

# Chronostylistic elements for the dating of the open-air rock art assemblage of Domingo García (Segovia, Spain)

■ SERGIO RIPOLL LÓPEZ\* ■ LUCIANO J. MUNICIO GONZÁLEZ\*\* ■  
■ LABORATORIO DE ESTUDOS PALEOLÍTICOS\*\*\* ■

## 1. Introduction

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The open-air rock art assemblage of Domingo García is located on the southern edge of the Northern Meseta, and comprises more than a hundred engraved Palaeolithic figures in eight centres. The discovery of this type of site is still novel and infrequent, although in the last few years other assemblages have been found, such as those of Siega Verde or Foz Côa, which are also located in the basin of the River Douro (North Meseta, Iberian Peninsula). In the present paper, we set out the main technical and stylistic characteristics that allow us to broach the chronological and cultural context of this assemblage of artistic expressions.

The distribution map of the currently known assemblages of incisions of Palaeolithic age reveals the existence of eight well-differentiated groups that are separated by apparently “empty” spaces. These groups are, from south to north: Santa María la Real de Nieva, Ortigosa de Pestaño, El Cerro de San Isidro, Las Canteras, Miguelañez, Valdebernardo-Cañamares, Rio Eresma and La Dehesa de Carbonero.

Among the species represented in the assemblage of Domingo García and within the total number of identified figures (115), the outstanding feature is the high percentage of equids (37,3%), a trend that recurs in almost all the geographical areas differentiated within the assemblage. The second group is that of indeterminate figures (25,2%), and is significant for the high number of figures that appear incomplete or damaged by natural or anthropic factors. Cervids and caprids have very similar percentages, around 15,6% and 13,9%, while bovids are the least represented species, with only 7/8% of the total.

Since it is difficult to establish chronological sequences in the absence of archaeological sites, the existence of a single style in an extensive geographical area, despite the use of different techniques in the execution of the engravings, suggests a unity that is at least cultural. We think that only by understanding this stylistic unity independently of any diachronic consideration will it be efficient to study the above-mentioned sites and to investigate further the interesting perspectives which, through this approach, can be discussed concerning the dynamics of the groups, their social organization and their relationships with the environment in which they lived. All in all, the assemblage of Domingo García together with the finds of Siega Verde (Salamanca) and the Valley of Côa (Portugal) allow us to believe in the existence of a cultural unity in the Douro Basin at the end of the Pleistocene which may indicate that its population was a possible communication route from the Atlantic coast to the interior of the Meseta.

## 2. The problem of dating

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At present, a whole list of rock art researchers — who daily grow more numerous — is trying to convince us, through arguments of differing degrees of validity, that a simple

stylistic appraisal is insufficient for dating any assemblage; and so we have to establish its chronological context by absolute direct dating methods in the same way as in other areas of the archaeological discipline. This “poststylistic era” (Lorblanchet and Bahn, 1991; Bahn and Lorblanchet, 1994) does not imply in their opinion, despite the radical positions of some researchers, that stylistic analysis has become an irrelevant and completely dispensable approach. On the contrary, their proposal is to combine the main dating methods that lie within our powers, in order to establish a chronology that is much more reliable than the always subjective stylistic approach. Sometimes, we have made use “in extremis” of Leroi-Gourhan’s well-known stylistic sequence (1965), but we have never arrived at a classification that agreed with the periods differentiated in his sequence. The figures described in our papers hardly fit into the so-called Style III-IV of this sequence. Possibly, Leroi-Gourhan’s stylistic analysis is only applicable to some “classical areas” (Dordogne, Pyrenees, etc.), as is the case with the lithic typology of Sonnevile-Bordes and Perrot (1953, 1954, 1955, 1956a, 1956b), where the abundance of sites allows us to establish these typological and stylistic frameworks. However, outside these “classical epicentres”, typological ideas blur into geographical variations that hardly fit the initial sequence. At this stage, every area needs modifications and amplifications to such an extent that, finally, they often depart completely from the original idea. We think that something similar happens with stylistic sequences in rock art. Many investigators try to analyse an assemblage of figures through stylistic descriptions and classifications without arriving at a global explanation. For example, sometimes a pronounced cervico-dorsal line fits with Style II/III, but the duckbill horse-head and the stepped mane fit well with Style III/IV. At this point, the researcher’s dilemma lies in having to decide which one of these conventions will take precedence in the final chronological framework.

The arguments used by the defenders of the “poststylistic era” appear pertinent if one reads their postulates with an open mind. We must not be obsessed by style, and we have to try to use other direct methods if at all possible. We have italicised the verb “to try” because in most cases the methods employed, despite their advantages, have too many serious disadvantages or handicaps. For example, one should mention the scientific and methodological inconsistencies in some of them, the economic cost of others, and the use of destructive methods with no certainty that the results will be satisfactory dates. Being conscious that we are studying a unique historical heritage, we put preservation before dating. In any case, one should not scorn a century of chronostylistic studies, in many cases with excellent results, at least until the introduction of direct chronologies in some sites like the caves of Cosquer (Marseilles, France) (Clottes et al., 1992; Clottes and Courtin, 1994) and Chauvet (Vallon Pont d’Arc, France) (Clottes et al., 1995). However, these are but two sites — albeit with a very important iconographic content — together with a hundred dates from about fifty sites that in most cases agreed with the stylistic chronology, as opposed to more than two hundred Palaeolithic rock art sites dated by the “traditional” method.

