

tion of calcareous rocks from animal remains, it is not necessary to discuss at present: that a considerable portion of many limestone rocks was so formed, cannot be denied. It was however objected to this theory, that the well known action of fire on limestone rocks would expel the fixed air, and render them soft and pulverulent. To this objection it was replied, that as the action of central heat on beds of marine shells took place under the ocean, the pressure of the water would prevent the escape of the fixed air, and would probably render the calcareous earth more fusible. This answer was regarded as a mere hypothesis for some time, but Sir James Hall determined to try its validity by experiments. Having calculated the resistance which a column of water fifteen hundred feet, or any given depth, would present to the escape of fixed air, he enclosed a quantity of powdered chalk in a gun barrel, and confined it in such a manner as to present an equal degree of resistance. He subjected the powdered chalk thus confined, to the action of a furnace; after some time it was drawn out and cooled, and was found converted into crystalline limestone or marble; and in one instance, where the chalk enclosed a shell, the shell had acquired a crystalline texture, without losing its form. Hence, in situations where chalk or earthy limestone are found to have a crystalline texture, when in contiguity with trap rocks, we may with a high degree of probability infer, that the limestone had been fused by the trap.

A recapitulation of the facts and experiments which prove the igneous origin of trap rocks, would afford a mass of evidence which might convince the most sceptical enquirer; but such a recapitulation is needless, as in many situations undoubted currents of lava pass into trap rocks, and we have ocular demonstration of the fact.

The reason why geologists were so long opposed to the igneous origin of basaltic rocks, may be explained partly by the attachment to received theories, and partly by the reluctance to admit a condition of our planet, so remote from present experience. It was thought an ample claim on our credulity, when we were required to believe, that all the habitable parts of the globe had been for ages submerged in the ocean, without requiring the further belief, that countries now remote from active volcanoes, had been repeatedly subject to the agency of subterranean fire. Yet, both these positions must be granted, if we will allow a legitimate induction from established facts.

The advocates of the aqueous origin of basaltic rocks, while they advanced theories, which made claims upon our faith, equally unsupported by present experience, failed entirely, in their attempts to explain, in a satisfactory manner, the causes of existing phenomena. The theory of Werner was, for some time, zealously supported, and particularly the least tenable part of it,—the formation of basaltic rocks by a second rising of the ocean, which deposited them on the summits of elevated mountains. It may be proper to give a brief account of this part of the Wernerian system, before it sinks into entire oblivion.