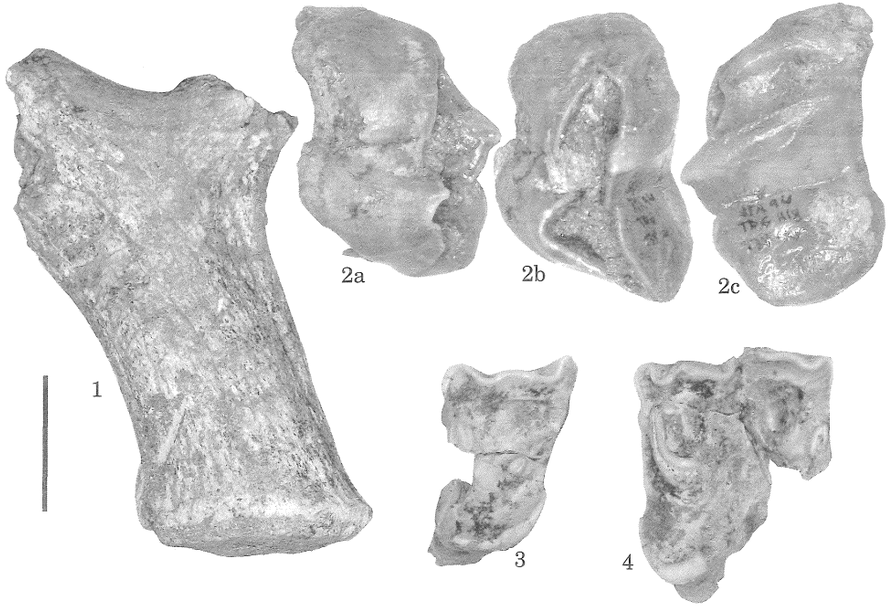

Figure 13. *Eucladoceros giulii* from Atapuerca TD6. (1) ATA96, TD6, talla 52, H-16, 505—right antler, external view. (2) ATA94, TD6, talla 39, H-18, 53—left D^2, lingual (a), occlusal (b) and buccal (c) views. Cervidae indet. from Atapuerca TD6. (3) ATA96, TD6, talla 45, I-18, b_n—left P^4, occlusal view. (4) ATA96, TD6, talla 47, H-18—left M^2, occlusal view. The bar represents 4 cm for (1), 1 cm for (2) and 2 cm for (3) and (4).

Discussion

The remains from TD6 cannot be attributed to *Leptobos*, the bovine species from Venta Micena or *Bos primigenius*. The morphology of the horn core resembles *Bison*. *Bison schoetensacki* and *Bison priscus* are too large and *Bison* from Piro Nord too small. General dimensions of teeth and bones resemble "*Bison voigtstedtensis*" and *Dmanisibos*.

A skull from the old excavations, claimed to be either from TD2 (Aguirre, 1995) or TD3 (Soto, 1987) was assigned to *Bison schoetensacki* cf. *voigtstedtensis*, although "*voigtstedtensis*" was already given species status (see Sher, 1997).

Sher (1997) discussed the direction of the horn cores in *Bison* and noted that those from Untermassfeld and Voigtstedt are directed much more posteriorly. The horncores of *Dmanisibos* and the skull from Atapuerca are also directed posteriorly.

The frontals between the horn cores have a convex transverse profile in *Bison* as early as in Pirro Nord. A concave transverse profile is present in material from Voigtstedt, Untermassfeld and Atapuerca assigned to *Bison*, and in *Dmanisibos*.

Bison from Pirro Nord, Isernia, Mosbach and other localities have relatively wide skulls. The skulls from Voigtstedt, Atapuerca and Dmanisi are relatively narrow.

Sher (1997) discussed in detail the robusticity of the metapodials; they are very robust in *B. priscus*, robust in *B. schoetensacki* and *Bison* from Pirro Nord and more slender in *B. menneri*. Robust metapodials are derived. *Dmanisibos* has small and slender metapodials (Vekua, 1997). Material from

