

record of the history has been constantly interrupted: now by upheaval, now by volcanic outbursts, now by depression, now by protracted and extensive denudation. These interruptions serve as natural divisions in the chronicle, and enable the geologist to arrange his history into periods. As the order of succession among stratified rocks was first made out in Europe, and as many of the gaps in that succession were found to be widespread over the European area, the divisions which experience established for that portion of the globe came to be regarded as typical, and the names adopted for them were applied to the rocks of other and far distant regions. This application has brought out the fact that some of the most marked geological breaks in Europe do not exist elsewhere, and, on the other hand, that some portions of the record are much more complete there than in other regions. Hence, while the general similarity of succession may remain, different subdivisions and nomenclature are required as we pass from continent to continent.

The smallest and simplest subdivision of the Geological Record is a *stratum*, layer, seam or bed. As a rule it is distinguishable by lithological rather than palæontological features. Where a bed, or limited number of beds, is characterized by one or more distinctive fossils, it is termed a *zone* or *horizon*, and, as already mentioned, is often known by the name of a typical fossil, as the different zones in the Lias are by their special species of ammonite.³ Two or more such zones, united by the occur-

³ Prof. Gaudry estimates the total number of zones in the European geological series at 114. In this calculation the Jurassic system is allowed no fewer than 34; the Carboniferous and Permian together, 10; and the Cambrian and Silurian together, 20 ("Enchaînements du Monde Animal: Fossiles Primaires," 1883). Prof. Lapworth has recognized 20 distinct graptolite zones in the Cam-