

garnet are also of frequent occurrence. (See Book IV. Part VIII.)

*Production of the schistose structure.*—All rocks are not equally permeable by water, nor is the same rock equally permeable in all directions. Among the stratified rocks especially, which form so large a proportion of the visible terrestrial crust, there are great differences in the facility with which water can travel, the planes of sedimentation, or those of cleavage or shearing where these have been developed, being naturally those along which water passes most easily. It is along these planes that differences of mineral structure and composition are ranged. Alternate layers of siliceous, argillaceous, and calcareous material vary in porosity and capability of being changed by permeating water. We may, therefore, expect that unless the original stratified structure has been effaced or rendered inoperative by any other superinduced structure, it will guide the metamorphic action of underground water, and will remain more or less distinctly traceable even after very considerable mineralogical transformations have taken place. Even without this guiding influence, superheated water can, to a certain extent, produce a schistose structure, parallel to its bounding surfaces, as Daubrée's experiments upon glass, above cited, have proved.

The stratified formations consist largely of silica, silicates of alumina, lime, magnesia, soda and potash, and iron oxides. These mineral substances exist there as original ingredients, partly in recognizable worn crystals, partly in a granular or amorphous condition, ready to be acted on by permeating water under the requisite conditions of temperature and pressure. We can understand that any re-combination and re-crystallization of the silicates will probably