considerations go to indicate that it is probably not far from the truth. Assuming then that this was the temperature at which the vesicle was formed, these authors proceed to determine the pressure necessary to prevent the complete vaporization of the water at that temperature, and obtain, as the result, a pressure of 87 atmospheres, equal to 84 tons per square foot of surface.[86] That many rocks were formed under great pressure is well shown by the liquid carbon-dioxide in the pores of their crystals.

Although, in almost all cases, the liquid inclusions are to be referred to the conditions under which the mineral crystallized out of the original magma, they may be exceptionally developed long subsequently, either in one of the original minerals during decomposition, or in a mineral of secondary origin, such as quartz of subsequent introduction.[87]

Liquid inclusions may be dispersed at random through a crystal, or as in the quartz of granite, gathered in intersecting planes (which look like fine fissures and which may sometimes have become real fissures, owing to the line of weakness caused by the crowding of the cavities), or disposed regularly in reference to the contour of the crystal. In the last case they are sometimes confined to the centre, sometimes arranged in zones along the lines of growth of the crystal.[88] They are specially conspicuous in the quartz

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[86] "Mémoire sur les Roches dites Plutoniennes de la Belgique," De la Vallée Poussin and A. Renard. Acad. Roy. Belg. 1876, p. 41. See also Ward, Q. J. Geol. Soc. xxxi. p. 568, who believed that the granites of Cumberland consolidated at a maximum depth of 22,000 to 30,000 feet.

[87] See Whitman Cross on the development of liquid inclusions in plagioclase during the decomposition of the gneiss of Brittany. Tschermak's Min. Mittheil. 1880, p. 369; also G. F. Becker, "Geology of Comstock Lode." U. S. Geol. Surv. 1882, p. 371.

[88] The way in which vesicles, inclosed crystals, etc., are grouped along the zones of growth of crystals is illustrated in Fig. 12.