Bednarik has questioned the Upper Palaeolithic chronology of the assemblage that is the focus of this paper, on the basis of the microerosion analysis that he carried out in Foz Côa (Vila Nova de Foz Côa, Portugal). However, we think that this Australian researcher’s methodology, presented in a issue of *Archaeometry* (Bednarik, 1992) is based on the concept that there is a relation between the degree of erosion suffered by some rock components (measured through observation with a binocular microscope) and the erosion observed in the groove of the engraving since the moment when it was supposedly executed. The only concrete application of this method that has been published so far is that of Besov Nos, Lake Onega, Russia (Bednarik, 1993), the age of which is unknown. So we do not think that this

dating method can be considered valid for dating open-air rock art on schists, since it is still in an experimental stage of development and has inherent scientific inconsistencies. In the assemblage of Domingo García there are some unquestionable chronological markers, though, being conscious that we should bear current theories in mind, we have tried to apply direct dating to this art assemblage. Hence, in 1996 we began a collaboration with A. Watchman to obtain a date that would enable us to join the group of directly dated sites.

The method used by Watchman (1992) has a scientific methodology based on radio-carbon analyses of sedimentary and biochemical skins associated with pollen. It is based on AMS dating of the encapsulated micro-organisms (spores, lichens, diatoms, etc.) in the mineral accretions (silica particles) deposited by rainwater over rock surfaces.

However, in the case of Domingo García, none of the incised rock surfaces that were analysed was found to have enough silica skins for dating. Watchman's explanation is based on the absence of sufficient rainfall through time for the creation of silica crusts. The impossibility of obtaining a direct date was a great disappointment for the investigating team.

Recently, R. Dorn's researches (1995) in the Portuguese Foz Côa Valley have raised several methodological objections to Watchman's method. On the one hand, he points out that this is not a closed system, since the deposition of organic matter spans a long time, and the analysis of silica crusts crossed by engraved lines does not give reliable results for dating the artistic expressions. These mineral skins have a very complicated origin, and generally they begin to form from the erosion of the rock, sometimes even inside the rock and before its exposure. On the other hand, at this stage, geochemical processes and the colonization of the rock surfaces influence the silica skins by several micro-organisms (lichens, mosses, etc). Thus, from the viewpoint of radiocarbon analyses, these skins should not be considered closed systems, and so the determination of the relation between the isotopes  $^{12}\text{C}$  and  $^{14}\text{C}$  encapsulated in them is absolutely random.

We have not ruled out an attempt to use other direct dating methods such as  $^{36}\text{Cl}$  or cosmogenic nucleoids, proposed by Phillips (1997) and Dorn, although they are expensive methods that need considerable financial support.

### *2.1. Chronostylistic conventions*

For the moment, we can use only the stylistic approach. For this purpose our study will be based in the main chronostylistic conventions from some of the engraved figures found in the rock surfaces of the assemblage of Domingo García.

The horse of rock 39 presents some of these conventions, such as its duckbill head, generally associated in classical studies with a Solutrean cultural horizon. This, together with a very pronounced cervico-dorsal line, characteristic of Style III, places it in this cultural horizon. However, the same engraved figure also presents other, more advanced conventions such as ears drawn with both lines projecting forward, eyes clearly depicted, or the existence of some anatomical details like the nose, the internal markings of the mane, or depictions of the coat, that suggest a slightly later chronology. The search for parallels for these engravings leads one to the exceptional collection of engraved and/or painted slabs from the Cova del Parpalló, nearly 600 km away (Pericot, 1942), whose recent study (Villaverde, 1994) shows the existence and validity of these stylistic conventions. This is not an isolated parallel, but a series of more than 5000 elements whose stratigraphic position allows absolutely no doubts as to their stylistic evolution. It is obvious that the geographical distance involved

represents an obstacle to making comparisons between the two assemblages. However, our aim here is simply to establish the existence of some stylistic conventions that characterize each cultural horizon.

The hind depicted in rock 39 allows us to arrive at a more precise chronology because of its multiple lines. This kind of depiction with multiple lines filling the engraved figure has clear parallels in the mobiliary and rock art found in several caves of the Cantabrian coast and the Levant, although we are always conscious that, here too, there is a big geographical distance. Hence, one can point to the shoulder-blades found in level 8 of the Cueva del Castillo (Puente Viesgo, Santander), attributed to an early Magdalenian context, or the finds in the upper Solutrean/final Cantabrian Solutrean level from the Altamira cave (Santillana del Mar, Santander). There is an evident technical and stylistic parallelism among the engraved hind heads found in both sites, despite their having been attributed to different cultural horizons. The archaeological chronology of both cultural moments now ranges from  $17\ 420 \pm 200$  BP (CSIC 258) in level I of Cueva Chufin (Riclones, Santander) (Cabrera Valdés 1977), attributed to an upper Solutrean, to  $15\ 910 \pm 230$  BP from the so-called level 2 of Altamira cave (González Echegaray, 1986), attributed to an early Cantabrian Magdalenian.

In the last years, several direct dates from some paintings in the Sala de los Polícromos of Altamira cave have been published, with dates ranging from  $14\ 710 \pm 200$  BP (GIF-91254) to  $13\ 750 \pm 190$  BP (GIF-91178) (Valladas et al., 1992). Two bison from the Cueva del Castillo have also been dated to  $13\ 060 \pm 200$  BP (GIF-911004) and  $12\ 910 \pm 180$  BP (GIF-91172) (Valladas et al., 1992).

The chronology based on the direct dates from the paintings is more recent than archaeological sequences but, despite the difficulties, it seems that we are in a transitional moment between a Final Solutrean and an Initial Magdalenian period.