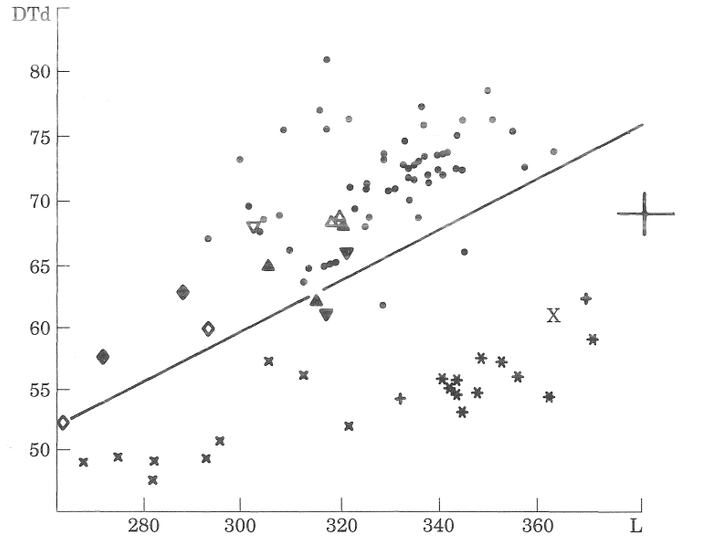

Figure 14. Bivariate plot of length (L) versus distal width (DT_p) in metacarpals of *Megaloceros* and *Eucladoceros*. The line indicates L=5 DT_p. *Eucladoceros*. Oblique crosses=*Eucladoceros* from Upper Valdarno (IGF). Asterisks=*E. giulii* from Untermassfeld (Kahlke, 1997). Crosses=*E. giulii* from Venta Micena ("*Praemegaceros solilhacus*" of Menéndez, 1987). Letter "X"=*E. giulii* from Atapuerca TD4. The average and ranges (n=3) for Apollonia-1 are indicated ("*Megaloceros* sp." of Kostopoulos, 1997). *Megaloceros verticornis* and (=?) *M. solilhacus* from Trimmingham (open triangle pointing downwards, Azzaroli, 1953), Voigtstedt (solid triangles pointing upwards, IQW), Süssenborn (solid triangles pointing downwards, IQW) and Soleilhac (open triangle pointing upwards, MCP). Diamonds=*Megaloceros dawkinsi (?)* from Mundesley (solid diamonds) and Sidestrand (open diamonds); data from Azzaroli (1953). Dots=*Megaloceros giganteus* from Europe (data from Lister, 1994).

the latest Late Pleistocene of Apollonia-1, assigned to *Bison* sp. (Kostopoulos, 1997), has metapodials of a robusticity comparable to the bison from Pirro Nord and *Bison schoetensacki*, and of a size intermediate between these two taxa, suggesting that these three forms might belong to a single lineage with increasing size but with stasis in the locomotor apparatus. A robusticity index cannot be calculated for the metacarpals from TD6, but their small distal width suggests that the metacarpals were relatively slender. Their distal width is outside the ranges of *B. schoetensacki* and close to the lower limit of *Bison* from Apollonia-1.

Posteriorly directed horncores, concave frontals, narrow skulls, and slender metapodials are primitive characters in the Bovinae, found long after the derived characters appeared at Pirro Nord and Apollonia-1. This might be explained by variability. However, the fact that these primitive characters occur together in Dmanisi (*Dmanisibos georgicus* Burchak-Abramovich & Vekua, 1992), Untermassfeld (*Bison menneri* Sher, 1997), Voigtstedt (*Bison voigtstedtensis* Fischer, 1975) and Atapuerca, suggests that these bovines are closely related and different from the *B. schoetensacki* and *B. priscus* lineages. The early evolution of *Bison* and similar forms is still poorly known. Pending a revision of early "*Bison*," the TD6 material is assigned here provisionally to Bovini cf. "*Bison voigtstedtensis*."

The morphologies described above (whether representing distinct species or just "primitive morphologies" within

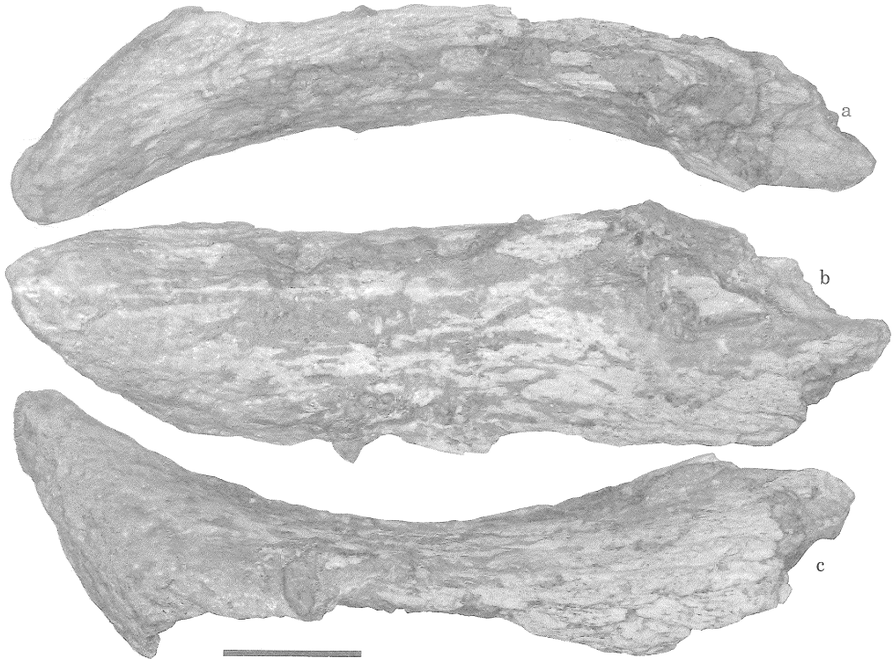

Figure 15. Bovini cf. "*Bison voigtstendtensis*" from Atapuerca TD6. ATA95, TD6, G-17, 144, z=508—tip of horn core. The bar represents 2 cm.

populations), occur latest in Voigtstedt. Agustí *et al.* (1987) placed Voigtstedt in their biozone MmQ3b, just below the Matuyama–Brunhes boundary. However, the locality seems to be in normally polarized sediments, and is generally placed in the Cromer (Wiegank, 1983). Taking this into account, the small bison-like bovid from TD6 suggests a late Early or an early Middle Pleistocene age.

