

The first occurrence of *Bison priscus* Bojanus in the Melpignano area (Lecce, Southern Italy)

Paola BOLOGNA

Carmelo PETRONIO

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

KEY WORDS — «ventarole» (karst cavities), *Bison priscus*, Late Pleistocene, Salento.

ABSTRACT — A few bovid specimens of an unpublished mammal assemblage coming from the Melpignano area (Lecce) have been referred by the morphologic analysis to *Bison priscus*. This can be considered as the first occurrence of this species in the Salento area. The presence of *B. priscus*, as well as the whole Melpignano fauna, is referred to a temperate climatic phase of the Late Pleistocene by the correlations of the whole fauna with many other faunas in the Salento area.

RIASSUNTO — [La prima segnalazione di *Bison priscus* Bojanus nell'area di Melpignano (Lecce)] — L'analisi morfologica dei resti di una associazione faunistica inedita proveniente dall'area di Melpignano ha permesso di riferire a *B. priscus* alcuni dei reperti di bovidi presenti in tale fauna. Questa può essere considerata la prima segnalazione di tale specie nella Penisola Salentina. Dalle correlazioni della fauna di Melpignano con altre del Salento si riferisce la presenza di *B. priscus*, così come dell'intera fauna, ad una fase climatica temperata del Pleistocene Superiore.

INTRODUCTION

Many fossil remains referred to different species of Late Pleistocene mammals have been found in the Pietra Leccese quarries in the Melpignano area, in particular from some karst cavities, known locally as «ventarole», located in the Nuzzo quarry.

In this paper we point out the presence in this fauna of *B. priscus* (Bologna *et alii*, in this volume). So far, in the Salento area only *B. europaeus* (some tibias and femurs of very large bovids found in the fossil-bearing cave of Cardamone (Le). So, this would represent the first and only one quotation of the genus *Bison* in the Salento area, but it was based only on the dimensions of the bones and it was not supported by a morphologic analysis. Therefore we can consider the occurrence of *B. priscus* in the Melpignano fauna, stated in the present paper, as the first certain identification of the presence of the genus *Bison* in the Salento area.

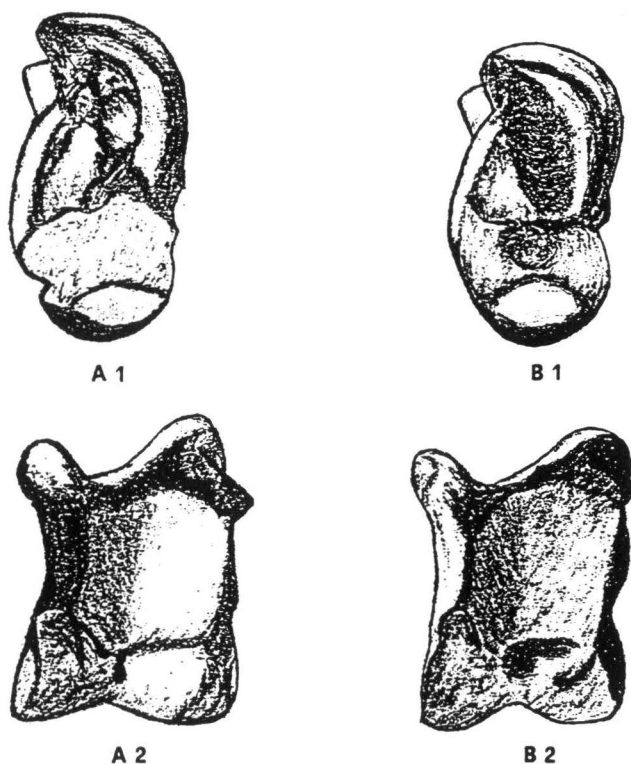
The remains referable to *B. priscus* are represented by only four post-cranial bones (astragalus, calcaneus, central tarsal bone and metatarsal). For their specific identification many different criteria, as proposed by Schertz (1936), Lawrence (1951), Olsen (1960) and Sala (1986), together with others, not considered by the previous authors, have been used.