In the decorated slab 17109 A and B from the Upper Solutrean level of the Cova del Parpalló (Villaverde, 1994) we also find two clear parallels with the hind of rock 39 from Domingo García. On the dorsal face of this slab we can see an incomplete caprid drawn with multiple lines and an internal fill of striated engravings. It is presented with a biangular oblique perspective. On the other hand, on the plaque's ventral face we can distinguish a multiple-line hind likewise filled with striations and with a biangular oblique perspective.

In Foz Côa, we can also find numerous technical and stylistic similarities, such as the big scraped deer (with striated engraving), depicted on rock 10C of the right-hand sector of Penascosa that contains another three little scraped deer (Zilhão, 1997). In other zones, such as Canada do Inferno, there are several figures of this type, especially on rock 14 (lower sector), where one can see two deer and one caprid filled with lines. In all these examples, despite the geographical distances between the sites, stylistic dating gives us the best way to obtain an indirect chronology for the Domingo García assemblage. The marked photographic realism displayed by the deer of rock 6, panel D in the Las Canteras area, together with its general pose and movement, leads us to attribute it with certainty to Early Style IV, culturally in an early Magdalenian horizon. In the artistic expressions that characterize this style, in Leroi-Gourhan's words (1965), "a mounting attention to detail is expressed in microscopic hatchings. These render the movement of the animal, or the play of light on the fur covering different parts of the body. A veritable pictographic code is established for the conventions of modelling, and cheeks, eye, the roots of the horns, the reflections of light on the flanks — all of these are rendered uniformly throughout a great part of the Franco-Cantabrian region". In this engraved deer, we can distinguish several patterns. The graceful hindquarters give it a perfect feeling of movement. The left hind-leg can be seen clearly, because at

the point where it should cross the right hind-leg the line is left unfinished, with the aim of giving a sensation of depth. Only one of the hooves is preserved, since the second is damaged by natural erosion. Conversely, the front legs are depicted in a rough way with convergent lines. The left front-leg is depicted extending forwards, giving the impression that the animal is walking. However, the same convention is used here as in the case of the hindquarters, undoubtedly in search of the three-dimensional effect of perspective. The head is beautifully depicted, with numerous details such as the almond-shaped eye without tear-duct, a closed mouth drawn with a single line, or the muzzle. However, this care for detail failed again in the antlers, where only one forward-projecting antler is engraved, that zoologists interpret as a deformation caused by a blow during antler growth. The beginning of the cervico-dorsal line, drawn with a discontinuous incision, can probably be interpreted as the coat of an adult animal, with some bald patches because of a change of season.

In rock 6, panel D of the Las Canteras area, there are three caprids with a common attribute that has great intrinsic significance for chronology. This convention lies in a single engraved line from the horn to the front leg, and another single line for the second horn and the cervico-dorsal line. It is worth remarking that between both horns there is an empty space without any line. This technique is used again in other caprids depicted on different rocks of the assemblage, such as that on rock 28/1, panel B.

The depictive scheme observed in these figures clearly points to Early Style IV, in the same way as the deer described above. In this panel, one of the most complex, and in which there are numerous superimpositions, one can see the artist's purpose — that is, to concentrate a high number of figures on such a small rock surface. In this case, the stratigraphy of figures has no chronological meaning per se, since stylistic conventions offer a far better explanation.

As we saw above, the photographic realism and the profusion of anatomical details and interior markings in the engravings are considered typical of Early Style IV. In this period one can also include the splendid depiction of chamois of rock 4 from the Las Canteras area. The artist's care for detail in the several anatomical elements represented, or the different colours of the coat, etc, enables us to establish a precise zoological identification, and provides enough significant data to arrive at a chronological attribution to a specific cultural horizon, possibly the Middle Magdalenian.

Another clear chronological marker can be found in the so-called ass of rock 9-bis of the Cerro de San Isidro. In spite of the figurative simplicity of this equid, one can obtain chronological data from its jaw and its duckbill shaped muzzle. Clearly, the chronological attribution of this convention is to the Solutrean, *sensu lato*.

### 3. Technical and stylistic analysis

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First and foremost, it is worth remarking that we have only taken into account here the taxonomically identifiable figures, omitting the group of engravings classed as “indeterminate” because of its low percentage in this kind of analysis.

#### 3.1. Techniques

In the assemblage of Domingo García, one can distinguish two kinds of techniques in the execution of the figures: pecking and fine-line. Only two depictions of horses comprise

the first group of large-size pecked figures. The most numerous group, containing all the rest of the figures, is characterized by an exceedingly fine and very shallow line, with the sole exception of a hind (figure n.º 1 of rock 39) drawn determinedly with multiple lines. The detailed study of the big pecked horse on rock 12 — the first Palaeolithic figure that was identified at Cerro de San Isidro, and which has been published and studied repeatedly (Martín Santamaría and Moure Romanillo, 1981; Ripoll López et al., 1994) — shows that, beneath the pecked figure, there are fine lines which follow the silhouette of the equid, particularly clearly on the front leg, mane and beginning of the nape. This leads us to suggest that the figure was first engraved with a fine line, like the rest of the depictions, in the manner of a sketch, as occurs in the Foz Côa assemblage (Zilhão, 1997), with the pecking carried out in a later phase.

Several studies have allowed us to identify and to reconstruct the different techniques employed by the Palaeolithic artists:

- Fine-line engraving, executed with a resistant, hard and sharp-pointed lithic tool of flint or quartz. The continuous repetition of the engraved action generates the existence of groups of parallel lines.
- Pecking, executed with direct or indirect percussion, perhaps with a rounded pebble, which produces lines or impact-marks that shape the interior markings of the depictions.