Conclusions

The ungulates from Atapuerca TD6 include *Equus* cf. *altidens*, *Stephanorhinus etruscus*, *Sus scrofa*, *Dama nestii? vallonetensis*, *Cervus elaphus*, *Eucladoceros giulii*, Cervidae indet. and Bovini cf. "*Bison voigtstedtensis*."

S. etruscus, *D. n.? vallonetensis* and "*Bison voigtstedtensis*" are late Early and/or early Middle Pleistocene elements. *Sus scrofa* and *Cervus elaphus* seem to have entered Europe during the late Early Pleistocene. *E. giulii* is known from the late Early Pleistocene. The presence of a stenonid *Equus* is probably not very helpful. The fauna fits a late Early Pleistocene age, coinciding with palaeomagnetic findings that situate TD6 between the Jaramillo Event and Brunhes Epoch. Assuming a younger age would extend the known range of *E. giulii* into the Middle Pleistocene. However, this species has been recognized only recently and its full temporal range may not yet be known. Although the ungulates are suggestive of a latest Early Pleistocene age, they do not conclusively rule out an earliest Middle Pleistocene age.

Several of the taxa found in TD6 are considered to be part of the interglacial faunas in central Europe (*Dama*, *Sus*) and

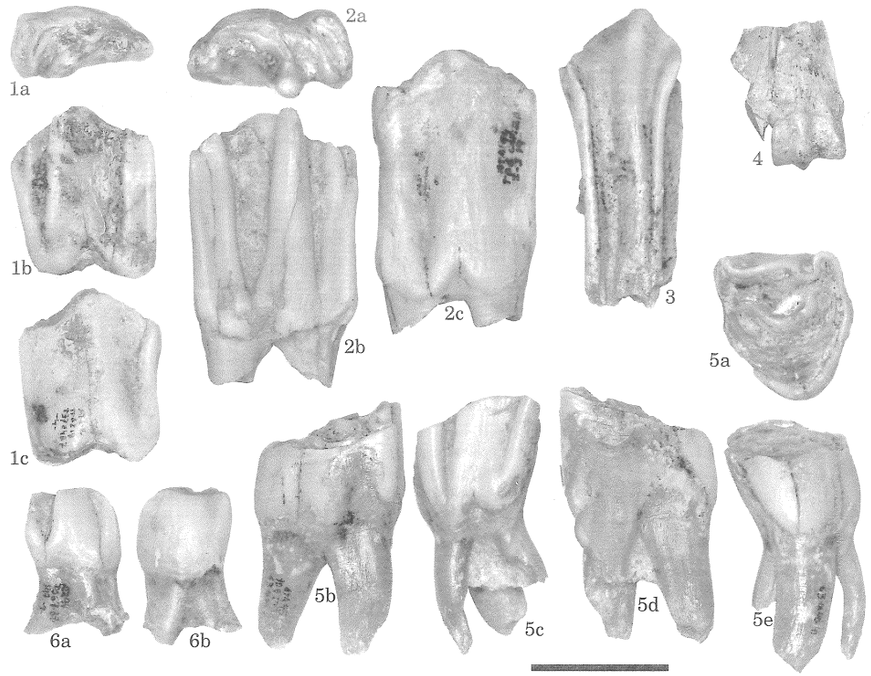

Figure 16. Bovini cf. "*Bison voigtstendtensis*" from Atapuerca TD6. (1) ATA94, TD6, talla 37, I-18—left P_3, occlusal (a), lingual (b) and buccal (c) views. (2) ATA94, TD6, I-3 (capilla), 19—right P_4, occlusal (a), lingual (b) and buccal (c) views. (3) ATA95, TD6, talla 40/41, H-17, 174—right M_x, first lobe, lingual view. (4) ATA94, TD6, H-18, talla 38, 19—distal metacarpal, anterior view. (5) ATA95, TD6, I-17, talla 40/41, 69—right P^4, occlusal (a), anterior (b), buccal (c), posterior (d) and lingual (e) views. (6) ATA94, TD6, H-17, talla 38, 19—left P_2, lingual (a) and buccal (b) views. The bar represents 2 cm for (1–3) and (5–6) and 6 cm for (4).

typical glacial taxa are lacking. The fauna from TD6 does not indicate an extremely cold climate. Typical glacial taxa include *Rangifer* and *Ovibos moschatus*. Others, such as *Alces* and *Saiga*, extended their ranges far to the southwest during glacial periods. Taxa like *Praeovibos* and *Ovibos* probably developed their "glacial" adaptations or life style gradually during the Middle and Late Pleistocene. Both *Praeovibos* and *Hippopotamus* are found in the Early Pleistocene of Venta Micena (Martínez Navarro, 1992); certainly no glacial environment.

