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Late Pleistocene mammals from the Melpignano (LE) «Ventarole»: preliminary analysis and correlations

Paola BOLOGNA*, Giuseppe DI STEFANO*, G. MANZI**, Carmelo PETRONIO*, Raffaele SARDELLA*
& Enrico SQUAZZINI*

* Dipartimento di Scienze della Terra, Università «La Sapienza» di Roma

** Dipartimento di Biologia Animale e dell'Uomo,
Università «La Sapienza» di Roma

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ABSTRACT — *Preliminary analysis on some faunal remains from the Melpignano (LE) area (with a premolar of Homo cf. neanderthalensis), allow the writer to a correlation between these remains (with others from nearby localities) and the faunal associations from the basal deposits of some caves: the caves opening between 2 and 8 mt a.s.l. and lying on Neotyrrenian beach deposits.*

These faunal associations are referred to the Late Pleistocene.

RIASSUNTO — [I mammiferi del Pleistocene superiore delle «ventarole» di Melpignano (LE): analisi preliminare e correlazioni] — *L'analisi preliminare di alcuni resti faunistici inediti nell'area di Melpignano (LE), comprendenti anche un premolare di Homo cf. neanderthalensis, dà lo spunto agli scriventi per una correlazione fra tali resti e quelli delle aree limitrofe, con le associazioni faunistiche rinvenute nei depositi basali di quelle grotte che si aprono fra 2 e 8 mt s.l.m. e che poggiano su depositi di spiaggia Neotirreniana.*

Tali associazioni vengono riferite al Pleistocene superiore.

INTRODUCTION

Many deposits with fossil remains are localized in the Salentine Peninsula. Different authors refer these deposits to the Late Pleistocene or to the late Middle Pleistocene.

The lithostratigraphical features and the different depositional patterns of the deposits do not allow an easy correlation of the faunas. In fact three different depositional patterns may be distinguished: cave deposits, outcropping ossiferous gravels and particular filling deposits of Karst cavities named «ventarole».

Cave deposits are numerous and are often characterized by a well defined succession of sediments. Besides, some of these caves show also stratigraphical and/or geomorphological evidences that allow to circumscribe the depositional events in well-defined periods of the Late Pleistocene. This is the case of Grotta Romanelli, Grotta delle Striare, Grotta del Sarcofago, Grotta del Cavallo, Grotta dei Giganti, Grotta Uluzzo C, Grotta M. Zei,

where the red clay deposits lie just above the Neotyrrenian beach (Blanc, 1953; Maviglia, 1955; Orlandi & Cigna, 1956; Cardini, 1958; Borzatti von Löwenstern, 1965, 1966, 1969; Palma di Cesnola, 1966; Campetti, 1985; Di Stefano *et alii*, 1992).

The outcropping ossiferous gravels are quite frequent especially in the eastern part of the Salentine Peninsula; they show vertebrate remains highly cemented with the rock matrix and their extraction or even their observation is often very difficult. Notwithstanding the bad conditions of observation, in some case it is possible to recognize the presence of various taxa; so, even the ossiferous gravels can give biochronological and biostratigraphical informations.

The so-called «ventarole» are Karst cavities in Miocene calcarenite filled with reddish sediments. They contain several vertebrate remains generally in a good state of preservation. «Ventarole» sediments are, for their particular genesis, obviously hardly correlatable with other sediments of the area. The only chronological indications can be drawn from

the analysis of the faunal assemblage and its comparison with the fauna from other sites with more precise stratigraphical characteristics.

From the following study of the faunal association from Cava Nuzzo «ventarole», in the Melpignano area, and from the presence in this association of a hominid upper premolar, we try to correlate it with associations of the Salento area with sure chronological data. This correlation will be realized both on the basis of the classification of the faunal elements and, where possible, on the analysis of the relative frequency of the different taxa.

