Geology treats of the earth in this grand relation. It is as much removed from Mineralogy as from Botany and Zoölogy. It uses all these departments; for the species under them are the objects which make up the earth and enter into geological history. The science of minerals is more immediately important to the geologist, because aggregations of minerals constitute rocks, or the plastic material in which the records of the past were made.

The earth, regarded as such an individuality in a world kingdom, has not only its comprehensive system of growth, in which strata have been added to strata, continents and seas defined, mountains reared, and valleys, rivers, and plains formed, all in orderly plan, but also a system of currents in its oceans and atmosphere, — the earth's circulating-system; its equally world-wide system in the distribution of heat, light, moisture, and magnetism, and of plants and animals; its system of secular variations (daily, annual, etc.) in its climate and all meteorological phenomena. In these characteristics the sphere before us is an individual, as much as a dog, or a tree; and, to arrive at any correct views on these subjects, the world must be regarded in this capacity. The distribution of man and nations, and of all productions that pertain to man's welfare, comes in under the same grand relation; for, in helping to carry forward man's progress as a race, the sphere is working out its final purpose. There are, therefore,

**Three departments of science, arising out of this individual capacity of the earth.**

I. Geology, which treats of (1) the earth's structure, and (2) its system of development, — the latter including its progress in rocks, lands, seas, mountains, etc.; its progress in all physical conditions, as heat, moisture, etc.; its progress in life, or its vegetable and animal tribes.

II. Physiography, which begins where Geology ends, — that is, with the adult or finished earth, — and treats (1) of the earth's final surface-arrangements (as to its features, climates, magnetism, life, etc.); and (2) of its system of physical movements or changes (as atmospheric and oceanic currents, and other secular variations in heat, moisture, magnetism, etc.).

III. The earth with reference to man (including ordinary Geography): (1) the distribution of races or nations, and of all productions or conditions bearing on the welfare of man or nations; and (2) the progressive changes of races and nations.

The first of these departments considers the structure and growth of the earth; the second, its features and world-wide activities in its finished state; the third, the fulfillment of its purpose in man.

**Relation of the earth to the universe.** — While recognizing the earth as a sphere in a world kingdom, it is also important to observe that it holds a very subordinate position in the system of the heavens. It is one of the smaller satellites of the sun, — its size about $\frac{1}{1200000}$ that of the sun. And the planetary system to which it belongs, although 3,000,000,000 of miles in radius, is but one among myriads, the nearest star being 7000 times