

The Tertiary deposits of the Swabian plateaux were studied by Quenstedt and Probst; those in Baden and Würtemberg were elucidated by Mandelslohe, Zieten, Klein, Miller, and Schill.

The sub-Alpine band of Tertiary deposits in Bavaria comprises the Flysch deposits of Eocene and Lower Oligocene age forming hills in front of the limestone mountains. On the undulating plains stretching northward are the Oligocene brown-coal strata and the younger Tertiary deposits. Sandberger, in 1853, was the first to recognise the Oligocene age of the brackish-water strata worked for coal at Miesbach, Penzberg, and Peissenberg. He identified *Cyrena semistriata* and other typical Upper Oligocene forms in the marls, and he compared the fauna of the marine series below the productive beds with the middle Oligocene fauna of the Weinheim sands near Alzey.

Gümbel in 1861 gave a full geological and palæontological account of these Tertiary deposits in his large volume on the Bavarian Alps. A new monograph on the fauna of the South Bavarian Oligocene Molasse, by H. Wolff, places the whole of the marine and brackish-water Oligocene formations of Southern Bavaria in the Upper Oligocene horizon. Similar conclusions had been formed by Theodor Fuchs and K. Mayer regarding the age of the equivalent deposits in the sub-Alpine band of Switzerland and Austria.

From what has been said it is evident that it was no longer difficult to determine the main divisions of Tertiary strata after the true principle had been discovered of identifying the *relative* age of the component members from a comparison of the faunas contained in them with one another, and with existing genera and species. But the attempts to provide a systematic zonal sub-division of the series, capable of general application, proved fruitless. Geographical areas and biological provinces attained a very high degree of local differentiation in Europe during Tertiary epochs, so that basins of deposit which appear to have had some kind of communication, or were at least very close to one another, nevertheless exhibit marked peculiarities in the lithological and palæontological development. Each basin passed through its own history of sedimentation, in nearly all cases a most chequered history. An area that was at one time an alluvial flat would at other times be usurped by an oceanic inundation, and again become dry