 2011) (Fig. 2). The stratigraphic sequence described for the site is the following:

–Surface Level. Topsoil. Very loose and heavily bioturbated organic soil. Limestone clasts produced by rockfalls from the ceiling. First indication of disturbed archaeological material. This level also contains a perimeter stone paving which delimited two medieval silos. Potential: 10-15 cm.

–Level B: Whitish-yellow silty matrix, well compacted, containing angular limestone gravel measuring 5-13 mm along the major axis. Abrupt, irregular upper limit and gradual, diffuse lower limit. A 30 mm deep layer of very dark sediment has been identified at the bottom of this level. A considerable amount of archaeological material has been retrieved from Archaeological Level B. The upper limit of this layer, defined by limestone blocks measuring 40-140 mm on the longest axis, has a predominantly south slope. It might be related to one of the most recent processes in the reduction of the cave cornice. AMS radiocarbon dating of the archaeological level is 12,060 ± 50 BP (Beta – 308859) (Fábregas *et al.*, 2012).

–Level C: A heavily compacted clay matrix with gravel and clasts. A steep south-facing slope follows the topography of the embankment, and intersecting levels 1, 2, 3 and 4. This is interpreted as a disturbance of the levels inside the cave.

–Level 1: The upper part consists of slightly compacted fine yellow sand with a subhorizontal

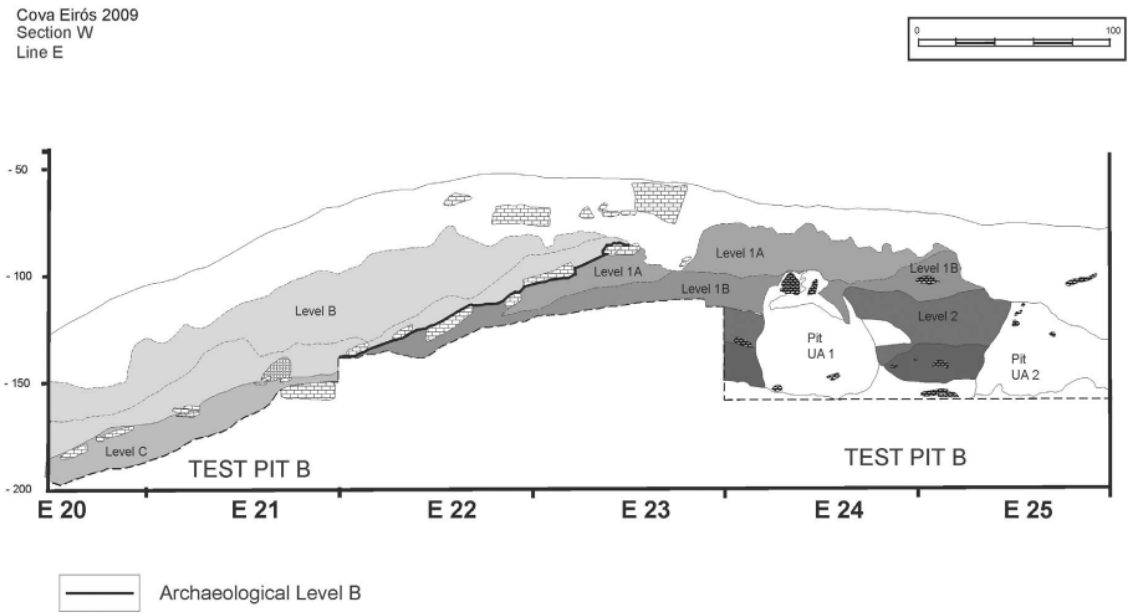

Figure 2. Stratigraphic profile West of the dig in Cova Eirós

laminar stratification (1A). The top is archaeologically sterile. At the bottom, the sand becomes orange, more compacted and a parallel horizontal stratification (1B). The top and bottom limits of the level are net. Depth: 10 to 23 cm.