MORPHOLOGICAL AND MORPHOMETRICAL REMARKS

Astragalus (text-fig. 1): in lateral view, in *B. priscus* it is possible to observe a step in correspondence of the postero-distal edge, at the level of the contact area between the plantar trochlea and the distal one. In *Bos primigenius* this step is never present. In the same view, the articular surface with the calcaneus is elliptical in shape and elongated antero-posteriorly, while in *B. primigenius* the same articular surface is more circular.

In posterior view in *B. priscus* there is a well developed tubercle at the level of the lateral edge of the proximal trochlea whereas in *B. primigenius* this is often absent or scarcely developed.

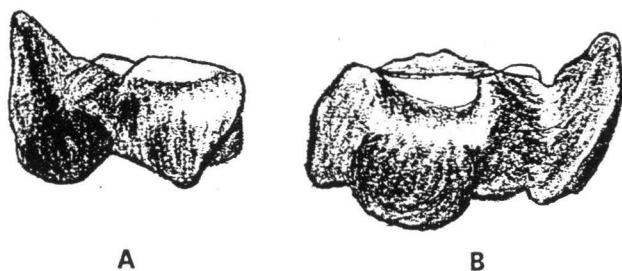
Calcaneus (text-fig. 2): in medial view the *sustentaculum tali* of *B. priscus* is characterized by a continuous curved supero-posterior margin, while in *B. primigenius* this margin forms an almost right angle. In *B. priscus*, in the same view, the small posterior surface for the articulation with the astragalus is subtriangular in shape. In *B. primigenius* the same surface is divided in two different parts by an introflexion of its anterior margin. So a proximal enlarged portion and a narrower distal one can be recognized.



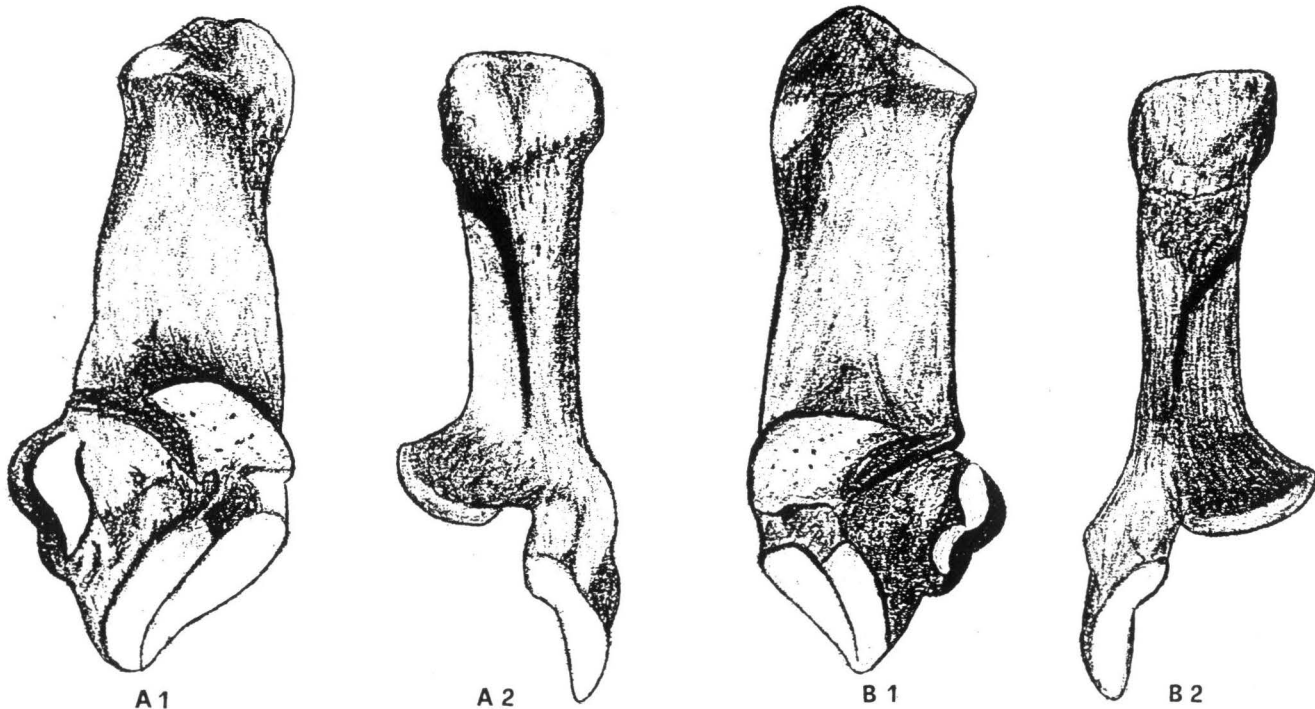
Text-fig. 1 - A) *Bison priscus* Bojanus: right astragalus (1: lateral view; 2: posterior view).
B) *Bos primigenius* Bojanus: right astragalus (1: lateral view; 2: posterior view).

