

Maypo in Chili), and D'Orbigny has described Ammonites and Gryphites from the Himalaya and the Indian plains of Cutch, these remains being identical with those found in the old Jurassic sea of Germany and France.

The strata which are distinguished by definite kinds of petrifications, or by the fragments contained within them, form a geognostic horizon, by which the inquirer may guide his steps, and arrive at certain conclusions regarding the identity or relative age of the formations, the periodic recurrence of certain strata, their parallelism, or their total suppression. If we classify the type of the sedimentary structures in the simplest mode of generalization, we arrive at the following series in proceeding from below upward :

1. The so-called *transition rocks*, in the two divisions of upper and lower graywacke (silurian and devonian systems), the latter being formerly designated as old red sandstone.

2. The *lower trias*,* comprising mountain limestone, coal-measures, together with the lower new red sandstone (Todtliegende and Zechstein).†

3. The *upper trias*, including variegated sandstone,‡ muschelkalk, and keuper.

4. *Jura limestone* (lias and oolite).

5. *Green sandstone*, the quader sanstein, upper and lower chalk, terminating the secondary formations, which begin with limestone.

6. *Tertiary formations* in three divisions, distinguished as granular limestone, the lignites, and the sub-Apennine gravel of Italy.

Then follow, in the alluvial beds, the colossal bones of the mammalia of the primitive world, as the mastodon, dinothe-

* Quenstedt, *Flötzgebirge Würtembergs*, 1843, s. 13.

† Murchison makes two divisions of the *bunter sandstone*, the upper being the same as the *trias* of Alberti, while of the lower division, to which the *Vosges sandstone* of Elie de Beaumont belongs—the *zeckstein* and the *todtliegende*—he forms his *Permian* system. He makes the secondary formations commence with the *upper trias*, that is to say, with the upper division of our (German) *bunter sandstone*, while the Permian system, the carboniferous or mountain limestone, and the devonian and silurian strata, constitute his *palæozoic formations*. According to these views, the chalk and Jura constitute the upper, and the keuper, the muschelkalk, and the *bunter sandstone* the lower secondary formations, while the Permian system and the carboniferous limestone are the upper, and the devonian and silurian strata are the lower palæozoic formation. The fundamental principles of this general classification are developed in the great work in which this indefatigable British geologist purposes to describe the geology of a large part of Eastern Europe.