

gian uplands overlies the Silurian stage 2 in the Christiania district. Subsequently H. H. Reusch obtained from the Bergen district clear proof of the Silurian age of certain crystalline rocks in that part of Norway.⁶⁸ He found among masses of mica-schist, hornblende-schist, gneiss, and other crystalline rocks, intercalated bands of conglomerate which, while obviously of clastic origin, have undergone enormous compression, the pebbles being squeezed flat and the paste having become more or less crystalline. The occurrence of such bands suggests a sedimentary origin for the whole series of deposits. But from several localities he obtained fossils which have been recognized as undoubtedly Upper Silurian. Some of the fossils occur in a crystalline limestone, which is intercalated in a dark lustrous phyllite. But they are found, as casts, most abundantly in a light-gray lustrous micaceous schist, which, under the microscope, is observed to be composed in large measure of quartz, not having a fragmental aspect, with mica, rutile, and tourmaline. The fossils recognized comprise *Phacops*, *Calymene*, several undeterminable gasteropods and brachiopods, *Cyathophyllum*, *Halysites catenularia*, *Favosites*, *Rastrites*, *Monograptus*, and some others.

According to Reusch the sequence of rocks is continuous, and their thickness must be at least 16,000 feet. If we suppose that the fossiliferous zones have been brought into an older series by plication of the crust, the fact remains that the rock in which most of the fossils occur is itself a micaceous schist, like those among which it is imbedded, and therefore a metamorphic rock. It is consequently proved that some at least of the metamorphic rocks of Norway are of Silurian age, and are associated with evidence of great mechanical movements in the crust of the earth.

The Alps.—In the geological structure of the central Alps, crystalline schists play an important part. Originally these rocks were regarded as one series, of much more ancient date than the ordinary sedimentary formations, and of very different origin. The discovery of Silurian, Devo-

⁶⁸ "Silurfossiler og Pressede Konglomerater i Bergensskifrene," Christiania, 1882; or the same work translated into German by R. Baldauf, "Die fossilienführenden krystallinischen Schiefer von Bergen in Norwegen," Leipzig, 1883. In the year 1889 I had an opportunity of personally going over Dr. Reusch's Bergen region and of collecting fossils from the rocks in which he found them. There can be no doubt that he has demonstrated that the metamorphism of that district has been connected with powerful dynamical movements, the latest of which are of younger date than the Upper Silurian period.