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Research Article

Hort De Vicentet (Elche/Elx): First Evidence of Solutrean Portable Art in Alicante. A Preview of Its Systematic Study

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Abstract

The UNED center is located in Hort de Vicentet (Elche, Alicante, Spain) in the town of Elche, situated within the municipality's urban Palm Grove. On the grounds surrounding the classrooms we have found a total of 11 stone slabs with a large number of figures. At first, we thought it impossible, but the evidence shows a set of figures that, based on stylistic conventions, we can attribute to the Upper Solutrean and, possibly, to the Evolved Upper Solutrean. Upon studying each of the surfaces, we saw a particularity that caught our attention: the large size of the eyes in some figures and the presence of another characteristic, namely partridge eyes, in equine figures. We can speak then about the "master of the large eyes" and "master of the partridge eyes," since it seems that all the figures were made by the same hand.

Keywords: Portable Art; Stone Slabs; Upper Solutrean; Upper Evolved Solutrean; New Technologies; Chrono stylistic Conventions; Chronological Framing

Introduction

The Mediterranean side of the Iberian peninsula is characterized by a scarcity of artistic expressions from the Upper Paleolithic, which contrasts with the abundance of sites attributed to this period. Nevertheless, since the end of the last century this reality has changed with the discovery of new evidence (Figure 1). In the province of Alicante, the sites with portable art are limited to advanced stages of the Magdalenian or the transition to the Epipaleolithic. This is the case of Cova del Barranc (Fleix), with a boulder fragment decorated with a horse (Cacho and Ripoll, 1987) [1]; of the rock shelter at Tossal de la Roca (Vall d'Alcalá), with seven stone slabs having zoomorphic (especially Equidae and cervid) and geometric motifs (Cacho and Ripoll, 1987; Cacho et al., 1995) [1,2]; or of the Cueva de Les Cendres (Moraira), with a bone decorated with a deer (Villaverde, 1985) [3]. As to rock art, all the sites in Alicante are also located in the north of the province (Figure 1). In Cova Fosca (Val d'Ebo) there are three panels with engravings of does, horses, a bovid and indeterminate quadrupeds that have been attributed to a final stage of the Magdalenian (Hernández et al., 1988) [4]. Also located in Val d'Ebo is Cova Reinós, where there is a rampant caprinae painted in red that has been placed in an indeterminate stage of the Solutrean (Hernández et al., 1988) [4]. In the Cova del Comte (Pedreguer) there are 15 panels with painted and engraved representations (horses, does, goats and some undetermined ones) attributed to a pre-Magdalenian time frame and symbols that are rare in Paleolithic art, which those who discovered them place in the final phase of the Solutrean and/or Magdalenian (Casabó et al., 2014) [5]. Likewise, two stone slabs have been found with engraved horses and a stone slab with ocher residue attributed to the Solutrean (Casabó et al, 2018) [6]. Lastly, in the Cova de Bolumini (Beniarbeig), a red symbol with vertical

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and subparallel bars has been identified on a column, probably having Paleolithic chronology (Barciela et al., 2015) [7].

But sometimes luck aligns with experience, and the combination leads to discoveries in unsuspected places, such as the set of engraved stone slabs that are the object of this work. Their identification fills the existing gap between the Paleolithic artistic expressions in the north of the province of Alicante and those in the region of Murcia (Figure 1).

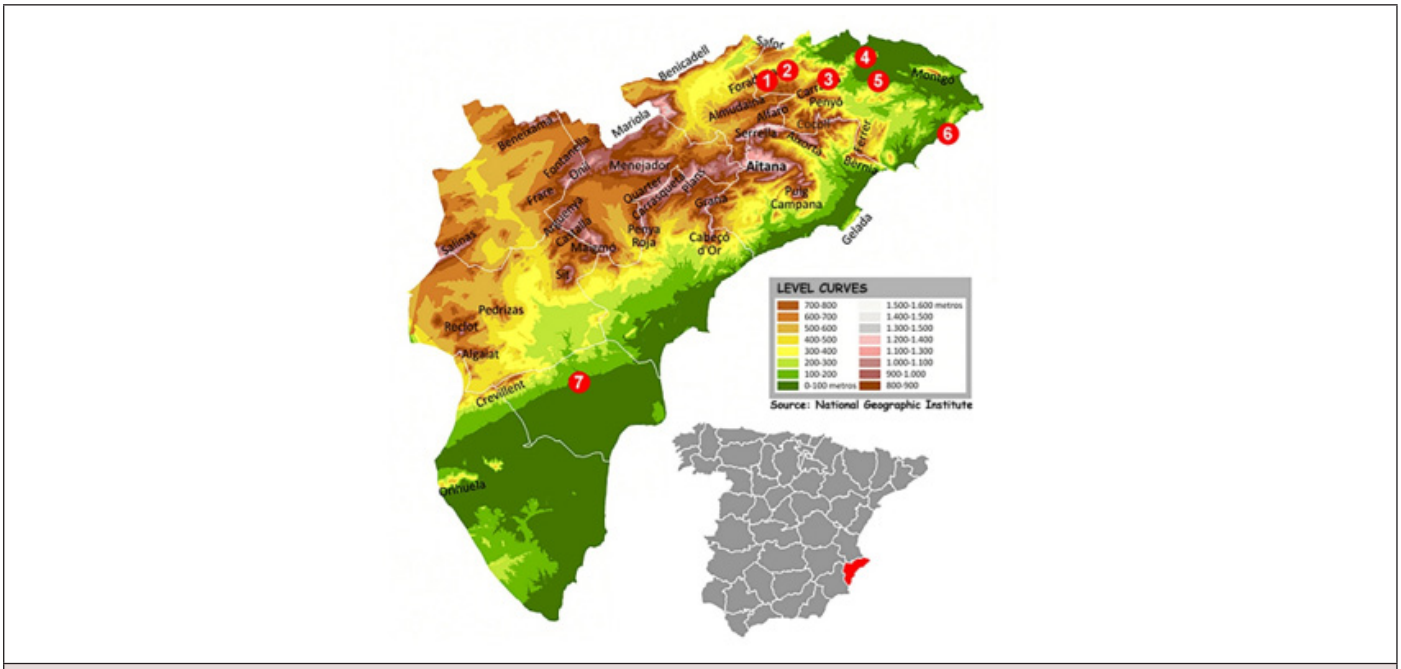


Figure 1: Sites mentioned in the text. 1: Tossal de la Roca. 2: Cova Fosca. 3: Cova Reinós and Cova del Barranc. 4: Cova Bolumini. 5: Cova del Comte. 6: Les Cendres. 7: Hort de Vicentet.

