

Upper Trias.	6.	Raibl strata with gypsum and rauch- wacke.	Raibl strata.	?
	5.	Arlberg lime- stone.	Hallstatt lime- stone (resp. Wetterstein)	Hallstatt limestone.
	4.	Partnach strata.	Partnach strata.	?
	3.	Virgloria lime- stone.	Virgloria lime- stone.	Virgloria limestone.
Lower Trias.	2.	—	Guttenstein limestone.	Guttenstein limestone.
	1.	?	Werfen strata.	Werfen strata.
Verrucano Con- glomerate (prob- ably Palæozoic).				

It will be seen that Richthofen sub-divided the true Trias, exclusive of the Dachstein limestone and Kössen beds, into two groups, upper and lower, which are applicable both in the northern and southern Alps. The Werfen strata pass upward into the black, poorly-fossiliferous limestones for which Hauer had introduced the name of *Guttenstein strata*. In 1852, it had been shown by Kudernatsch that the upper layers of these strata contain numerous hornstone concretions, are thinly-bedded, and nodular.

Several Brachiopod species (*Terebratula trigonella*, *Spirifer fragilis*, *Mentzeli*, etc.) were found in these upper horizons by Pichler in the neighbourhood of Innsbruck, and by Escher near Reutte. Richthofen found Ammonites and Bivalves resembling *Monotis* in these layers at the Virgloria Pass, and the characteristic Brachiopods in the Lichtenstein area. As the Guttenstein limestones frequently alternate with Werfen strata in the eastern Alps, Richthofen separated the Guttenstein strata from the upper more characteristic hornstone layers, and called the latter *Virgloria Limestone*.

Gümbel had found in the Partnach ravine, near Partenkirchen, marly shales with *Halobia Lommeli* (afterwards called *H. Parthanensis*) and *Bactryllium Schmidti*. Above these marls and shales in the Vorarlberg, Richthofen had found a dark-