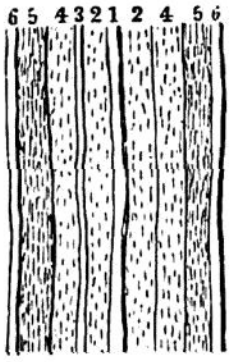
iron, also on oxidizing gives red or yellow-brown colors to the decomposed material of the rock. Moreover, the percolating waters carry the changes downward, and especially along the sides and center of the vein. The waters descending along the walls of the vein (and any ascending vapors also) often alter the adjoining rock to clay, making along the side walls the *selvage* of the vein. Further, the waters may carry along carbonic acid, or sulphuric acid (made from oxidized sulphur), and so convert oxidized metals — as of lead or copper — into carbonate and sulphate. In this way phosphates, arsenates, and other salts of the metals, as well as carbonates and sulphates, become mixed with the ores of the vein as secondary products.

2. *Structure.* — Fissure veins are either *simple* or *banded*. Those simple in structure are alike in mineral or minerals from side to side; while the banded have the materials in layers parallel or nearly so to the walls, so that in a cross-section they look banded.

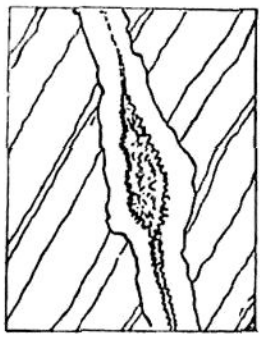
Granitic or feldspathic veins are usually simple. They may have great width, extending sometimes to 100 feet, and may consist of a number of minerals; but the minerals are not ordinarily arranged parallel to the walls. The larger veins sometimes contain feldspar and quartz in crystalline masses that weigh tons, and mica in plates a yard across, and occasionally beryls as large as a flour barrel. A beryl of Grafton, N. H., weighed 2900 pounds. Some spodumene crystals are four feet long. From this extreme magnitude there are gradations to those in which the crystallizations are an inch and less in size. The granite of veins seldom has the moderate fineness and evenness of grain fitting it for architectural purposes; the even-grained kinds are probably always of igneous origin.

305.



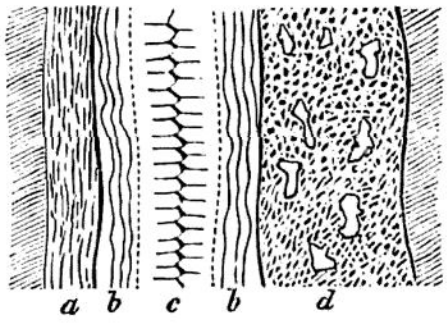
Banded vein, Valparaiso. D.

306.



Quartz vein, Cheshire, Conn. D.

307.



Banded vein, at Godolphin Bridge, Cornwall. De la B.

But granitic veins are sometimes banded, as in Fig. 305, in which 1, 3, and 6 are bands of quartz; 2 and 4, bands having the structure of gneissoid granite, and 5 that of gneiss. Fig. 306 contains a two-banded vein of quartz. It illustrates the usual mode of origin of bands, showing that they are layers made by deposition against the two walls. It is also a vein of copper ore, the ore lying in the wider open portions of the vein.

Figs. 307–309 represent other banded veins, having the bands in two