

Ardennes, and of Lapworth on the north-west Highlands, revealed many new and highly interesting subjects of research in connection with dynamo-metamorphism.

Johann Lehmann, in the work mentioned above (p. 355), accepted the views of Lossen, and demonstrated the effects of "dislocation metamorphism" from a large number of excellent illustrations of microscopic rock-sections. According to Lehmann, the metamorphic rocks may be arranged in two groups. One comprises the various modifications of gneiss, granulite, felsite, and hornblendic schist which have originated as rock-material consolidated from molten magma, and have received their characteristic foliate structure from the action of pressures before solidification had been completed. He advocated the plutonic origin of this group upon the assumption that there is in the crust a corresponding rock-magma, the source of the deep-seated eruptive rocks, granite, syenite, diorite, gabbro, and that these rocks are connected with the gneiss group by a complete series of transitional modifications.

The other group comprises the remaining crystalline schists, gneissic schist, micaceous schist, chloritic schist, talcose schist, phyllites, etc. These have been produced by "dislocation metamorphism" carried out in very high degrees. In the case of gneissic schist the original rock-material, while undergoing the processes of metamorphism, has been invaded by, or impregnated with, granitic injections, but the series of typical schists have been metamorphosed without any injection of foreign magma. The original character of the rock-material is, according to Lehmann, not always demonstrable, but he thinks it abundantly evident that the metamorphic series is intimately associated in the field both with fragmental or clastic deposits and with rocks of igneous origin. Lehmann insisted that it was erroneous to attribute the metamorphic schists to a definite, pre-Cambrian geological epoch; it was in his opinion far more probable that they belonged to the different epochs during which extensive mountain-movements had been in progress. Professor Barrois in 1884 likewise showed that the schists and gneisses in Brittany, which had been regarded as pre-Cambrian, really represented metamorphosed sedimentary deposits belonging to various Palæozoic epochs.

The involved stratigraphical problem presented by the