

*Pre-Cambrian Fossils.* By Sir WILLIAM DAWSON, LL.D., F.R.S.

The author stated that it was his object merely to introduce the specimens he proposed to exhibit, by a few remarks rendered necessary by the present confusion in the classification of Pre-Cambrian rocks. He would take those of Canada and Newfoundland as at present best known, and locally connected with the specimens in question.

He referred first to the 'Olenellus Zone,' and its equivalent in New Brunswick, the 'Protolenus Fauna' of Matthew, as at present constituting the base of the Cambrian and terminating downward in barren sandstone. This Lower Cambrian had in North America, according to Walcott, afforded 165 species, including all the leading types of the marine invertebrates.

Below the Olenellus Zone, Matthew had found in New Brunswick a thick series of red and greenish slates, with conglomerate at the base. It has afforded no Trilobites, but contains a few fossils referable with some doubts to Worms, Mollusks, Ostracods, Brachiopods, Cytideans, and Protozoa. It is regarded as equivalent to the Signal Hill and Random Sound Series of Murray and Howley in Newfoundland, and to the Kewenian, and the Chuar and Colorado Cañon Series of Walcott in the west. The latter contains laminated forms apparently similar to Cryptozoon of the Cambrian and Archæozoon of the Upper Laurentian.

The Etcheminian rests unconformably on the Huronian, a system for the most part of coarse clastic rocks with some igneous beds, but including slates, iron ores, and limestones, which contain worm-burrows, sponge-spicules, and laminated forms comparable with Cryptozoon and Eozoon. The Huronian, first defined by Logan and Murray in the Georgian Bay of Lake Huron, has been recognised in many other localities, both in the west and east of Canada and the United States; but has been designated by many other local names, and has been by some writers included, with the Etcheminian and sometimes with part of the Laurentian, in the scarcely defined 'Algonkian' group of the United States Geological Survey.

Below the Huronian is the Upper Laurentian or Grenville system, consisting of gneisses and schists (some of which, as Adams has shown, have the chemical composition of Palæozoic slates), along with iron ore, graphite, and apatite, and great bands of limestone, the whole evidently representing a long period of marine deposition, in an ocean whose bed was broken up and in part elevated before the production of the littoral clastics of the Huronian age. It is in one of the limestones of this system that, along with other possible fossils, the forms known as *Eozoon Canadense* have been found. The author did not propose to describe these remains, but merely to exhibit some microphotographs and slices illustrating their structure, referring to previous publications for details as to their characters and mode of occurrence.

Below the Grenvillian is the great thickness of Orthoclase gneiss of various textures, and alternating with bands of hornblende schist, constituting the Ottawa gneiss or Lower Laurentian of the Geological Survey. No limestones or indications of fossil remains have yet been found in this fundamental gneiss, which may be a truly primitive rock produced by aqueo-igneous or 'crenitic' action, before the commencement of regular sedimentation.

The author proposed, with Matthew, to regard the Etcheminian series and its equivalents as Pre-Cambrian, but still Palæozoic; and, as suggested by himself many years ago, to classify the Huronian and Grenvillian as *Eozoic*, leaving the term Archæan to be applied to the Lower Laurentian gneiss, until it also shall have afforded some indications of the presence of life.

He insisted on the duty of palæontologists to give more attention to the Pre-Cambrian rocks, in the hope of discovering connecting links with the Cambrian, and of finding the oceanic members of the Huronian, and less metamorphosed equivalents of the Upper Laurentian, and so of reaching backward to the actual beginning of life on our planet, should this prove to be attainable.

Section 1-17-1911

The first section of the act is...

The second section of the act is...

The third section of the act is...

The fourth section of the act is...

*Pre-Cambrian Fossils.* By Sir WILLIAM DAWSON, LL.D., F.R.S.

The author stated that it was his object merely to introduce the specimens he proposed to exhibit, by a few remarks rendered necessary by the present confusion in the classification of Pre-Cambrian rocks. He would take those of Canada and Newfoundland as at present best known, and locally connected with the specimens in question.

He referred first to the 'Olenellus Zone,' and its equivalent in New Brunswick, the 'Protolenus Fauna' of Matthew, as at present constituting the base of the Cambrian and terminating downward in barren sandstone. This Lower Cambrian had in North America, according to Walcott, afforded 165 species, including all the leading types of the marine invertebrates.

Below the Olenellus Zone, Matthew had found in New Brunswick a thick series of red and greenish slates, with conglomerate at the base. It has afforded no Trilobites, but contains a few fossils referable with some doubts to Worms, Mollusks, Ostracods, Brachiopods, Cytideans, and Protozoa. It is regarded as equivalent to the Signal Hill and Random Sound Series of Murray and Howley in Newfoundland, and to the Kewenian, and the Chuar and Colorado Cañon Series of Walcott in the west. The latter contains laminated forms apparently similar to Cryptozoon of the Cambrian and Archæozoon of the Upper Laurentian.

The Etcheminian rests unconformably on the Huronian, a system for the most part of coarse clastic rocks with some igneous beds, but including slates, iron ores, and limestones, which contain worm-burrows, sponge-spicules, and laminated forms comparable with Cryptozoon and Eozoon. The Huronian, first defined by Logan and Murray in the Georgian Bay of Lake Huron, has been recognised in many other localities, both in the west and east of Canada and the United States; but has been designated by many other local names, and has been by some writers included, with the Etcheminian and sometimes with part of the Laurentian, in the scarcely defined 'Algonkian' group of the United States Geological Survey.

Below the Huronian is the Upper Laurentian or Grenville system, consisting of gneisses and schists (some of which, as Adams has shown, have the chemical composition of Palæozoic slates), along with iron ore, graphite, and apatite, and great bands of limestone, the whole evidently representing a long period of marine deposition, in an ocean whose bed was broken up and in part elevated before the production of the littoral clastics of the Huronian age. It is in one of the limestones of this system that, along with other possible fossils, the forms known as *Eozoon Canadense* have been found. The author did not propose to describe these remains, but merely to exhibit some microphotographs and slices illustrating their structure, referring to previous publications for details as to their characters and mode of occurrence.

Below the Grenvillian is the great thickness of Orthoclase gneiss of various textures, and alternating with bands of hornblende schist, constituting the Ottawa gneiss or Lower Laurentian of the Geological Survey. No limestones or indications of fossil remains have yet been found in this fundamental gneiss, which may be a truly primitive rock produced by aqueo-igneous or 'crenitic' action, before the commencement of regular sedimentation.

The author proposed, with Matthew, to regard the Etcheminian series and its equivalents as Pre-Cambrian, but still Palæozoic; and, as suggested by himself many years ago, to classify the Huronian and Grenvillian as *Eozoic*, leaving the term Archæan to be applied to the Lower Laurentian gneiss, until it also shall have afforded some indications of the presence of life.

He insisted on the duty of palæontologists to give more attention to the Pre-Cambrian rocks, in the hope of discovering connecting links with the Cambrian, and of finding the oceanic members of the Huronian, and less metamorphosed equivalents of the Upper Laurentian, and so of reaching backward to the actual beginning of life on our planet, should this prove to be attainable.