Only in the case of the pecked figures, the two horses of rock 12, can one observe the successive use of the different techniques. In the first stage, the fine line was used with the aim of sketching the outline that later would be pecked. These techniques may (or may not) be contemporaneous, although there are no objective criteria for either viewpoint. However, the pecking must have been executed over a short interval of time, since the impact-marks show an identical patina to the rest of the rock, and thus are contemporaneous with the unique final-Pleistocene Aeolian event.

### 3.2. *Modelling*

Modelling is used in rock art with the aim of highlighting some anatomical elements of the figure, the possible colouring of the coat, or simply with the intention of achieving some volume in contrast with a flat two-dimensional depiction. The main difficulty is to try to establish the border between modelling and conventions, because in some cases the two categories can become confused. However, as we shall see later, modelling provides scant data in relation to the chronological attribution of the engravings, as opposed to stylistic conventions that have a more extensive distribution, not only in rock art assemblages but also in mobiliary art whose stratigraphic position allows us to establish cultural horizons.

The study of modelling helps one to evaluate the attention paid by the artist to the depiction, and broadens our interpretative and symbolic perspectives. As an example, we can turn once more to the decorated slabs from the Cova del Parpalló, where, using the author's data (Villaverde, 1994), we have tried to check the possibility of establishing a stylistic sequence based on modelling. Taking all the Solutrean levels and Magdalenian strata together, one can only see significant differences in the predilection for the technique of full or partial striated engraving in the Solutrean, and the technique of hatched striations in the Magdalenian. Other techniques appear simultaneously in both horizons, with similar relative fre-

quencies. In any case, it cannot be concluded that the use of one technique or another is exclusive to a particular cultural horizon. In the assemblage of Domingo García we have found 11 figures with modelling, i.e. 12,79% of the total number of identified depictions. In our opinion, this percentage has little significance for any statistical interpretation.

If we break down the typology of the Domingo García assemblage, we can apparently distinguish two stages in execution. On the one hand, modelling in the cervids is mainly executed with the kind of striated engraving that, as we saw in the Cova del Parpalló, is characteristic of the Magdalenian. On the other hand, equids are inconclusive where modelling is concerned, since both parallel striated engravings and hatched striations can, in percentage terms, appear in both cultural horizons.

With regard to modelling, we are once again faced with the problem of evolution in rock art. Theoretically, in Leroi-Gourhan's opinion (1965), the simplest techniques correspond to early stages, whereas more elaborate techniques appear in more recent periods. But scraping, a more complex methodology, is found in the Solutrean levels of the Cova del Parpalló, while striated or multiple lines, apparently of greater conceptual simplicity, occur in the Magdalenian of this site. In other words, the French researcher's postulates cannot always be adapted completely to the area under study.

### 3.3. *Aesthetics and Style*

In some cases, the natural relief of the rock surfaces has been used to accentuate the sensation of volume in some of the depictions, as for instance in the hind executed with multiple fine lines on rock 39, whose head is represented in one plane of the rock surface while the rest of the body, front legs and hindquarters, have been executed using very shallow reliefs of the rock with the aim of highlighting these areas. In the first articles (Ripoll López and Muncio González, 1992; Ripoll López et al., 1994) about this art assemblage, we described the figures as depictions of animals conceived in naturalistic form, in static positions without signs of movement except in a very few cases (horse on rock 37). The animals were at times simply sketched, and at other times appear incomplete, with only the head and/or the front extremities depicted or, to a lesser extent, the cervico-dorsal line and hindquarters. The fidelity with which some anatomical features were executed leads one to think that they did not judge it necessary to complete the figures to establish the existence of particular species from their environment. They always depicted them in profile and, from the stylistic point of view, it is possible to identify a series of conventions which seem to denote a relative chronological and cultural unity within the assemblage: muzzles in the shape of a duck's bill in the case of horses; the head and horn of caprids sketched with a single line, and absence of a line joining the two horns; and marking of manes and ventral lines which refer us generically to the end of the Solutrean period, a cultural attribution that is also confirmed by the extremities of the figures, which are not completed with hooves and which end in more or less parallel lines. Alongside this group, which is certainly the most numerous and homogeneous, there are also figures with more advanced stylistic conventions, like the multiple lines of the hind of rock 39 which are very similar to those of the shoulder-blades from the cave of El Castillo (Almagro Basch, 1976) and Altamira (Cartailhac and Breuil, 1906); or the horse of rock 37 which likewise contains some multiple lines such as can be seen in other parietal depictions on the Cantabrian coast, together with the magnificent interior markings and anatomical details of some of the cervids and chamois of the Canteras area, which enable us to extend the chronological-cultural attribution of the assemblage into the early Magdalenian.

### 3.4. *Superimpositions*

The first argument used to establish a chronology for those undated artistic expressions was the stratigraphic superimposition of the figures. However, this fact is not always of decisive value, since two superimposed depictions could have been intentionally executed in this way at the same moment.

In the art assemblage of Domingo García, we have clearly differentiated two iconographic series. On the one hand, there are the fine-line engravings which are stylistically Upper Palaeolithic, and, on the other, the rest of the pecked depictions. One exception is the big horse of rock 12 that was described above. The first kind of engravings always appear on rock surfaces polished by Aeolian erosion, and they are very damaged in most cases, not only by later natural erosion, but also by the pecked art assemblage which is clearly post-palaeolithic.

Similarly, the fine-line engravings have a patina of exactly the same colour as the rock surface. Not one of the Palaeolithic figures has a different or lighter colour. However, the pecked group is distributed on all kinds of rock surfaces, and fundamentally on those created later than the erosion of the above-mentioned polished surfaces, although they are also found on the latter.

