sandstones, and sandstones, as they approach granites, lose their (sometimes fossiliferous) characters, and become changed into crystalline limestones, serpentine, &c., and quartz rock. In other cases gradual changes of a different kind are observed in slaty and schistose rocks as they approach granites. Clay-slates are simply clays consolidated by pressure, often affected by cleavage, and sometimes chemically altered. Approaching granites ordinary slates often assume a foliated structure by the development of distinct mineral layers of quartz, felspar, and mica. This is gneiss. Analyse some kinds of mica-slate, gneiss, and common sandy clay, and their average composition will not differ more than three clays, three pieces of gneiss, and three bits of granite often do from each other.

Granite is sometimes merely gneiss still further metamorphosed by heat in the presence of moisture; and, though this is not the popular notion, I have long held it, and some other geologists share this opinion. When slate is changed to gneiss, there is no development of materials which were previously absent, but simply a re-arrangement of its constituents, according to their chemical affinities, in rudely crystalline layers, which seem in gneiss to have found facilities for their development in pre-existing planes, whether of bedding or of cleavage; or, in other words, if the rocks be uncleaved when metamorphism occurs, the foliated planes show a tendency to coincide with those of bedding; but if intense cleavage has preceded, the foliation will generally tend to follow the planes of cleavage. Furthermore, in gneissic rocks, garnets, schorl, staurolite and staurotide, hornblende, and other minerals are frequent in some localities, especially near and in contact with granite. All the chief materials of these are