CAVA NUZZO (MELPIGNANO, LECCE) FAUNA

In the Melpignano (LE) area numerous quarries for the extraction of the «Pietra Leccese» are active. In one of these, called Cava Nuzzo, several well preserved fossil vertebrate remains were collected from some «ventarole» located in the inactive part of the quarry. More recently, from subsequent washings of some clay-sandy samples, a hominid upper premolar has also been found. A preliminary analysis of the faunal association allows to distinguish the following taxa:

Elephas cf. *antiquus* Falconer & Cautley
Stephanorhinus sp.
Equus caballus L.
Equus hydruntinus Regalia
Sus scrofa L.
Bison priscus Bojanus
Bos primigenius Bojanus
Cervus elaphus L.
Dama dama (L.)
Capreolus capreolus (L.)
Canis lupus L.
Vulpes vulpes (L.)
Lynx lynx (L.)
Crocota crocuta Erxleben
Meles meles L.
Lepus europaeus Pallas
Oryctolagus cuniculus (L.)
Erinaceus europaeus L.
Aves indet.
Homo cf. *neanderthalensis* King

DISCUSSION ON THE FOSSIL REMAINS

Elephas cf. *antiquus* Falconer & Cautley.

Several limb bone fragments have been found, all belonging to young individuals, thus their deter-

mination at a specific level is not sure. Therefore, the absolute length/medium diameter ratios are more similar to the genus *Elephas* which shows more robust and squatter bones, than to *Mammuthus*.

Equus caballus L. (text-fig. 2)

This species is represented by few long bone remains (all belonging to young individuals), mandibular fragments with teeth and some loose teeth. The morphological characteristics and size of these specimens allow to ascribe them without any doubt to this species. Moreover, the large size and some morphological features of the molars seem to be typical of this horse from Salento (De Giuli, 1983).

Equus hydruntinus Regalia

We have only three remains: a deciduous tooth, a humerus proximal epiphysis and a complete tibia. The specimens morphology and the size of the tibia are typical of the Regalia ass.

Sus scrofa L.