The patina of this pecked series of figures is minimal, and in no case has the same colour as the rock surface, being always much lighter. This fact enables one to see them much better, since they stand out clearly on the dark background of the rock surface.

These pecked figures are always superimposed on the other depictions. There is not one example in which pecked figures appear beneath fine-line depictions. In addition, in many cases, the pecked figures have damaged, totally or partially, the late Pleistocene depictions.

## 4. The study of morphometric conventions

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### 4.1. *The end of the muzzle*

In accordance with the patterns highlighted in V. Villaverde's monograph on the Cova del Parpalló (1994), we have adopted the following variations to describe the muzzle of the different depictions: open or closed and, within the latter group, straight, rounded, pointed, duck-bill shaped, and modelled. Finally, we have added a category called "indeterminate", for cases where this anatomical feature is not represented.

Among the equids, there is a predominance of rounded muzzles (37,20%), although the duckbill shape also has a high percentage (25,58%), followed by the modelled specimens (11,62%), which may have some chronological meaning, leaving aside the "indeterminate" category (16,27%).

With regard to cervids, the modelled muzzle is the best-represented category (27,78%), followed by the rounded (16,67%), straight and pointed ones (11,11%), while for the rest of the types there is insufficient data.

For bovids, the rounded-muzzle group stands out (44,44%), followed by the pointed (22,22%). The rest of the categories all have the same percentage (11,11%).

Finally, caprids are executed in most cases with rounded (31,25%) and pointed (25%) muzzles, although one can also find straight and modelled specimens (12,50%).

In all the identified animals represented, one can observe a high percentage of rounded muzzles (31,39%). The modelled muzzles account for 15,11%, and the duckbill category for

12,79%, though the latter have only been identified in equids. Finally, one can differentiate straight muzzles (9,30%), while open ones are hardly represented at all.

The extensive assemblage of decorated plaquettes from the Cova del Parpalló allows the establishment of a general evolution, in which there can be observed a predominance of open muzzles until the Upper Solutrean; while after this phase there appears the closed variety. One can establish a clear association between the duckbill muzzles and the Solutrean cultural horizon, while the closed-modelled muzzles are clearly identified with the Magdalenian. Closed-pointed muzzles are characteristic of the Evolved Solutrean and the beginnings of the Early Magdalenian.

Bearing in mind the important data in the above paragraph, and taking into account the open or closed depiction of the muzzles, then in the assemblage of Domingo García almost the entire artistic corpus (97,68%) would be later than the Upper Solutrean, and should perhaps be attributed to the Early Magdalenian.

Regarding the specific morphology of the closed muzzles, in the equids group, one can distinguish two series that are more or less significant for chronology. On the one hand, there are equids with duckbill shaped muzzles (25,58%), attributed to a Solutrean *sensu lato*; and on the other, modelled-closed muzzles (11,62%), attributed to the Magdalenian period.

As for the cervids, since the modelled-closed category presents the highest percentage (27,78%), they must be attributed fundamentally to the Magdalenian horizon, though some pointed-closed muzzles could be attributed either to the Evolved Solutrean or to the Early Magdalenian. Overall, the cervids seem to show a cultural unity, from the viewpoint of the morphology of their muzzles.

Among the bovids, the situation is similar to that of the cervids, although the percentages are diametrically reversed. The pointed-closed muzzles account for 22,22%, while the modelled-closed specimens constitute 11,11%.

These proportions can be seen again within the group of caprids, where pointed muzzles account for 25%, and modelled examples for 12,50%. In any case, one can appreciate here again the above-mentioned cultural unity in the transition between the Final Solutrean and the Early Magdalenian.

The general percentages support this idea, since numerical differences among the three most representative categories (duck's bill, pointed and modelled) are not far from each other.

#### 4.2. *Equid manes*

To develop this section we have adopted the criteria followed by J. Zilhão in the rock art assemblage of Foz Côa (1997), where there is an extensive series of equid depictions whose stratigraphic superimposition on the rock surface allows one to establish a comparative chronology. In all the instances where there is a superimposition of equids, those that clearly have internal markings in the mane, chronologically Magdalenian, are always superimposed on engravings that only have the ears and cervico-dorsal line, or the mane incorporated with the ears to form a kind of step, without internal markings or specific anatomical details, and attributed to the Solutrean.

At Parpalló, there are not enough decisive arguments, in the series of depicted equids, for establishing an iconographic sequence, since the presence of details represented in the equids is minimal. One cannot distinguish a clear correlation between a specific type of

mane and a specific cultural period, since different conventions are used throughout the stratigraphic sequence.

However, at Domingo García, where there are no superimpositions, we have observed the same situation as at Foz Côa. The engravings that are identified with the first type, that is to say, internal markings in the mane, etc, account for 23,25%, while the engravings without any internal details attain 46,51% of the total number of equid depictions.

This proportion supports what was said above concerning muzzles, since one can observe an extensive series that could be attributed to the Solutrean, while the rest, less decisively identified, could be attributed to the Magdalenian.

### 4.3. *The Shape of the upper part of the head*

In this section we summarize the way in which the heads of the depictions have been executed. For this purpose, we are going to follow, at least in part, V. Villaverde's typology (1994), highlighting only the types identified in the art assemblage of Domingo García. In this analysis, we examine how the artists executed the ears, horns and finally, whether the upper part of the head has been drawn closed or open.

With regard to the cervids, the most representative type is the naturalistic (50%), followed by the normal linear (16,66%), while somewhat rarer are the "U"-shaped open linear, triple linear line, and triple naturalistic line types (5,55%). Three headless figures have also been identified (16,66%).

