

CHAPTER VI.

ON GNEISS AND MICA-SLATE, AND THE ROCKS WHICH ARE ASSOCIATED WITH THEM.

On the Passage of Granite into Gneiss.—Gneiss and *Granit veiné*.—Mica-Slate.—Formation of Gneiss and Mica-Slate.—Talcous Slate, and Chlorite Slate.—Crystalline Limestone denominated Primary, occurs both in Primary and Secondary Mountains.—Formation of Limestone and Coral Islands by Animal Secretion.—Dolomite, or Alpine Magnesian Limestone.—Serpentine and Ollite, or Potstone.—Euphotide or Saussurite the hardest and heaviest of Rocks.—Trap Rocks changed to Serpentine.—Eurite or White Stone.—Primary Porphyry a Mode of Granite.—Recurrence of the same Rocks in Rock Formations of different Epochs.

THE principal primary rocks, enumerated with granite in the preceding chapter, were Gneiss and Mica-slate. With these, certain rocks are frequently associated, and are therefore regarded as primary; for, where one rock occurs imbedded in another, it is evident that the enclosed rock must be as ancient as the rock which enfolds it, unless the imbedded rock has been subsequently protruded within more ancient rocks, as is the case with some volcanic or trap rocks.

Gneiss received its name from the German miners; according to Mr. Jameson, the decomposed stone on the sides of some metallic veins was first so called; but Werner designated by this term a schistose or slaty granite, abounding in mica. Granite frequently passes into gneiss by an almost imperceptible gradation: where the quantity of felspar decreases, and the crystals or grains become smaller, if the mica increases in quantity, and is arranged in layers, the rock loses the massive structure, and becomes schistose; we have then a true gneiss. By the reverse of this process, if the quantity of felspar increases, and the mica diminishes, the rock loses the schistose structure and becomes massive, and we have granite again. Some geologists call this secondary granite; but the upper and lower granite, and the gneiss, are in this instance, but different modes of the same rock.

The granite of the Alps, which Saussure calls *granit veiné*, is properly an incipient state of gneiss: the mica is arranged in thin parallel laminæ varying in distance from each other; when they approach very near, they form what in hand specimens is called true gneiss. When the parallel layers of mica are at some distance from each other, they give a striped appearance to the rock. Laminæ of quartz, of considerable thickness, sometimes separate the felspar from the mica, and occasionally, masses of quartz are imbedded in gneiss. When the mica becomes very abundant, and the other constituent parts are small in size and quantity, gneiss passes into mica-