

from the system of fine fissures by which it is broken up, and partly from more direct and effective access of rain. Eventually the cohesion of the stone at that part is destroyed, and the crumbling marble falls out, leaving a hole in the middle of the slab. When this takes place, disintegration proceeds rapidly. Three years ago I sketched a tomb in this stage on the east wall of Canongate Churchyard. In a recent visit to the place I found that the whole of the marble had since fallen out.

The first cause that naturally suggests itself in explanation of the remarkable change in the structure of a substance usually believed to be so inelastic as white marble, is the action of frost. White statuary marble is naturally porous. It is rendered still more so by that internal solution which I have described. The marble tombstones in our graveyards are therefore capable of imbibing a relatively large amount of moisture. When this interstitial water is frozen, its expansive force, as it passes into the solid state, must increase the isolation of the granules and augment the dimensions of a marble block. I am inclined to believe that this must be the principal cause of the change. Whatever may be the nature of the process it is evidently one which acts from within the marble itself. Microscopic examination fails to discover any chemical transformation which would account for the expansion. Dr. Angus Smith has pointed out that in towns the mortar of walls may be observed to swell up and lose cohesion from a conversion of its lime into the condition of sulphate. I have already mentioned that sulphate does exist within the substance of the marble, but that its quantity, so far as I have observed, is too small to be taken into account in this question. The expansive power is exerted in such a way as not sensibly to affect the internal structure and composition of the