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HUMAN REMAINS FROM THE SOLUTREAN PERIOD IN THE NERJA CAVE (MALAGA, SPAIN)

ABSTRACT: A study of human remains from the Solutrean period found in the Nerja Cave (Málaga) in 1963 is presented. The remains belong to four individuals, three adults (one male, one female and one of undetermined sex) and one infantile. The best preserved individual, Nerja-1, displays plesiomorphic traits of cranial robustness and morphological characteristics that are similar to those observed in other European Upper Paleolithic specimens.

KEY WORDS: Nerja cave – Solutrean – Human remains – Iberian Peninsula

INTRODUCTION

The Nerja human remains were found by A.M. de la Quadra Salcedo during archaeological search in the "Sala del Vestíbulo" of the Nerja Cave in 1963. The remains pertain to the burials of four individuals, three adults (one male, one female and one of undetermined sex), and one infantile. The skeletal material was deposited at the Laboratorio de Antropología (Universidad de Barcelona) for study. Dr. M. Fusté published a preliminary report in 1964 (Fusté 1964), but the Nerja specimens have remained unstudied since then, later suffering the consequences of a fire that occurred at the University of Barcelona. After the fire, the Nerja remains were identified by Dr. T.A. Varela. In 1996 the Nerja remains were returned to the Patronato de la Cueva de Nerja, in which museum they will be preserved in the future.

Although the stratigraphy of the Nerja Cave has been extensively studied in the last decade (Jorda 1986), there exists some doubt about the correct attribution of these human remains to the Solutrean levels (Garralda, Vandermeersch 1993), mainly because the original excavation account was never published. Also, the information available about the associated lithic industry does not help to verify the dating to the Solutrean with certainty. Furthermore, the remains were seriously damaged by fire, and thus it could be difficult to date them with certainty

using C-14. However, due to the scarcity of human remains from the Upper Paleolithic in the Iberian Peninsula (Garralda 1986, 1989, Garralda, Vandermeersch 1993), we still consider the description and study of the Nerja remains to be of great interest.

THE MATERIAL

Four individuals were found in the Sala del Vestíbulo: one adult male (Nerja-1), one adult female (Nerja-2), one adult of undetermined sex (Nerja-3) and one infantile individual. The former (Nerja-1) is undoubtedly the most interesting specimen, with the cranial face and the mandible relatively well-preserved, although crushed into numerous fragments. The reconstruction of the skull was made by M. Fusté. Nerja 2 is a neurocranium badly distorted due to earth pressures, while Nerja-3 only consists of small postcranial fragments. For these reasons, description and study here is mainly focused on Nerja-1.

Morphological description

Nerja-1

Nerja-1 is a robustly-built skull, with impressive supraorbital ridges and a very prominent glabellar region (Figure 1 and 2). Moreover, the frontal is flat, the mastoid

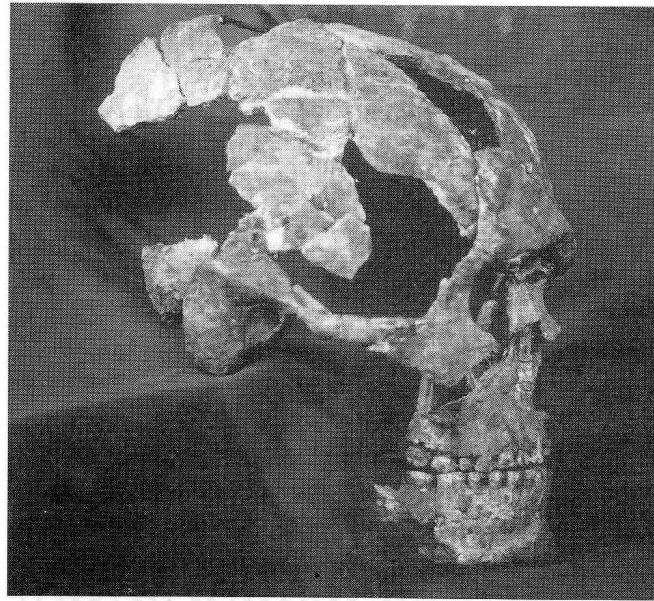
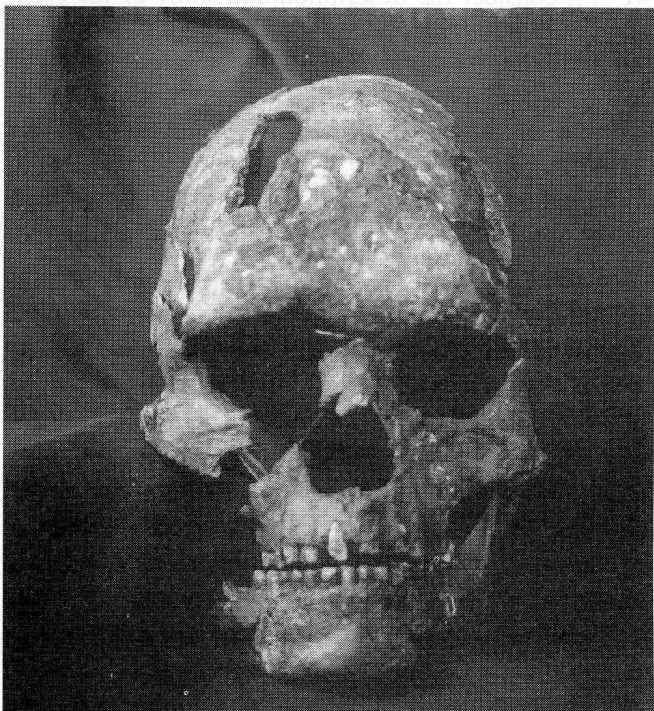


