the English geologists assigned the Wealden formation, exclusive of the Purbeck strata, to the Lower Cretaceous horizon.

The definition of a limit has proved even more difficult in the regions with Alpine facies, where there is no littoral series of passage-beds from Jurassic to Cretaceous horizons. Marine strata of Upper Jurassic age are frequently covered conformably by similar deposits of Lower Cretaceous age, and any line of separation seems at first sight necessarily of an arbitrary character. Oppel, in a contribution to the *Zeitschrift* in 1865, opened the question of the Jurassic-Cretaceous limit in the Alps. He comprised under the name of "Tithonian Horizon" a number of Alpine and Carpathian deposits (the *Diphya limestones* of South Tyrol, the Northern Alps and Dauphiné, the *Aptychus shales*, the *upper mountain limestone* of the Northern Alps, and the *Stramberg strata*), together with the lithographic shales of Bavaria and Nusplingen, the Purbeck and Portland strata of England and the North of France, and on the basis of their peculiar Cephalopod fauna classified the Tithonian series as an independent group of strata between the Kimmeridge and the Neocomian horizons. Regarding the precise systematic position, Oppel seemed to incline rather to the inclusion of the Tithonian group in the Jurassic system. An enumeration of one hundred and seventeen Cephalopod species, most of them from Stramberg, Rogoznik, South Tyrol, and the lithographic shales of Franconia, affords the evidence upon which Oppel erected the Tithonian horizon.

Long before Oppel's paper, Beyrich had in 1844 drawn attention to the relations of the "Klippen limestone" and "Stramberg limestone"; and Stur, Hauer, Hohenegger, and Suess (1858) had identified both these limestone formations as Upper Jurassic, whereas Zeuschner (1844-48) had assigned the "Klippen" limestones of the Carpathians at first to Upper Jurassic, then to Neocomian, and had stated that the fauna was a mixed Jurassic and Cretaceous fauna.

Benecke showed, in his able work on the Triassic and Jurassic deposits of the Southern Alps (1866), that two faunas are contained in the red Jurassic Ammonite limestone, the younger of which contains *Terebutula diphya* as the leading fossil, and a number of peculiar Ammonites. The older is characterised by *Ammonites acanthicus* and other Upper Jurassic Ammonites. Benecke paralleled both horizons with