

accomplished. The first and second are intended to serve as a General Introduction, and to show the relations of the natural sciences to each other and to that complex study which we call geology. In writing the six succeeding essays it was the author's design to bring together, in a concise form, the facts and the reasonings from which are deduced what he regards as the *Principia* of geogeny, geognosy, and mineralogy.

The chemistry of the atmosphere, and the relations of the earth's aerial envelope alike to outer space and to the gases condensed and the waters precipitated on the surface of the globe, as set forth in the third and fourth essays, constitute a necessary preliminary to the study of rock-masses. These, in Essays V., VI., VII., are considered from three different points of view; the genesis and the geognostic relations of the various crystalline rocks, and finally the decay of these, which has determined their present surface-outlines, and has given rise to the materials of the uncrystalline sedimentary strata. In the fifth essay an attempt has been made to show the defects of each of the many contradictory hypotheses hitherto proposed to explain the origin of the crystalline rocks, and to set forth a new one, according to which they have been derived — for the most part indirectly and by aqueous solution — from a single primary plutonic mass, which itself, however, modified both by the action of water, and by partial separations through crystallization and eliquation, has been the direct source of many exotic rocks. All of these points are more fully discussed in Essay VI.

The new hypothesis, as set forth in Essays V. and VI., is the result of nearly thirty years of studies having for their object to reconstruct the theory of the earth on the basis of a solid nucleus, to reconcile the existence of a solid interior with the flexibility of the crust, to find an