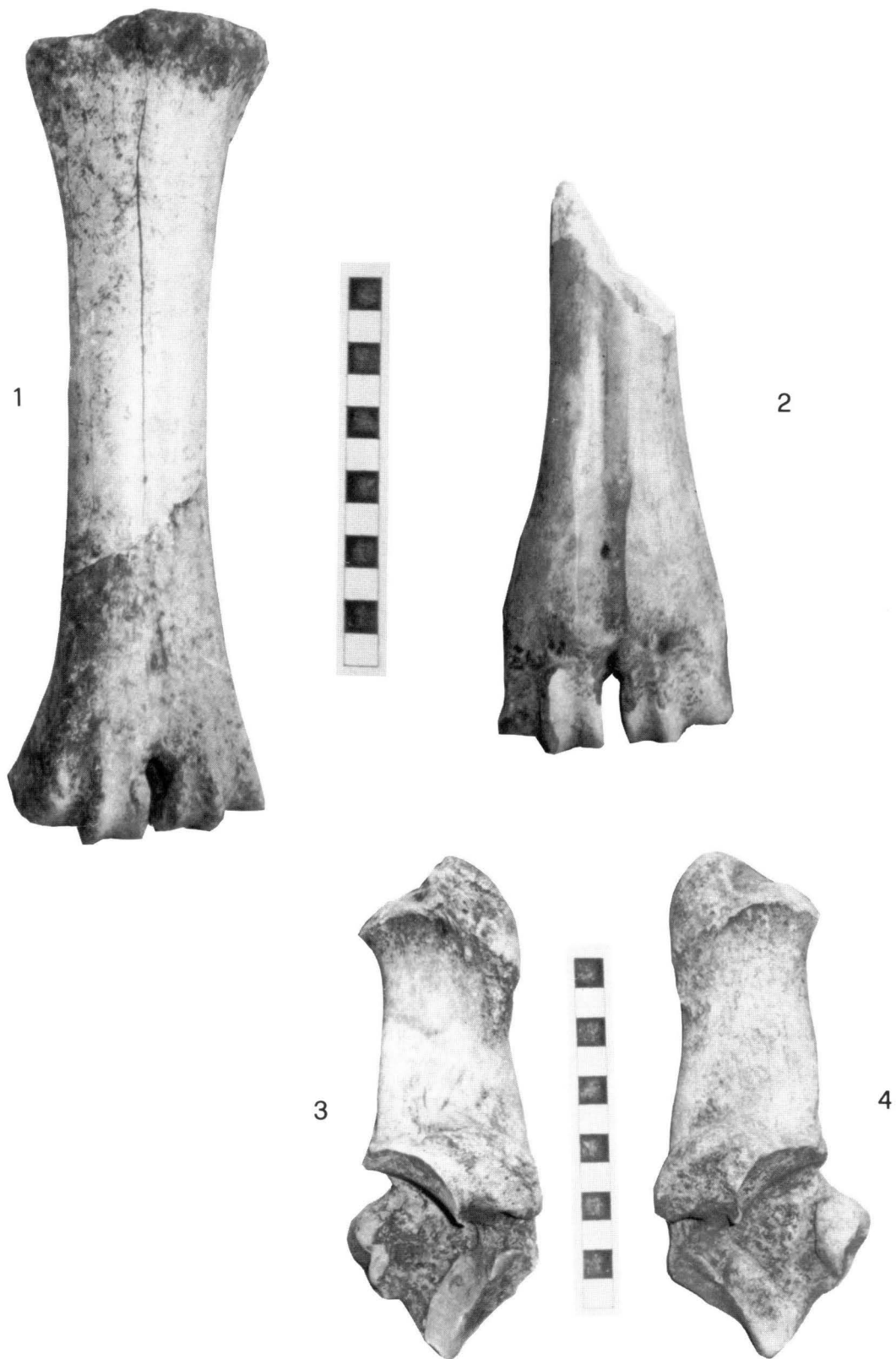
This species is represented by some long bones, a nearly complete spinal column of a young individual and some teeth.

Bison priscus Bojanus (text-fig. 1)

Four post-cranial bones are referable to this species. Specific identification has been based on the morphological distinctive criteria between the genus *Bos* and the genus *Bison* as proposed by various Authors (Schertz, 1936; Lawrence, 1951, Olsen 1960; Sala, 1986; Bologna & Petronio, 1993).

In particular, in the astragalus a well developed tuberculum at the lateral border of the proximal trochlea level is posteriorly present while it lacks or is just outlined in *Bos primigenius*. In correspondence of the postero-distal border a step is present on the lateral face of *Bison* while it is absent in *Bos primigenius*. From the same view, the articular surface with the calcaneus has an elliptical form and is antero-posteriorly extended while this surface is more rounded in *Bos primigenius*.

The supero-posterior border of the *sustentaculum tali* of the calcaneus is curvilinear in shape; on the contrary it forms a right angle in *Bos primigenius*. The medial border of the posterior face of this bone becomes progressively larger towards the top of the bone, while in *Bos primigenius* it becomes suddenly larger at about the half of its length, forming a sort of angle. The little posterior articular surface for the astragalus is subtriangular in shape in *Bison priscus*, moreover, in *Bos primigenius* the anterior borders show an introflexion between the wider proximal part and the narrower distal one.



Text-fig. 1 - 1) *Bos primigenius* Bojanus, metacarpal; 3) *Bos primigenius* Bojanus, calcaneus; 2) *Bison priscus* Bojanus, metatarsal; 4) *Bison priscus* Bojanus, calcaneus. Late Pleistocene, Cava Nuzzo, Melpignano, Lecce.