The professors at the central headquarters of the *Universidad Nacional de Educación a Distancia* (the UNED) travel to associated UNED centers, with 62 centers spread across Spain and 17 abroad, to do in-person exams. These were done at three calls held in February, June and September 2023. Awarding of the different spots is by lottery and students can attend any of them.

At the February 2023 call, one of the authors (Dr. Sergio Ripoll López) was named president of the examination panel at the associated center in Elche (Alicante). This institution is located in the northern part of the municipality and is situated in the middle of the Palm Grove of Elche, in what is known as Hort de Vicentet (Figure 2). It is found in the urban area of Elche, near Molí del Real, the Municipal Park and the Torre de los Vaillo. Hort de Vicentet is connected to the evolution of the Palm Grove of Elche, an agricultural system of Arab origin (10^{th}-11^{th} centuries) based on water use through irrigation canals and the planting of palm trees in grids to protect other crops. Like most historic groves, the one at Vicentet was created as a production unit. It was used to grow dates, alfalfa, pomegranates and olive trees under the shade of the palm trees, following the tiered cultivation system typical of oases. The enclosure housed a traditional house called the Casa del Hort de Vicentet. As the city grew, the original residential structure of the grove disappeared. The house was located on land that currently houses the garages for Elche's bus station. Despite changes in its environment, the grove retained its tree mass. Today, Hort de Vicentet has lost its productive nature to become a public and recreational space. It forms part of the greenery that connects the historic center with the northern part of the city (Jaén, 1989) [8].



Figure 2: Location of Hort de Vicentet. The image on the left shows the UNED buildings. The elongated building on the right is the Aula Magna, where the exams are taken. The evidence found comes from the area to the north and east of the structure.

Exams are taken in the Aula Magna, a building adjacent to the associated center. During one of the breaks, while walking through the Palm Grove, Dr. Ripoll was drawn to a small limestone rock with some incisions. His first thought was of an engraved stone slab, but the setting made him discard this idea as impossible. During another break he examined it again, and with help from the low-angle light coming off the sunset he identified several horse protomes and a goat. It seemed impossible, but the evidence was very clear and conclusive.

Also on this panel was Dr. Manuel García Rodríguez, a geologist in the Department of Environmental Sciences at the UNED and a regular collaborator in various rock art projects of the Laboratory for Paleolithic Studies (*Laboratorio de Estudios Paleoliticos*, L.E.P. in its Spanish acronym). When analyzing the small rock, he immediately understood the implications of the discovery. But he also raised the same objections as Dr. Ripoll. That is, that the entire setting had been dug up to excavate the building where the exams were being held and, therefore, everything was in a secondary position.

In the following days, another nine pieces were found in the same setting with a varied number of representations. The director of the associated center, Mr. Francisco Escudero Galante, and the secretary, Mr. Rafael J. Valdivieso Sarabia, were informed of the findings and could not believe that Paleolithic portable art had been discovered in the Palm Grove of Elche and, especially, in the area around their center.

After this, another of the authors, Dr. Francisco Javier Muñoz Ibañez, was also selected by lottery to be on the Elche panel in the February 2024 call and he found two more decorated stone slabs.

It is clear, although seemingly implausible, to find evidence of Paleolithic portable art in the Palm Grove of Elche and, therefore, we have called our project UNEDXPECTED, uniting our institution with this unexpected discovery.

Materials and Methods

The stone surfaces found can be classified as small rocks with reduced dimensions, between 14.9 and 7.4 cm in length. Two of them have a structure similar to the idea of a laminated stone slab, with a thickness between 1.3 and 2.1 cm (Table 1, Figure 15,16). Practically half (6) are medium-grained or coarse limestone, while the rest (5) are very fine-grained. All have beige coloration, except for 7 (Figure 16), which is darker and brownish in color. Table 1 shows these characteristics, as well as the measurements and coloration of each of them, following the traditional method from the Munsell color system (Munsell Color Company, 1975) [9]. But we have also used a new technology, the Nix Mini sensor, which lets us take the color data at a specific point and facilitates the exact color in various types of readings. We have opted for the CIELAB color and sRGB color, which are the most common in graphic arts and the most similar to what we have used up to now (Table 1).

Table 1: Dimensions, texture and color of the stone slabs. LSS: Laminated stone slab.

STONE SLAB	TEXTURE	LENGTH cm.	WIDTH cm.	THICKNESS cm.	MUNSELL COLOR	CIELAB COLOR	sRGB COLOR
1	Medium grain	13.8	11.1	3.5	HUE10YR 7/4	60.44,3.95,21.29	161,143,108
2	Medium grain	11.9	9	3.9	HUE10YR 7/2	61.79,1.39,19.44	160,148,115
3	Fine grain	10	6.9	4.9	HUE10YR 7/3	57.35,2.97,14.56	149,135,112
4	Medium grain	10.3	6.2	3.7	HUE10YR 7/3	69.90,2.35,18.64	180,166,134
5	Fine grain	14.2	6.4	3.1	HUE10YR 7/3	53.75,1.28,21.27	139,127,92
6 (LSS)	Medium grain	10.4	8	2.1	HUE10YR 7/1	58.17,3.09,21.64	154,137,102
7 (LSS)	Fine grain	7.9	5.2	1.3	HUE10YR 7/4	70.13,2.45,22.31	185,169,131
8	Medium grain	8.5	7.4	3.3	HUE10YR 7/4	78.86,0.95,17.95	205,194,162
9	Medium grain	14.9	8.4	5.3	HUE10YR 7/3	66.29,3.00,20.19	176,159,121
10	Fine grain	7.4	5.7	4	HUE10YR 7/3	62.81,3.45,20.19	166,149,116
11	Fine grain	8.9	8	4.6	HUE10YR 7/3	75.65,1.08,14.82	195,185,159

As it is an object with small dimensions, the figures can be placed in any direction. It seems that there is always a preferred position, probably the first phase, in which there are a greater number of figures, but when rotating the piece, we see that there can be representations in any direction.

In order to identify each and every one of the representations in the set, we follow a four-fold path. Firstly, *De visu*. This first observation, whether with the naked eye or with the help of a conventional magnifying glass with 12 magnifications, allows us to determine if there is a face with a greater number of figures and if there is a primary orientation, and thus decide which is the front and which is the back.

