

Leymerie, and afterwards strongly advocated by Jules Martin in several able treatises (1860-65).

The next important advances in the knowledge of Alpine Trias were those made by Gümbel in the northern zone of the Alps. The volume cited above by Gümbel on the Bavarian Alps was accompanied by five geological map-sheets surveyed on the scale of 1:100,000, and by forty-two sections elucidating the geology of the Bavarian Alps. It was the work of a resourceful man with inexhaustible energy, an iron frame, complete mastery of the latest information in his subject, an unquenchable thirst for new facts, new discoveries, and withal possessed of a genius for stratigraphical problems. For fifty years C. W. Gümbel occupied a pre-eminent position amongst European geologists. As Director of the Bavarian Geological Survey he controlled a wide sphere of geological, mineralogical, and palæontological activity, and his own individual achievements are amongst the most remarkable in the history of Alpine geology.

Even in this first large volume by Gümbel, he unfolded his novel conception that there had been at one time a mountain-chain to the north of the present Alps, stretching from the south-west edge of the mountains and uplands of the Bavarian Forest westward as far as the central French plateau. Gümbel called this supposed earlier mountain-range the *Vindelic Chain*, and upon the hypothesis that it separated Lower Bavaria and the adjoining areas from the region of the existing Bavarian Alps, he explained the differences between the deposits of the Alpine and extra-Alpine Trias. Again, upon the hypothesis that the disappearance of the Vindelic Chain was in some way associated with the vast upheaval of the eastern Alps in Cretaceous and Tertiary epochs, Gümbel thought many of the complicated questions regarding the lithological composition and peculiar surface distribution of the "Flysch" and pebble-beds of the north Alpine slopes might find an explanation. Be that as it may, Gümbel's "Vindelic Chain" has received more countenance in the Alpine literature than usually falls to the share of the more daring flights of geologists.

A favourite theme with Gümbel was the determination of time-equivalents in the faunal succession displayed in the rocks of Lower Bavaria and those of the Bavarian Alps, and this tendency to emphasise the comparative aspect of Alpine and extra-Alpine deposits is apparent even in the nomenclature