FIGURE 1. Nerja-1 skull in lateral view.

processes are strongly developed, and the bone of the cranial vault is notably thick (6 mm at bregma). The general morphology of the face resembles that described in the classic European "Cro Magnon" type, as Fusté (1964) has already pointed out. Accordingly, the face is broad and low and the orbits are clearly quadrangular in shape. In contrast, the nasal aperture is relatively wide, a feature also observed in the Cro-Magnon 1 male.

The mandible is short and gracile, with a low, wide ramus; the mental protuberance is notably marked. All the dentition is preserved, although some teeth are covered by carbonates.

FIGURE 2. Nerja-1 skull in frontal view.



Nerja-2

Both parietal bones are preserved, along with the left temporal. The cranial vault, especially the left parietal, is clearly distorted, however. Two wormian bones can be observed in the lambdoid suture. A small frontal fragment is also present, showing the upper margin of the left orbit and the glabellar region. The small and short mastoid process and the weakly-developed glabellar region indicate that this was a female individual, as Fusté (1964) already observed.

The mandible has been preserved, although the right ramus is missing and the dental arch is largely covered by carbonates. In addition, there are two small, poorly-preserved fragments of the maxilla, along with some teeth.

Several postcranial bones associated with this skull were found during the excavation. In particular, there are a complete right humerus and right fibula (both reconstructed by Fusté), and proximal fragments of the left femur and the right ulna and radius. In addition, some other minor remains from the left fibula, the ribs and the pelvis are still preserved. In general, the bones and the muscle attachments are gracile. Thus, the postcranial remains clearly confirm the sex attribution for this specimen.

Nerja-3

Nerja-3 is only represented by extremely small skeletal fragments belonging to an adult individual. However, it is not possible to extract any valuable information from these remains.

Nerja infantile individual

There exist some badly-preserved cranial fragments, mainly the right temporal bone and some maxillary fragments, in which the first and second deciduous molars can be observed. In addition, there is one deciduous canine and one inferior second deciduous incisor. The presence of the germ of a permanent first molar with the middle third of the crown completed points to an age of around 36 months for this individual.

RESULTS

Metrical analysis

The metric variables obtained for the Nerja-1 skull are displayed in Table 1 (some of them are only approximate, due to extensive damage to the skull). The variables were measured following the techniques of Martin and Saller (1957) and Howells (1973). The cranial indexes show that the face of Nerja-1 is broad and short (upper facial index = 44.76), and the orbits are wide and low (orbital index = 68.18). In addition, the nose is mesorrhine (nasal index equals 50.90). Although it was not possible to measure the cephalic index, Nerja-1 has a long cranial vault, and thus was clearly dolichocephalic.

The measurements for the Nerja-2 postcranial bones are displayed in Table 2. The humerus and ulna maximum length are the values measured by Fusté (1964). From these

data, it is possible to estimate the stature of this individual. According to the method of Manouvrier, the stature is 159.5 cm (humerus), 165.0 cm (ulna) and 158.2 cm (fibula); when the method of Trotter and Gleser is used the values obtained are slightly superior: 162.5 cm (humerus) and 159.0 cm (fibula).