The second phase is to take high-resolution photographs (14,000 pp) with low-angle lighting in all positions until covering all of the faces. The more images we obtain, the greater the results in the fourth phase.

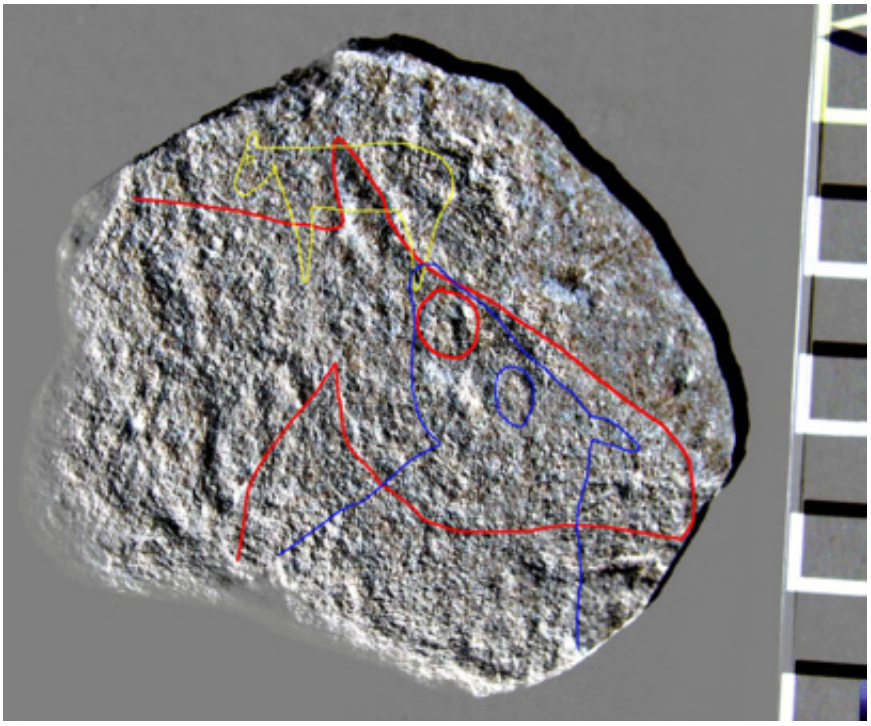


Figure 3: Relief filter from the Photoshop program, which lets us see the grooves in each of the pieces more accurately. In this case the back of stone slab no. 8.

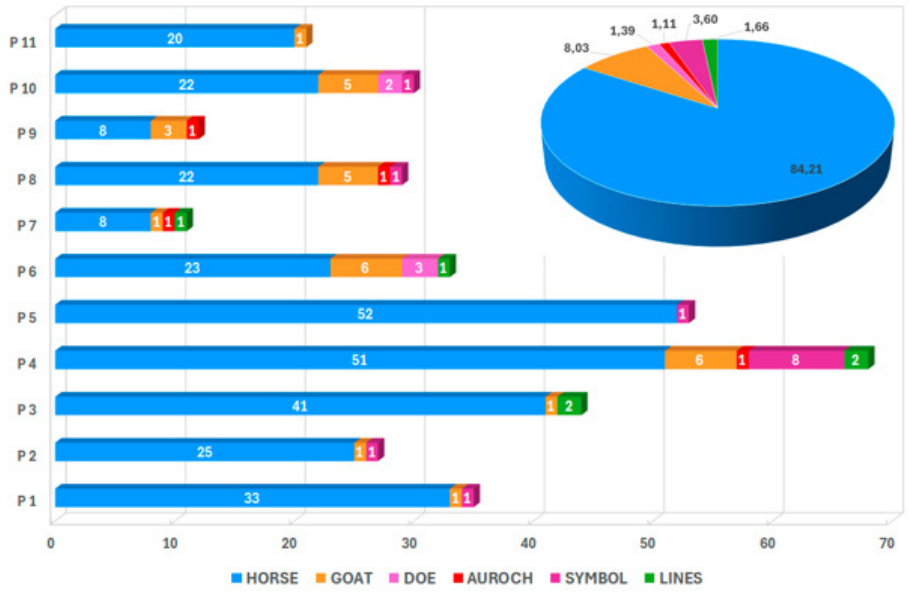


Figure 4: Number of figures represented on each of the stone slabs analyzed and their percentage of the total ideograms.

The third step is 3D scanning of each of the faces and sides of the piece using the Artec Space Spider 3D scanner, which gives us a very high resolution of 0.005 microns per inch. This lets us identify all the grooves of the piece no matter how thin and/or eroded they are. This 3D model has been combined with the high-resolution photographs taken in the prior phase, along with the images captured by the scanner (Figure 5).

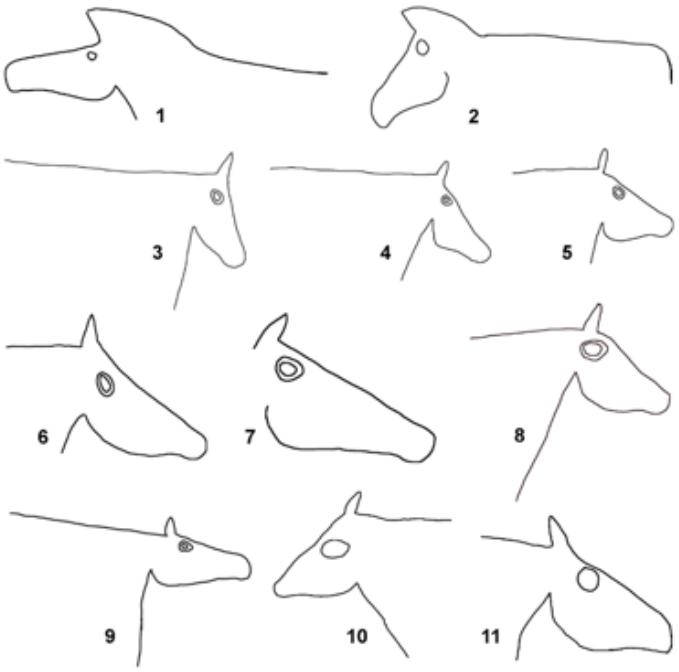


Figure 5: Representations of Equidae. Horses with ladder mane: 1: stone slab 1 back and 2: stone slab 2 front. Horses with partridge eyes: 3-5: stone slab 4 front; 6-9: stone slab 4 back and 7: stone slab 5 front. Horses with large eyes: 11: stone slab 8 front.