Among the caprids one again finds that the naturalistic forms (25%) are the most common, followed by the "V"-shaped open linear type (18,75%), while the other types are uniformly represented — the triple naturalistic line, triple linear line and "V"-shaped naturalistic (12,50%), while the normal linear type is scarcely represented (6,25%). Headless figures (2) account for 12,50%.

In this case, the bovid heads of normal type are the most represented (44,44%), followed by the "S"-shaped linear type and those with horns executed by parallel lines, with the same percentages (22,22%). Finally, only one bovid figure without horns has been identified.

With regard to the manes of equids, the main group of depictions are those that have been represented with non-stepped manes (51,16%), greatly outnumbering the rest of the types represented, since only one equid has been identified with a stepped mane (2,32%), and another one with an open stepped mane (2,32%).

### 4.4. *Cervico-dorsal lines*

For the analysis of the cervico-dorsal lines of the animals depicted at Domingo García, three fundamental categories have been established: concavity, convexity and straightness. These elements have been applied to the line drawn from the nape to the hindquarters of the animal. In some cases, we can hardly differentiate these anatomical parts, due to the poor state of preservation, so that sometimes one only can distinguish two of them. In other instances, the line is composed of only one of the above-mentioned categories, i.e. the straight, the convex or the concave one. Finally, in some cases, the cervico-dorsal lines are incomplete.

The most variability is found among the equids, since they are the main species represented in the assemblage. The cervico-dorsal line has been represented in 28 of the 43 iden-

tified depictions. The straight and convex-straight types predominate, both with 16,27%, followed by the convex (11,62%). The rest of the types are represented unequally, with insignificant percentages. It is worth emphasising the absence of the concave-straight-convex type.

Among the 18 identified cervids, nearly two thirds (11) present the cervico-dorsal line. In this group the straight type predominates (22,22%), while the convex and the convex-straight have the same percentage (11,11%). The convex-concave-convex and the concave-straight-convex types are poorly represented (5,55%). Finally, there are no depictions of convex-concave or concave-convex type in this group.

Of the nine identified bovids, six show the cervico-dorsal line. The straight and convex types predominate (22,2%), followed by the concave-straight or straight convex (11,11%). The other types are not represented.

Among the caprids, with their total of 16 figures, ten show the cervico-dorsal line. The straight type is dominant (31,25%), with lower percentages for the straight-concave type (18,75%) and, in last place, the convex and concave-convex (6,25%).

To conclude this section, it is worth noting the predominance of the straight cervico-dorsal line among all the identified species (20,93%), followed by the convex and convex-straight line (11,62%). The rest of the types have insignificant percentages.

#### 4.5. *The shape of the legs*

The different categories used in this section have again been adopted from V. Villaverde's book about the decorated plaquettes from Parpalló (Villaverde, 1994).

Of the 16 identified caprids, 9 have some of their limbs represented (56,25%); only 6 of them (47,50%) have a single leg per pair, while 4 of them have two legs at either the back or the front.

There is not a single depiction with closed-parallel legs, and the other types have insignificant values, with just one or two instances.

Among the bovids, only 3 of them, out of a total of 9 figures, have their extremities (33,33%), and only one of them shows the forelegs, which are of the linear type. This category is the most represented, both in forelimbs and hind limbs, with two depictions for each.

The same occurs with the cervids, where animals without limbs are the most numerous (11; 61,11%). Among the different types that occur, the best represented are those with the legs in an arch (46,15%). There are no examples of parallel legs, while the rest of the types are equally distributed, with one or two examples of each.

Equids are the species with the biggest frequency of depicted legs, which is logical since they are the most numerous animal in the assemblage. Of the 43 specimens, only 16 are represented without their extremities (37,20%). There are no depictions of legs in an arch, open-parallel in three lines, or closed-parallel type. The most numerous type is that of linear legs, with 11 instances for forelimbs (61,11%) and a similar percentage for hindquarters (64,70%). In second place come open-parallel forelegs (17,64%), while the rest of the types have insignificant percentages.

It is important to make clear that the low number of depicted legs is not only due to their absence, but also to the fact that in many cases one can see that limbs were originally drawn but are now lost through damage. Only in a few specific cases is it possible to know if the legs were executed, but even so, they cannot be classified, and we prefer to label them animals without legs, since in most cases it is impossible to discern whether their legs were really executed or simply cannot be seen today.

On analysing the totals of the depicted types of leg, and omitting their division by species or between hind- and forelegs, we observe a great predominance of the linear types, due to the high number of depicted legs on equids. We can also see that 46,51% of identified animals have no extremities, or these have not been preserved, while there are no depictions of the closed-parallel leg type.

Far behind the linear types (34,88%) there are the legs in an arch (10,46%) and the triangular specimens (9,30%), followed by the open-parallel and extended-triangular extremities (5,81%), and finally, with similar percentages, the open-parallel in three lines (3,48%) and naturalistic parallel legs (4,65%).

## **5. Figures represented, the absence of others and their incidence in the chronology**

Some writers like R. Bednarik (1995) think that these open-air rock art assemblages cannot be chronologically attributed to Palaeolithic art, owing to the absence of representative cold fauna species as mammoths, bison, cave bears, woolly rhinoceros or reindeer. But his apparent lack of familiarity with peninsular prehistory means that he appears completely unaware of the fact that, outside the Cantabrian coast, there is not one archaeological or paleontological site dated to the Final Upper Pleistocene that contains remains of this cold fauna. The faunal elements found in the sites belonging to the middle and final phases of the Upper Palaeolithic are the same as those depicted in the extra-Cantabrian rock art and in mobiliary art — i.e. fundamentally, equids, caprids, bovids and cervids. In the Mediterranean area, the main faunal component is the rabbit group (Lagomorphs), particularly *Oryctolagus cuniculus* (Aura and Villaverde, 1995).