In the metatarsus, the diaphysis and the distal epiphysis connection shows a discontinuity beyond which the condilar borders are parallel. In *Bos primigenius*, instead, this connection is continuous with well bell-shaped condilar borders. A well developed transversal groove exists in *Bison* between the diaphysis and the condyles, that is only scarcely outlined in *Bos primigenius*. Moreover, in *Bison* the supratricular tubercles are well outlined so that the connection area between the diaphysis and the articular condyles seems swollen, while in *Bos primigenius* it is flattened.

Bos primigenius Bojanus (text-fig. 1)

This species is represented by numerous well preserved remains. A large number of the remains belong to young individuals. Long bones fragments, tarsal bones and few teeth are usually found; skull remains lack completely but a small terminal part of a horn core is present. Systematic determination is justified by the previous comparisons with *Bison priscus*.

Cervus elaphus L.

Various remains referable to the red deer have been found. However, this species is not very common and many of its remains are fragmentary. Some teeth and parts of the post-cranial skeleton are present. Skull and antler remains lack completely: thus it is impossible at the moment to attribute the examined remains to one of the Pleistocenic red deer subspecies.

Dama dama (L.) (text-fig. 2)

Fallow deer is the most abundant mammal in this fauna. A large number of remains have been found that allow a quite detailed study of this species. A great percentage of young individuals can be noted. The examination of the remains (in particular of the antler remains) allows to point out the presence of the species *Dama dama*, and to exclude the Middle and late Middle Pleistocene *Dama clactoniana*. A more detailed analysis could allow to explain the characteristics of the Late Pleistocene fallow deer; at the moment it is possible to state some features that allow to distinguish the late Middle Pleistocene (stage 7) *Dama dama* from the Late Pleistocene *Dama dama*: lack of large tines in the crown in the Late Pleistocene fallow deer; lack of the ectostyle in the lower molars in the Late Pleistocene fallow deer, the ectostyle is, on the contrary, always present in the stage 7 *Dama dama*; the presence of the posterior cingulum in the Late Pleistocene fallow deer which usually lacks in the late

Middle Pleistocene *Dama dama*. Moreover, the fallow deer abundance allows paleoenvironmental considerations.

Capreolus capreolus (L.)

Some remains testify the presence of the roe deer in the Melpignano fauna, but this species is quite scarcely represented.

Canis lupus L. (text-fig. 2)

Few remains can be ascribed to the wolf: long bone fragments, mandibular remains with teeth and some vertebrae. Bones and teeth size and the morphological characteristics of the teeth correspond to those of the Late Pleistocene wolf.

Vulpes vulpes (L.)

Only a canine is present but its morphology and size make it referable to this species.

Lynx lynx (L.)

There is only a first phalanx that fits in the variability range of the boreal lynx.

Crocota crocuta (Erxleben) (text-fig. 2)

The presence of this species is well proved due to the large number of remains that leaves no doubt about their determination. More particularly, an occipital skull portion with the typical strong sagittal crest has been found. Moreover, a mandibula with the complete jugal tooth series and a maxillary portion with the three premolars are present. These remains probably belong to two different individuals because of the different teeth wearing.

Meles meles L.

Only few maxillary fragments with few teeth have been found but their morphologies make sure the specific attribution.

Lepus europaeus Pallas

Remains attribute to this species are far less abundant than those of the rabbit: only some maxillary fragments with teeth and a single broken femur have been collected; these remains are surely referable to *Lepus europaeus* for their morphology and size.

Oryctolagus cuniculus (L.)

This species, more abundant than the previous one, is mainly testified by long bones and mandibles.



Text-fig. 2 - 1) *Dama dama* (L.), hemimandible; 2) *Dama dama* (L.), fragment of frontal bone with the basal part of the antler; 3) *Equus caballus* L., metacarpal; 4) *Equus caballus* L., femur; 5) *Crocuta crocuta* Erxleben, hemimandible; 6-7) *Canis lupus* L., mandibular fragment; 8) *Canis lupus* L., maxillary fragment with P4 and M1. Late Pleistocene, Cava Nuzzo, Melpignano, Lecce.

Erinaceus europaeus L.

