

A JUVENILE MANDIBLE WITH DECIDUOUS TEETH OF *ANCYLOTHERIUM PENTELICUM* (PERISSODACTYLA, CHALICOTHERIIDAE, SCHIZOTHERIINAE), COLLECTED BY BARNUM BROWN FROM THE LATE MIOCENE OF SAMOS (GREECE)

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Chalicotheres are a relatively rare but important group of extinct perissodactyls, best known for combining clawed ungual phalanges with an herbivorous dentition. Unequivocal Chalicotherioidea first appeared in the Eocene of Asia; the family Chalicotheriidae is first known from the Oligocene and diversified into two subfamilies, the Chalicotheriinae and Schizotheriinae, both of which survived into the Pleistocene.

Only two chalicotheres species are known from complete skeletal remains: *Moropus elatus*, a schizotheriine chalicotheriid from the early Miocene of North America (Holland and Peterson, 1914; Coombs, 1978), and *Anisodon grande*, a chalicotheriine chalicotheriid from the middle Miocene of Europe (Filhol, 1891; Zapfe, 1979; Anquetin et al., 2007). Remains of other species range from very fragmentary to moderately complete. Over many years newly discovered elements have helped to fill in major gaps in our understanding of the anatomy of previously described species, as has recently been the case for the European Miocene schizotheriines *Metaschizotherium bavaricum* and *Metaschizotherium fraasi* (Coombs, 2009; Fahlke and Coombs, 2009).

*Ancylotherium* is the latest surviving member of the Schizotheriinae. The best-known species of this genus is *Ancylotherium pentelicum*, a characteristic but relatively uncommon member of the late Miocene (Turolian, MN 12–13) Pikermian Biome (Solounias et al., 1999; Solounias, Rivals, and Semperebon, 2010), which stretched from southeastern Europe into Asia. Gaudry and Lartet (1856) first established the species *Macrotherium pentelicum* for postcranial material from Pikermi (Greece). Gaudry (1862) later figured the material assigned to this species and named a new genus, *Ancylotherium*, to incorporate it. At that time no cranial or dental materials were included in *Ancylotherium*. Teeth were known but wrongly attributed to a rhinoceros (see historical comments by Schaub, 1943), because until Filhol's (1891) description of a complete skeleton of *Anisodon* from Sansan (France) no one recognized that the unusual clawed feet of chalicotheres belonged with their perissodactyl teeth. In the 150 years since *A. pentelicum* was first named, our knowledge of its anatomy has gradually increased. Notable milestones include the description of the forelimb (Schaub, 1943), maxillary dentition (Thenius, 1953), skull (Garevski, 1974; Geraads et al., 2007), lower jaw and dentition (Garevski and Zapfe, 1983), and additional postcranial elements (Roussiakis and Theodorou, 2001; Saraç et al., 2002). Two additional species of *Ancylotherium* are now known from partial skeletal materials from Africa: *Ancylotherium hennigi* (Dietrich, 1942; see also Butler, 1965, and Coombs and Cote, 2010) and *Ancylotherium cheboitense* Guérin and Pickford, 2005. It is also evident that the distribution of *Ancylotherium* extended into China, as attested by remains attributed to *Gansuodon pingliangense* Wu and Chen, 1976 and *Hoanghootherium anlungense* Tung, Huang, and Qiu, 1975, but strongly resembling *Ancylotherium* (Coombs, 1978, 1989; Geraads et al., 2006) and by early Pleistocene material referred to *Ancylotherium* sp. by Li and Xue (2004).

Geraads et al. (2001) gave some attention to the juvenile morphology of *Ancylotherium pentelicum* by figuring and describing an immature skull with DP2–DP4 from Bulgaria. Geraads, Spassov, and Kovachev (2006) subsequently figured additional upper deciduous teeth from Samos (Greece) for comparison. Morphology of the lower deciduous teeth of *A. pentelicum* has been less clearly portrayed. Dietrich (1928) showed a lower jaw with dp3, dp4, and m1 from Samos in occlusal view, but the single view, small size of the figure, and the presence of only a root of dp2 leave many aspects of the anatomy of this specimen uncertain. Mecquenem (1924–1925) provided measurements of a complete set of lower deciduous premolars (dp2–dp4) referable to *A. pentelicum* from Maragha (Iran), but did not figure or describe them in any detail. The current paper amends the gap and provides comparative information about the immature lower teeth and mandible.

ANCYLOTHERIUM FROM SAMOS

Solounias (1981) reviewed the history of the classic mammalian fossil collections from Samos, a Greek island in the eastern Aegean Sea near the coast of Turkey. He also relocated the old quarries and figured them in their geographic and geologic contexts. His table 9 gave bone bed locality information for many of the recorded species, including *Ancylotherium pentelicum*, shown to occur in 3 of the 11 bone beds of known stratigraphic position: S (Stefana District, collections by Forsyth Major), A ('Adrianos' = Adrianos District, collections by Forsyth Major and Acker), and Q1 (Quarry 1 in the Adrianos District, collections by Brown, Melentis, and Solounias). In addition, *A. pentelicum* is listed as present in two collections whose stratigraphic position is unknown: bone bed 1 of Schlosser (1904) and the Samos collection at the Mineralogical and Geological-Paleontological Institute of Münster (PIM). The stratigraphic and biostratigraphic comparisons in Solounias (1981:260) proposed that Q1, A, and probably the PIM collection are stratigraphically close to one another in the Main Bone Bed Member of the Mytilini Formation and that material from Stefana collected in 1887 by Forsyth Major is from "the same level as the Main Bone Beds."

More recently, Koufos (2009) and Kostopoulos et al. (2009) have updated information on fossil excavations on Samos, based on new collections and more detailed lithostratigraphy conducted by geologists from the University of Thessaloniki. In particular, figure 11 of Kostopoulos et al. (2009) shows the stratigraphic positions of Q1 and the A (Adrianos) site at about the same level as their new MTLA–E fossil sites in the upper Main Bone Bed Member of the Mytilini Formation.

Specimens of *A. pentelicum* from Samos are important components of several publications. Forsyth Major was the first to mention the Samos material (Major, 1888, 1894). Schaub (1943) used specimens collected by Forsyth Major and held in the museum at Lausanne (Switzerland) as the nucleus of his classic description and reconstruction of the forelimb of *A. pentelicum*. The immature lower jaw noted by Dietrich (1928) also came from Samos and is conserved in Berlin (Germany). Two of the upper