

its numerous sections and correct fundamental conceptions of the tectonic relations of the various groups of strata, their *Sketch of the Structure of the Eastern Alps* provided the first intelligible wayboard for the student of the geology of the Tyrol, and was recognised as the starting-point of further research.

Excellent special sections were worked out by Lill von Lilienbach in the Salza Valley from Bischofshofen and Werfen to Teisendorf (1830), and from Werfenweng through the Tannen Range to Mattsee (1833). These afforded a true representation of the stratigraphical succession of the rock-groups which compose the northern limestone Alps, but Lill went far astray in the vague attempts which he made to identify the Alpine rocks with extra-Alpine formations. One of his most noteworthy contributions was his careful determination of the guiding thread supplied by the reddish and greenish "Werfen" shales, whose name is taken from their typical development at Werfen in that area. Lill traced them everywhere as the basis of the Alpine limestone, but he erroneously assigned them and a considerable part of the limestone to the Wernerian "transitional" series (*ante*, p. 58). Lill's chief stratigraphical results may be summarised in tabular form:—

*Upper Alpine Limestone*, comprising the "Hippurite" limestone of Untersberg, etc.

*Middle Alpine Limestone* (regarded as Jurassic). { Shales and sandstones with clays, gypsum, and the salt deposits of Hallein, Berchtesgaden, Hallstadt, and Aussee; Rossfeld and Schellenberg strata.

*Lower Alpine Limestone*, doubtfully indicated as "transitional formations." { Red marble of the Dürnberg; Adneth limestone with Ammonites; limestone and dolomite of the Watzmann, Tannen, and the Hohe Göll groups.

*Werfen Shales* with interbedded gypsum (regarded by Lill as a "transitional" formation).

H. G. Bronn examined the fossils collected by Lill, and in a supplementary paper to Lill's in the *Neues Jahrbuch* (1831), emphasised the unusual character of the fauna of Ammonites and Monotis present in the Dürnberg limestone, and its apparent affinities with Liassic and Transitional marine faunas.