At Siega Verde (Villar de Argañán, Salamanca) (Balbín et al., 1995), some animal figures have been interpreted as a *Megaloceros*, a lion, a bison and a rhinoceros, though there are doubts with regard to their specific taxonomic attribution, since the pecking technique together with their small size do not permit the expression of many details which would facilitate their taxonomic identification. In other cases the joining of several engraved lines, which may or may not be connected with each other, has led the research team to distinguish this kind of species.

Turning once again to the Cova del Parpalló (Gandía, Valencia), and the Cueva de Ambrosio (Vélez-Blanco, Almería), both of which have perfectly dated series of images, they do not contain a single depiction of cold fauna. All the evidence points to the fact that the whole of the Iberian Peninsula outside the Cantabrian area constituted a faunal region characterized by a complete absence of species adapted to cold climates, even at the level of microfauna, despite a few rare elements such as *Apodemus mystacinus* and *Alocricetus bursae* from level VII of Cueva de Ambrosio (Sesé and Soto, 1988) whose survival in relict forms seems to provide evidence for some of the cold climatic characteristics of the Middle Pleistocene. It is possible that other taxa attributed to severe environments, such as the cave bear (*Ursus spelaeus*) or the brown bear (*Ursus arctos*), were present throughout the Upper Pleistocene, as is reflected in the recently discovered depictions of La Mina de Ibor (Castañar de Ibor, Cáceres) (Ripoll and Collado, 1996) or the fossil bones found in the Solutrean sites of Furninha and Salemas in Portugal (Cardoso, 1993). In any case, on numerous capitals in the cloister of Santa María la Real de Nieva church (Segovia), located in the study-area of the Palaeolithic depictions, one can see images of bears, and there is written evidence that the last brown bear was hunted in Segovian lands at the end of the 19th century. Therefore, taphonomically, it is possible that a figure identified as a bear could be found at any moment.

## 6. Final considerations

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One can highlight two important cultural horizons that mark these artistic assemblages. The earlier one can undoubtedly be attributed to the Solutrean, and the other, rather more recent one to the Magdalenian. All of the depictions, whose profusion, artistic quality and antiquity are remarkable, correspond to these two periods.

Moreover, in the artistic assemblage of Domingo García, there is another massive iconographic series of pecked figures, without patina and of more recent, clearly post-palaeolithic date, which will be studied and analysed in a future monograph.

Since it is difficult to establish chronological sequences in the absence of archaeological sites, the existence of a single style in an extensive geographical area, despite the use of different techniques in the execution of the engravings, suggests a unity that is at least cultural. We think that only by understanding this stylistic unity independently of any diachronic considerations will it be possible effectively to study the above-mentioned sites and to investigate further the interesting perspectives which, through this approach, can be discussed concerning the dynamics of the groups, their social organization and their relationships with the environment in which they lived. The Early Upper Palaeolithic has been detected irrefutably at four sites: Quinta da Granja, Quinta da Barca, Quinta da Barca Sul and Salto do Boi (J. Zilhão, pers. comm.). In these four sites, two very clear cultural levels have been found which correspond on the one hand to the final Gravettian (23 000 – 21 000 BP) and, on the other, to a final Upper Magdalenian (12 000 – 10 000 BP). Up to now, not a single trace of the Mesolithic has been found. In the high basin of the Douro, it would be desirable to carry out further geoarchaeological investigations to identify places where sites attributable to the Upper Palaeolithic might have been preserved.

The existence of outstanding open-air Palaeolithic rock art assemblages shows that a major part of Quaternary art is not found exclusively in caves and suggests that, in the past, a huge quantity of these artistic expressions were executed in the open air.

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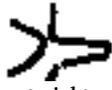
\* Universidad Nacional de Educación a Distancia • Departamento de Prehistoria e Historia Antigua • Avda. Senda del Rey, s/n • 28080 Madrid • España.

\*\* Junta de Castilla y León • Segovia • España.

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**TABLE 1**

Different categories of muzzle and their percentage distribution between the different species represented. (Drawings based on Villaverde, 1994).

	END OF THE MUZZLE				Total
	Equids	Cervids	Bovids	Caprids	
 open	–	1 (5,56%)	1 (11,11%)	–	2 (2,32%)
 straight	3 (6,97%)	2 (11,11%)	1 (11,11%)	2 (12,50%)	8 (9,30%)
 rounded	16 (37,20%)	2 (11,11%)	4 (44,44%)	5 (31,25%)	27 (31,39%)
 pointed	1 (2,32%)	2 (11,11%)	2 (22,22%)	4 (25%)	9 (10,46%)
 duck's bill	11 (25,58%)	–	–	–	11 (12,79%)
 modelled	5 (11,625%)	5 (27,78%)	1 (11,11%)	2 (12,50%)	13 (15,11%)
indeterminate	7 (16,27%)	6 (33,33%)	–	3 (18,75%)	16 (18,60%)
<b>TOTAL</b>	<b>43</b>	<b>18</b>	<b>9</b>	<b>16</b>	<b>86</b>

**TABLE 2**

The proportion of open to closed muzzles.

Open muzzles	2 (2,32%)
Closed muzzles	84 (97,68%)

**TABLE 3**

The incidence of the muzzle categories in relative chronology.