"Cold taxa" are not known from Spain, except from the Cantabrian Cordillera and Pyrenees, and late in the Pleistocene (Aguirre, 1989). *Coelodonta antiquitatis* is known from a number of localities, as well as from cave art (Arsuaga Ferreras & Aguirre Enríquez, 1979). As far as I can judge, all of these localities are from the Late Pleistocene. The same seems to be the case with *M. primigenius* (Aguirre, 1989). The composition of the micromammal faunas suggests that Spain had a milder climate than Europe north of the Pyrenees throughout the Pleistocene (Sesé, 1994). The only record of a lemming from Spain (*Dicrostonyx andaluciensis*) is based on a single tooth from the Late Pleistocene, from an assemblage that otherwise does not indicate cold

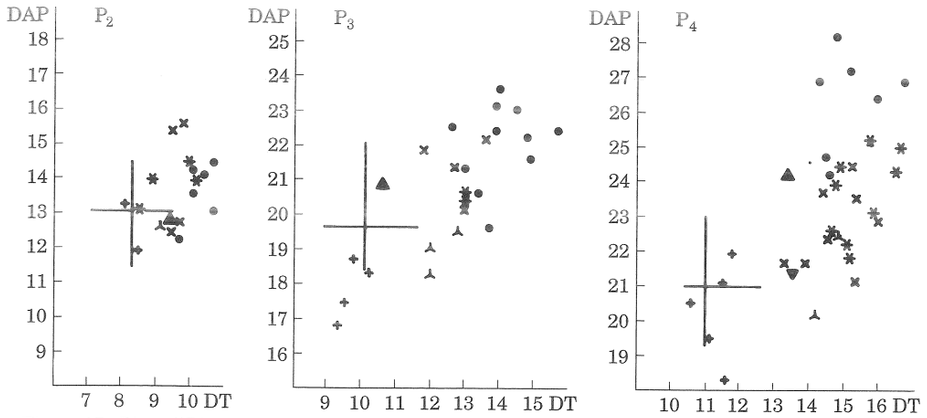

Figure 17. *Bison*, "*Bison*" and *Bos* lower premolars. The upper part of the figure gives maximum length (DAP)–maximum width (DT) bivariate plots. *Bos primigenius* from Paglicci (dots; DSCGPF). *Bison* from Pirro Nord (crosses; IGF), Mosbach (oblique crosses; NMM), Isernia (asterisks: DSCGPF) and Soleilhac-Blanzac (triangles pointing downwards; NMB). (Bovini cf.) "*Bison voigtstendtensis*" from TD6 (triangles pointing upwards), Voigtstedt (three pointed stars; IQW). Means and ranges of "*Bison*" from Venta Micena (Moyà Solà, 1987, n=7 for P_2 and n=12–14 for the other premolars).

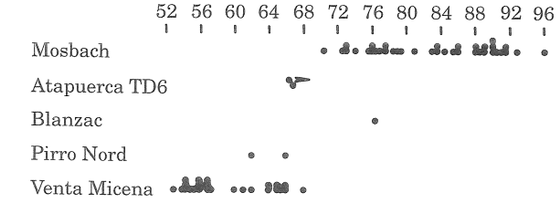

Figure 18. Distal width (DT_d) of *Bison* and "*Bison*" metacarpals. Provenance of data as in Figure 17.

conditions (Sesé, 1994). All this suggests that glaciations did not have a great impact on the Spanish large mammal community and certainly not in the Early and early Middle Pleistocene. The "interglacial" fauna seems to have had continuity in Spain, uninterrupted by glacial cycles.

Denell & Roebroeks (1996) supposed that humans "might have occasionally moved into southern Europe well before 500,000 years ago, as and when conditions permitted, but without living there 'continuously'." If the "interglacial" fauna had continuity in Spain, so might human populations.

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Appendix 1 Material and abbreviations of measurements

Abbreviations of measurements.

DAP Antero-posterior diameter in teeth or bones. Bones: DAP_p proximal, DAP_{pf} proximal facet, DAP_d distal, DAP_{df} distal facet, DAP_m minimal. Teeth: DAP_b basal, DAP_o occlusal. Antler: DAP_b DAP measured just above the burr, DAP_r DAP of burr.

DLL Linguo-labial diameter in incisors.

DMD Meso-distal diameter in incisors.

DT Transverse diameter ("width"). Bones: DT_p proximal DT_d distal, DT_{df} distal facet, DT_m minimal. Teeth: DT_a anterior lobe, DT_p posterior lobe, DT_{pp} third lobe in M3. Antler: DT_b measured just above burr, DT_r burr.

H Height. Bones: H_a, anterior, H_{ext} external, H_{int} internal. Teeth: H_{la} labial, H_{li} lingual. Antler: distance of the first bifurcation till the burr, H_{ext} external, H_{int} internal (measured in two ways: from below the burr and from the top of the burr). In the index $100H_{ext}/DAP_b$, the distance from below the burr is used.

