

from 1,000 to 1,500 feet, and associated with quartzites; the whole constituting a series comparable in value to the entire lower Paleozoic. These strata, greatly affected by undulations and penetrated by eruptive rocks, were by Logan traced with infinite labor over an area of 2,000 square miles; and a geological map of this region, published by him in the Atlas to the Geology of Canada in 1863, is the first attempt to unravel the stratigraphy of this most ancient and disturbed series of rocks.

At the summit of this series was found a mass of about 10,000 feet of stratified crystalline rocks, which, unlike those below, consisted chiefly of labradorite and hypersthene rocks, with some little included gneiss and quartzite and a band of crystalline limestone. This series Logan subsequently showed to be unconformable to the older gneisses, and gave it the name of Upper Laurentian, subsequently exchanged for that of Labradorian or Norian.

Indirect evidence that these lowest rocks were not really Azoic was soon pointed out, and in 1858 obscure forms resembling those of *Stromatopora* were detected in the Laurentian limestones, and were exhibited by Logan to the American Association for the Advancement of Science, in 1859, as probably organic; but it was not till 1864 that Dawson announced that these and other similar forms were the remains of a gigantic rhizopod, to which he gave the name of *Eozoön Canadense*. The history of this curious form is well known, and its organic nature, though at one time much contested, is now disputed by few.

To Logan we owe a large part in the investigations of the Canadian Survey which have established the following great facts in the geology of the Azoic or, as they may henceforth be called, the Eozoic rocks:—

I. The relations of the Laurentian as a great stratified series of crystalline rocks of aqueous origin, occupying a position at the base of the known geological column and containing evidences of organic life.

II. The fact of the unconformable superposition to the Laurentian of the Upper Laurentian or Norian series.

III. The first recognition that unconformably overlying the Laurentian was still another series of crystalline stratified rocks, the Huronian. (The relative ages of the Norian and Huronian still remain undetermined, for the reason that they have never yet certainly been found in juxtaposition.)

IV. The fact that the Laurentian, Norian, and Huronian, are all of them unconformably overlaid by the lower members of the New York Paleozoic series.

His labors on the Laurentian rocks were continued at intervals up to 1867, and were performed with an amount of fatigue and sacrifice