

Hutton's work was projected upon a plane half a century beyond the recognised geology of his own time. Hutton's audience of geologists had to grow up under other influences than polemical discussions between Neptunists and Plutonists, and had to learn from Hutton himself how to tap the fountain of science at its living source.

In 1793 a Dublin mineralogist, Kirwan, attacked Hutton's work in ignoble terms, and the great Scotsman, now advanced in years, resolutely determined to revise his work and do his best by it. Valuable additions were made, and the subject-matter brought under more skilful treatment. In 1795 the revised work appeared at Edinburgh, in independent form and in two volumes. It was his last effort. Hutton died in 1797 from an internal disease which had overshadowed the closing years of his life.

The original treatise of Hutton is divided into four parts. The first two parts discuss the origin of rocks. The earth is described as a firm body, enveloped in a mantle of water and atmosphere, and which has been exposed during immeasurable periods of time to constant change in its surface conformation. The events of past geologic ages can be most satisfactorily predicted from a careful examination of present conditions and processes. The earth's crust, as far as it is open to our investigation, is largely composed of sandstones, clays, pebble deposits, and limestones that have accumulated on the bed of the ocean. The limestones represent the aggregated shells and remains of marine organisms, while the other deposits represent fragmental material transported from the continents. In addition to these sedimentary deposits of secondary origin there are *primary* rocks, such as granite and porphyry, which, as a rule, underlie the aqueous deposits.

In earlier periods the earth presented the aspect of an immense ocean, surmounted here and there by islands and continents of primary rock. There must have been some powerful agency that converted the loose deposits into solid rock, and elevated the consolidated sediments above the level of the sea to form new islands and continents.

According to Hutton, this agency could only have been heat; it could not have been water, since the cement material (quartz, felspar, fluorine, etc.) of many sedimentary rocks is not readily soluble in water, and could scarcely have been provided by water. On the other hand, most solid rocks