

formed' indicate depths from the surface varying from 15,100 to 65,500 feet. From certain passages it is evident that Mr. Sorby considers that gneiss and granite were formed approximately under similar circumstances. I quote this thoroughly philosophical memoir, that the reader may be less startled with the statement, that gneiss and some granites were formed by the metamorphosis of strata at depths counted by many thousands of feet, and also to give strength to the assertion, that under such circumstances water was present.¹

If the above views be correct, though many granites having been completely fused have been injected among strata, and are thus to be classed as intrusive rocks, yet in the main, so far from the intrusion of granite having produced many mountains by mere upheaval, both gneiss and granite would rather seem to be often the results of the forces that formed certain mountain chains. Possibly this result was connected with the contraction of the earth's crust and the heat produced by the intense lateral pressure that, with much movement of parts, produced the contortion of vast masses of strata, parts of which, now exposed by denudation, were then deep underground, and already acted on by the internal heat of the earth in a degree proportionate to their depth.²

¹ See 'Journal of the Geological Society,' vol. xiv., 1858. Sorby.

² See Report, Brit. Assoc. 1866, p. 47: 'Address to the Geological Section,' Ramsay. Also an elaborate memoir by Mr. Robert Mallet, 'On Volcanic Energy, &c.,' Trans. Royal Soc., vol. clxiii. p. 147.