

veins and the dykes and veins of granite, basalt or other eruptive rocks. He looked upon them all as the results of chemical precipitation from an ocean that covered the rocks in which fissures had been formed. Hutton, in like manner, drew no line between the same two well-marked series of veins, but regarded them all as formed by the introduction of igneous material. Though more logical than Werner, he was, as we now know, entirely in error in confounding under one denomination two totally distinct assemblages of mineral matter. Werner correctly referred veins of ores and spars to deposition from aqueous solution, but was completely mistaken in attributing the same origin to veins of massive rock. Hutton, on the other hand, went as far astray in regard to his explanation of mineral veins, but he made an important contribution to science in his insistence upon the truly intrusive nature of veins of granite and whinstone.

There was another point of difference between the views of Werner and of Hutton in regard to mineral veins. One of the undoubted services of the Freiberg professor was his clear demonstration that veins could be classified according to their directions, that this arrangement often sufficed to separate them also according to age and material, those running along one parallel, and containing one group of minerals, being intersected by, and therefore older than, another series following a different direction, and consisting of other metals and vein-stones. This important distinction found no place in Hutton's system. To him it was enough that he was able to show that certain