–Level 2: Orange clay-loam, more compact than the previous level. Two distinct facies: at the top (level 2a), purer sands, without concretions, while the lower limit is marked by the presence of small limestone plates. At the base (sub-level 2b) several small subangular limestone clasts (3-5 cm), heavily carbonated, with a crust in the southern sector. Net ondulating base level. Archaeological level. 34-45 cm deep. C14 AMS radiocarbon dating: 31,690 ± 240 BP (Beta – 254280)

–Level 3: Brown clay with small-sized limestone gravel. More compact and homogeneous than the overlying level. Contact with level 2 is net and undulating, indicating the existence of a gap between the two levels. Archaeological level. 20-35 cm deep. OSL dating: 84,807 ± 4919 BP (MAD-5612BIN).

–Level 4: Composed of clays and fine yellow sands, heavily carbonated with sub-rounded limestone and schist gravels. Minor lateral variations. Archaeological level: currently under excavation. Unknown depth.

3. Middle Palaeolithic occupations

Two levels attributed to the Middle Palaeolithic, the most substantial records in the study of this period in Galicia, have been identified in the lower part of the sequence.

Level 4

Level 4 has a high density of archaeological material, currently the richest of the sequence. The excavation and analysis of the data is still underway, however preliminary results point to certain aspects. As in most of the identified occupations in Cova Eirós, the lithic assemblage is dominated by quartz (90.1%), with quartzite playing a secondary role (9.7%). Knapping products are over-represented, with few cores and retouched tools on flake (sidescrapers, denticulates, etc.) which, in conjunction with the scarcity of corticality in the products, indicates that this assemblage represents the final stages of reduction. From the technological characteristics of the product, we can deduce that the predominant knapping methods are longitudinal and orthogonal strategies, although discoidal and Levallois quartz products have been identified amongst the higher quality items, particularly in the fine-grained quartzite. The technological characteris-

tics of the lithic assemblage on this level suggest that it is Mode 3.

The faunal assemblage includes remains of bears, deer and horses. Several show evidence of human intervention (fracturing and cut marks) and thermal alteration. Several bone fragments have been attributed to *Coelodonta* sp.

The most significant discovery on this level was 5 metres from the current entrance: a combustion structure with a small (40 x 25 cm) oval focal area (Fábregas *et al.*, 2012). A large concentration of tools and skeletal remains, many of them with evidence of heat impact, was identified lying around this hearth.

Level 3

The initial excavation of this level was heavily affected by the presence of medieval silos, restricting its area to 1.5 m^2. The size of the current work area permitted excavation in the entire zone to commence, allowing us to gather more information about the Neanderthal occupations in Cova Eirós.

The detected lithic assemblage consists of 702 items. The predominant raw material is quartz (90%), followed by fine grain quartzite (8%). The identified reduction methods are Levallois, discoidal and orthogonal, with some evidence of Kombewa (Fábregas *et al.*, 2009; Rodríguez *et al.*, 2011). As in the previous level, the operational chains are fragmented, with a clear predominance of knapped products and few cores. The presence of retouched items –sidescrapers, denticulates and becs– is greater here (9.9%). This aspect is more obvious in the fine-grained quartzite, an allochthonous lithic resource, represented by Levallois flakes and points, as well as sidescrapers bearing evidence of treatment as curated tools (Fig. 3). The characteristics of the lithic assemblage on Level 3 suggest its attribution to Mode 3, with a differential management of lithic resources found in north-western Iberia in the Middle Palaeolithic, defined particularly by the relationship of Levallois techniques to fine-grained quartzite and the use of more expedient methods with quartz, although quartz Levallois products have also been found. Functional analysis of this assemblage has identified hunting-related activities (broken spear tips), butchering and hide treatment at the site (Lazuén *et al.*, 2011).