In the last stage of the computer process we use Adobe Photoshop to create a file in which we add as many layers as the frames we have from the second phase and combine the visible ones. We duplicate and save the layer resulting from the coupling of all the photos. We then incorporate the 3D model in another layer. We place the duplicate layer in the first position (on top) and apply the stylize and bas-relief filter with a percentage of 100 and a height of 130. From this, with all the layers visible and over the last one, we create a dozen or more empty layers, according to what we saw in the first phase (you can add as many as necessary) to start outlining, in every one of them, each of the identified figures. To do this we use the Wacom Intuos A3 digitizer tablet. With the digitizer pen we choose the pencil tool, with a thickness of 8 and a specific color, and we again trace each of the lines of the layer in bas-relief. We will probably have to hide this layer and see the images to check the reliability of our drawing. When we have several layers drawn, in order not to mix up the representations we can use the tone and saturation tool to change the color of each of the figures by choosing the corresponding layer. It is advisable to save the file at each step, given that it creates files of several hundred megabytes, but in this way, we make sure that the process is complete. With the visibility of the layer, we can see each of them more accurately and, above all, work with greater reliability. Finally, selecting the background that interests us most and hiding the work layers, we put together the file and then save it as a JPG.

Once we have all the piece's faces processed, we create a new file with the front photographed, the front with the identified figures, and we do the same if we have the sides and the back, to have an overall view of the analyzed element.

Discussion

On all the stone slabs the groove of the drawing is extremely thin, with a width and depth of less than 1 mm, and is fully patinated. Most are V-sectional, although there seems to be a second phase with larger figures with deeper incisions (< 2 mm) and sectioned in U.

The number of figures represented in the 11 elements analyzed comes to 361 ideograms (Figure 6), of which 342 are zoo morphs (94.74%), 13 are symbols (3.6%) and 6 are groups of unconnected lines (1.66%).



Figure 6: Pangaré effect. 1: detail of the partridge eye ring. 2 and 4: pangaré effect in Przewalski horses. 3: Fighting bull with partridge eyes.

As for the morphology of the identified species, we have subdivided each of the taxa completely (showing head, front and back leg), protome (showing head, chest and/or back line and/or front leg) and head (there is no chest or back line). The most represented species is the horse (304 / 88.21%), of which 190 are protomes, 87 are complete and 25 times only the head is represented.

In all the stone slabs, except for 7 (Figure 16), we have a series of representations with excessively large eyes. The artist represented one single eye of the pair, twice as large as what would be normal or conventional in a representation of an Equidae and, in some cases, even triple the normal size (Figure 7: 10-11). This would be the signature of the person we have called the "*master of the large eyes.*" This specificity is found in 70 of the 304 horses represented, which is 23.02% of the total and is present both on the front and back of the pieces. Stone slab 2 (Figure 11) stands out, which is only drawn on one face, where 17 of the 26 horses represented have this characteristic.

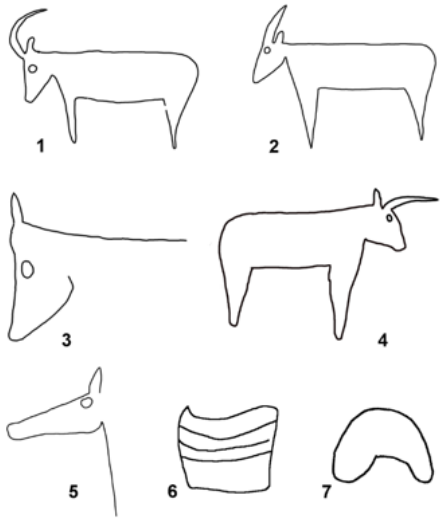


Figure 7: Caprinae: 1: stone slab 8 back (male), 2: stone slab 8 back (female or juvenile) and 3: stone slab 6 front (infant). Bovid: 4: stone slab 9 front. Doe: 5: stone slab 6 front. Symbols: 6: stone slab 6 front (basket or container?) and 7: stone slab 1 front (bilobated).

Additionally, there is another stylistic innovation. This is to represent, up to seven times (2.3%), horses with large but at the same time concentric eyes (stone slab 4 front and back, and stone slab 5 front), which in bullfighting terminology are known as *partridge eyes* (Figure 7: 3-9), hence the other designation. A fighting bull has partridge eye when it shows degradation of the red color around the eyelids. It gets this name because it highly resembles the eye ring on partridges (Figure 8). This is a peculiarity exclusive to bulls with reddish coloring (scarlet, peach and dark chestnut) and a concentric band around the eyes, which is discolored compared to the rest of their coat and intensifies in the area around the tear duct.

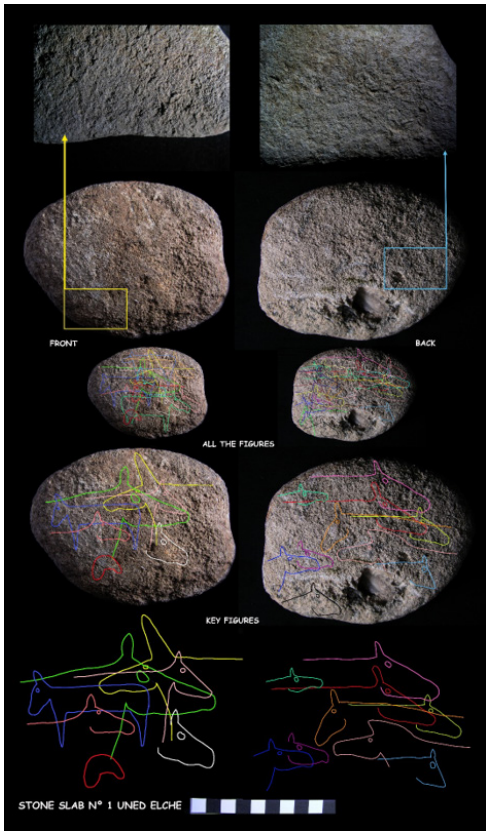


Figure 8: Stone slab no. 1.

