

104° Fahr.).<sup>3</sup> The most elaborate and carefully conducted series of experiments yet made in this subject are those conducted by Mallet. He subjected 16 varieties of stone (limestone, marble, porphyry, granite, and slate) in cubes averaging rather less than 1½ inches in height to pressures sufficient to crush them to fragments, and estimated the amount of pressure required, and of heat produced. The following examples may be selected from his table:<sup>4</sup>

Rock	Temperature (Fahr.) in 1 cubic foot of rock due to work of crushing	Number of cubic feet of water at 32 deg. evaporated into steam at 212 deg.	Volume of ice at 32 deg. melted to water at 32 deg. by one volume of rock
Caen Stone, Oolite.....	8°·004	0·0046	0·04008
Sandstone, Ayre Hill, Yorkshire	47°·79	0·0234	0·2026
Slate, Conway.....	132°·85	0·07	0·596
Granite, Aberdeen.....	155°·94	0·072	0·617
Scotch furnace-clay porphyry....	198°·97	0·083	0·724
Rowley Rag (basalt).....	213°·23	0·109	0·925

Within the crust of the earth, there are abundant proofs of enormous stresses under which the rocks have been crushed. The weight of rock involved in these movements has often been that of masses several miles thick. We can conceive that the heat thus generated may have been sufficient to promote many chemical and mineralogical rearrangements through the operation of water (*postea*, p. 519), and

<sup>3</sup> "Geol. Experimentale," p. 448 *et seq.* This distinguished chemist and geologist has during the last forty years devoted much time to researches designed to illustrate experimentally the processes of geology. His numerous important memoirs are scattered through the *Annales des Mines*, *Comptes Rendus de l'Academie*, *Bulletin de la Societe Geologique de France*, and other publications. But he has collected and republished them as "*Etudes Synthetiques de Geologie Experimentale*," 8vo, 1879—a storehouse of information. The admirable memoirs of Delèsse in the same journals should also be studied. The transformation of aragonite into calcite has been shown by Favre and Silbermann to give rise to a relatively large disengagement of heat. H. Le Chatelier, *Compt. Rend.* (1893), p. 390.

<sup>4</sup> *Phil. Trans.* 1873, p. 187.