The faunal assemblage is characterized by a high percentage of fragmentation, hindering its taxonomic definition. Some of the bones show clear cut marks and fractures, pointing to the anthropic factor as the main agent in butchering-related activities, skinning and access to bone marrow. Taxonomically, *Cervus elaphus* has the highest representation, followed by *Rupicapra rupicapra* and *Capreolus capreolus*. Carnivores include numerous *Ursus spelaeus*, with many neonatal tooth remains. The presence of *Canis lupus* and *Vulpes vulpes* is also documented, indicating the alternating use of the cave by hominids and carnivores.

4. Upper Palaeolithic sequence

Level 2

The level 2 lithic assemblage contains a high percentage of small-sized quartz industry (93.3%). Although the type of raw material and the large number of knapping fragments hinder an accurate techno-typological definition, certain changes in the supply strategies –with the appearance of small amounts of rock crystal and flint– and the presence of blades in rock crystal ascribe this assemblage to be attributed to the initial Upper Palaeolithic. C14 dating places these occupations in the Aurignacian.

The faunal record includes *Cervus elaphus* and *Capreolus capreolus* and a remarkable representation of carnivores, with several remains of *Canis lupus* and *Panthera pardus*, as well as both bear species which hibernated in the cave (*Ursus arctos* and *U. spelaeus*). The faunal remains show a high level of fragmentation and some have obvious cut marks and fresh fracture. The low density of lithic tools, the identification of fragmented operational chains and the higher incidence of carnivore taxa point to occupations with little impact, perhaps related to short, repeated stays, alternated with the cave's use as a den by carnivores and ursids.

Level 1

The material is concentrated at the base of this stratum, where 729 archaeological items have been recovered (Fábregas *et al.*, 2010; Rodríguez *et al.*, 2011). The lithic assemblage is predominantly quartz (86.1%), while flint and rock crystal have a greater representation (4.8 % and 6.1 %, respectively), parallel to an increased blade and bladelet component. Two types of chaines opéra-