In horses, this term was used in ancient treatises on equestrian coats to describe a similar visual effect (Díez, 1495; Reyna, 1547; Chacón, 1551; Cubillo, 1862) [10-13], but it has a different genetic base. In the horse it manifests itself mainly as a lighter or "washed out" rim of hair, technically known as the pangaré effect, which surrounds the eye, giving it that partridge eye appearance. It also commonly appears in other areas such as the muzzle, belly, upper arm and groin (Figure 8). It is considered an atavistic trait, as it is present almost universally in species of ancient wild Equidae such as the Przewalski (*Equus ferus przewalskii*) or the Tarpan (*Equus Ferus Ferus*), the Onager (*Equus hemionus*) and the Ass (*Equus africanus asinus*). In domestic horses, it is common in breeds such as the Exmoor or the Haflinger. The specific gene that causes pangaré has still not been identified, although it is assumed to act like a dominant gene. This allele would be related to the convention of the ventral "M" in the representation of Equidae during the Magdalenian. But it is the first time that this characteristic of ocular representations in Equidae is confirmed during the Solutrean (Figure 7: 3-9).

At this time, we cannot specify whether this stylistic marker was made by the "*master of the large eyes*" or by another artist. But both share the large size when it comes to representing the eye. If we add these seven partridge eyes, equally as large, to the previous ones, the number of representations of horses with large eyes reaches 77 (25.32%). Also, these eyes are likely to disproportionately represent this change in coloration in the eye socket.

Moreover, we have an element that allows us to place these figures quite precisely. We are referring to the convention known as *ladder mane*, which places us on the cultural horizon of the middle Solutrean. That is, around 20,000 years before the present day. We have identified at least two horse figures (Figure 7: 1 and 2) with this feature.

Next, we find the goats, with 29 representations (8.03%), of which 15 are complete and 14 are protomes (Figure 6). Also, there are some males with large horns, twisted and curved from the mesial zone (12), typical iconography of these types of representations in Paleolithic art. (Figure 9: 1), and the taxonomic study indicates that more than half (17) correspond to females with almost straight horns and juveniles with smaller horns (Figure 9: 2). There are several representations of juvenile goats with the characteristic triangular morphology of the head without horns, but both the silhouette of the head and the large eye they have lead us to think of this attribution (Figure 7: 3). Likewise, it is significant that no male is represented with a wattle.

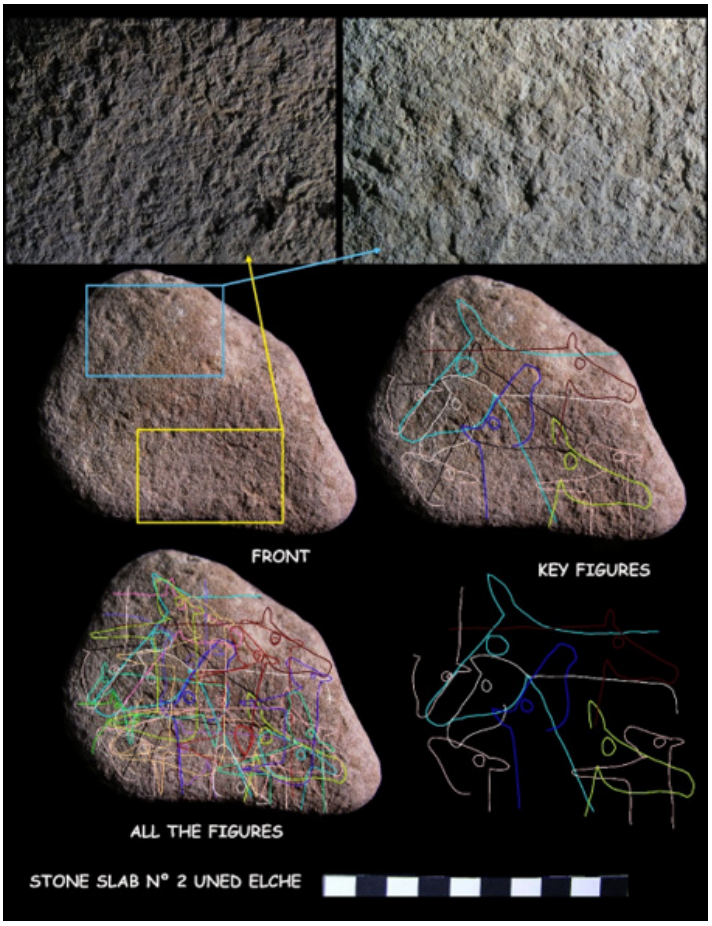


Figure 9: Stone slab no. 2.

Cervids (51,39%) and aurochs (41,11%) appear as the remaining animals (Figure 6). In the first case, it is undoubtedly females with large triangular ears and elongated heads without antlers. Three protomes and two heads have been identified (Figure 9: 5). The aurochs always appear complete (Figure 9: 4).

There are several elements (13) that we have included under the term of symbols, which adopt different morphologies (Figure 6). Some of these ideomorphs could be associated with vulvas, such as those on the front of stone slab 4 (Figure 13), another could be a basket or container (Figure 9: 6), which appears on the back side of stone slab 10 (Figure 19), and there is a bilobated element (Figure 9: 7) on the front side of stone slab 1 (Figure 10). There is also a section for unconnected lines. That is, the ones that do not form any figure and which we have included on each stone slab, differentiating between the front and back (Figure 12).

Regarding laterality, almost half of the figures (55.89%) are arranged towards the left, while 44.11% are pointed towards the right (Figure 18). If we analyze this parameter by species, this proportion remains between the Equidae, dominating those arranged towards the left (58.24%) versus those facing to the right (41.76%). The majority of the goats are pointed towards the left, with 22 representations (75.86%), versus seven that are pointed towards the right. Among the cervids, only one is pointed to the right. In the only four aurochs represented in the set, two are arranged towards the left and two towards the right.

This analysis of laterality provides us with very important information about the artists who engraved these figures. In our database of present-day hands used to analyze Paleolithic hands, we asked our collaborators to draw, schematically, a quadruped in a corner of the index card they had to fill out. Among right-handed people, 99.9% arranged the figure with its head to the left, while 99.9% of left-handed people placed the head to the right.

If we analyze our list from this perspective, we see that most of the figures have been made by one or various right-handed people as they are arranged to the left. But we also have a wide representation of figures made by left-handed people.

Apparently, there seems to be a synchronous rendering in all the representations, but within the narrow grouping we can individualize at least two very clear hands carrying out the work. On the one hand, the one we have called the "*master of the large eyes*" and, on the other, the "*master of the partridge eyes*."

