atomic weight of 187.5. Its chief difference from platinum is that when fused with potassium cyanide, the melt is orange. This work of Guyard's has never been confirmed.

In 1877 Sergius Kern* announced the discovery of a new metal in platinum residues with atomic weight of 154, to which he gave the name of davyum. This has not only not been confirmed but recently Mallet† has gone over the whole ground with great care, and has shown that in all probability Kern's davyum is a mixture of iridium with rhodium and a little iron. Mallet obtained a residue in much the same way as Kern with similar properties and atomic weight, but proved it to be a mixture. This is the more significant since 154 would be the anticipated atomic weight of a metal lying between the lighter and heavier metals of the group.

The great influence of one of the metals of this group upon the properties of another, even if present in but small quantities, has already been alluded to. It has been long known and a very considerable series of experiments on this point is described by Claus.‡ Nevertheless it remains true that a good proportion of the workers on these metals have, for a time, at least, supposed themselves discoverers of new elements. We may say, however, that not yet is there any reliable evidence of any new metal between the two series, that is, with an atomic weight of about 150; nor has there been any trace of *eka-manganese*, with its atomic weight of 100, and which some chemists would expect to find resembling the platinum metals in its properties.

It is by no means impossible that new metals may be discovered in this group, but the fact that in more than half a century, no confirmed discovery of such has taken place, and that had it not been for a misinterpretation of reactions by which ruthenium was overlooked, we might say that it lacked but three years of a century since a new metal has been discovered, is not calculated to give us much encouragement. There does, indeed, seem, according to the periodic table, to be a place for three metals of atomic weight near 150, but it hardly seems probable that such occur in any of the known platinum ores which have been so thoroughly investigated, unless it be in extremely minute quantity. There is, however, always the possibility of the discovery of new platinum ores, differing in character from those now known, which, whether from the Ourals, or Colombia, or from the Pacific coast, are approximately the same in composition.

Jas. Lewis Howe.
Washington and Lee University.

(*To be concluded.*)

* *Chem. News*, 36 (1877), 4, 92, 114, 155, 164; 37 (1878), 65.

† *Am. Chem. J.*, 20 (1898), 776.

‡ C. Claus; Beiträge zur Chemie der Platinmetalle, Dorpat, 1854, chap. iv. Modificationen, welche die ursprünglichen Reactionen der einzelnen platinmetalle durch Beimengungen der übrigen Metalle aus dieser Gruppe erfahren, p. 42.

THE ROYAL SOCIETY OF CANADA.

The nineteenth meeting of the Royal Society of Canada was held in Ottawa, Canada, from May 28th to May 31st inclusive, in the Assembly Hall and rooms of the Provincial Normal School. Besides fellows of the Society from various provinces there were delegates from affiliated societies in all parts of the Dominion of Canada who reported as to the work done by them. Rev. Professor Clark, the able principal of Trinity University, Toronto, delivered the annual address 'On the Work of the Royal Society.' Numerous papers bearing upon history, science and belles-lettres were read.

Dr. L. O. Howard, the eminent economic entomologist from Washington, delivered a most practical and admirably illustrated lecture, on the evening of May 31st, His

Excellency, the Governor-General of Canada, Lord Minto, presiding. A deputation of fellows of the Royal Society waited upon Premier Sir Wilfred Laurier, and members of his cabinet urging upon them the necessity of erecting a national museum building in which to house, safely and well, the immense collections which have been acquired by the Geological and Natural History Survey of Canada since 1842. This deputation consisted of Rev. Professor Clark, Dr. G. M. Dawson, Sir Sandford Fleming, Sir James Grant, President Loudon, Monseigneur Laflamme (rector of Laval University, Quebec), Hon. Joseph Royal, Dr. L. H. Fréchette, Hon. Premier Marchand, Dr. George Stewart, Professor John Cox, of McGill University, and the member of Parliament for Ottawa, Dr. N. A. Belcourt. The deputation was well received and a definite promise made that an item would be placed in the supplementary estimates for the coming year toward the erection of a National Museum.