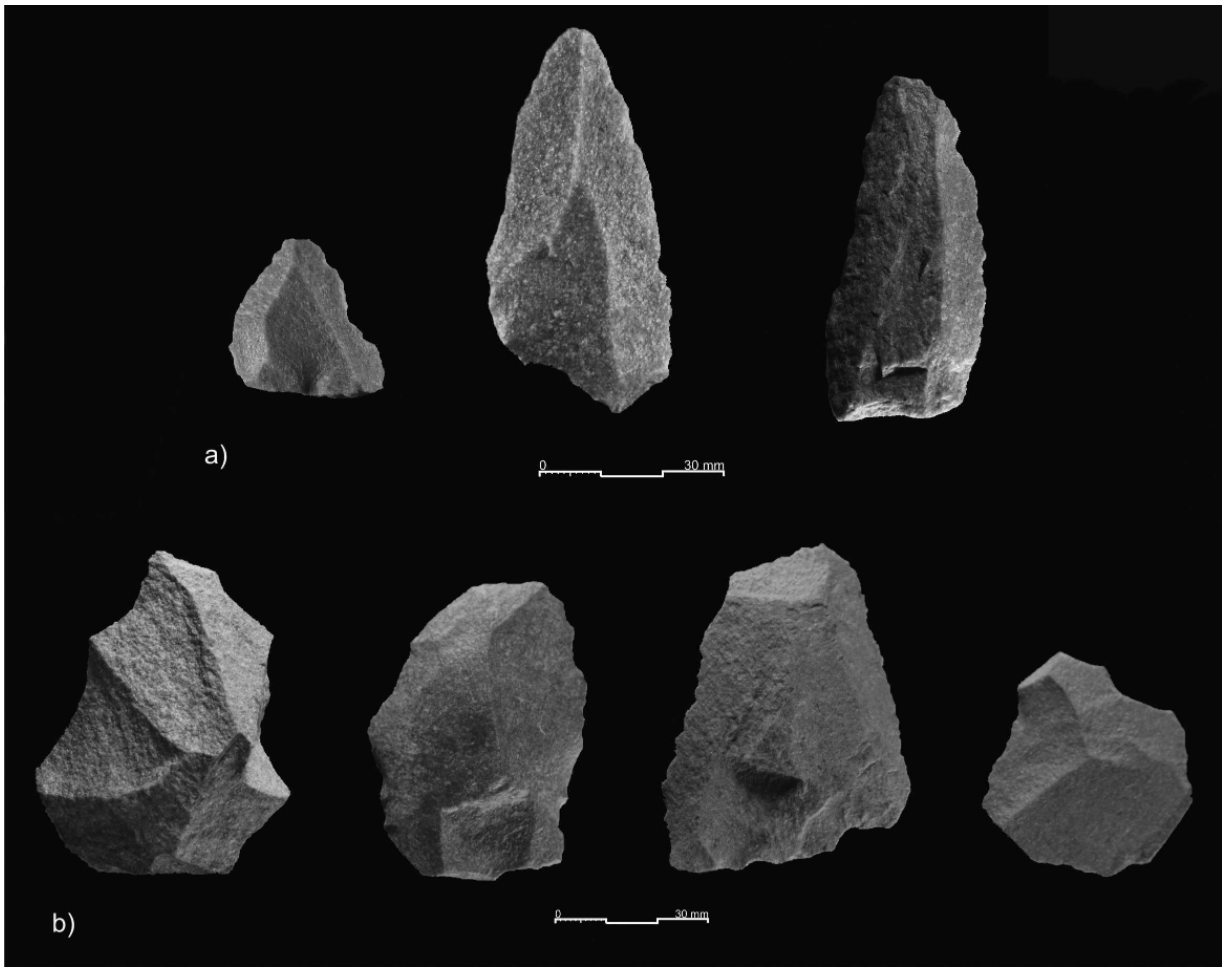

Figure 3. Levallois points (a) and flakes (b) in quartzite from the Middle Palaeolithic levels (Level 3 and 4).

toires have been detected at this level, depending on the type of raw material and the purpose of the reduction. In the local quartz and quartzites, more expeditious strategies (longitudinal or centripetal) were used to obtain flakes, while in the case of rock crystal and flint, production focused on blade flakes, with microblade cores and bladelets in this material as well as a few backed items (Fig. 4). While the quartz prisms are of local origin, the flint items, only found in elements from the end of the knapping sequences, are from further afar, possibly linked to the above-mentioned outcrops 12-14 km to the NE. The technical nature of the assemblage and the datings currently available ascribe this level to the end of the Gravettian.

The faunal assemblage consists of 135 items. *Rupicapra rupicapra* and C*ervus elaphus* still predominate amongst the herbivore species, but there is a significant decrease in the carnivores with respect to the previous levels, particularly ursids, a trend documented at other sites in Cantabria. One outstanding discovery on this level is a pendant made from a canine tooth of a small carnivore (Fábregas *et al.*, 2010).

The top of level 1 (1A) is a succession of small layers of fine and coarse sands of wind-borne origin. This level is sterile, indicating that the cave was probably not occupied by either humans or animals during the harshest periods of the Last Glacial Maximum, contemporary to the formation of nearby glaciers (O Queixadoiro).

Level B

Archaeological level B is linked to the final retreat of the cave ledge, defined by a line of limestone slabs and blocks, some over 30 cm in diameter. The palaeosol indicates an embankment

dynamic on a steep slope towards the archaeological south. Moving inwards, this level merges with the current organic floor, and thus the preserved area is quite small (barely 3 m^2). Radiocarbon dating places this event right at the end of the Magdalenian (Fábregas *et al.*, 2010).

The lithic assemblage shows a clear specialization, with a high percentage (40.6%) of rock crystal, second only to quartz. There are two different *chaines opératoires* in the reduction strategies: the production of flake items in quartz and quartzite with longitudinal, orthogonal and, to a lesser extent, bipolar techniques; and on the other hand, specialized production centred on the exploitation of rock crystal prisms for bladelets and backed elements. Given that all parts of the sequence are represented here (cores, volumetric adjustment elements, retouched products, etc.), it follows that these items were produced *in situ*.

