

bedded in a more recent crystalline magma of orthoclase and quartz. (B) Porphyroid granites, generally finer in grain than the preceding, and further distinguished by the occurrence of bi-pyramidal crystals of quartz (which made their appearance between the old felspar and the recent orthoclase), and of a notable quantity of white mica (rare among the ancient granites) posterior in advent even to the more recent quartz.<sup>165</sup>

Among the component minerals of granite, the quartz presents special interest under the microscope. It is often found to be full of cavities containing liquid, sometimes in such numbers as to amount to a thousand millions in a cubic inch and to give a milky turbid aspect to the mineral. The liquid in these cavities appears usually to be water containing sodium and potassium chlorides, with sulphates of these metals and of calcium (p. 196).

The mean of eleven analyses of granites made by Dr. Haughton gave the following average composition: silica, 72.07; alumina, 14.81; peroxide of iron, 2.22; potash, 5.11; soda, 2.79; lime, 1.63; magnesia, 0.33; loss by ignition, 1.09; total, 100.05, with a mean specific gravity of 2.66.

Most large masses of granite present differences of texture in different parts of their area. Some of these variations depend on the relation of the mass to the surrounding rocks (Bk. IV. Pt. VII.). Others may occur in any portion of a granite boss, and have been produced by the circumstances in which the mass consolidated. Some granites are marked by the occurrence of the cavities above referred to where the individual minerals have had room to assume sharply defined crystalline forms. Many granites are apt to be traversed by veins, sometimes due to a segregation of the surrounding minerals in rents of the original pasty magma, sometimes to a protrusion of a less coarsely crystalline (micro-granitic, felsitic) material into the main rock (Fig. 30). Some of the more important of these varieties are distinguished by special names. Thus, where the component quartz and felspar have crystallized together so as to inclose each other and assume a tendency to an orientation of their longer axes in one general direction, as they are specially apt to do in segregation-veins, the rock is termed *Pegmatite*.<sup>166</sup> One of the most interesting struc-

<sup>165</sup> Bull. Soc. Géol. France, 3d ser. iii. (1875), p. 199.

<sup>166</sup> For an admirable and exhaustive account of the Pegmatite veins, and their associated minerals in Southern Norway, see the great monograph by Prof. W. C. Brögger in Groth's Zeitsch. Krystallographie, xvi. (1890).