Only four mandibular fragments with teeth have been found which allow a sure specific attribution.

Homo cf. neanderthalensis King

An isolated human tooth (to be named «Melpignano 1», following Oakley *et alii*, 1971) has been recovered at Cava Nuzzo; it was found within a block of sediment during cleaning and restoration of the faunal sample. The tooth is an adult upper premolar: presumably, a first right maxillary premolar (P3) in consideration of the morphology of the crown, whereas the presence of a single root is partially in contrast with this conclusion and involves a possible attribution to a P4; anyhow it should be considered that a longitudinal depression is clearly visible on both sides of the root and that taurodontism is probably concerned (see below).

Melpignano 1 (text-fig. 3) is a well preserved tooth and shows interesting features which are briefly examined here, but will be subjected to further analyses in the near future from both phenotypical and functional perspectives. It presents two cusps of approximately the same area in occlusal view, with the vestibular cusp more extended in size than the other and the lingual one developed toward the mesial side. A weak wear facet affects only the lower margin of the vestibular cusp, indicating that the tooth belonged to a young adult. The occlusal inspection also shows the ancient removal of a bright

blunting which involves two thirds of the distolingual side of the crown, as well as the defect of a small enamel plug which affects in central position the mesial edge of the occlusal plane. Above the cemento-enamel junction, a third-cervical inflation of the vestibular surface of the crown is referable to a residual cingulum and concurs to give a pleiomorphic characterization to this premolar.

The crown is normally elongated and measures 7.2 and 9.3 mm (MD and VL diameters were taken according to Tobias, 1967). An orientative morphometric comparison is given in figure 4, where mesio-distal and vestibulo-lingual measurements of Middle and Late Pleistocene human P3 are plotted.

It is manifest that Melpignano 1 is metrically distinguished from the more archaic specimens (late *H. erectus*, «Archaic *H. sapiens*»), while it fits the medium values of the early modern comparative sample (upper Paleolithic Europeans) and the lower range of the Neandertal variability, consistently with the relatively reduced size of some Neandertal tooth samples from Mediterranean latitudes: e.g., the Neandertals of Monte Cicero (Mallegni, 1992; Manzi & Passarello, 1993), Hortus (de Lumley, 1973) and Shanidar (Trinkaus, 1978) sites.

The roots are fused into a single and extended one, with a sigmoid course in buccal view and longitudinally furrowed on both proximal surfaces. It is hypothesisable that these features are in association with a wide vestibulo-lingual extension of the pulp cavity: i.e. with taurodontism, a common feature among Neandertals (e.g. Stringer *et alii*, 1984).

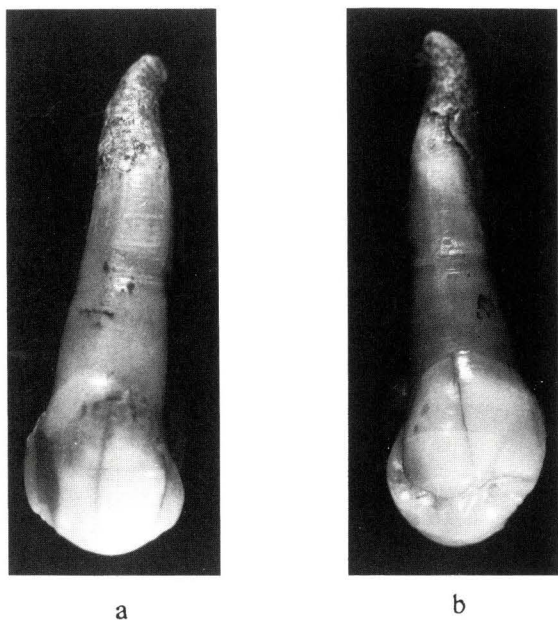
Hypoplastic signs are evident on both the crown and the root. One slight line of enamel hypoplasia is clearly visible in the middle of the vestibular surface of the crown, while several fine annular depressions affect the root in its medial part.

