# THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE[1]

## SECTION E—GEOLOGY AND GEOGRAPHY AND ASSOCIATED SOCIETIES

*The American Association for the Advancement of Science and Canadian Geology: A retrospect:* W. G. MILLER, provincial geologist, Toronto, Ontario. The working together of Canadians and Americans in the association has done much to promote pleasant relations between the two countries and to advance science. When the association was founded, over seventy years ago, prominent Canadian geologists were among its first members and contributed important papers, some of which, especially that one which introduced the terms Huronian and Laurentian have become classic. Certain views held concerning the age relations of pre-Cambrian rocks in the earlier years of the association are contrasted in the paper with those which are at present current.

*Some physiographic forms of western North Dakota:* HARRY N. EATON. Illustrations of the Bad-land topography of the Little Missouri River Valley; the Missouri River escarpments and flood plain, with erosional details of the Fort Union formation; the Missouri Coteau; the Altamont moraine; slump topography; clinker buttes, etc.

*Mineralography or the microscopy of the ore minerals:* ELLIS THOMSON, University of Toronto. The history of the study; technique and equipment employed in the preparation of polished sections; microscopic examination; microphotography and the practical application of the method.

*A new genus and species of dinosaur from the Belly River beds of Alberta:* W. A. PARKS. A description of a remarkable new genus of dinosaur found recently in the Cretaceous beds on the Red Deer River. It has a peculiar projection backward over the neck of the bone of the skull into a prong over four feet in length.

TUESDAY AFTERNOON SESSION, DECEMBER 27

This session was largely given up to the discussion of glacial geology.

*The glacial period: its record in Iowa:* GEORGE F. KAY. For many years Iowa has been recognized as one of the most important areas in the world for the study of the Glacial Period. Distinctive deposits mark five glacial epochs and four interglacial epochs. Attention is directed to the significance of the gombotils, which on account of their distinctive characters and wide distribution are considered to be among the best of horizon markers. They strengthen the view that the Glacial Period was probably hundreds of thousands and possibly millions of years in length.

*Some recent and pleistocene glaciers of Argentina and Bolivia:* A. P. COLEMAN.

*The drumlins:* COLONEL JOHN MILLIS. Since in the opinion of the writer the conditions favorable for drumlin formation are basin-shaped areas with impeded drainage, the radial movement of ice from these basins produced crevasses which became filled with water in summer. On freezing in winter, it produced pressure resulting in a buckling of the drift beneath the ice.

*Stratigraphy and paleontology at Toronto:* W. A. PARKS. The Paleozoic rocks in this district are overlain by the remarkable series of glacial and interglacial beds which have been formerly so fully described by Dr. Coleman and which contain evidences of interglacial epochs warmer than the present climate of the region. The Paleozoic rocks which consist of shales and limestones are exposed at a few rather widely separated points and while there are some variations in the fossil characters indicating different zones there are no physical unconformities in the series.

*Outline of the physiographic history of northeastern Ontario:* W. H. COLLINS. A summary of the data showing what important diastrophic movements have occurred in this area and the evidence which fixes the periods in which these revolutions have occurred.

WEDNESDAY MORNING SESSION, DECEMBER 28

Address of Dr. Eliot Blackwelder, the retiring vice-president of the section, on "The Trend of Earth History."

The remainder of the morning session was mostly taken up with papers bearing on sedimentation.

*Sedimentation in Lake Louise, Alberta:* W. A. JOHNSTON. The sediments being formed in the lake are glacial silts derived from Victoria glacier near the head of the lake. Conditions of sedimentation are somewhat similar to those which existed in northwestern America at the close of the Ice Age. Core samples from the bottom of the lake taken by means of a bottom sampler and sounding machine show fairly distinct banding believed to be seasonal.