Faunal remains –including a deer antler– are quite scarce, possibly due to the more organic component of the sediment.

Level C

Level C is in the outer part of the embankment, with a steep south slope (lines 20-21). It contains a high density of lithic and bone material. These items show a mixture of features, evidence of the disturbance of this assemblage (Fábregas *et al.*, 2009). Taphonomicaly, the bones are in different stages of fossilization and wear. Within the lithic assemblage, Levallois flakes in quartz and quartzite akin to those recovered from levels 4 and 3 have been identified, along with rock crystal and flint blades and bladelets and flakes of the type found on levels 1 and 2. This level is therefore considered to be the result of the dismantling and disturbance of the levels inside the cave at the top of the embankment due to erosion during the retreat of the cave ledge.

5. Recent Prehistory and Early Medieval occupations

While most of the identified occupations at the site have been ascribed to various periods in the Middle and Upper Palaeolithic, there is also evidence of this cave's use in subsequent periods. In recent prehistory, it was used as a burial site, judging by the Bell-beaker ceramic material recovered at the entrance (Fábregas *et al.*, 2012), and the human remains found inside the cave (Corridor), dated at the height of the Bronze Age (Ua-38121, 3151 ±31 BP). These funerary activities can be contextualised in the late Bell-beaker horizons and the middle of the second millennium BC.

Finally, the surface level contained several storage structures (silos, UA1 and UA2), a hearth (UA06) and a perimetral pavement related to agro-pastoral activities in Cova Eirós from the late 10th to the 15th century AD (Teira *et al.*, 2012).

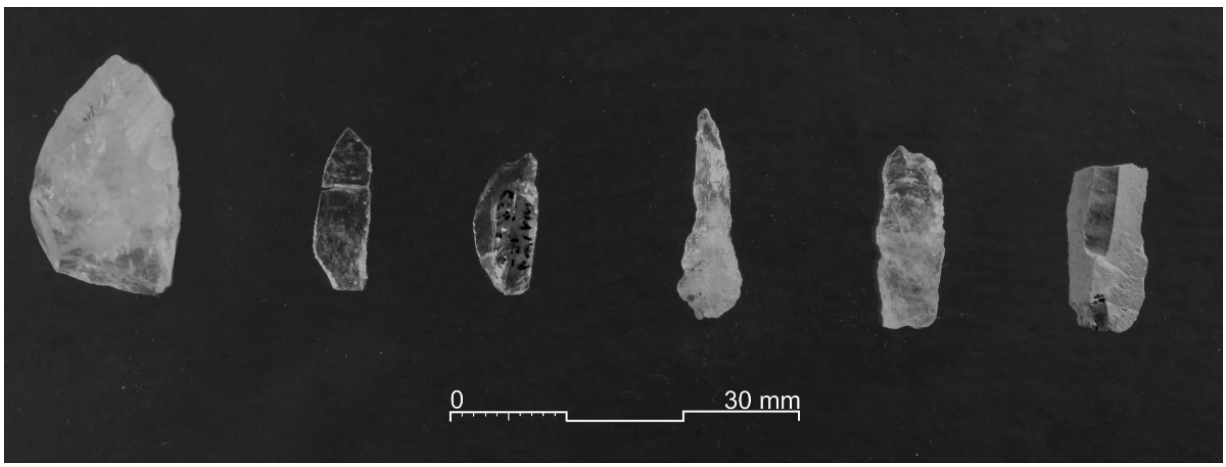

Figure 4. Core and bladelets in rock crystal, and flint bladelet from Cova Eirós, levels 1 and B.