Amongst the scientific papers which no doubt prove of more interest to the readers of SCIENCE than the historical or purely literary of the French and English Sections, the following are noted:

MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES.

On the Depression of the Freezing-Point by Solutions Containing Sulphuric and Hydrochloric Acids: By JAMES BARNES, M.A., Dalhousie College, Halifax, N. S. Communicated by Professor J. G. MacGregor.

The object of this paper is to find out whether or not the depression of the freezing-point by solutions containing (1) sulphuric acid, and (2) sulphuric and hydrochloric acids, is calculable by the aid of the dissociation theory and of electrically determined ionization coefficients, and if so on what assumption as to the mode of ionization of the sulphuric acid. Kryoscopic observations on these solutions are of interest because sulphuric acid is usually supposed to divide into H and HSO_4 as ions in somewhat strong solutions and into 2H and SO_4 in extremely dilute solutions, the change from the one to the other mode of ionization occurring gradually as dilution is increased. The possibility of predicting the depression, therefore, forms a test not only of the general applicability of the dissociation theory, but also of the electrical method of determining the ionization coefficients and of the current view of the mode of ionization of sulphuric acid. A modification of Loomis's method has been used for the determination of the freezing-points, and Kohlrausch's method for the determination of conductivities.

On the Relative Bulk of Weak Aqueous Solutions of Certain Sulphates and their Constituent Water: By CHARLES M. PASEA, B.Sc., Dalhousie College, Halifax, N. S. Communicated by Professor J. G. MacGregor.

Dilute solutions of several of the sulphates have been found to possess a smaller volume than the water which they contain when in the free state. The object of this paper is to determine whether or not this is so in the case of solutions of the sulphates of sodium, manganese, cadmium and iron. The requisite observations of density were made with an Ostwald-Sprengel Pycnometer, with an accuracy of about 1/200 per cent. which in most cases was found to be sufficient for the purpose in hand.

A Universal Electrical Measuring Apparatus: By W. LASH MILLER, B.A., Ph.D., and F. B. KENRICK, B.A., Ph.D.

Mathematical Notes: By J. H. MCDONALD, B.A., University of Toronto. Communicated by Professor Baker, Ph.D.

The paper is divided into three parts, and deals with the development of theorems on the following subjects: (1) Special bi-

quadratic involutions and the transformation of elliptic integrals. (2) The representation of a number as the sum of two squares. (3) The twisted biquadratic curve of the first species.

Electrical Screening in Vacuum Tubes: By J. C. McLennan, B.A., Demonstrator in Physics, University of Toronto. Communicated by President Loudon.

The paper deals with a changing effect observed by Professor J. J. Thomson in connection with his experiments on Faraday cylinders inserted in vacuum tubes. The effect referred to is traced to electric conduction along the surface of the glass walls of the tube. Insulators such as sealing wax are shown to be quite unreliable in electrometric work without inner tubes, when voltages such as those produced by an induction coil are used. The importance of good earth connections is developed and Faraday cylinders inserted in vacuum tubes are shown to act as perfect electrical screens unless made of metal thin enough to permit cathode rays to pass through.

Canadian Experiments with Nitragin for promoting the Growth of Legumes: By Frank T. Shutt, M.A., F.I.C., F.C.S., and A. T. Charron, B.A.

By means of diagrams and photographs Mr. Shutt indicated the striking results recently obtained at the Central Experimental Farm or Station at Ottawa in soil-inoculation. The paper when published will be copiously illustrated. Fellows of Section IV. attended the meeting in Section III. during the reading of this important paper.

An Apparatus for the Determination of the Melting Point of Fats: By Frank T. Shutt, M.A., F.I.C., F.C.S., and H. W. Charlton, B.A., Sc.

