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NOTICE.—No Report, Paper, or Abstract can be inserted in the Volume unless the MS. is in the Secretary's hands by 4 p.m. THIS DAY.

By Order of the COUNCIL.

MONTREAL, 1884.

BRITISH ASSOCIATION

FOR THE

ADVANCEMENT OF SCIENCE.

FIFTY-FOURTH MEETING, 1884.

JOURNAL

—OF—

SECTIONAL PROCEEDINGS

No. 7.

ISSUED WEDNESDAY MORNING, SEPT. 3,

AT EIGHT A.M.

MEMBERS AND ASSOCIATES ARE REQUESTED TO CALL FOR LETTERS AT THE POST OFFICE, AND LEAVE INSTRUCTIONS WITH THE LOCAL SECRETARIES.

MEETINGS THIS DAY.

SECTIONS.....at 11 A.M.*—THE SECTION ROOMS.

GENERAL COMMITTEE.....at 1. 0 P.M.—MCGILL UNIVERSITY.

CONCLUDING GENERAL MEETING....at 2.30 P.M.—QUEEN'S HALL.

*SEE PAGES 3 AND 4.

PRINTED UNDER THE SUPERINTENDENCE OF THE SECRETARY.

GAZETTE PRINT, MONTREAL.

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PER
Z-133
(5)

3

PAPERS TO BE READ ON WEDNESDAY,

SEPTEMBER 3RD, 1884.

Section A.—Mathematical and Physical Science.

This Section will not meet to-day.

Section B.—Chemical Science.

This Section will not meet to-day.

Section C.—Geology.

This Section will meet at 10.30.

1. *Matthews, G. F., A.M., F.R.S.C.*—The Geological Age of Acadian Fauna.
2. ————The Primitive Conocoryphean.
3. *De Rance, C. E., and W. Topley.*—Report of the Committee upon the Rate of Erosion of the Sea Coasts of England and Wales, and the Influence of the Artificial Abstraction of Shingle and other Material in that Action.
4. *Milne, Prof. J.*—Fourth Report on the Earthquake Phenomena of Japan.
5. *Hull, Prof. E., LL.D., F.R.S.*—The Geology of Palestine.
6. *Cope, Prof. E. D.*—On the Permian genus *Cricotus*.
7. ————On the Pliocene Vertebrata of the Plateau of the Cordilleras of N. America and Mexico.
8. *Hallett, P., M.A.*—Notes on Niagara Falls.

Section D.—Biology.

This Section will not meet.

Section E.—Geography.

This Section will not meet.

Section F.—Economic Science and Statistics.

[AT THE SYNOD HALL.]

1. *H. J. Hague.*—The Banking system of Canada.
2. *Hyde Clarke.*—Prospective prices in Europe, America, and Asia.
3. *W. A. Douglass.*—Harmonies and Antagonisms of Social Forces.
4. *Rev. G. Cecil White.*—Notes on Friendly Societies.
5. *Don Arturo de Marcoartu.*—Commercial Relations of Canada with Spain and its Colonies.
6. *Dr. Beaufort Hurlbert.*—Forestry.

(This Section will close at 1 p.m.)

SECTION G.—Mechanical Science.

[AT THE CONGREGATIONAL COLLEGE.]

1. *W. Whitaker, B.A., F.G.S.*—The Extent to which a Geological Formation is available as a gathering-ground for Water-supply.
2. *J. Dillon.*—Flood Regulators.
3. *D. Pidgeon.*—Agricultural Implements.
4. *Dr. Brown.*—The Destruction of Town Refuse.
5. *Admiral J. E. Commerell.*—Prevention of Accidents at Sea.

Section H.—Anthropology.

[AT THE WESLEYAN COLLEGE.]

The Section will meet at 10 o'clock.

1. *Admiral F. S. Tremlett.*—Lapidary Sculptures of the Dolmens of the Morbihan.
2. *R. Law and James Horsfall.*—An Account of small Flint Implements found beneath Peat on the Pennine Chain.
3. *James Dallas.*—On the Primary Divisions and Geographical Distribution of Mankind.
4. *A. L. P. Cameron.*—Notes on some tribes of New South Wales.

PAPERS READ ON TUESDAY,

SEPTEMBER 2, 1884.

Section A. — Mathematical and Physical Science.

SUB-SECTION OF MATHEMATICS.