6. Mobile and rock art

The recurrent presence of Upper Palaeolithic communities in eastern Galicia, the discovery of mobile art and, most importantly, documentation of rock art in northern Portugal indicated that rock art could probably be found in Galicia as well. In 2011, several paintings and engravings were discovered in Cova Eirós, the first Palaeolithic rock art detected in north-western Iberia (de Lombera and Fábregas, 2013). Previously, the only evidence of Palaeolithic art in this region was the Férvedes II stone pendant in Xermade (Lugo) and *Dentalium* shells found on Lower Magdalenian levels at Valdavara 1 (Becerreá, Lugo).

Mobile art

Several items of mobile art have also been found at the Cova Eirós site (Fábregas *et al.*, 2010; 2012). A small pendant in a perforated canine, probably from a fox (*Vulpes vulpes*), was found on the Gravettian level (Level 1). Several bone industry remains were also found, including a double pointed speartip from the interfaces of an Upper Palaeolithic level (1C). Both sides are decorated with a zigzag pattern composed of several parallel, discontinuous lines, whose closest equivalent would be Magdalenian items from the Altamira and El Pendo sites (Fábregas *et al.*, 2012).

Rock art

There are several parietal art forms inside Cova Eirós from the Upper Palaeolithic. The ongoing characterization, classification and dating work of these motifs will permit a precise definition of the chrono-cultural coordinates of these Palaeolithic expressions. Eleven decorated panels have been identified to date. One of the features of the series –also a constraint for their study– is the poor state of the images due to heavy washing of the paintings and also the large amount of recent graffiti which has affected many of the motifs.

The largest concentration is in the Main or Mammoth Hall, the widest space of the cave, 15 metres long and up to 5 m. high. Many painted and engraved motifs are on the walls at low or mid-height. Although figures have been identified in all sectors of this hall, the majority are on the west wall (Panels I to VI), looking inwards on the right. This sector contains the most complex themes and panels, with associations of black paintings and engravings, especially on Panel III. On the opposite wall is Panel VIII, with highly complex concepts, distribution and number of engravings, alternating signs with geometric and zoomorphic subjects. Graphic work has also been located in different recesses in the cave and the south-east gallery, an indication of the wide dispersal of these manifestations. Half of the motifs detected to date are painted elements, followed by engravings (46.4 %) and the possible use of reliefs or natural highlighting of the rock (3.6 %). However, engraved figures are most probably under-represented in the counts, as many lines have been classified together. It is also important to note that many black lines or dots may be the result of repeated visits to the interior zones of the cave during recent prehistory, early medieval and contemporary periods. The motifs are generally small and heavily influenced by the spaces and surfaces available in the cave. Quantitatively, the main themes are painted dots and lines; thin engraved lines, both individual and in sets; zoomorphs, both painted and engraved (bovids and possibly deer, equids and carnivores), many of them incomplete (partial representations of cervical-dorsal lines, hindquarters, etc.) followed by the representation of signs.

The predominant painting technique is black. FT– Raman spectrometry analysis has identified the use of charcoal as a pigment. Engravings include thin, shallow lines, in some cases striated and others associated in a dense, variegated manner. Finally, the possible use of natural enhancements of the rock surface with morphologies reminiscent of animal silhouettes, in which specific dots or lines serve to highlight certain anatomical parts of the animal, have also been documented. There is a great technique and thematic homogeneity in this art. According to technical and stylistic studies currently underway, certain techno-morphological characters permit a working hypothesis for the chrono-cultural context of this art. The presence of numerous thin linear, composite and striated engravings superimposed on other motifs, the depiction of zoomorphs with elongated bodies and members, simplified representations of limbs, bodies with filled innards (e.g. bovid Panel I, Fig. 5) and the small-sized figures all seem to suggest the end of the Magdalenian/transition to the Mesolithic. However, the infor-

mation now available prevents us from ruling out the possibility of older motifs.