	MUZZLES AND CHRONOLOGY					
	Solutrean <i>duck's bill</i>		Solutrean/Magdalenian <i>pointed</i>		Magdalenian <i>modelled</i>	
	N.º	%	N.º	%	N.º	%
Equids	11	25,58	1	2,32	5	11,62
Cervids	-	-	2	11,11	5	27,78
Bovids	-	-	2	22,22	1	11,11
Caprids	-	-	4	25	2	12,50
<b>TOTAL</b>	<b>11</b>	<b>12,79</b>	<b>9</b>	<b>10,46</b>	<b>13</b>	<b>15,11</b>

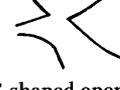
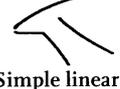
**TABLE 4**

The incidence of equid manes in the chronology .

				
Equids		Solutrean	Solutrean	Magdalenian
Indetermined				
<b>TOTAL</b>	<b>19 (44,18%)</b>	<b>1 (2,32%)</b>	<b>10 (23,25%)</b>	<b>13 (30,23%)</b>

**TABLE 5**

The shape of the upper part of the head of cervids and caprids in the art assemblage of Domingo García. (Drawings based on Villaverde, 1994).

Types	TYPOLOGY OF THE HEAD		
	Cervids	Caprids	Total
 Triple-linear-line (TLL)	1 (5,55%)	2 (12,50%)	3 (8,82%)
 Triple-naturalistic-line (TNL)	1 (5,55%)	2 (12,50%)	2 (5,88%)
 "V"-shaped open linear (LOV)	–	3 (18,75%)	3 (8,82%)
 "U"-shaped open linear	1 (5,55%)	–	1 (2,94%)
 "V"-shaped naturalistic	–	2 (12,50%)	1 (2,94%)
 Normal linear (NL)	3 (16,66%)	1 (6,25%)	4 (11,76%)
 Simple linear (SL)	–	–	–
 Naturalistic (N)	9 (50%)	4 (25%)	13 (38,23%)
<b>TOTAL</b>	<b>15 (83,33)</b>	<b>14 (87,50%)</b>	<b>29 (85,29%)</b>

**TABLE 6**

The shape of the upper part of the head in bovids. (Drawings based on Villaverde, 1994).

TYPOLOGY OF THE HEAD IN BOVIDS				
Bovids				
	"S"-shaped linear	Vertical-parallel-linear	Normal	Without Horns
TOTAL	2 (22,22%)	2 (22,22%)	4 (44,44%)	1 (11,11%)

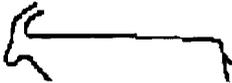
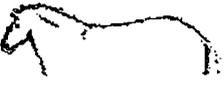
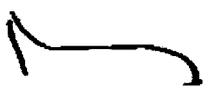
**TABLE 7**

The shape of the upper part of the head in equids. (Drawings based on Villaverde, 1994).

TYPOLOGY OF THE HEAD			
Equids			
	Stepped manes	Open stepped manes	Non-stepped manes
	1 (2,32%)	1 (2,32%)	22 (51,16%)
			TOTAL
			24 (55,81%)

**TABLE 8**

Cervico-dorsal lines in equids, caprids, bovids and cervids from Domingo García.

TYPOLOGY OF THE CERVICO-DORSAL LINES					
	Equids	Cervids	Bovids	Caprids	Total
 straight	7 (16,27%)	4 (22,22%)	2 (22,2%)	5 (31,25%)	18 (20,93%)
 concave	1 (2,32%)	1 (5,55%)	–	–	2 (2,32%)
 convex	5 (11,62%)	2 (11,11%)	2 (22,2%)	1 (6,25%)	10 (11,62%)
 convex-straight	7 (16,27%)	2 (11,11%)	1 (11,11%)	–	10 (11,62%)
 convex-concave	2 (4,65%)	–	–	–	2 (2,32%)
 concave-convex	2 (4,65%)	–	–	1 (6,25%)	3 (3,48%)
 convex-concave-convex	3 (6,97%)	1 (5,55%)	–	–	1 (4,65%)
 concave-straight-convex	–	1 (5,55%)	–	–	1 (11,16%)
 straight-convex	1 (2,32%)	–	1 (11,11%)	3 (18,75%)	5 (5,81%)
<b>TOTAL</b>	<b>28 (65,11%)</b>	<b>11 (61,11%)</b>	<b>6 (66,60%)</b>	<b>10 (60,50%)</b>	<b>55 (63,95%)</b>

**TABLE 9**

Comparison of the different types of depicted legs in several species (drawings based on Villaverde, 1994).

	TYPOLOGY OF THE LEGS				Total
	Equids	Cervids	Bovids	Caprids	
 in arch	-	6 (66,66%)	-	3 (33,33%)	9 (10,46%)
 open-parallel	4 (80%)	-	-	1 (20%)	5 (5,81%)
 open-parallel in 3 lines	-	-	-	3 (100%)	3 (3,48%)
 naturalistic-parallel	2 (66,66%)	-	-	1 (3,33%)	3 (3,48%)
 linear	22 (73,33%)	3 (10%)	4 (13,33%)	1 (3,33%)	30 (34,88%)
 triangular	3 (37,50%)	1 (12,50%)	1 (12,50%)	3 (37,50%)	
 extended-triangular	8 (9,30%)	2 (40%)	2 (40%)	-	1 (20%)
 closed-parallel	5 (5,81%)	-	-	-	-
 naturalistic	2 (50%)	1 (25%)	-	1 (25%)	4 (4,65%)
without legs	16 (40%)	11 (27,50%)	6 (15%)	7 (17,15%)	40 (46,51%)

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