inclosing cavities. Thus, in the nepheline of the ejected blocks of Monte Somma, he found that the relative size of the vacuities was about ·28 of the fluid, and assuming the pressure under which the crystals were formed to have been not much greater than sufficient to counteract the elastic force of the vapor, he concluded that the nepheline may have been formed at a temperature of about 340° C. (644° Fahr.), or a very dull red heat, only just visible in the dark. He estimated also from the fluid cavities in the quartz of granite that this rock has probably consolidated at somewhat similar temperatures, under a pressure sometimes equal to that of 76,000 feet of rock.[84] Zirkel, however, has pointed out that even in contiguous cavities, where there is no evidence of leakage through fine fissures, the relative size of the vacuole varies within very wide limits, and in such a manner as to indicate no relation whatever to the dimensions of the inclosing cavities. Had the vacuole been due merely to the contraction of the liquid on cooling, it ought to have always been proportionate to the size of the cavity.[85]

MM. De la Vallée Poussin and Renard, attacking the question from another side, measured the relative dimensions of the vesicle and of its inclosed water and cube of rock-salt, as contained in the quartziferous diorite of Quenast in Belgium. The temperature at which the ascertained volume of water in the cavity would dissolve its salt was found by calculation to be 307° C. (520° Fahr.). But as the law of the solubility of common salt has not been experimentally determined for high temperatures, this figure can only be accepted provisionally, though other

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[84] Sorby, Q. J. Geol. Soc. xiv. pp. 480, 493.   [85] "Mik. Beschaff." p. 46.