Thus, it can be tentatively concluded that stress events occurred during growth and development of the individual at about the ages of 3-5 and 6-9 years (according to Ubelaker, 1978; compare Ogilve *et alii*, 1989).

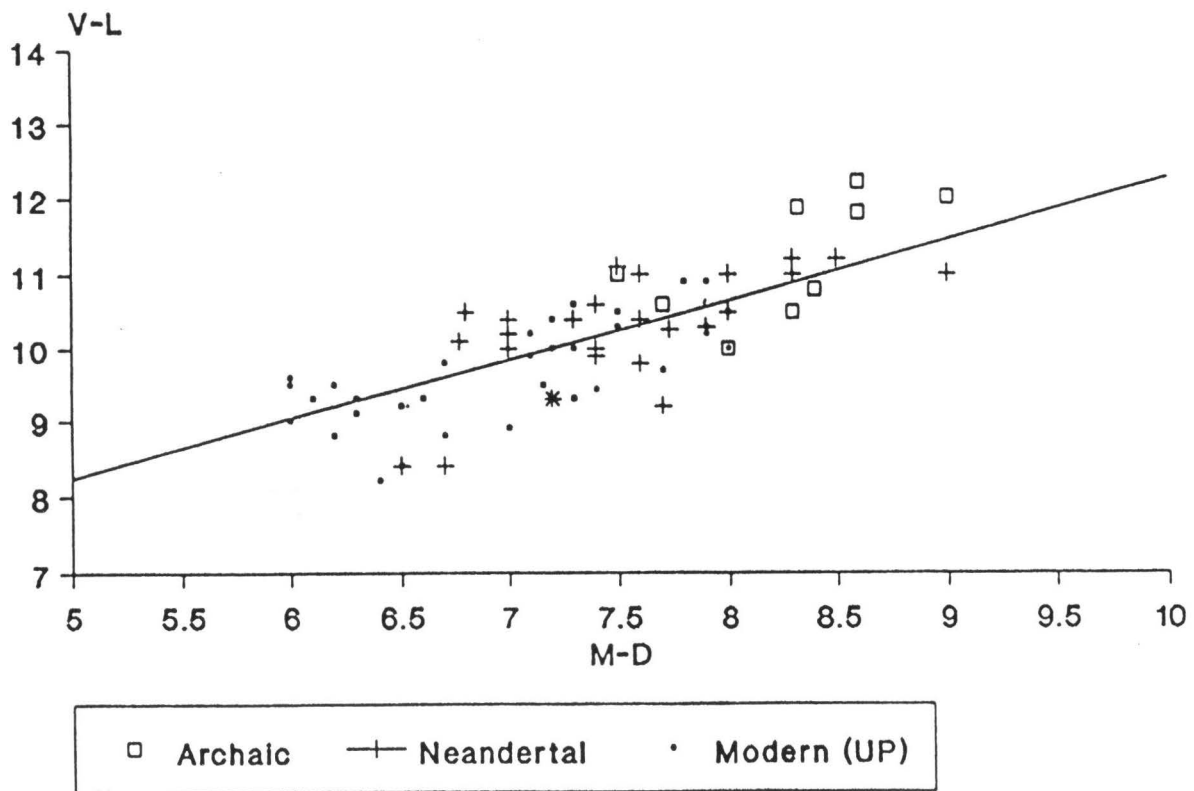
CONCLUSIONS

After the study of the faunal association and of the human remain from Cava Nuzzo (Melpignano), we think it is suitable to propose some working hypotheses to define the time of deposition of those remains in the «ventarole» sediments.

As said in the introduction, the «ventarole» clay-sandy sediments do not show elements that allow to define a stratigraphical succession; the bones are both at the base and at the top of the fractures



Text-fig. 3 - Human premolar (Melpignano 1), a) vestibular view, b) lingual view.



