

the inference that the succession of the primitive rocks in a downward direction, corresponds to their age from oldest to youngest, because it was, of course, through a solidification from the outside inwardly, that the strata in question were formed, (*Lehrbuch I*, 489). The only way of explaining the origin of the newer cryptogenous rocks, left to the supporters of this hypothesis, is to suppose that their material has been protruded from the interior through the earth's crust in an eruptive form.

The most considerable difficulties which this hypothesis has to contend with, arise from the relations of the structure of the primitive formations, and from the mineralogical character of certain of the rocks belonging to it. Whether these difficulties can be explained away by the supposition of a hydro-pyrogenous development of the outside part of the primitive solidified crust, as indicated by Angelot, Rozet, Fournet, Scheerer and others, we must leave undecided in the meantime. Scheerer attempted, in a peculiar manner, to overcome the difficulties which the structure and architecture of the gneiss present. He regards them as an original phenomenon, produced during the solidification itself, by the action of electro-magnetic currents; and comes to the final conclusion, "that the primitive formations, with all the diversity of their rocks, are only to be regarded as the first hardened crust of the solidifying earth." If the vertical position of the primitive gneiss strata, as displayed in their parallel-zoned, fan-shaped and gable-formed architecture, is really to be looked upon as their original position, then the verdict which Kittel thus expressed, must be pronounced correct: "so long as a hypothesis is unable thoroughly to explain the almost vertical position of the primitive strata, it cannot be regarded as even approximately near the truth." (*Skizze der geogn. Verhältnisse von Aschaffenburg*, p. 40).

Scheerer concludes from the contortions and undulations of the gneiss layers, that the primitive rocks must have originally been in a soft, plastic state, and Macculloch, even earlier, arrived at the same conclusion, from the surprising contortions of the mica-schist, which he compared with similar windings in the structure of certain basalts. There is probably nothing to be said against the correctness of this deduction, which receives complete confirmation from the so frequently occurring elongation of the constituent of gneiss and other primitive rocks. But whether this plastic condition has been occasioned by high temperature alone,