TABLE 1. Cranial measurements of Nerja-1, following the technique of Howells (1973) and Martin and Saller (1957). *: approximate measurement; +: measurement taken by symmetry.

Howells' variable definition	Nerja-1	
Bizygomatic breadth (ZYB)	143*+	
Nasion-Prosthion height (NPH)	64	
Nasal height (NLH)		52
Orbit height (OBH)		30*
Orbit breadth (OBB)		43*
Nasal breadth (NLB)	28	
External palate breadth (MAB)	64	
Bifrontal breadth (FMB)		107
Biorbital breadth (EKB)		96*
Interorbital breadth (DKB)		25*
Cheek height (WMH)	22	
Nasion-Bregma chord (FRC)	115*	
Minimum nasal breadth (WNB)	10	
Bimaxillary breadth (ZMB)		97*+
Martin and Saller variable definition		
Minimum frontal breadth (9)	104*	
Maximum frontal breadth (10)	112*+	
Frontal arch (26)		144
Auricular height (20)	109*	
Interorbital breadth (50)		23*
Orbit breadth (51)		44*
Nasal height (55)	51	
Maxillo-alveolar breadth (61)	63	
Total mandible length (68)		99*
Symphysial height (69)	30	
Ramus height (70)		58*
Minimum ramus breadth (71a)	35	
Other variables		
Bone thickness at bregma	6	
Bone thickness at frontal protuberances	6	
Mandible body height (between M1 and M2)	25	
Symphysial width	11	

TABLE 2. Measurements of Nerja-2 postcranial bones. (F): measurement taken by Fusté (1964).

	Nerja-2	
Humerus		311(F)
Maximum length		
Minimum diameter (middle)	14*	
Maximum diameter (middle)	19*	
Radius		
Minimum perimeter		34
Ulna		
Maximum length		252(F)
Antero-posterior diameter		21
Transversal diameter		17
Femur		
Transversal diameter (under trochanter)		25
Antero-posterior diameter (under trochanter)	31	
Fibula		
Maximum length		341*

DENTITION

Metrical values

The metrical values (mesio-distal and bucco-lingual diameters) for the dentition of Nerja-1 and Nerja-2 are displayed in Table 3. Diameters were measured using the approach followed by Wolpoff (1971).

As a whole, the metrical values for the Nerja-1 and Nerja-2 teeth are large, and fit well with the variation found in other European Upper Paleolithic individuals (Frayer 1978), especially in the bucco-lingual diameters, a measurement which is less affected by dental wear. However, the upper third molars from Nerja-2 are notably small, a fact which is in agreement with the reduction observed in these teeth in later populations.

Looking at the values from the lower second molar, it can be observed that the Nerja values (both 1 and 2) are slightly smaller than those of an Aurignacian individual from the El Castillo Cave (Garrañda *et al.* 1992).

TABLE 3. Teeth dimensions (B-L, bucco-lingual diameter; M-D, mesio-distal diameter) and dental wear (Smith 1984) of permanent dentition from Nerja-1 and 2. *: approximate measurement.

Teeth	Side	Mandible			Maxilla		
Nerja-1 Specimen		M-D	B-L	Wear	M-D	B-L	Wear
I1	Left	4.8	6.0	7	7.9	6.8	7
I1	Right	5.1	6.2	7	—	—	—
I2	Left	5.0	6.5	7	5.9	6.4	7
I2	Right	6.1	6.7	7	6.4	6.6	6
C	Left	6.0	7.6	6	6.6	8.7	7
C	Right	6.9	7.9	6	7.1	8.6	6
Pm3	Left	6.7	7.7	6	6.1	9.8	6
Pm3	Right	6.4	7.8	6	6.0	10.2	6
Pm4	Left	6.3	8.2	6	5.8	9.5	6
Pm4	Right	6.3	8.2	5	5.2	9.0	6
M1	Left	10.4	10.3	7	8.5*	11.7*	8
M1	Right	11.1	10.0*	7	9.0	11.5	7
M2	Left	11.0	9.9	5	9.2	11.3	4
M2	Right	10.8	10.1	4	9.4	11.1	5
M3	Left	9.9	9.7	3	—	—	—
M3	Right	10.0	10.0	3	—	—	—
Nerja-2 Specimen							
Pm4	Left	—	—	—	6.4	9.5	5
M1	Left	—	—	—	9.9	11.8	6
M1	Right	10.2	10.7	6	—	—	—
M2	Left	—	—	—	9.4	11.5	5
M2	Right	10.8	10.3	5	10.7	11.5	5
M3	Left	—	—	—	7.3	10.4	3
M3	Right	10.7	10.0	3	7.3	10.6	3