Text-fig. 4 - Crown length (MD) and breadth (VL) of Melpignano 1 (*) compared with first upper premolar dimension of Middle and Late Pleistocene specimens; measurements in mm. Data from various sources (see literature in Orban *et alii*, 1988).

without any sign of flutiation or long carrying; they are chaotically deposited and do not seem to have any particular taphonomic pattern; the fracture have been probably filled very quickly; the mammal associations, from the composition and the faunal abundance, seem coeval, even if in small areas.

It seems evident that any attempt of chronological definition must proceed through the correlations with other faunal association collected in the nearby areas which have a precise chronological attribution.

As said previously, Salento caves are very numerous, but only in some of them the deposits lie on more or less extended outcrops of ancient beach, presumably of Neotyrrenian age (Hearty *et alii*, 1986), testified by typical deposits, lithophaga holes and pot holes. In fact these cave sediments, constituted by red clays often with breccia intercalations, overlie beach sediments correlatable with shorelines high from 2 to 8 metres a.s.l. A more ancient shoreline of Eutyrrhenian age (Hearty *et alii*, 1986) is also testified by a marine litoral succession with abundant *Strombus bubonius* remains cropping out at 28-35 m a.s.l. near Gallipoli and Capo d'Otranto

(Di Stefano *et alii*, 1992). The K, I, H and G levels of Grotta Romanelli, and also the basal sediments of Grotte delle Striare, Grotta del Sarcofago, Grotta del Cavallo, Grotta dei Giganti, Grotta Uluzzo C and Grotta M. Zei, are all localized from 0 to 8-10 m a.s.l. and lie on Neotyrrenian conglomerates (Di Stefano *et alii*, 1992). Unless to hypothesize that some neotectonic events in the Salento area could have changed the heights a.s.l. of the Tyrrhenian beaches it seems probable that the basal levels of the cave succession are younger than 90-100.000 years B.P. and that they were deposited during the last phases of the stage 5 or during the more recent stages of the oceanic plaeotemperature scale.

Moreover, it must be remembered the absolute U/Th dates of the two lower and upper stalagmitic levels of Grotta Romanelli yielded ages less than 69.000 years B.P. and less than 40.000 years B.P. (Fornaca Rinaldi & Radmilli, 1968).

Paleoethnological data on the lower levels of the mentioned caves, especially Grotta Romanelli, are at present critically revised. Most of paleoethnologists (Blanc, 1920, 1953; Campetti, 1986; Musisi, 1990) believe that the human industry of these

Localities		Species										
		Grotta Romanelli (T. r.)	Grotta del Cavallo	Grotte delle Striare	Grotta Uluzzo C	Grotta M. Zei	Grotta del Sarcofago	Grotta dei Giganti	San Sidero 3	Fondo Cattie	Gora di Melpignano	Cava Nuzzo
Elephas antiquus		*		*			**		*			
Elephas cfr. antiquus												**
Elephas sp.												
Stephanorhinus kirchbergensis		**			*		*	*	*		*	*
Stephanorhinus sp.							*	*				
Stephanorhinus hemitoechus						*						
Equus caballus		*	***	*	**	*	*	**	**	**	*	**
Equus hydruntinus			**		*		*	*	**			*
Sus scrofa			**	*	*			*	**	*	*	*
Hippopotamus amphibius		*		*			*	*	**			*
Bos primigenius		***	***	*		***	**	***	**	**	**	***
Bison priscus												*
Capra ibex			*					*				
Capreolus capreolus								*				*
Cervus dama		*	*	*	**		*	**	**	**		***
Cervus elaphus			**	*	**	**	*	*	*	**	***	*
Ursus sp.				*					*			
Canis lupus		*	*	*	*				**	*	*	**
Canis sp.		***									*	
Vulpes vulpes			*	*	*	*		*	*			*
Felis silvestris			*									
Lynx lynx				*								*
Panthera pardus			*									
Panthera leo spelaea					*				*	*		
Crocota crocuta		*		*	*		*	*	*	*		**
Meles meles		*										*
Lutra lutra		*								*		
Mustela putorius											*	
Monachus monachus		*										
Lepus europaeus			*	*	*	*						*
Lepus timidus				*								
Oryctolagus cuniculus		***	*	***		***		**	***		***	**
Glis glis								*				
Eliomys quercinus			*						*			
Muscardinus avellanarius								*				
Microtus cfr. gregalis									*			
Microtus cfr. agrestis									*			
Microtus arvalis		*							*			
Pitymys savii			**						**	***		
Apodemus sylvaticus									*			
Erinaceus europaeus			*						*			*
Otis tarda		*										
Otis tetrax		**										

