The well-known eponym El Sidrón has a very special history (Fig. 1). It started with the development of a karstic system between two types of rock (sandstone and Neogene conglomerates) as a result of the flow of a small stream. It continued with the use of the cave as a refuge and a hiding place during the Spanish Civil War and the aftermath and with the presence of some endemic species of bats and cave insects. It ended up as the
container of non-figurative scarce and enigmatic rock art (Pinto, 1975; Rasilla et al., 2011: 189-191) and above all, a significant number of Homo neanderthalensis fossil remains associated to the Mousterian lithic industry.

Its incorporation into archaeological and paleoanthropological research was inevitably linked to the devastating war episode referred to above, because, for obvious reasons, the discovery of two jaws in 1994 led to legal proceedings, a police report and administrative proceedings that, after it was proved that they belonged to the Neanderthal species (Prieto et al., 1998, 2001; Rosas and Aguirre, 1999), ended in 1999 with the design and immediate implementation of a research project.

The project posed a key question at the beginning: whether the material that appeared in the Osario gallery (Fig. 1) actually came from that place and whether the existing record had been removed. Both cases were proved to be true during the early stages of archaeological excavation. The project also tackled new questions: how did the remains get to this gallery? What is their chronology? What are the physical and paleobiological characteristics of the human fossils? What is the relationship between the fossils and artefacts associated with them? (Fortea, 2003, 2007b, 2007c, Rasilla et al., 2011a, 2011b; Rasilla et al., 2013).

Obviously, at the outset it was difficult to predict that the archaeological and anthropological record obtained would greatly exceed expectations, as this is an exceptional site due to the amount and quality of the remains and the results, inferences and interpretations obtained and obtainable.

From 2000 to the present, several parts of the karst system were excavated as the aforemen-
tioned questions were answered and according to the requirements that the study itself imposed. The intensity of activity in the Osario Gallery has been constant, GPR techniques even being used from the beginning to verify the burial theory and act accordingly, and it was confirmed that the materials were in secondary position, concentrated almost entirely in the area within sectors 2 and 3 from strip 10 to the north, with some remains in sector 4 (Fig. 1 and 2). Therefore, there was no funeral activity in this gallery.

After answering the question of how the record got there, the questions pointed in a different direction, i.e., outside the system. Its character provided clear indications that the original place of deposit was not a settlement in use. Therefore, the area where the human fossils, lithic industry and few examples of associated fauna were deposited would need to be searched in addition to the archaeological site.

To answer this question, two complementary activities were carried out. Firstly, geophysical analysis, gravimetric analysis and mechanical boreholes and archaeological test pits were used to try to find out about the subsoil in the vertical exterior of Osario Gallery and identify shelters, galleries and channels in the karst system directly related to it and currently covered up (Fig. 2). Secondly, various boreholes were made in two shelters in the system, which had a high probability of containing the site: in La Cabaña and La Tumba. In addition, data was collected on the archaeological map made in the council and to survey the surrounding area.

The results are different. In relation to Osario Gallery and its vertical exterior, a hypothesis on the filler model has been established by implementing geological and geophysical data from both sites (Cañaveras et al., 2011; Silva et al., 2011), while archaeological boreholes in the shelters have not offered anything related to Mousterian / Neanderthal, although La Cabaña has delivered an interesting but modest collection of lithic material, bones, pottery and fauna –wild and domesticated according to the stage– from the late Upper Paleolithic / Mesolithic, Chalcolithic / Bronze, Iron, Roman and Medieval that support the presence of these groups and, in some cases, the use of caves for their settlement (Rasilla et al., 2011c).

Similarly, the study of the lithic industry that was being carried out in El Sidrón from 2005 and a little later in La Viña rock shelter (Santamaria 2006, 2012) revealed an interesting fact related to the raw material that, in parallel, also required prospecting of this abiotic element. There is a type of flint in the area, and even in the conglomerates inside the cave, of which much of the lithic industry of El Sidrón is made but which also appears in small amounts in the Middle and Upper Paleolithic levels of La Viña.

This had an immediate corollary, as it was necessary to check whether this flint could be found in other sites and Paleolithic levels in Asturias and Cantabria and at the same time, develop a specific line of research regarding siliceous raw materials (Fortea et al., 2010; Santamaria et al., 2010, 2011). The information collected has allowed this raw material to be named “Sílex de Pilona”, and from now on, studies of prehistoric lithic industry must take into account this type of siliceous rock, as its proven travelling quality makes it a region-wide lithologic trace. Although the Cantabrian region joined these studies late, we are gradually discovering the siliceous raw materials present in Asturias and that could have been used by our ancestors (Duarte et al., e.p.; Tarriño et al., 2013).