In posterior view, in *B. priscus* the medial edge of the posterior surface widens out towards the tuberosity of the bone with a continuous trend, while in *B. primigenius* the same margin widens out suddenly forming an angle in the middle of the posterior surface.

Central tarsal bone (os naviculocuboideum) (text-fig. 3): for this bone we consider only two distinctive characters that are easy to recognize, but have never been proposed by other authors till now. In posterior view in *B. priscus* a well definite swelling under the medial tubercle is present, while the lateral tuberosity is scarcely developed. On the con-



Text-fig. 3 - A) *Bison priscus* Bojanus: left central tarsal bone (posterior view).
B) *Bos primigenius* Bojanus: right central tarsal bone (posterior view).

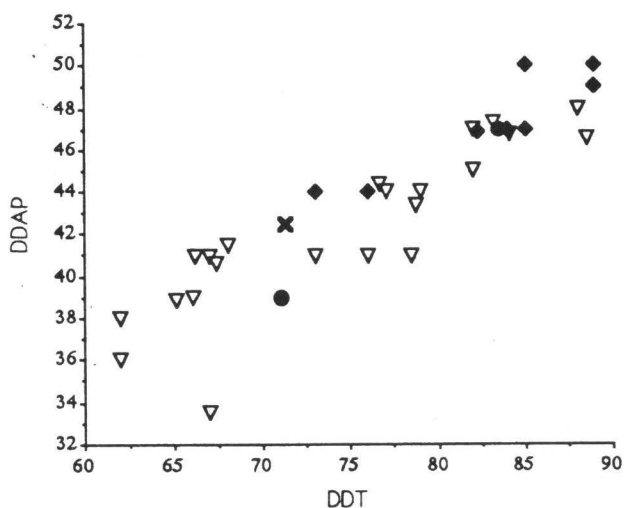


Text-fig. 2 - A) *Bison priscus* Bojanus: right calcaneus (1: medial view; 2: posterior view).
B) *Bos primigenius* Bojanus: left calcaneus (1: medial view; 2: posterior view).

trary in *B. primigenius* the swelling under the medial tubercle is absent, but the lateral tuberosity is well pronounced.

Metatarsal (text-fig. 4): only one specimen of this bone is represented by a distal portion. In anterior view, in *B. priscus* there is an evident discontinuity along the margins at the level of the contact area between the diaphysis and the distal epiphysis. So, the margins that are divergent above the contact area, become parallel at the level of the condyles. In *B. primigenius* the connection between the diaphysis and the distal epiphysis is continuous and distally divergent. This character is not pointed out in the scatter diagram concerning the transversal distal diameter versus the antero-posterior one (text-fig. 5): in relation to the transversal diameter the two areas are almost completely overlapped. Nevertheless *B. priscus* seems to have, on average, a bigger transversal distal diameter. On the contrary, the antero-posterior distal diameter of the metatarsal of Bison is clearly bigger. The distal articular surface, in fact, shows an intercondylar crest for the articulation with the first phalanges that is rather prominent, which probably allows a major stability together with a good cursorial aptitude.