*A natural classification of sedimentary rocks:* RICHARD M. FIELD. Owing to the increased

[1] Toronto, December 27, 1921.

interest in the study of clastic rocks, new terms are needed to describe new phenomena. For instance, conglomerates may differ greatly—not only as to compositions but also as to origin, and the phenoclasts should not always be called pebbles. The petrogenesis of the sedimentary rocks is intimately related to paleogeography and paleobiology. The paper is a suggestion that more attention should be paid to the "life-history" of sedimentary rocks.

*The Pre-Cambrian of western Patricia:* E. M. BURWASH. A summary and comparison of the pre-Cambrian complexes of the Lac Seul region and of the Manitoba boundary north of the Winnipeg River.

WEDNESDAY AFTERNOON SESSION, DECEMBER 28

*Some of the physico-chemical properties of colloidal solutions and their relation to geological processes:* E. F. BURTON. The study of colloidal solutions has to deal with the properties of suspension of small solid or liquid particles in such a liquid as water. Their geological importance rests on the conditions under which such suspensions are precipitated from their solutions, as, for example, in the formation of deltas and, also, on the curious effect of small traces of certain jelly-like substances on the properties of soils. Surface tension, electrical charges and molecular motions play a rôle in bringing about the stability of such suspensions and in regulating conditions of precipitation.

*The present status of the medina problem in southeastern Pennsylvania:* HARRY N. EATON. The Pennsylvania Geological Survey has investigated recently the extent of the ridge-making sandstone of the North or Blue Mountain in southern Pennsylvania, and the stratigraphic and faunal successions of the superjacent Silurian and Devonian strata on the north side of the mountain. Tentative conclusions were reached as follows: For over one hundred miles in extent the ridge-making sandstone is overlain conformably by the Clinton and probably is of Medina age, apparently correlating with the Shawangunk grit of the Delaware Water Gap region and western New Jersey. The upper Silurian and lower Devonian limestones of the New York State series were not deposited over the area immediately north of the mountain, the Cayuga shale lying directly below the Hamilton sandstone as far east as the Lehigh Gap; isolated exceptions being a thin band of Helderberg-Oriskany chert west of the Susquehanna River valley, and a thin Onondaga limestone bed in Schuylkill County, east of Swatara Gap.

The session then adjourned for a visit to the Royal Ontario Museum under the leadership of Dr. A. P. Coleman and Dr. W. A. Parks.

THURSDAY MORNING SESSION, DECEMBER 29

*The Mackenzie River Basin:* D. B. DOWLING. The basin of the Mackenzie River is underlain by Devonian limestones and shales thinly covered by Cretaceous and Tertiary sediments. The shales and dolomites underlying the upper Devonian limestones are of Middle Devonian age and in places are petroliferous. The area which may be considered as forming a possible oil field consists of a belt showing comparatively little disturbance between the crushed and metamorphosed zone of the Rocky Mountains and the overlap of the Paleozoic on the Archean to the east. The field is divided by a line of folds which may be considered a spur of the mountains which cross diagonally in a north and south direction. The eastern part exposed around Great Slave Lake is comparatively undisturbed. The portion west of the mountain spur shows signs of partaking in the earth movements. A triangular area with upturned edge next the mountains shows minor crumplings or lines of anticlines in a general east and west direction near the northern border. These terminate to the east in a probable fault line or line of breaks in which the downthrow is on the east side with the upthrow on the west side showing only in the ridges which are anticlinal in section. The surface east of this line of breaks is a flat plane, covered by Cretaceous, Tertiary and later sediments leading to the hills of the Franklin range to the east. The Devonian shows erosion previous to the deposition of what is probably Upper Cretaceous. Denudation of the Cretaceous is indicated previous to the deposition of the Tertiary and in this interval nearly all the mountain building took place since the Cretaceous is uplifted with the Devonian and the Tertiary but slightly tilted. The structure of the basin included within the pressure folds that bound the part of the oil field west of the Franklin range must be interpreted mainly from the Cretaceous measures assuming that the unconformity with the Devonian was a planation of horizontal beds near sea level. The Tertiary basins represent down warpings of the plane underlain by Cretaceous which was to base level of erosion at the inception of the mountain building. Southward Cretaceous sediments are present in great masses and form thick deposits which were elevated by the earth stresses and now form the plateaus of the plains to the south. The Cretaceous measures against which the pres-

sure from the west was expended extended northward to the latitude of the Liard River at least. Northward there seems to have been less of a barrier and the alignment in the Rocky Mountains, preserved from the boundary line northward to that point, is broken and the Mackenzie Mountains represent the eastward extension of the lines of weakness developed by the lateral compression. The eastern margin of this earth movement affects the area under study.