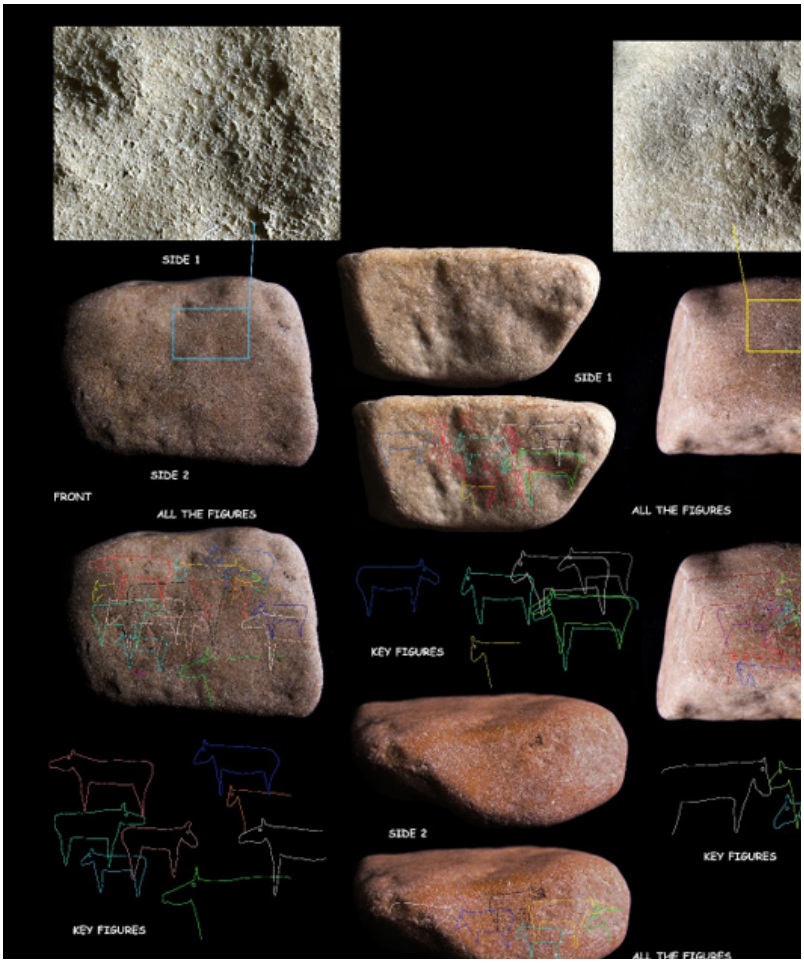


Figure 10: Stone slab no. 3.

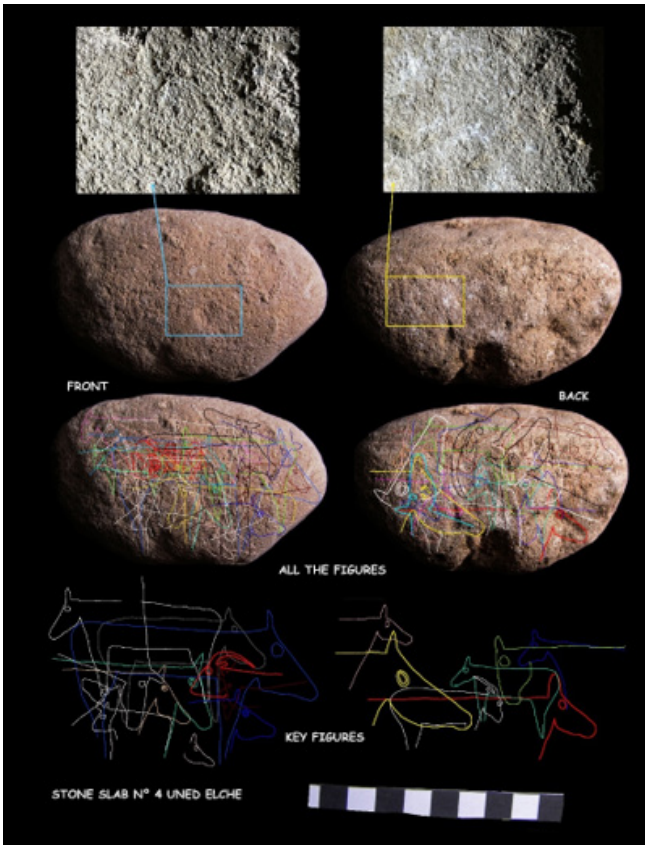


Figure 11: Stone slab no. 4.

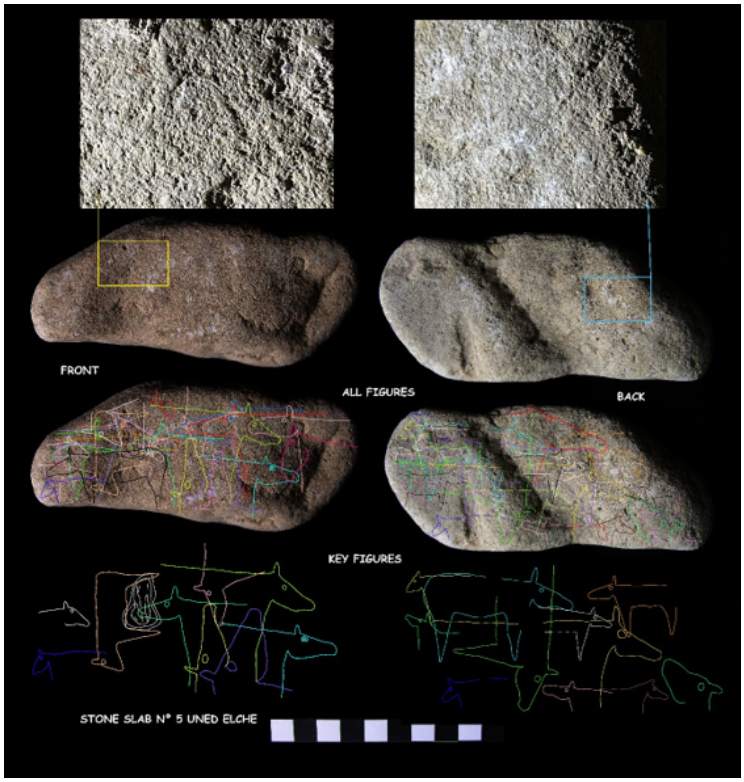


Figure 12: Stone slab no. 5.

