

hydrous magnesian silicates, notably to serpentine and talc. In the weathering of the aluminous varieties, silica, lime, magnesia, and a portion of the alkalis are removed, with conversion of part of the earths and the iron into carbonates. The further oxidation of the ferrous carbonate is shown by the yellow and brown crust so commonly to be seen on the surface or penetrating cracks in the hornblende. The change proceeds until a mere internal kernel of unaltered mineral remains, or until the whole has been converted into a ferruginous clay.

Anthophyllite (Rhombic Amphibole $(\text{MgFe})\text{SiO}_3$) is a mineral which occurs in bladed, sometimes rather fibrous forms, among the more basic parts of old gneisses; also in zones of alteration round some of the ferro-magnesian minerals of certain gabbros.

Soda-amphiboles resemble ordinary hornblende, but, as their name denotes, they contain a more marked proportion of soda. They include a blue variety called *Glaucophane*, which is found abundantly in certain schists; *Riebeckite*, which is also blue and occurs in some granites and microgranites; *Arfvedsonite*, a dark greenish or brown variety.

Uralite is the name given to a mineral which was originally pyroxene, but has now by a process of paramorphism acquired the internal cleavage and structure of hornblende (amphibole). Under the microscope a still unchanged kernel of pyroxene may in some specimens be observed in the centre of a crystal surrounded by strongly pleochroic hornblende, with its characteristic cleavage and actinolitic needles (postea, p. 1040). *Smaragdite* is a beautiful grass-green variety also resulting from the alteration of a pyroxene.

Augite (Monoclinic Pyroxene, CaO 12-27.5, MgO 3-22.5, FeO 1-34, Fe_2O_3 0-10, Al_2O_3 0-11; SiO_2 40-57.4). Divided like hornblende into two groups. 1st. Non-aluminous, with a prevalent green color (malacolite, coccolite, diopside, sahlite, etc.). 2d. Aluminous, including generally the dark green or black varieties (common augite, fassaite). It would appear that the substance of hornblende and augite is dimorphous, for the experiments of Berthier, Mitscherlich and G. Rose showed that hornblende, when melted and allowed to cool, assumed the crystalline form of augite; whence it has been inferred that hornblende is the result of slow, and augite of comparatively rapid cooling.²⁸ Under

²⁸ The same results have been obtained recently by Fouqué and Michel-Lévy, "Synthèse des Minéraux et des Roches," 1882, p. 78.