*The influence of rock structure on quarrying methods:* OLIVER BOWLES. While brief reference is made to the effect of joints on drilling and blasting limestone, chief emphasis is placed on the importance of rock structures in dimension stone quarrying, and the influence of such structures on the quality of the finished products. Reference is made to the manner in which marble, slate and granite quarrying methods should be modified to conform to best advantage with such rock structures as slaty cleavage, bedding, grain and rift. The great need of a more extended application of geology to quarry problems is emphasized.

*The fluorspar deposits of the Madoc district, Ontario:* M. E. WILSON. The fluorspar deposits of the Madoc district are all veins occupying fault fissures of post-Ordovician age, and are similar in type to the fluorspar deposits of the central United States and the north of England. The principal features that distinguish the deposits are that they occur in part in faults on which the displacement has been horizontal and in a region where igneous rocks of later age than the Pre-Cambrian are unknown. The evidence bearing on the origin of these deposits therefore lends greater support to the hypothesis that they have been formed through the agency of meteoric waters than in the case of other fluorspar deposits of the Madoc type.

*The geology and surface features of the Torngat Mountains in northern Labrador:* A. P. COLEMAN. The rocks displayed in northern Labrador are chiefly Laurentian granites and gneisses and Grenville sedimentary deposits. On the upturned edges of these rocks there are much later Pre-Cambrian sediments with gentle dip. The earlier Pre-Cambrian rocks, once forming great ranges of mountains, have been cut down to a peneplain of which the northeastern edge has been elevated, forming a tableland. The edge of the tableland has been carved by great valley glaciers into the wildest mountains of eastern North America, and a few small glaciers still survive. This glacial work has excavated some of the most impressive fiords to be found in America.

*Gaspé Peninsula: the country, its geology and economic possibilities:* F. J. ALCOCK. This paper is a brief description of the physiography and geology of Gaspé peninsula, with particular reference to an area in the interior where a variety of igneous rocks occur. Associated with these are important deposits of zinc and lead which present certain features of interest.

*The geology of oil in Canada:* D. B. DOWLING. A discussion of the oil producing areas and prospective oil fields of Canada.

No program was prepared by Section E on the afternoon of December 29 in order that the members might meet with Section M (Engineering) and hear a number of papers of interest to geologists and geographers. In the evening a combined dinner for Sections E and M was held in the Music Room of Hart House, University of Toronto, where a very enjoyable time was spent.

E. S. MOORE,
*Secretary, Section E*

## SECTION Q—EDUCATION

SECTION Q held session from December 28 to 30. A dinner and smoker was held on Wednesday evening. The dinner was followed by an address by Dr. R. M. Yerkes, of Washington, entitled "Remarks Concerning the Research Information Service of the National Research Council and Its International Relations." On Friday morning a session was held in conjunction with Section I. At this session E. K. Strong, Jr., of the Carnegie Institute of Technology, delivered his retiring presidential address for Section I, and Dr. Charles H. Judd, of the University of Chicago, delivered his retiring vice-presidential address for Section Q on "Technique of Scientific Revision of the Curriculum." A joint session of Section Q and K was held on Friday afternoon, at which a symposium on "An International Auxiliary Language" was given.

The average attendance at the final sessions included in the program was good throughout, including from 125 to 250 educators and psychologists.

BIRD T. BALDWIN.
*Secretary, Section Q*