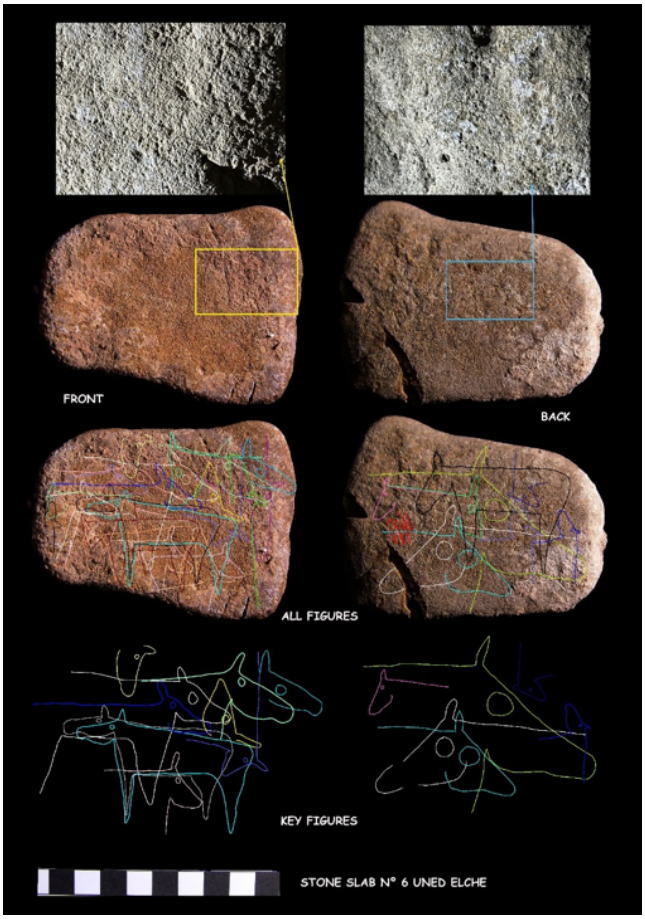


Figure 13: Stone slab no. 6.

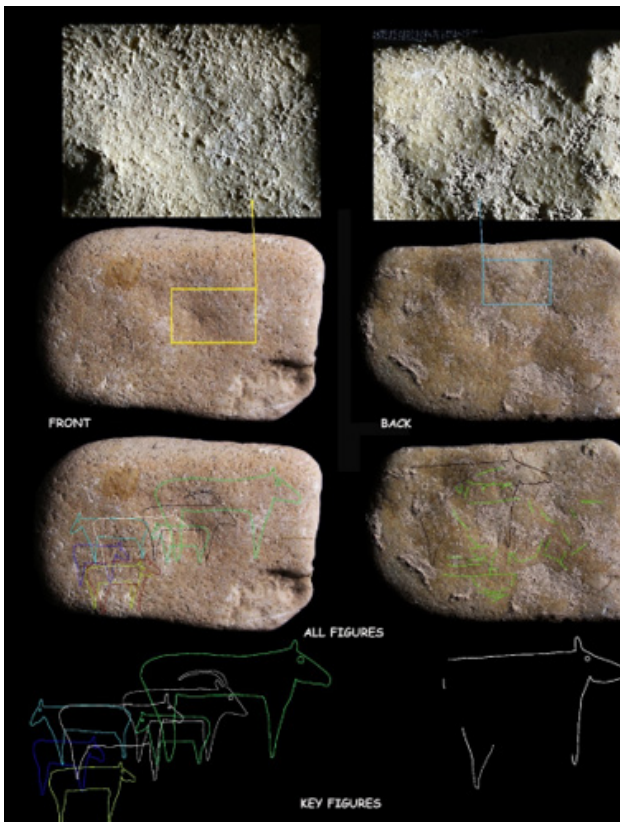


Figure 14: Stone slab no. 7.

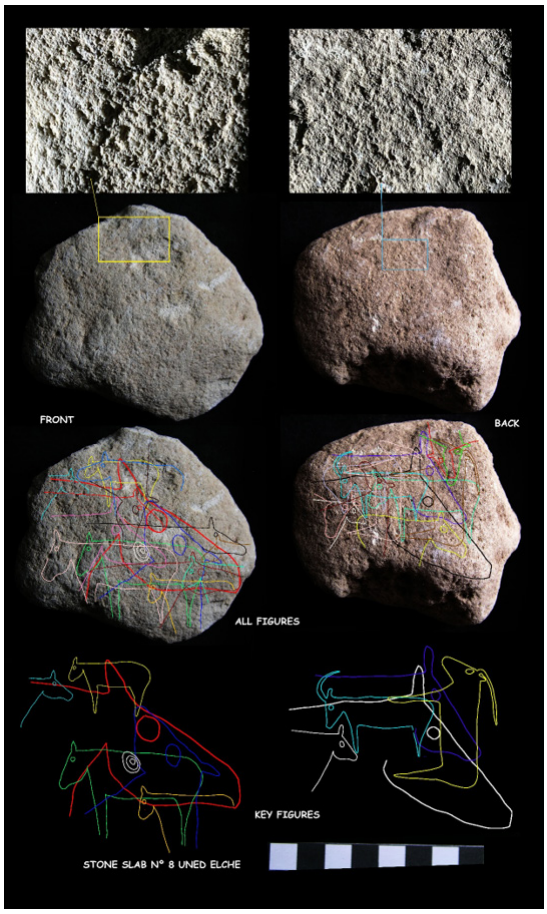


Figure 15: Stone slab no. 8.

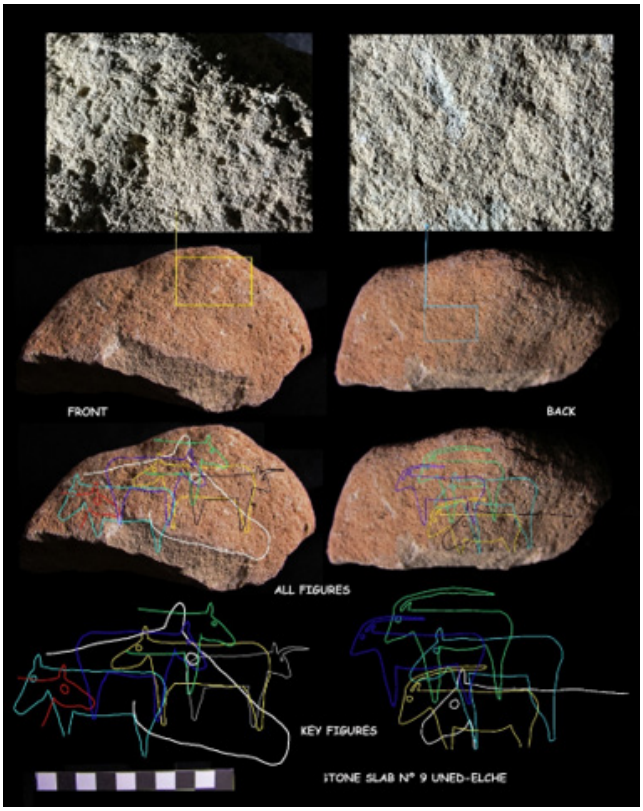


Figure 16: Stone slab no. 9.

