

He was able to fuse the carbonate without the loss of its carbonic acid, thus practically demonstrating the truth of Hutton's contention. He obtained from pounded chalk a substance closely resembling marble. Applying these results to the Huttonian theory, he contended that the effects shown by his experiments must occur also on a great scale at the roots of volcanoes; that subterranean lavas may melt limestone; that where the molten rock comes in contact with shell-beds, it may either drive off their carbonic acid or convert them into limestone, according to the heat of the lava and the depth under which it acts; and that his experiments enabled him to pronounce under what conditions the one or the other of these effects would be produced. He concluded that having succeeded in fusing limestone under pressure, he could adduce in that single result "a strong presumption in favour of the solution which Dr. Hutton has advanced of all the geological phenomena; for the truth of the most doubtful principle which he has assumed has thus been established by direct experiment."<sup>1</sup>

Hardly less striking were Hall's experiments in

<sup>1</sup>"Account of a series of experiments showing the effects of compression in modifying the action of heat," read to the Royal Society of Edinburgh, 3rd June 1805.—*Trans. Roy. Soc. Edin.* vi. p. 71. The same ingenious observer subsequently instituted a series of experiments to imitate the consolidation of strata. By filling an iron vessel with brine and having layers of sand at the bottom, he was able to keep the lower portions of the sand at a red heat, while the brine at the top was not too hot to let the hand be put into it. In the end the sand at the bottom was found compacted into sandstone. *Op. cit.* x. (1825), p. 314.