

peroxide of iron, silica, and carbonate of lime. Moderate pressure equally distributed over a rock presenting everywhere nearly the same amount of resistance will promote consolidation, but may produce no further internal change. Where the component particles are chiefly crystalline, pressure may induce a crystalline structure upon the whole mass, as recent experiments have shown.⁸⁷ If, however, the pressure becomes extremely unequal, or if the rock subjected to it can find escape from the strain in one or more directions, it may undergo shear in certain planes, or may be crumpled, or the limit of its rigidity may be passed, and rupture may take place. Some consequences of these movements may be briefly alluded to here in illustration of hypogene action in dynamical geology.

(1.) **Minor Ruptures and Noises.**—Among mountain-valleys, in railway-tunnels through hilly regions, or elsewhere among rocks subjected to much lateral pressure, or where, owing to the removal of material by running water, and the consequent formation of cavities, subsidence is in progress, sounds as of explosions are occasionally heard. In many instances, these noises are the result of relief from great lateral compression, the rocks having for ages been in a state of strain, from which as denudation advances, or as artificial excavations are made, they are relieved. This relief takes place, not always uniformly, but sometimes cumulatively by successive shocks or snaps. Mr. W. H. Niles of Boston has described a number of interesting cases where the effects of such expansion could be seen in quarries; large blocks of rock being rent and crushed into fragments, and smaller pieces being even discharged with explosion into the air.⁸⁸

⁸⁷ W. Spring, Bull. Acad. Roy. Belg. 1880, p. 376.

⁸⁸ Proc. Boston Soc. Nat. Hist. xviii. p. 272 (1876).