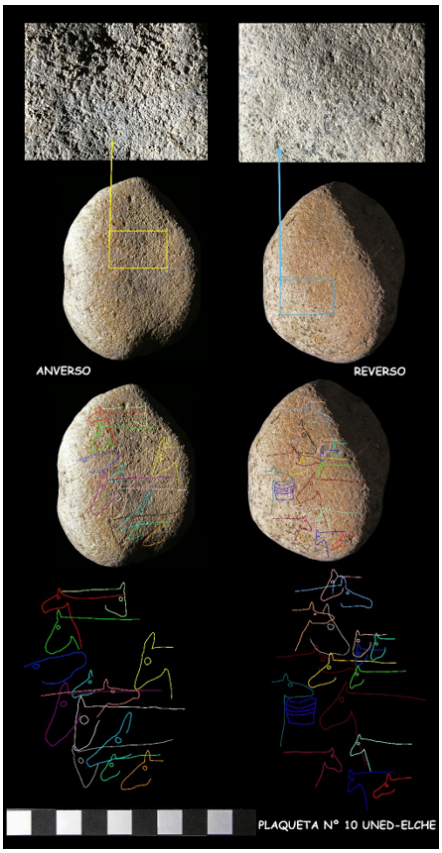


Figure 17: Stone slab no. 10.

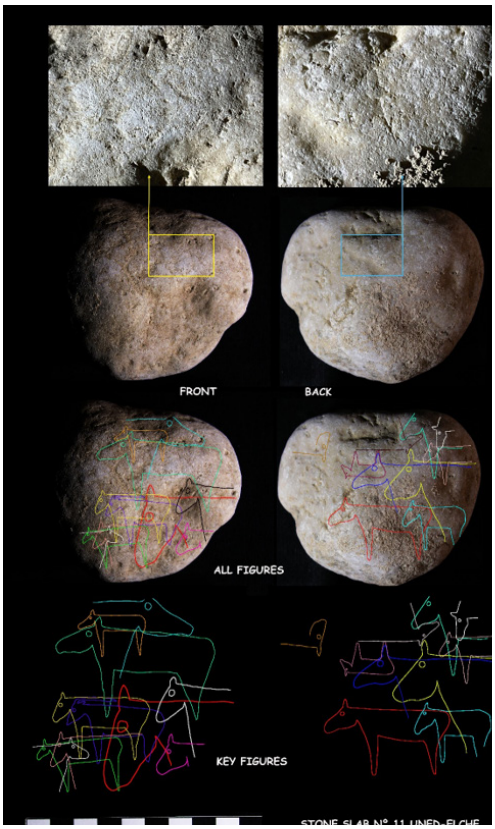


Figure 18: Stone slab no. 11.



Figure 19: Macro detail photographs of some of the figures engraved on the Stone slabs no. 4 and 6.



Figure 20: Macro detail photographs of some of the figures engraved on the Stone slabs no. 8 and 9.

About The Chronology

As a set of portable art, it should be able to be dated with a good amount of reliability due to its archaeological context. But what we present here is a superficial collection in a secondary position and, in a worst-case scenario, totally displaced from its original placement. Thus, we have to resort to other methods in order to situate this evidence on a cultural horizon: the chronological conventions we observe not only in other large sites with portable art, such as the Cova del Parpalló (Villaverde, 1994) [14], but also in groupings of outdoor rock art such as those in the Sierra Oeste of Madrid (Ripoll and Latova, 2023) [15], allow us to contextualize the different elements.

As a fundamental marker, well documented in numerous sites, we have the chrono stylistic convention called "*Ladder mane*," in which the horses' ear is incorporated into the main, which forms a sinuous curve with the cervicothoracic line [16]. This marker, present in many sites, lets us locate it with great precision as of the middle Solutrean, that is, about 20,000 BCE. In our grouping we have two clear pieces of evidence, on the front of stone slab 1 and on the back of stone slab 2 [17]. Therefore, many of the stone slabs can be attributed to this cultural horizon (Figure 7).

The convention of what is known as "*Duckbill*," which refers to the drooping thick lower lip of the Equidae, offers us a very specific chronological marker in the Upper Solutrean cultural horizon, that is to say [18], about 18,000 years ago (Figure 7). Most probably this characteristic can be applied to a very specific species of horse.

The absence of horses with open manes and of the convention of the ventral "M," despite the existence of some with pangaré, excludes a Magdalenian chronology.

But in this Elche grouping, we have two other markers that do not appear in any Upper Paleolithic repertoire: the "*large eyes*" and the "*partridge eyes*" in the representations of Equidae [19]. The stratigraphic analysis, which we can do with total precision with the 3D models of each of the pieces, lets us determine the superposition of each of the figures with respect to the one that is beneath it [20].

The Ladder manes are beneath the Equidae with "*large eyes*" and "*partridge eyes*." Moreover, whenever both elements coexist in the same space, the "*partridge eyes*" are over the "*large eyes*," like on the back side of stone slab 4 (Figure 13) and on the front side of stone slab 5 (Figure 14). On stone slabs 6, 8 and 11 (Figure 15,17,20), the figures with "large eyes" are positioned over the rest of the iconographic ensemble [21]. Moreover, the "partridge eyes" remind us of an ancient race of Equidae, whose origin would be located at least in the Upper Pleistocene [22].

As such, although we lack chronological framing for these types of markers, as they are situated over the figures set in the Upper Solutrean, we think that they can be contemporaneous or slightly later [23,24]. That is, they could be dated in an Upper or Upper Evolved Solutrean [25].

Conclusions

As we said at the beginning of this text, luck combined with expert eyes leads to unexpected discoveries. This, quite simply, is an advance for the study of a set of evidence collected on the surface, which must be completed in the future through the corresponding research project. As it is an area that has been dug up due to construction, first it will be necessary to locate where the sediment is intact and, if so, make a stratigraphic survey and later an open-area excavation to be able to locate the area of occupation, if this did exist.

New technologies such as GPR (Ground-Penetrating Radar) can help us find this sediment intact and then consider, along with UNED-Elche, a participatory archeology project for students of this specialty. These people can learn not only the rudiments of an archaeological excavation but also the use of new geomatic technologies applied to the study and analysis of portable art objects.

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