

to have advanced much, notwithstanding his constantly increasing experience and the enormous amount of observations amassed by him regarding the rocks of the mountains.

His first quarto volume appeared in 1779, the second in 1786, the third and fourth in 1796. There was thus an interval of fifteen years during which, with unwearied industry, he continued to traverse the Alps from end to end, and to multiply his notes regarding them. Yet he does not seem ever to have reached any broad conceptions of stratigraphical succession, or of orographical structure. When he came upon strata crumpled and doubled over upon themselves, he thought of crystallization in place as the cause of such irregularities. The idea of subterranean disturbance would sometimes occur to him, but for many years he dismissed it with an expression of his incredulity, remarking that "if the underground fires had been able to upraise and overturn such enormous masses, they would have left some trace of their operation, but that after the most diligent search he had been unable to discover any mineral or stone which might even be suspected to have undergone the action of these fires."¹ He had thus no conception of any operation of nature other than that of volcanoes, which could produce great disturbances of the terrestrial crust. Not only had he met with no trace of any igneous rock in the Alps, but the granite veins which he found traversing a schist, and which he at once regarded as throwing light on the origin of that rock, were believed by him to be almost

¹ *Voyages dans les Alpes*, vol. iii. (1796) p. 107.