On Soil Temperature: A continuation of papers presented at preceding meetings. By Prof. C. H. McLeod, M.E.

GEOLOGICAL AND BIOLOGICAL SCIENCES.

The Nepheline Rocks of Ice River, B. C: By A. E. Barlow, M.A., D.Sc. Communicated by Dr. G. M. Dawson.

Among the rock specimens collected by Dr. G. M. Dawson, in 1884, are some which seem to possess many points of rather unusual interest at the present time, illustrative for the most part of the phenomenon of magmatic differentiation, with which of late we have become more familiar through the labors of Vogt, Brögger and others. The specimens in question were obtained from exposures along and in the vicinity of Ice River, a branch of the Beaverfoot River in British Columbia, about eight miles southeast of Leanchoil and Ottertail stations on the Canadian Pacific Railway. The hand specimens, which were made the subjects of examination, were of necessity rather hurriedly collected and were chosen mainly as representing the various phases of this igneous complex. It is therefore a very agreeable surprise to find that the material thus selected at a time when magmatic differentiation was but little understood, should illustrate a passage so complete that no appreciable gap occurs unrepresented by specimens from the most basic Ijolite containing 36.988 per cent. of silica to ordinary nepheline and sodalite syenite containing 53.638 per cent. of silica.

Notes on North American Species of Dadoxylon: By Professor D. P. Penhallow, of McGill University.

The author brings under review a large amount of material collected by the late Sir William Dawson, representing various species of the genus *Dadoxylon*, and he also describes new species of allied plants from the Cretaceous and Permian of Kansas from the collections of Professor C. S. Prosser. The plants formerly included under the name of *Dadoxylon*, are now to be regarded as falling into the three principal groups, of

which the first, extending through Paleozoic time, properly belong to the genus *Cordaites*, which is now fairly well known through its fruit, flowers, leaves and stem structure. The second group embraces plants of the same general Araucarian type, but ranging through the more recent formations commencing with the Jurassic. The third group is reserved under the old name of *Dadoxylon*, for all those plants which cannot be readily assigned to a given and well recognized genus, and from which they may be transferred as occasion requires.

The present revision eliminates many of the errors of the earlier descriptions, and draws attention to important characters hitherto overlooked.

Quarry and Workshop of the Stone Age in New Brunswick: By G. F. MATTHEW, A.M., LL.D.

The author describes a locality on the St. John River in New Brunswick, which appears to be the source of certain carnelian weapons and implements that have been found at various points on the River St. John. The locality is at Washadunoak Lake, in Queen's County.

Notes on the Physical Feature and Geology of the Area between the Lower Ottawa and the St. Lawrence Rivers: By R.W. ELLS, LL.D.

This paper discusses some of the points relating to denudation which have been furnished by a series of borings recently made in the area south of the Ottawa River. From these the presence of a preglacial channel of that river of considerable depth is clearly shown following in part the lines of the Canada Atlantic and the Canadian Pacific railways. The thickness of the several formations of the Palæozoic formations in this part of the basin is also considered, and the presence of several important faults and anticlinals which traverse the district is considered, and their probable location given. These features are of interest at the present time in view of the inquiries recently made as to the possible occurrence of natural gas and oil in certain portions of this basin.

The Palæozoic Formations of Eastern Canada: By HENRY M. AMI, M.A., D.Sc., F.G.S., of the Geological Survey of Canada. Communicated by Dr. Fletcher.

Considerable discussion has arisen of late regarding the place which many of the geological formations of Eastern Canada occupy in the column of the Palæozoic period. There is much confusion in the variety and use of many geological, geographical and other terms in describing or defining various formations in this portion of Canada.

An attempt is made to present a simple and at the same time comprehensive classification of the various strata which compose the earth's crust and belong to the Palæozoic period. Many interesting questions in the nomenclature of Canadian rock formations are discussed and such names introduced as will serve to designate many hitherto unrecognized or undifferentiated formations in Canada.