Inferences from different disciplines and analysis techniques

1. The arrival of the archaeological record (Sánchez-Moral et al., 2007; Silva et al., 2011; Cañaveras et al., 2011; Santamaria et al., 2010, 2011, 2012; Rasilla et al., 2011a; Santos et al., 2012a and b).

   After the primary position had been discarded and the Osario Gallery deposit had been buried, it was necessary to explain how the accumulated material had got here, as it invariably came from an area outside this one. Initially, the contributions must have come from the southern area, following the direction of the stratification and of the water that, coming from the runoff and the drips, happens in winter and spring inside the gallery. However, the data questioned this hypothesis and transferred the vehicle to channels located in the ceiling.

   This was because the vast majority of the material is concentrated between frames E-H/10 – E-H/4 and there are a few remains, with a slight increase in the number of fauna, which is always scarce, in squares D-E-F/20-23 (Fig. 1). Even if we project the archaeological evidence onto the floor...
Figure 2. Top: Interpretive geological cut of Osario Gallery. The geological features and the most significant geomorphological levels are shown in relation to the geophysical anomalies detected, the mechanical boreholes and the profiles of Osario Gallery (GO) and Main Gallery of El Sidrón cave (P). Bottom: Dissolution mesomorphology in the floor of Osario Gallery. A: Details of how the partitions and shovel shapes control the texture and geometry of the deposits (area F-G /9). B: Detail of the partitions exposed in area E-F/8-9. C: View from the north of the centre of the gallery (September 2010) and diagram of the stratigraphic series.
plan, we see a cone shape in both cases, which supports an entrance from the outside.

This phenomenon can be explained because outside, on one of the edges of a karst polje, there was a rock shelter where the archaeological record was deposited and a stream sinks a few metres down, as currently occur in La Cabañina rock shelter. For some reason, the system got blocked, coinciding with a storm or a stage of significant rainfall, the water rising up to the level of the rock shelter. When it became unblocked at a later stage, the deposit suddenly and very quickly entered the cave via channels, getting trapped in the Osario Gallery (Fig. 2). In this final position there was a post-deposition process focused mainly on the eastern wall favouring the flow of the aforementioned water and in a sinkhole that affected area E/9. Then the rock shelter broke apart and covered the quaternary sediment but its position has been located using geophysical analysis, gravimetric analysis and the corresponding topography. We are trying to access this place in order to check if there are any remains and, if there are, what the deposition process was like, as this would re-open the hypothesis that it had been a burial site.

Furthermore, we can probably deduce, based on the position of the record inside the gallery, the arrangement of the elements (fossils, tools and fauna) in the original exterior rock shelter. The majority of the material was located in a specific area that entered via a channel that took it to sectors 2 and 3 of the gallery and a little of the material —particularly the fauna— was in a different area, but nearby, and entered via another channel that took it to sector 4 of the gallery (Fig. 1).

2. Chronology of the fossils and lithic tools (Torres et al., 2010, 2011; Wood et al., 2013).

Both the taxa and the techno-complex to which they belong make it necessary to use different absolute dating systems, as at best, since ~55,000 BP; 14C cannot be used and because depending on the result, we could be in the centre of the current debate on the Middle Paleolithic/Upper Paleolithic – Homo neanderthalensis/Homo sapiens— the debate on the persistence of Neanderthal groups in the Iberian Peninsula up to chronologies around 25-24,000 BP.

It is important to point out that, firstly, for various reason, not all of the procedures chosen have returned satisfactory results (e.g. Uranium/Thorium) and secondly, problems have been brought to light that could arise according to the methods used by the laboratories and also, problems related to subsequent archaeological interpretation. To minimise this impact, several remains were dated using various procedures (AARD, ESR and 14CAMS), the dates of the first two coinciding quite well and those of the third being very different and out of range (Geochron Laboratories).

As the dates could fall within the C14 range and in order to clear up the doubts generated, samples were sent to another laboratory (Beta Analytics). The results (between ~35,000 and ~41,000 BP) placed the El Sidrón record within the aforementioned debate. However, there was news of the dates obtained from a sample sent in 1998 to the Gif-sur-Yvette laboratory (48,500±2600 and 49,200±2500 BP) that significantly changed the vision and interpretation of the El Sidrón record.

At the same time, samples were taken to date the sediment using OSL, into which the archaeological and anthropological materials fit quite well, to the ceiling and wall, and they were correlated with those obtained using other procedures.

Finally, for the project led by Oxford University various unique European sites, including El Sidrón, were dated and the date of 48,400±3200 BP was returned.

As maybe easily inferred, there is a disagreement between the dating of Geochron/Beta and Gif/Oxford and the main reason for this is the pre-treatment used to eliminate any contamination. Geochron/Beta used the conventional system whereas Gif/Oxford used more sophisticated protocols, ninhydrin and ultrafiltration, respectively.