I Index (DAP/DT) × 100% or (DMD/DLL) × 100%.

L Length of a bone.

R Diameter in the distal part of a humerus, measured at different places (R1, R2 etc.) (see van der Made, 1996).

Occasionally, measurements of teeth are given as DAP × DT, as DAP × $DT_a - DT_p$ or as $DAP_o/DAP_b \times DT_a - DT_p$ (for instance 23·5/22·9 × 12·3 − 12·2). For *Equus*, measurements are given at the occlusal surface, at half the height of the crown and 2 cm above the base (for instance: 25·3/25·1/23·4 × 15·7/15·6/14·9 − 15·6/15·4/14·7). In such formula, . . or −− indicates that measurements could not be taken because of damage or wear (−−), or that they were not taken for another reason (. .), for instance, the tooth was partially covered by sediment or bone.

Material

Equus cf. *altidens*

ATA94, TD6, G-16, talla 38, 16. Unworn left $D^{3/4}$. 34·5/33·5/33·5 × . ./25·6/25·6, H=29·1, Protocone . ./9·2/9·2.

ATA94, TD6, H-17, talla 38. 9. Three small fragments of a P_x or M_x.

ATA95, TD6, H-16, talla 40–41, 274. Fragment of left D^x.

ATA95, TD6, G-17, talla 40/41. Third phalanx forelimb. L basal >48·7, L dorsal −−, DT >71·1, width of facet 47·8, DAP_{pf} −−, DAP_p −−, angle ± 50°.

ATA95, TD6, G-18, talla 38–39, 53. Right $D^{3/4}$. 33·9/31·2/31·2 × 23·6/25·9/25·9, H>22·9, Protocone 9·1/. ./. ., PI 27, 2-3-1-2/1 protocone type 4, pli caballin, hypoconal constriction, hypoconal islet, wide parastyle, narrow mesostyle.

ATA95, TD6, H-16, talla 4, 77. Left $M^{1/2}$. 25·5/24·8. . × 25·1/25·7/. ., H>60, Protocone 9·5/9·2/. ., PI 37/37/. ., 1-3-1-1/0,

protocone type 4, no hypoconal constriction, nor hypoconal islet, wide parastyle, narrow mesostyle.

ATA95, TD6, I-16, 129. Left $M^{1/2}$. 27·1/26·3/. . × 24·9/26·1/. ., H>70, Protocone 13·2/12·2/. ., PI 49/46/. ., 1-4-2-1/0, protocone type 6, no hypoconal constriction, nor hypoconal islet, narrow para- and mesostyle.

ATA95, TD6, I-16, talla 53, 300. Left P_{2-4} and fragment of the anterior lobe, possibly of the M_1. P_2: 37·1/37·1/34·8 × 12·8/14·5/12·6 – 15·8/17·2/15·5, H>58·5, Double knot 16·5/17·1/16·8, Preflexid 9·6, Postflexid 17·3, type 7 linguaflexid, extremely shallow ectoflexid with pli caballinid. P_3: posterior half, DT_p 19·0/18·9/17·6, Postflexid 15·5, type 7 ectoflexid. P_4 (partially in mandible): 30·1/29·4/28·2 × 17·1/. ./. . – 17·6/. ./. ., H>77·2, Double knot 17·7/18·2/17·4, Preflexid 9·0, Postflexid ± 14·0 (partially covered by sediment), type 2 linguaflexid, type 1 ectoflexid, no pli caballinid.

ATA96, TD6, G-16, 239, talla 40–41. Lingual side of the left upper P or M. H>30, DAP ± 24, Protocone 9·7/– –/9·7, PI ± 40, 1-1-1-0/0, protocone type 3/4.

ATA96, TD6, H-17, 302, talla 50. Left $M^{1/2}$. 24·7/– –/25·2 × 26·8/– –/28·4, H> 34, Protocone 11·7/– –/. ., PI 47/– –/. ., 0-3-2-0/0, protocone type 3/6, no hypoconal constriction, nor hypoconal islet, wide and convex parastyle, wide mesostyle.

ATA96, TD6, I-16, talla 53, 298. Left $M_{1/2}$ (M_2 of the same individual as ATA96, TD6, I-16, 300?). 27·2/27·6/25·2 × 15·5/18·9/16·4 – 14·0/16·2/14·2, H>64, Double knot 15·4/17·4/15·7, Preflexid 6·9, Postflexid 8·3, type 1 linguaflexid with V-shape until near the bottom (where it nearly touches the ectoflexid and turns convex), deep ectoflexid type 6, no pli-caballinid.

ATA96, TD6, I-18, talla 48, 82. Left $M_{1/2}$. 27·6/27·8/25·5 × 16·5/16·4/15·0 – 15·9/17·5/15·0, H>53, Double knot 15·7/16·8/15·3, Preflexid 8·2, Postflexid 11·4, type 2 linguaflexid, type 1 ectoflexid, which does not enter the isthmus, no pli-caballinid.

