

like those of the Magnesian Limestone group of England. The Kupferschiefer contains numerous fish (*Palæoniscus Freieslebeni*, *Platysomus gibbosus*, etc.). This deposit is believed to have been laid down in some inclosed sea-basin, the waters of which, probably from the rise of mineral springs connected with some of the volcanic foci of the time, were so charged with metallic salts in solution as to become unfit for the continued existence of animal life. The dead fish, plants, etc., by their decay, gave rise to reduction and precipitation of these salts as sulphides, which thereupon inclosed and replaced the organic forms, and permeated the mud at the bottom. This old sea-floor is now the widely-extended band of copper-slate which has so long and so extensively been worked along the flanks of the Harz. After the formation of the Kupferschiefer the area must have been once more covered with clearer water, for the Zechstein Limestone contains a number of organisms, among which *Productus horridus*, *Spirifer undulatus*, *Strophalosia Goldfussi*, *Terebratula elongata*, *Camarophoria Schlotheimii*, *Schizodus obscurus*, and *Fenestella retiformis* are common. Renewed unfavorable conditions are indicated by the dolomite, gypsum, and rock-salt which succeed. Reasoning upon similar phenomena as developed in England, Ramsay has connected them with the abundant labyrinthodont footprints and other evidences of shores and land, as well as the small number and dwarfed forms of the shells in the Magnesian Limestone, and has speculated on the occurrence of a long "continental period" in Europe, during one epoch of which a number of salt inland seas existed wherein the Permian rocks were accumulated. He compares these deposits to what may be supposed to be forming now in parts of the Caspian Sea.

Some of the deposits of the Zechstein in Germany have a great commercial value. The beds of rock-salt are among the thickest in the world. At Sperenberg, near Berlin, one has been pierced to a depth of nearly 4000 feet; yet its bottom has not been reached. Besides rock-salt and gypsum there occur with those deposits thick masses of salts of potash (*Carnallite*) and magnesia (*Kieserite*) and other salts.

In Bohemia (pp. 1356, 1386, 1400) and Moravia, where the Permian system is extensively developed, it has been divided into three groups. (1) A lower set of conglomerates, sandstones, and shales, sometimes bituminous. These strata contain diffused copper ores, and abound here and