

The mid-Cretaceous saga

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Ever since its introduction in 1822, the Cretaceous System has been arbitrarily divided into two or three series, a situation that continues unabated today to the obvious detriment of clarity in stratigraphic communication. Contrary to common belief, the current two-fold division into lower and upper Cretaceous, separated at the base of the Cenomanian (Ogg et al., 2016), has never been formally defined and ratified; it is merely a widely adopted practice. Throughout the last four decades, in particular, the terms mid-Cretaceous and middle Cretaceous have been increasingly used in the literature. A Google internet search (February 2017) for “mid-Cretaceous” or “middle Cretaceous” with corresponding terms in German, French, Spanish, Portuguese and Russian yields nearly half a million hits – a clear evidence that they fulfil a need in stratigraphic nomenclature. However, as there is no agreement about the scope of the unit, the terms mean different things to different authors, from the entire Barremian–Santonian interval to solely the Cenomanian, although in the majority of cases the term is used loosely without explanation. This terminological “law of the jungle” leads to confusion, and voices have been raised for a formal (re)division of the Cretaceous System (e.g., SCOTT et al., 2005; OGG, 2007; GRADSTEIN et al., 2008; KAKABADZE & BENGTON, 2009). During the nearly two hundred years since the Cretaceous System was introduced, a considerable amount of data has accumulated, providing a basis for ultimately settling the question of a two-fold vs. three-fold division. With its 80 million years, the Cretaceous is by far the longest of the Phanerozoic periods, and the informal [sic] early and late Cretaceous epochs even longer than the entire Silurian and Neogene periods. Most Phanerozoic systems are divided into three series, even though they may represent considerably shorter time spans than the Cretaceous.

Chronostratigraphic division is largely linked to palaeontological events manifested in the rock record. The historically and arguably still most important group for Cretaceous biostratigraphy and, by extension, chronostratigraphy are the ammonites. Major taxonomic turnover events, reflected at the family- and genus-group level, may indicate suitable boundaries between series/epochs. To produce a basis for a formal proposal for a division of the Cretaceous System/Period into series/epochs, the patterns of taxonomic turnovers among the key fossil groups, primarily ammonites, inoceramid bivalves and foraminifers, should be analysed in detail and integrated with data on palaeogeographic and palaeoclimatic events.

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