CHAPTER II.

AZOIC SYSTEM

Various crystalline Schists, forming the primeval Crust of the Earth.—Contortions to which they have been subjected.—Presence of Igneous Rocks.—Condition of the Earth at the time of their Formation.—Effects of Metamorphism.—This System characterized by an entire Absence of Organic Remains.—Supposed Causes of their Absence.—Geographical Distribution of these Rocks on the northern Coast of Lake Superior.—Divided into two Groups.—Associated Igneous Rocks.—Metallic Contents.—Their Relation to the Silurian Strata.—Their Distribution on the southern Shore.—External Characters.—Igneous Products.—Lines of Lamination in Slates.—Prevalence of Iron.—Difficulty in estimating the Thickness of this Group.—Contortions of the Strata.—Remarks on the existence of this System in other parts of the World.

The Azoic System—so called from the entire absence of organic remains—comprises the most ancient of the strata which form the crust of the earth. They consist for the most part of gneiss, hornblende, chlorite, talcose and argillaceous slates, interstratified with beds of quartz, saccharoidal marble and immense deposits of specular and magnetic oxide of iron. Most of these rocks appear to have been of detrital origin, but greatly transformed by long-continued exposure to heat. They are sub-crystalline or compact in their structure, and rarely present unequivocal signs of stratification. They exhibit the most violent dislocations; in one place the beds are vertical, in another, reversed, and in another, present a succession of folded axes.

Intermingled with them is a class of rocks whose igneous origin can hardly be doubted, and to whose presence the metamorphism so characteristic of this series, is in some measure to be ascribed. They consist of various proportions of hornblende and feldspar forming traps and basalts, or where magnesia abounds, pass into serpentine rocks. They appear in some instances to have been protruded through the prëexisting strata in the form of dykes or elvans; in others to have flowed in broad lava streams over the ancient surface; and in others to have risen up through some wide-expanding fissure, forming axes of elevation.

Most geologists, at this day, admit that the earth was originally in a fluid state and refer to heat as the solvent power; that the earth gradually parted with portions of this heat so as to allow the materials to crystallize and form a crust around the incandescent nucleus; that the waters acting on this crust detatched particles of matter and carried them far into the ocean, where they were deposited in extensive beds, or strata; and that by long-continued exposure to heat, they assumed the crystalline character which they now present. Their transformation in aggregation, structure and chemical composition, has not resulted from mere contact with plutonic or volcanic masses, but from gaseous sublimations which accompany erupted