In *B. priscus* a deep transversal groove is pre-



Text-fig. 5 - Dispersion diagram between the transversal distal diameter and the antero-posterior distal diameter of the metatarsal.

× *Bison priscus* (Melpignano) ● *B. schoetensacki*
 ◆ *B. priscus* ▽ *Bos primigenius*

sent in the area between the diaphysis and the condyles, while in *B. primigenius* the same groove is scarcely developed.

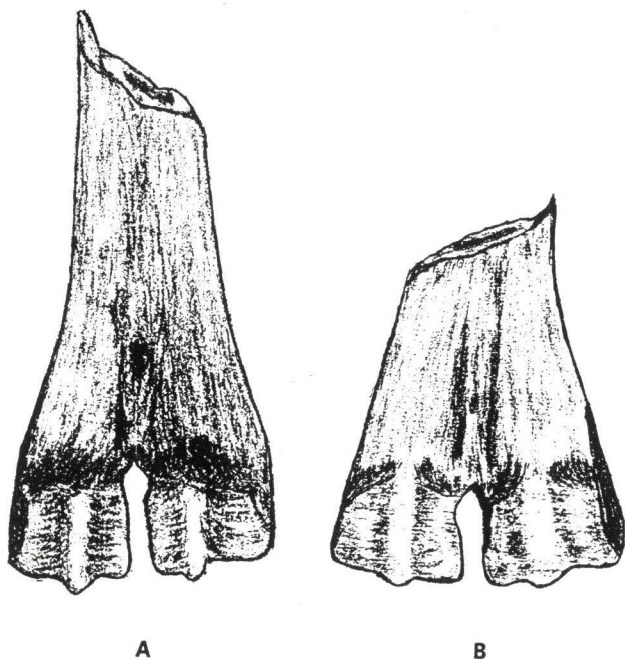
The supracondylar dimples are very clearly developed; in *B. primigenius* they are scarcely pronounced.

In *B. priscus* the supratubercles are so well pronounced that the contact area between the diaphysis and the articular condyles is swollen, whereas in *B. primigenius* those tubercles are scarcely developed and the contact area is almost flattened.

In *B. priscus* the medial and lateral intercondylar crests are parallel one each other, while in *B. primigenius* they tend to diverge distally.

CONCLUSIONS

B. priscus, a bovid of big size with heavy skeleton and large horns, has been pointed out for the first time in Italy presumably in the Fontana Ranuccio Faunal Unit (Late Galerian), while its presence seems to be not verified in the mammal assemblage of Riparo Visogliano (Bon *et alii*, 1991). In the upper part of the Middle Pleistocene (Rianian) the occurrences of this species are still rare, while during the Late Pleistocene it is well represented in the mammal assemblages of Central and Northern Europe and it is less frequent in those of Southern Europe. At the end of the Late Pleistocene



Text-fig. 4 - A) *Bison priscus* Bojanus: right metatarsal (anterior view).
 B) *Bos primigenius* Bojanus: left metatarsal (anterior view).

in the central-eastern Europe *B. priscus* was replaced by *B. bonasus*, a species of smaller size.

During the various climatic stages of the Late Pleistocene, *B. priscus* migrated northwards and westwards in the warm and temperate periods, while it moved southwards during the colder ones. During this time, in Northern Italy, *B. priscus* appears in the mammal assemblages referred to cold and dry stages, while in Southern Italy, where *B. primigenius* is the dominant species, *B. priscus* is extremely rare. It succeed in penetrating in Sicily where it was found at the Grotta dei Puntali (Pohlig, 1911; Fabiani, 1953; Burgio *et alii*, 1983) and Grotta S. Teodoro (Sala, 1986).

