small globule or bubble, sometimes stationary, sometimes movable from one side or end of the cavity to the other, as the specimen is turned. With a high magnifying power, the minuter bubbles may be observed to be in motion, sometimes slowly pulsating from side to side, or rapidly vibrating like a living organism. The cause of this trepidation, which resembles the so-called "Brownian movements," has been plausibly explained by the incessant interchange of the molecules from the liquid to the vaporous condition along the surface where vapors and liquid meet—an interchange which, though not visible on the large bubbles, makes itself apparent in the minute examples, of which the dimensions are comparable to those of the intermolecular spaces.[83] The bubble may be made to disappear by the application of heat.

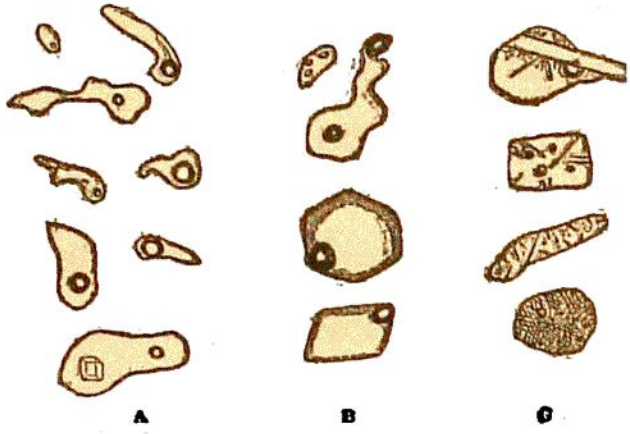

Fig. 11.—Cavities in Crystals, highly magnified; A, Liquid Inclusions; B, Glass Inclusions; C, Cavities showing the devitrification of the original glass by the appearance of crystals, etc., until in the lowest figure a stony or lithoid product is formed.

With regard to the origin of the bubble, Sorby pointed out that it can be imitated in artificial crystals, in which he explained its existence by diminution of volume of the liquid owing to a lowering of temperature after its inclosure. By a series of experiments he ascertained the rate of expansion of water and saline solutions up to a temperature of 200° C. (392° Fahr.), and calculated from them the temperature at which the liquid in crystals would entirely fill its

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[83] Charbonelle and Thirion, Rev. Quest. Scientif. vii. (1880) 43. On the critical point of water, etc., in these cavities see Hartley, Journ. Chem. Soc. ser. 3, vol. ii. p. 241. Pop. Sci. Rev. new ser. i. p. 119.