is seen in Plate 25, fig. 2. It was taken in ordinary light, and magnified 50 diameters. Every stage can be traced, however, from the mosaic of twinned and somewhat flattened grains to the areas of perfectly granulated material. Minute lines of granulated calcite first appear along directions of intense twisting in the mosaic, then these become more numerous, and finally the complete breaking down of the mosaic into finely granulated material, filled with twisted remnants of the calcite grains, can be seen. The question of time does not seem to play any important part in the character of the deformation. The structure of the marble deformed in 64 days is essentially the same in character as that which was deformed to the same extent in 10 minutes. In both cases the lines of cataclastic structure and the intervening areas composed of flattened grains are found. It seems probable, however, from a study of the thin sections, that very rapid deformation tends to render the former structure more pronounced and more abundant, and as the granulated calcite is apparently the weakest portion of the mass, in this way to make the rock which is rapidly deformed weaker, as it is shown to be by the tests. The fact that the twinning and other structures above described are not developed in the cones proves that they are not produced by statical pressure or cubic compression, but that they are developed only when actual movement takes place in the mass.

In one experiment, of which a photograph is given in Plate 23, fig. 6, under the pressure of the two pistons, the marble was deformed as above described, causing the enclosing tube to bulge in a marked manner, and the pressure being continued, the enclosed marble tore the wrought-iron tube apart, developing a ragged rent across the fibres of the iron in a vertical direction, and commenced to fall out of the rent in the form of a fine white powder. On removing the pressure and milling open the tube, the remaining marble was found to be still firm and compact, except in the vicinity of the rent, where it was pulverulent.

c. *Deformation of the Dry Rock at* 300° *C. and at* 400° *C.*

It was next sought to determine experimentally in what respect the second factor, namely, heat, would influence the result. A column of the same Carrara marble and of the same dimensions as those used in the former experiments was enclosed in a wrought-iron tube of the same construction as before. This, which is marked (A) in the accompanying figure (fig. 1), is surrounded by a cast-iron jacket (B), which is bored to receive it. The casting is so arranged that hot gases circulate in an annular channel (D) within it and outside of the wrought-iron cylinder (A), so that the marble is kept at a high temperature while the pressure is applied. The casting is as massive as possible so as to equalise the temperature of the interior and enable that of the enclosed rock to be inferred by a Callendar's platinum resistance thermometer (C), which is inserted at the side of the shell in the air space (E). The hot gases are excluded from this space by the wall (F); and the heat flows into the cylinder and