7. Conclusions

The Cova Eirós site contains the most complete stratigraphic sequence now available for the study of the Middle and Upper Palaeolithic in Galicia. It allows a direct comparison of evolving technologies, subsistence strategies, adaptation to and exploitation of the territory between the Neanderthals and the *H. sapiens* of north-western Iberia. Cova Eirós is a reference point in tracing the history of the settlement of Galicia's eastern ranges (Serras Orientais) and its relationship to the open air settlements and rock-shelters elsewhere in north-western Iberia. The archaeological record and the cave art at this site point to a similarity and even convergence with historical processes identified along the Cantabrian Coast.

Acknowledgements

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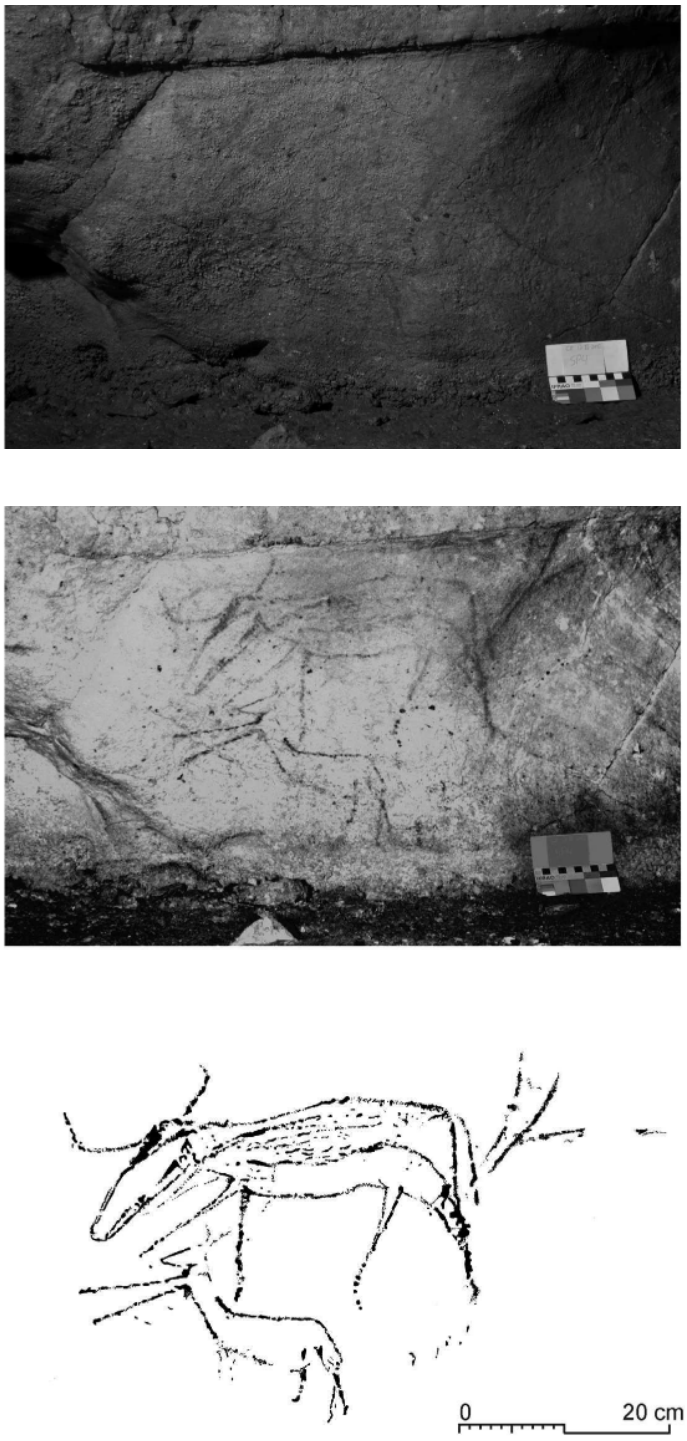

Figure 5: Photograph filtered with D-Stretch and tracing of bovid and cervid zoomorphs on Panel I.