is admitted by all whether they believe in the fusion of the central nucleus or not. Internal fire still prevails to a great extent in the interior of our planet, and its effects appear to have been the greatest, and the most extensive in the earliest periods. Volcanic mountains and islands are known to have risen, even in modern times, from the bosom of the ocean and islands are still existing where in former ages the sea raged uncontrolled. The sub-marine volcanos also occasionally project flames, smoke, and red-hot stones through the ocean, and thus inform us, that water cannot always subdue fire, that even now, there are strata, at the bottom of the sea, where extreme ignition and extreme hydrostatic pressure, operate conjointly, upon the firm materials; and that both, aided by the principal chemical agents which we know to exist in the constitution of our globe, may unite to produce results of which our trifling experiments can give us but a feeble conception. An attempt for instance, to dissolve granite by boiling it in water is just as rational as an attempt to melt it in a common fire; neither experiment can possibly succeed; but the former would not prove that, granite was never dissolved nor the latter, that granite was never melted; because, the circumstances which may have operated in the interior of the earth are not under our control and our experiments are therefore nugatory.

In volcanic countries, silex is certainly dissolved by hot alkaline water under great hydrostatic and steam pressure, and granite is as certainly melted in the intense heat of deep seated fire.*

We should accept with equal readiness the aid of fire or water, or other agents, as they may appear best adapted to explain a given effect, and we should not hesitate to call in all the great natural powers whether mechanical or chemical, as there may be occasion.

There is no doubt that fire and water and other powerful chemical agents have operated in all ages in producing mineral crystallization. Of these however, fire appears to have been by far the most active, and although it is not proved by actual experiment, or even by rigorous observation, there is every reason to admit that even granite has been melted in the bowels of the earth and therefore may crystallize from a state of igneous fusion. If this be true of the proper crystals of granite, it may be also true of the imbedded crystals which it contains, and therefore of all other crystals. Those which

* It appears now to be generally conceded, agreeably to the conclusions of Cordier, that the temperature of the earth increases as we descend. Sources of error have been indeed pointed out, but they appear to be local and accidental.