

physical geography of the American continent, that the grand physical features of that area were early defined; and that through all time, from the close of the Archæan period, if not before, the ranges of land which are near the mountain chains were the boundaries between great continental basins, that were in a marked degree independent in the progress of rock-making and of life.

CHAPTER II.

PRE-CAMBRIAN PERIOD.

Archæan¹ or Azoic Rocks.

BENEATH the oldest organic or life-bearing stratified rocks of the entire globe, we have evidence of still older crystalline schists and massive metamorphosed strata. These rise to the surface, and now appear by means of two agencies—(1) either through elevation from their original and deeply-seated position, or (2) through exposure to long-continued denudation, which has in course of time removed the superincumbent strata, thus laying bare the earlier framework or basis of the igneous, unstratified, and oldest stratified series.

These (probably) fundamental rocks are considered by some as portions of the primeval mass or crust of the globe, affording us an insight into what we may believe this congealed nucleus to be; while other physicists, again, regard them as metamorphosed, stratified, or sedimentary rocks, belonging to the earliest periods of geological time, long prior to the deposition of the so-called Lower Cambrian and Silurian Rocks. Whatever their origin, we are bound to admit them to be at present the *oldest* known rocks.

Archæan Time.—It is at all times difficult to establish the true chronology of deposits of high antiquity, for unconformity below succeeding or newer formations does not conclusively show the real but only the relative age of the strata in question, nor can it be said that lithological or petrological characters are decisive as to age. Dana defines Archæan time as “including strictly in its commencement an Azoic age, or the era in which the physical conditions were incompatible with the existence of life. . . . Therefore,” he says, “this era, so far as we know, is without recognisable records, for no rocks have yet been known to be earlier in date than those which are now supposed to have been formed since life first began to exist. . . . These Archæan rocks are the only universal formation. They extend over the whole globe, and formed the floor of the ocean, and the material of all emerged land when life first appeared. The thickness which they acquired during the long era, from the time of the first-formed crust, can never be known.”

¹ A term first proposed by James D. Dana, since generally received and adopted both in America and Britain (Manual of Geology, pp. 146–161).