



The first Polish find of Lower Paleocene crocodile *Thoracosaurus* Leidy, 1852: geological and palaeontological description — reply

Marcin ŻARSKI, Gwidon JAKUBOWSKI, Eugenia GAWOR-BIEDOWA

Żarski M., Jakubowski G., Gawor-Biedowa E. (1998) — The first Polish find of Lower Paleocene crocodile *Thoracosaurus* Leidy, 1852: geological and palaeontological description — discussion. *Geol. Quart.*, 42 (4):483–484. Warszawa.

Marcin Żarski, Eugenia Gawor-Biedowa, Polish Geological Institute, Rakowiecka 4, 00-975 Warszawa, Poland; Gwidon Jakubowski, Museum of the Earth, Polish Academy of Sciences, Al. Na Skarpie 20/26, 00-488 Warszawa, Poland (received: 15.10.1998; accepted: 19.11.1998).



We are grateful to M. Machalski for his critical comments concerning our paper devoted to the crocodylian find. We consider it a pity that M. Machalski was not a co-author of the paper, because than he could have presented his views on the discussed subjects more fully.

Ad. 1. M. Machalski's remark about the misleading nature of the title is unfounded, since the title provides information about the age of the find and by no means suggests that thoracosaurian crocodiles are restricted to the Lower Paleocene.

Ad. 2. The paper is concerned with the remains of the crocodile of the genus *Thoracosaurus* from Paleocene deposits in Poland. Indeed, the authors erroneously ascribed the description of the Czarnogłowy specimen of *Machimosaurus hugii* to C. Meyer, yet this statement served only as an indication that the *Thoracosaurus* from Kamienny Dół is not the first fossil crocodile found in Poland.

Ad. 3. The Kazimierz Opoka is terminated with hard limestone, at the top of which the present authors place the Cretaceous/Tertiary boundary. The overlying formations were mixed up and almost destroyed in the Danian and therefore their age cannot be Maastrichtian. M. Machalski is entitled to his own interpretation of the Cretaceous/Tertiary boundary.

Ad. 4. The upper sequence of the Kazimierz Opoka, which is terminated with hard limestone, belongs to the *Belemnella kazimiroviensis* Zone, whose top part is defined by A. Błaszkiwicz as *Hoploscaphites constrictus crassus* and referred to in the paper.

Ad. 5. Indeed, in his unpublished paper M. Machalski did not point out when the lithification of the limestone had taken place. The present authors believe that it happened in the Danian.

Ad. 6. It is obvious that Paleocene foraminifers entered Maastrichtian deposits through being washed out or introduced by burrowing organisms. It appears that it was formulated in an understandable way.

Ad. 7. Of course, M. Machalski is right. Burrows were meant, not borings. It is a proof-reading oversight.

Ad. 8. The present authors are aware that *Lyropecten acuteplicatus* is restricted to Maastrichtian deposits, yet it is very interesting to note that it occurs up to one metre above the Cretaceous/Tertiary boundary. Other Maastrichtian deposits, e.g. belemnites, occur above the Cretaceous/Tertiary boundary up to 0.4 m only in this section. On p. 144 *Lyropecten acuteplicatus* is erroneously included among Paleocene fossils, but on p. 145 it is correctly defined as Maastrichtian fossil.

Ad. 9. Figure 4 was prepared on the basis of an unpublished paper (M. Machalski, M. Żarski in: M. Żarski 1997) and the present authors modified it in comparison with the original. The caption should read: Modified map, based on ...

Ad. 10–12. M. Machalski's comments concerning the of *Thoracosaurus*-bearing deposits are also partly true, since in the case of 19th-century finds from North America, France and Holland in reality there exists no palaeontological and geological documentation of the same degree of precision as possessed by the evidence gathered at Kamienny Dół, which

unequivocally points out to the Lower Paleocene age of the Polish *Thoracosaurus*. The age of the layers in which the known remains of thoracosaurian crocodiles have been discovered has been variously interpreted in existing literature on the subject. The Cretaceous/Tertiary boundary has been moved up and down, and, accordingly, it has been claimed that the layers in question are either Upper Cretaceous or

Lower Paleocene. In fact it might have been better to state that thoracosaurian crocodiles occurred at the turn of the Cretaceous and the Paleocene, which was indeed suggested in the caption to Fig. 4, p. 150.

Ad. 13. It is an obvious proof-reading mistake. The phrase should read: bivalves and gastropods, as in the English text.

Translated by Tomasz Wyżyński