

hook-shaped Hamites, and the various groups were recognised in the classification by the use of descriptive adjectives. Buch also gave a clear exposition of the progressive complication in the sutural lines which could be observed in following the phylogeny of the Ammonitidæ from the Palæozoic epochs through the Mesozoic, and showed how a surmise might be made respecting the age of an Ammonitid genus from the relative degree of complexity in the sutural limits.

Buch's three sections, Goniatites, Ceratites, and Ammonites, were defined by subsequent writers more in harmony with zoological definitions of the group, but the discovery of the rich Triassic fauna of St. Cassian showed that the distinctions between these sections were by no means so sharp as had been supposed. Buch's work undoubtedly gave a new impulse to the study of fossil Cephalopods. The middle decades of the nineteenth century saw the publication of a large number of memoirs, elucidating the genetic relationships of the Palæozoic and Mesozoic genera. The erection of new genera and species went on rapidly, and the necessity began to make itself felt for a further sub-division of the typical genus Ammonites. Barrande, Hall, and other authors had already divided the original Nautilites into a number of genera.

The decisive step of sub-dividing the Ammonites was ventured by Suess in 1865. In a short memoir on the organisation of the Ammonites, Suess converted the adjectival nomenclature of the individual groups of species into names of genera (*Phylloceras*, *Lytoceras*, *Arcestes*), and pointed out that in addition to the sutural line, external form and ornamentation of the shell, there were other features of systematic value, such as the margin of the mouth and the length of the chambers. A similar reform was advocated by Alpheus Hyatt in his memoir on the Liassic Ammonites (1869). The previous nomenclature of families was discarded by Hyatt, and numerous new genera were erected, whose limits were much more narrowly defined than had been customary. As one might have expected, the new tendency met at first with strong opposition, but it was supported and followed by Laube, Zittel, Mojsisovics, Waagen, and Neumayr.

Waagen in 1871 combined the Ammonitid genera in eight groups, attributing great importance to the presence or absence of the shell plates termed "*Aptychus*" and "*Anaptychus*," and to the particular structure of these remains. Neumayr in