The lime-soda feldspars, labradorite and oligoclase, and the lime feldspar, anorthite, were obtained in crystals, from the fusion together of their constituents, by Fouqué and Lévy in 1878.

Two days of fusion only were required for labradorite. They have also produced by similar methods the rocks augite-andesyte, doleryte, basalt, and others. The augite-andesyte was made by fusing together 3 parts of oligoclase and 1 of augite, and it contained octahedrons of magnetite formed at the expense of part of the augite. Doleryte was obtained in like manner by substituting labradorite for oligoclase. Such experiments prove that these rocks may be made from the constituents by metamorphic methods, if the heat is sufficient for fusion; and other facts leave scarcely a doubt that they may be formed also at lower metamorphic temperatures.

Hawaiian caves, made by the flowing away of the lava after it was crusted over, and hot with the heat that was left by the lavas, contain long stalactites of basalt, with isolated crystals of the feldspar, pyroxene, and magnetite, in their cavities, as explained on page 295. In this case, there was no decomposition and recomposition, but simply solution, transfer, and recrystallization. The heat was that left by the passing lava; for there was no other possible source; and it was less than that of fusion, for much had been lost by the expansion of the superheated vapor as it escaped. The vapors would have contained sulphur, or sulphurous acid, and perhaps other ingredients, but beyond increasing solvent powers, if this, these aids had nothing to do.

These facts are eminently instructive as to the powers of superheated steam. It can do transfer work, take up labradorite, pyroxene, and magnetite at one place, and transfer and deposit them crystallized in another. The facts above stated also prove that superheated steam, at a high temperature, may produce that *plastic* state of a rock, which is like fusion in any other way in its ability to obliterate all previous structural features, and which, therefore, could make *granite out of materials that otherwise would have the bedding of a gneiss.*

At Birmingham, Conn., 10 miles west of New Haven, the porphyritic gneiss of the region comes up, in one place, through the gneiss and mica schist, as a broad and nearly vertical vein, or dike, of porphyritic granite — a rock like the bedded gneiss, except in the absence of bedding, and in its vein-like position. It is plainly a result of the plastic condition of the rock in the vicinity of a fracture. In cases of veins of *fine-grained* granite, it is always a question to be considered whether it is not the plastic granite of a region of metamorphism rather than vein-made granite, or that of eruption from a deep-seated source. Vein granite is usually coarsely crystalline, and consequently irregular in its grain. If the granite of a narrow dike, or vein, intersecting any rock is crystalline granular to its wall, the evidence is conclusive that the inclosing rock was hot, and it is almost certain that the conditions when it was formed were those of metamorphism.

Further, the pressure which is so enormous in some cases of mountain-making, increases the solvent power of hot moisture, and promotes the welding of grains by the closeness of the contact.

Variations in degree of heat and amount of moisture. — The metamorphic effects in a region are greatly varied by differences in temperature, and in amount of moisture. The region has necessarily its area of maximum heat,