Some Recent Work in Economic Entomology. Presidential Address of Section: By the REV. DR. BETHUNE.

In his presidential address Dr. Bethune presented a most comprehensive and practical treatise giving historical references and data bearing upon researches in economic entomology in Canada. From the days of small beginnings to the present specific legislation, restricting the encroaches and ravages of insect pests, as well as encouraging the application of every scientific fact of value to man in the department of agricultural pursuits, the author points out what has been, and what is, being done.

Sponges from the Coasts of North-Eastern Canada and Greenland: By LAWRENCE M. LAMBE, F.G.S. Communicated by Dr. Whiteaves.

The present communication forms the fifth of a series of papers, four of which have already appeared in the transactions of this Society, three of these are upon the recent marine sponges of the Pacific and one on those of the Atlantic or eastern coast of Canada, mainly from the Gulf of St. Lawrence and the coast of Nova Scotia. The paper now submitted is supplementary to the one last mentioned and treats of the more northern forms. It is based upon a collection received from Professor D'Arcy Thompson of University College, Dundee, Scotland. The Monaxonida, Tetractinellida, and Calcarea are represented by twenty species, half of which are described as new. Six octavo plates of drawings illustrate the descriptions and show the spicules and their position in the skeleton as well as the general form of the sponges.

The Cerebral Neurons in relation to Memory and Electricity: By Sir James Grant, K.C.M.G., M.D.

The brain neurons and cells, like the cells in other tissues of the body, as years pass on, give evidence of lessening power and activity. The line of present investigation demonstrates that the electrical current through the brain rotates its molecules to such a degree as to produce a most noticeable physiological response, in the direction of improved memory.

Un éboulement à St. Thuribe-de-Vincennes, comté de Champlain: Par Mgr. J. C. Laflamme.

Modifications remarquables causées dans le régime de la rivière Ste-Anne par l'éboulement de St-Alban: Par Mgr. J. C. Laflamme.

These two papers by the Rector of Laval University, Quebec, deal with important geological phenomena affecting the Pleistocene or later Quaternary boulder clays, marine clays, sands and gravels of the north shore of the St. Lawrence. There the streams which flow into this river are now cutting into these newer and uncemented rock-materials in order to form a river bed, and what appears to be a period of unstable equilibrium has set in, leading to many disastrous landslides and landslips in which many human lives have been lost, not to speak of destruction of other life and property.

The Honorary Secretary's Annual Report dealt with the progress of research in the various sections throughout Canada. The preservation of the site of Louisbourg, Nova Scotia, the proposed National Museum, the death and loss to science and the Society of its first president, Sir William Dawson, the proper equipment of a Hydrographic Survey for Canada, tidal observations and other historical as well as literary results were referred to in an able and eminently practical manner.

The following is a list of the officers of the society elected for the ensuing year: *President*, Dr. Louis Honoré Fréchette, C.M.G.; *Vice-President*, President Loudon of Toronto University; *Honorary Secretary*, Sir John G. Bourinot; *Honorary Treasurer*, Dr. James Fletcher.

In the Geological and Biological Section the following officers were elected: *Chairman*, Dr. A. H. Mackay, Halifax, Nova Scotia; *Vice-Chairman*, Professor F. D. Adams, McGill University, Montreal; *Secretary*, Professor G. U. Hay, St. John, New Brunswick.

In the Physical and Mathematical Science Section, the following were chosen: *Chairman*, President Loudon; *Vice-Chairman*, Dr. R. F. Ruttan; *Secretary*, E. Deville, Surveyor-general of Canada, Ottawa.

H. M. Ami.

SCIENTIFIC BOOKS.

The Logical Bases of Education. By J. Welton, M.A. London, Macmillan & Co. 1899. Pages xvi + 288.

This book is one of a series, 'Macmillan's Manuals for Teachers,' edited by Oscar Brown-