For this reason, it is more sensible to take on the older dating values; the average value of these is 48,800±1600, and are generally more in agreement with the AAR, ESR and OSL values.


What is perhaps more worthy of note is that the existence of thirteen individuals and the practice of anthropophagy has been proved (Fig. 3). This has been possible because various specific molar
and other specific bone parts have appeared and also due to the reliable presence of cut marks and deliberate fracturing of various human bones.

We have other examples from the discovery of a large number of Neanderthal individuals in the same site but in this case, it has been possible to study the mitochondrial DNA of twelve of them, which provides a new view of some of their behaviour, such as the movement of females and the higher stability of males (patrilocality) in Neanderthal groups. Various lines of research are open that will explore the interpretation of this “family” on a scale unseen before now, helped by the good general state of preservation of the fossils.

Seven adults (3♀, 3♂, 1♀?), three teenagers (2♂, 1♀?), two juniors (1♂?, 1♀?), one child (1♀?) and a total of ~2100 items give an illustrative source of information about laterality (right-handedness); the use of the mouth as a third hand by all adults and teenagers (grooves in the front

Figure 3. Top left: Side view of a jaw and maxilla in anatomical connection. Top right: Cut marks on a humorous. Bottom: Photo and sketch of one of the reconstructed assemblages with a total of twenty-one pieces.
teeth); episodes of physiological stress –malnutrition– (at least one hypoplasia coinciding with weaning and, in some cases, two or more); a mandibular abscess on adult 2 that must have caused chewing problems and pain; calculus present in all individuals with traces on a specimen of bitumen and consumption of medicinal plants; estimated height (between 164-171 cm and between 153-161 cm: an average of 164 cm); a neurocranial morphology tending towards brachycephaly; a slight anatomic variation depending on the geographic area, those from the south tending more towards a wider face and less prognathous than those from the north; and their skeletal characteristics correspond to those known as classic Neanderthal.

In addition, one adult female was red-haired and fair-skinned; one individual was blood type 0 (variant 001); Neanderthals had language, although at the moment we do not know how complex it was; one specimen could detect bitter taste but needed to eat a large quantity of the product to notice it; and the mitochondrial lineage of twelve individuals could be established. Thus, four adults (14, 33), two teenagers and one junior belong to lineage A; one adult female belongs to lineage B and one adult (c), one teenager, one junior and one child belong to lineage C. What is significant is that each adult female has a different lineage (A, B, C) and that all adult males belong to the same lineage (A).

Therefore, at some time, a culinary practice was carried out on a group that was related to one another to some extent, which gives a very accurate snapshot of not only a biological fact but also a cultural one, their remains being left in the aforementioned rock shelter in a way that they were not affected by carnivores or rodents and could smoothly fossilise until they were discovered.

4. The qualities of the material culture and of the biotic and abiotic resources (Fortea et al., 2003; 2007a, 2007b, 2007c, 2009, 2010; Rasilla et al., 2011a, 2011b; Sesè, 2011; Sanchiz and Martín, 2011; Santamaria 2012; Santamaria et al., 2010, 2011; Duarte et al., e. p.; Tarriño et al., 2013).

Associated to the human fossils, around ~400 lithic artefacts with unmistakable Mousterian type-technology conditions and a few fauna remains have been found. The type of raw material –Piloña flint– used in general stands out; the refitting of various lithic pieces that currently represents 20%, but this will increase with new yearly incorporations (Fig. 3); the arrangement of the archaeological record and the scarceness and properties of the macro-mammal fauna (deer, large bovid, chamois, horse, wolf and bear).

The presence of Cretaceous flint in primary and secondary position in the Neogene conglomerates is of significant interest because the Neanderthals used this raw material, and some pieces of quartzite, to make their tools in direct relation to the priority activity deduced from the data exposed: tools for processing their conspecifics. This is based on the fact that this material entered Osario Gallery at the same time and the fossils and the refits also show that cores were collected from the immediate surroundings, they were knapped, different elements were used (flakes, denticulate tools, etc.) and they were left in the same place.

A key food element, such as fauna, in principle does not have any relation to the activity considered because it only has marks from carnivores and, therefore, in this case it was not directly related to humans. It reached this deposit through the activity of carnivores and when the aforementioned event occurred, all of the material that was in this part of the site entered at the same time, getting trapped in the natural traps of Osario Gallery.

Data suggests that it is a unique cultural fact and occurred quickly over time, focusing on a prominent task; therefore, it is vital to discover –and we are working on this– other Mousterian sites near El Sidrón to document this other part of human activity that is not reflected in the present one.
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PLEISTOCENE AND HOLOCENE HUNTER-GATHERERS IN IBERIA AND THE GIBRALTAR STRAIT:
THE CURRENT ARCHAEOLOGICAL RECORD