ATA96, TD6, G-16, z=606, perfil, 281. Third phalanx, hind limb. L 50·1, dorsal length 48·6, width – –, width of facet 39·2, DAP_{pf} 20·9, DAP_p ± 34, angle 40–45°, circumference ± 125.

ATA96, TD6, H-16, talla 51, 481. Fragment of proximal facet of a third phalanx.

ATA96, TD6, H-18, 150. Right $P^{3/4}$ 29·0/– –/28·6 × 28·6/– –/27·8, H>42·2, protocone 6·8/– –/8·2, PI 23, 1-3-3-1/1, protocone type 4, but short and square, hint of a hypoconal constriction, no hypoconal islet, wide para and mesostyles.

ATA96, TD6, talla 49, G-18, 132. Root of left C^x.

ATA96, TD6, I-18, talla 44, 65. Right D_x/P_x/M_x, germ, central fragment.

ATA97, TD6, H-16, talla 54, 548. Left M_3. 30·9/33·2/31·5 × 12·9/12·8/12·7 – 11·3/11·3/11·4, H>61·5, preflexid 8·1, postflexid 8·3, double knot 13·6/15·0/14·3. Type 5 linguaflexid, but reaching the ectoflexid and therefore slightly "deformed", type 5 ectoflexid, entering the isthmus, no pli-caballinid.

ATA97, TD6, G-16, talla 54, 333. Left astragalus. Internal length ≥55·3, DT_p ≥42·2, DT_d 49·0, DAP_d facet 35·1.

Stephanorhinus etruscus

ATA95, TD6, H-16, talla 40–41, 165. Left $P_{3/4}$, anterior lobe. DT_a >19·1.

ATA95, TD6, H-16, talla 40–41, 195. Left D_3. 39·1 × 17·5 – 20·1.

ATA95, TD6, H-17, talla 40–41, 127. Left $M^{1/2}$, antero-buccal side damaged. DAP >45·2.

ATA95, TD6, G-16, talla 40–41, 132. Left D^2. 34·8 × 31·2 – 30·6.

ATA95, TD6, G-16, talla 42, G-16, 154. Fragment of upper cheektooth.

ATA95, TD6, H-16, talla 42, 290. Left $D^{3/4}$, antero-buccal fragment.

ATA95, TD6, H-17, talla 42, 203. Fragment of upper cheek tooth.

ATA96, TD6, G-18, talla 52, 445. Left astragalus. DT_p 68·3, H_{int} 68·9, H_m 57·8, H_{ext} 67·9, DT_{df} 61·5, DAP facet navicular 37·8.

ATA96, TD6, H-16, perfil. Posterior fragment of a left cheek tooth. DT_p >22·1.

Sus scrofa

ATA94, TD6, G-16, talla 39, 22. Left P_3 in a mandible fragment with the alveoli for the P_2. DAP 13·9, DT_a 6·4, DT_p 7·5.

Dama nestii? vallonetensis

ATA94, TD6, I-18, talla 37, 40. Right mandible with $P_2 – M_2$. P_2 10·7 × 6·6; P_3 13·1 × 7·8; P_4 13·4 × 8·8; M_1 14·9 × 10·2 – 10·9; M_2 17·5 × 11·9 – 11·4.

ATA94, TD6, I-16, talla 39, 116. Right distal humerus. DT_d facet 4·5, R1 33·0, R2 23·1, R3 28·1, R4 21·1.

ATA94, TD6, I-16, talla 38, sc. Left M^x. 19·1/. . × 19·6 – . ., Hla >18·1.

ATA94, TD6, G-17, talla 38, 6. Left naviculo-boid. DAP 30·9, DT 33·3.

ATA94, TD6, I-16. Right lunar. DAP 26·3, DT_p 17·1, DT_d 12·2, H_a 19·0, Facet magnum 9·0, Facet unciform 4·4.

ATA94, TD6, I-18, talla 37, 8, z=486. Right first phalanx, DAP_p >34·6, DT_p 29·6.

ATA94, TD6, H-16, talla 38, 20, z=510. Right third phalanx. DAP 17·0/19·7. DT_p 14·7, L 36·6.

ATA94, TD6, G-17, talla 39, 70. Juvenile right second phalanx. DAP_d 11·8, DT_d 17·8.

ATA94, TD6, I-18, talla 36, 22,. Distal metacarpal (left?). DT_d 32·9. Left pulley DAP 22·8, DT 15·2. Right pulley 22·9, 15·3.

ATA94, TD6, H-18, talla 38, 12. Dorso-proximal part of left first phalanx.

ATA95, TD6, G-17, talla 40–41, 118. Postero-proximo part of left metatarsal.

ATA95, TD6, H-18, talla 40–41, 76. Right proximal radius. DT_p >39·5.

ATA95, TD6, H-16, talla 40–41, 88. Left scapula. DAP_d >48·7, DAP_{df} 34·4, DT_d 32·3.