Tab. 1 - Late Pleistocene mammal faunas from selected localities in the Salento area: *rare; **frequent; ***very frequent.

sediments has to be attributed to a typical even if archaic mousterian technique. Other paleoethnologists, believe more realistic an age referable to the Early Paleolithic-Middle Paleolithic transitional phase (Guidi & Piperno, 1992).

This last more ancient dating of the human industry takes hint even from some considerations by Sala (1980) on the supposed antiquity of the fauna associated with these artefacts, collected in the lower levels of some of the previously mentioned caves and, moreover, from the attribution of some dog remains to *Canis cf. mosbachensis*, a typical species of Middle Pleistocene (Masini *et alii*, 1991).

However thinking more realistic the data suggested by the shorelines and considering that this dog species has been pointed out also from the late Middle Pleistocene fauna of Quisisana (Capri island) (Capasso Barbato & Gliozzi, 1993) and San Sidero 3 (Sala *et alii*, 1992), it is more reasonable to conclude that the species *mosbachensis* found persistence niches in the Italian peninsula until Late Pleistocene. It must be considered that faunas from such levels contain also *Equus hydruntinus* with elephants, rhinos, hippos. The first occurrence in Italy of the Regalia ass is in Sedia del Diavolo (Roma) sediments (attributable to the 7 or 6 stage of the paleotemperature scale) (Caloi & Palombo, 1986) but it became common and more abundant (Campetti, 1986) in the final phases of the stage 5 and, over all, in the stage 4 and 2. The same concept of «fossil marker» seems to have the human working of the shell *Callista chione*, almost always found in association with the hydruntine ass, in particular mousterian horizons of the basal levels of these caves (Campetti, 1986).

After the illustration of the chronological position of the pachyderm fauna from the salentine caves, the qualitative and quantitative analogies among the salentine faunal association and those from the Melpignano area are finally shown, as at present known (tab. 1). In the Melpignano deposits abundant remains of *Elephas antiquus*, *Stephanorhinus kirchbergensis*, *S. hemitoechus* and *Hippopotamus amphibius* are present. *Equus hydruntinus* and, in large abundance, *Bos primigenius*, *Cervus elaphus* and, over all, *Dama dama* are associated with these large mammals. These cervids appear in the more recent levels of Torre in Pietra (Roma) (Caloi & Palombo, 1978, 1988) and Sedia del Diavolo (Roma) (Caloi *et alii*, 1980; Caloi & Palombo, 1988) (stage 7 of the paleotemperature scale), but are frequent during the Late Pleistocene. More particularly, the modern fallow deer occurs in the stage 5 and is clearly distinct from Middle late Pleistocene (stage 7) *Dama dama* as said before. The

other macromammals species in the tab. 1, are not chronological indicators because they are known from the Middle Pleistocene.

The micromammals are useful only for a paleoenvironmental point of view.

Taking into account the presence of the red deer and the Regalia ass associated with the pachyderms and the abundance of the fallow deer, as it is recorded in the mentioned salentine caves, and the presence of the hominid premolar which shows modern or Neandertal (but certainly not more archaic) affinities, it is possible to limit the deposition of the Cava Nuzzo «ventarole» sediments to the Late Pleistocene. More likely, it could be hypothesized that the chronological attribution of these remains could be limited to the 5c-5a or younger isotopic stages.

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