

cooled under a vast pressure of the ocean and its subjacent beds; and hence they are called *plutonic rocks*; whereas the latter are denominated *volcanic rocks*.

There is strong reason to believe that in some instances, as in Saxony, and in Sutherlandshire, and Arran in Scotland, granite has been protruded through the strata after it became solid. Solid basalt was protruded in a similar manner, according to Von Buch, in the year 1820, in the island of Banda, in great quantities.

The most important of the unstratified rocks will now be described in the order of our classification, as nearly chronologically (beginning with the oldest), as the present state of knowledge will admit.

I. GRANITIC ROCKS.

The essential ingredients of granite are quartz, feldspar, and mica. Its prevailing colors are white and flesh-colored. In some cases the materials are very coarse, the crystalline fragments being a foot or more in diameter. In other cases, they are so fine as to be scarcely visible to the naked eye; and between these extremes there exists an almost infinite variety. The fine-grained varieties are best for economical uses; but the coarser varieties abound most in interesting simple minerals.

Varieties. *Graphic granite or Pegmatite*, is composed of quartz and feldspar, in which the former has an arrangement which makes the surface of the rock exhibit the appearance of letters, as in Fig. 60.



Graphic Granite.