ATA95, TD6, I-17, talla 42, 74. Right shed antler. DAP_r 44·6, DT_r 47·7, DAP_b 35·9, DT_b 36·9, H_{ext} >51·9/>45·8, $100H_{ext}$/DAP_b >145.

ATA95, TD6, G-17, talla 42, 241. Sesamoid from behind the external side of a left first phalanx. L 13·4, DAP 10·7, DT 6·7.

ATA95, TD6, G-17, talla 40–41, 207. Right mandible with much worn M_{1-2}. M_1: 15·3/15·3 × 10·7 – 11·9. M_2: 19·4/19·4 × 12.8 – 12.2.

ATA95, TD6, G-17, talla 40–41, 197. Left naviculocuboid. DAP 28·1, DT31·8.

ATA96, TD6, H-16, talla 43, 385. Left I_2. DT 7·0, DMD 5·2, DLL 5·6, H – –, DMD root 3·9, DLL root 4·6.

ATA96, TD6, H-16, talla 43, 739. Proximal part of a left first phalanx. DT_p 17·1.

?ATA96, TD6, G-17, talla 52, 143. Paracone of right M^x.

?ATA96, TD6, I-17, talla 45, 109. Tip of the tine of an antler.

?ATA96, TD6, G-17, talla 52, 360. Left $M^{2?}$. 20·9/19·7 × 206 – ≥19·9.

ATA96, TD6, H-16, talla 43, 339. Proximal part of left first phalanx. DAP_p >22·7, DT_p 17·1.

ATA96, TD6, G-17, talla 44, 288. Distal part of left third phalanx.

ATA96, TD6, talla 48, lavado micro. Left P^3. 13·9 × 14·8 – 15·0. "Lavado micro" = found while wet screening sediment for micro-mammals.

ATA96, TD6, I-18, 77. Left pedicle and basal part of antler. Pedicle: DAP 40·2, DT 37·5. Antler: DT_b >36·4.

ATA96, TD6, H-17, talla 43, 215. Fragment of right mandible. Condyle: DT>14·3.

ATA97, TD6, H-16, talla 54, sc. Right P_3. 13·2 × 6·9 – 7·7.

ATA97, TD6, G-16, talla 54, 323. Left third phalanx. DAP_p >21·6/>19·1, DT_p 14·9, L 41·3.

ATA97, TD6, H-16, talla 54, 601. Basal fragment of shed antler (*Dama/Cervus*?).
ATA97, TD6, H-16, talla 54, 324. Basal fragment of shed antler.
ATA97, TD6, H-10, talla 54, 570. Right shed antler, basal part. Rose: DAP >60·7, DT 55·4. Antler: DAP_b 51·5, DT_b 43·9, H_{ext} 58·7/54·5, $100H_{ext}/DAP_b$ 114.
ATA97, TD6, G-16, talla 54, 349, z=645. Fragment of left shed antler. (*Cervus*?)
?ATA94, TD6, J-18, talla 37, 3. Shaft of left metatarsal. Juvenile. DAP_m 8·4, DT_m 9·0.
?ATA94, TD6, J-17/18 (capilla), talla 37. Left magnum. Juvenile.
?ATA94, TD6, I-16, talla 39, 68. Left scapula, distal part. Facet: DAP 29·2, DT 25·3.

Eucladoceros giulii Kahlke, 1997
ATA94, TD6, I-18, talla 37, 8. Right phalanx 1. Proximal fragment. DT_p 29·6.
ATA94, TD6, H-18, talla 39, 42. Left unciform. DAP 29·9, DT 27·6, H 22·6.
ATA94, TD6, H-18, talla 39, 53. Left D^2. 21·9 × 12·6 – 14·6, H_{la} 14·9.
?ATA94, TD6, H-18, talla 38, 23. Fragment of the distal pulley of a metapodial.
ATA95, TD6, I-17, talla 42, 81. Proximal part of a left third phalanx. DAP_p >31·2, DT_p 23·6, L – –.
ATA95, TD6, G-16, talla 40–41, 69. Dorso-proximal fragment of a right first phalanx.
ATA95, TD6, G-18, talla 38/39, 40. Fragment of the shaft of a metatarsal.
ATA96, TD6, H-16, talla 52, 505. Right shed antler, including base of the brow tine and base of main beam. Diameters (DAP × DT): below the burr: 57·4 × 52·0, burr: ≥67·2 × 63·6, above the burr: 60·3 × 55·5, brow tine 35·2 × 34·6, main beam: – – × ≥40·4. H_{ext} 124·9/119·8, H_{int} 127·5/115·7.

Cervus elaphus
ATA94, TD6, G-17, talla 38, 41. Right P_3. 17·9 × 9·7.
?ATA94, TD6, H-16, talla 38, 18, z=510. Right DI_1. DT 10·6, DLL 5·2, H_{li} 9·7, Root: DMD 5·2, DLL 4·9.
ATA94, TD6, H-18, talla 38, 20. Naviculocuboid. DAP 36·9, DT 36·1.
ATA96, TD6, talla 48. Left M^3. – –/ >25·1 × – – – 23·2.
ATA96, TD6, H-17, talla 43, 207. Sesamoid from behind the external side of the left first phalanx. L 15·6, DAP 13·0, DT 7·6.