Dental wear

The dental wear data were estimated using the Smith (1984) classification, which comprises eight stages of wear. Nerja-1 and 2 display a significant degree of dental wear, which has affected the dentine in most of the teeth (Table 3). Following the Brothwell categories for molar wear (Brothwell 1981), an age between 35–45 years can be estimated for both individuals. The wear on the anterior dentition is especially intense. This suggests that the ante-

rior teeth were used as a third hand in manipulative tasks, as has been observed in other human groups (Schultz 1977, Hinton 1981, Lalueza 1992). The presence of broad scratches on the enamel of these teeth, observed by Scanning Electron Microscopy (Lalueza 1996a), is concordant with this hypothesis.

In addition, several furrows have been observed on the occlusal surface of the left premolars, oriented at 40–45° with respect to their mesio-distal diameter. Observed with a Scanning Electron Microscope (Lalueza 1996a), numerous fine scratches fill the interior of these furrows, suggesting that their etiology was the repeated movement of some kind of fibrous and abrasive material across the teeth. The existence of paramasticatory activities in these individuals is in agreement with the tendency towards specialization and diversification in the subsistence systems as suggested by the archaeological evidence from Solutrean sites (Straus 1991).

DISCUSSION

Upper Paleolithic sites are scarce in the Iberian Peninsula (Straus 1991), and very few of them have yielded significant human remains (Figure 3). The main sites with human material are: Parpalló (Gandía, Valencia) (Davidson

features related to cranial robustness can be observed, such as marked supraorbital ridges, prominent glabellar region, bone thickness and non-vertical frontal bone. In contrast, the female individuals from Beneito and Parpalló (although the latter is a juvenile), seem to have notably gracile skulls.

In addition, the dimensions of the teeth of the Nerja, El Castillo and Tito Bustillo individuals are large (especially the premolars and molars), and fit well within the range of variation observed in other European Upper Paleolithic samples (Frayner 1978). Incidentally, this large dentition size persisted in some later Mesolithic groups, such as that from the La Oliva site (Valencia) (Pérez-Pérez *et al.* 1995), located in the vicinity of the Barranc Blanc and Parpalló sites. The Mesolithic-Neolithic transition seems to represent a quite important morphological rupture in the Iberian Peninsula (Lalueza 1996b).

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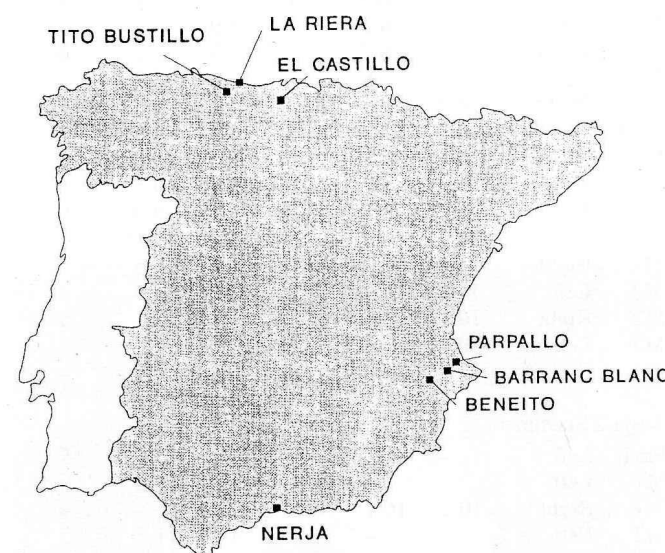


FIGURE 3. Main Upper Paleolithic sites from the Iberian Peninsula that have yielded significant human remains.

1989, Bubner 1975), Beneito (Muro de Alcoy, Alicante) (Garralda, Vandermeersch 1993), Barranc Blanc (Rótova, Valencia) (Fusté 1960), El Castillo (Puente Viesgo, Santander) (Vallois, Delmas 1976, Garralda 1988, 1989), Tito Bustillo (Ribadesella, Oviedo) (Garralda 1976), La Riera (Posada de Llanes, Santander) (Garralda 1986) and Nerja (Málaga).

In the adult male individuals preserved (El Castillo 1 and 2, Barranc Blanc and Nerja-1), several plesiomorphic