B. priscus is a species which is well adapted to the cold steppe environments, while *B. primigenius* prefers grasslands, open woods and margins of the forests. Besides, *B. primigenius* prefers a damper climate than *B. priscus*. Therefore the *B. priscus* and *B. primigenius* association in the Salento area let us think about a steppe environment, intercalated by woods and grasslands. The existence of a steppe environment in the Salento area is also confirmed by the presence of *Equus hydruntinus*, *Ovis tarda* and *O. tetrax* (Blanc, 1920, 1928).

The mammal assemblage of Melpignano, with the presence of a high percentage of *Cervus dama* together with the big pachyderms, can be referred to a temperate stage of the Late Pleistocene, during which the first evidence of a climatic deterioration begins to show, testified by the presence of both *B. priscus* and *E. hydruntinus*.

The correlation of the Melpignano fauna with those of many caves and «ventarole» of the Salento area, lets us to suppose this temperate phase could be referred to one of 5c-5a or the beginning of 4 stage of the paleotemperature scale (Bologna *et alii*, in this volume).

REFERENCES

- BLANC, G.A., 1920, Grotta Romanelli I. Stratigrafia dei depositi e natura e origine di essi: Arch. Antr. Etn., 5: (1-4): 1-39.
- , 1928 Grotta Romanelli II. Dati ecologici e paleontologici: Arch. Antr. Etn., 58 (1-4): 1-49.
- BOLOGNA, P., DI STEFANO, G., MANZI, G., PETRONIO, C., SARDELLA R. & SQUAZZINI E., 1993, Late Pleistocene mammals from the Melpignano «ventarole»: preliminary analysis and correlations: Boll. Soc. Pal., 33.
- BON, M., PICCOLI, G., & SALA, B., 1991, I giacimenti quaternari di vertebrati fossili nell'Italia Nord-orientale: Mem. Scien. Geol., 43: 185-231, 3 fig., 1 tab.
- BOTTI, U., 1890, La grotta ossifera di Cardamone in Terra d'Otranto: Boll. Soc. Geol. Ital., 19: 689-717.
- BURGIO, E., OLIVA N. & SCALONE, E., 1983, La collezione vertebratologica della Grotta dei Puntali presso Carini (Palermo): Naturalista Sicil. S. 4-7 (1-4): 67-79, Palermo.
- FABIANI, R., 1953, L'Istituto e il Museo di Geologia dell'Università di Palermo: (2° ed) Ist. Geogr. Tiberino, p. 46, Roma.
- LAWRENCE, B., 1951, Post-cranial skeletal characters of Deer, Pronghorn, and sheep-goat with notes on *Bos* and *Bison* (Part II): Pap. Peabody Mus., 35 (3): 9-43, Cambridge (U.S.A.).
- OLSEN, S. J., 1960, Post-cranial skeletal characters of *Bison* and *Bos*. Paper of Peabody Mus., Archaeol. Ethnol. Harvard Univ., 35 (4), 15.
- POHLIG, H., 1911, Bovides fossiles de l'Italie: Bull. Soc. Belge de Geologie, Proces verbal, 21 Nov. 1911, 25: 311-322, Bruxelles.
- SALA, B., 1986, *Bison schoetensacki* Freud. from Isernia La Pineta (early Mid-Pleistocene - Italy) and revision of european species of bison: Paleontographia Italica, 74: 113-170.
- SCHERTZ, E., 1936, Zur Unterscheidung von *Bison priscus* Boj. und *Bos primigenius* Boj. and Metapodien und Astragalus, nebst Bemerkungen über einige diluviale Fundstellen. Senckenbergiana, 18/1-6: 37-71.

(manuscript received July 22, 1994
accepted September 27, 1994)