Cervidae indet.
ATA95, TD6, H-16, talla 45. Paracone of left M^1.
ATA96, TD6, I-18, talla 45. Much worn left P^4 and M^2. P^4: – –/19·7 × 27·1. M^2: – –/ 30·4 × 32·7 – – –.
ATA96, TD6, H-16, talla 47, 435. Much worn left M^3. – –/28·3 × 30·4 – 27·5.

Bovini cf. "*Bison voigtstedtensis*"
ATA94, TD6, G-18, 32. Distal metacarpal. DT_d >66·7, DAP_m <33·3, left pulley: DAP 40·1, DT >28·3, right pulley DAP 41·5, DT 33·4.
ATA94, TD6, H-17, talla 38, 19. Left P_2. DAP 12·7, DT 9·5.
ATA94, TD6, H-18, talla 38, 19. Distal metacarpal with one pulley. Pulley: DAP 37·1, DT 32·6.
ATA94, TD6, H-18, talla 36. – –. Distal part of a right first phalanx. DT_d ≥32·4, DAP_d ≥24·4.
ATA94, TD6, I-17, talla 39, 23. Fragmentary left first phalanx. DT_p ≥32·7.
ATA94, TD6, I-3 (capilla), 19. Right P_4. 24·2/23·5 × 13·4, H_{la} 35·2.
ATA94, TD6, I-18, talla 37. Left P_3. 20·8/ 18·8 × 10·7.
ATA94, TD6, G-17, talla 39, 68. Sesamoid from behind the internal side of a left first phalanx. L 19·8, DAP 20·6, DT 17·1.
ATA94, TD6, H-17, talla 39, 43. Distal fragment of a right first phalanx.
ATA94, TD6, H-18, talla 39. Fragment of (probably) a right parietal.

ATA94, TD6, I-18, talla 37, 35. Fragment of left P^3.
ATA94, TD6, I-17, talla 39, 28. Fragment of distal pulley of metapodial.
ATA95, TD6, H-16, talla 40–41, 235. Sesamoid from behind the external side of a left first phalanx. L 23·1, DT 12·2, DAP 20·1.
ATA95, TD6, H-17, talla 40/41, 174. First lobe of right M_x, upper part, not worn.
ATA95, TD6, talla 40–41, 183. Sesamoid from behind the internal side of a left first phalanx. L 20·1, DAP 20·6, DT 16·7.
ATA95, TD6, G-16, 69. Distal metacarpal (left?). DT_d 67·4, DAP_m 28·9, left pulley DAP 36·9, DT 31·4, right pulley DAP 36·8, DT 37·6.
ATA95, TD6, G-17, 144, z=508. Tip of horn core.
ATA95, TD6, I-17, talla 40/41, 69. Right P^4. 18·2/16·0 × 21·7.
ATA95, TD6, H-17, talla 40–41, 106. Right ulnar. H 45·3, H_a 33·5, DAP 38·4, DT 26·8.
ATA95, TD6, H-16, talla 40–41, 158. Distal part of a left second phalanx. DAP_d 30·8, DT_d >27·5.ATA95, TD6, H-17, talla 40–41, 111. Right unciform. Articulates with ulnar no. 106. DAP 37·0, DT 35·7, H 29·1.
ATA96, TD6, G-18, talla 44, 106. Metacone of right M^x or $D^{3/4}$.
ATA96, TD6, H-16, talla 45, 419. Right first phalanx. DT_p >36, L >68, DAP_d >22·8, DT_d >32·2.
ATA96, TD6, G-17, talla 44, 285. Sesamoid from behind a left third phalanx. L≥14·9, DAP ≥11·1, DT 23·7.

Appendix 2 Abbreviations of collections

AVP=Accademia Valdarnese del Poggio, Montevarchi. DSCGPF=Dipartimento di Scienze Geologiche e Paleontologiche, Univesità di Ferrara, Ferrara. EBDS=Estación Biologica de la Doñana, Sevilla. HUJ=Hebrew University of Jerusalem. IGF=Istituto di Geología, Firenze. IPUW=Institut für Paläontologie der Universität Wien. IQW=Institut für Geowissenschaften, Bereich Quartärpaläontologie, Weimar. MB=Museo de Burgos. MCP=Musee Crozatier, Le Puy-en-Velay. MNCN=Museo Nacional de Ciencias Naturales, Madrid. NMB=Naturhistorisches Museum, Basel. NMM=Naturhistorisches Museum, Mainz. NMW=Naturhistorisches Museum, Wien. NNML=Nationaal Natuurhistorisch Museum, Leiden. TMH=Teylers Museum, Haarlem. UCBL=Université Claude Bernard, Lyon. UCM=Universidad Complutense de Madrid. ZMA=Zoölogisch Museum, Amsterdam.