1. *Professor J. C. Adams.*—Note on Newton's Theory of Astronomical Refraction, and on his explanation of the motion of the Moon's Apogee.
2. *Rev. Dr. C. Taylor.*—A Historical Note on Continuity.
3. *Professor R. S. Ball.*—On a Model of the Cylindroid, showing the nodal line.
4. *Professor G. P. Young.*—On Solvable Irreducible Equations of prime degree.
5. *Professor Lindemann.*—On the tact-invariant of a Cubic Curve and a Conic Section.
6. *Professor W. Dyck.*—On the "Analysis Situs" of three-dimensional spaces.
7. *Professor W. M. Hicks.*—On the Expression of the Coordinate of a point in terms of the potential and line of force at the point.
8. *Professor W. M. Hicks.*—On the pressure at a point inside a vortex-ring of uniform vorticity.
9. *Professor A. W. Phillips.*—Transformation of the stereographic equatorial projection of a sphere by means of a certain form of the Peaucellier cell.
10. *R. F. Davis.*—A Geometrical Theorem in connection with the three-cusped Hypocycloid.
11. *E. P. Culverwell.*—On the discriminating condition between maxima and minima in the Calculus of Variations.

12. *David P. Todd.*—On the invariable plane of the Solar System.
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SUB-SECTION OF PHYSICS.

1. Report of Committee for facilitating the adoption of the Metric System in Great Britain.
2. *Lord Rayleigh.*—On the Colours of Thin Plates.
3. *Lord Rayleigh.*—On Clark's Standard Cells.
4. *Professor Fitzgerald.*—On an Analogy between Heat and Electricity
5. *J. Urquhart Mackenzie.*—The Telemeter System.
6. *Professors Reinold and Rücker.*—The thinning of liquid films by electric current.
7. *Professor Chandler Roberts.*—On the diffusion of metals.
8. *W. J. Millar.*—On Iron and other metals in the solid and molten states.
9. *Professor George Forbes.*—On the velocity of light of different colours.
10. *Albert A. Michelson.*—The velocity of light in carbon disulphide and the difference of the velocities of red and blue light in the same.
11. *Professor R. S. Ball.*—On a systematic research for stars with a measurable annual parallax, and its result.
12. *Dr. Stone.*—On an electro-dynamometer with extremely light moving coil for the measurement of small alternating currents.
13. *W. H. Preece.*—On the law regulating the connexion between current and intensity of incandescence of carbon-filaments in glow lamps.
14. *Professor S. P. Thompson.*—The equations of dynamo-electric machines.

15. *E. O. Walker*.—On earth currents.
16. *B. Thacher*.—On a new cylindrical slide-rule.
17. *H. Borns*.—On the inconveniences of the present mode of quoting scientific journals.
18. *P. Burton*.—An account of unusual coloured bows observed in fogs.
19. *J. B. Francis*.—On the temperature of the interior of a block of melting ice.

Section B.—Chemical Science.

1. Discussion on Chemical Changes in their Relation to Micro-organisms, to be opened by Professor Frankland.
2. *R. Warington*.—On Nitrification.
3. *Professor W. O. Atwater*.—On the Assimilation of Atmospheric Nitrogen by Plants.
4. *Sir John Lawes and Dr. Gilbert*.—On some Points in the Composition of Soils, with Results illustrating the Sources of Fertility of Manitoba Prairie Soils.
5. *H. B. Dixon*.—On the Velocity of Explosions in Gases.
6. *Professor Carnelley*.—On the Colour of Chemical Compounds; chiefly as a Function of the Atomic Weights of their Constituent Elements.
7. *G. P. Girdwood and J. M. Benrose*.—Preliminary Note on a Blue-colouring Matter found in certain Wood undergoing Decomposition in the Forest.

Section C.—Geology.

1. *Gilbert, G. K., U. S. Geological Survey*.—Plan for the Subject-Bibliography of North American Geology.
2. *Claypole, Prof. E. W., B.A., B.Sc., F.G.S., Geological Survey of Pennsylvania*.—On some remains of Fish from the Upper Silurian Rocks of Pennsylvania.
3. *Marsh, Prof. O. C.*—American Jurassic Mammals.
4. *Jones, Prof. T. R., F.R.S.*—On the Geology of South Africa.

5. *Dawson, Principal Sir W., C.M.G., LL.P., F.R.S.*—On the more Ancient Land Floras of the Old and New Worlds.
6. *Gardner, J. S.*—On the Relative Ages of the American and English Cretaceous and Eocene Series.
7. *Wethered, E.*—On the Structure of English and American Carboniferous Coals.
8. *Jones, Prof. T. R., F.R.S.*—Second Report on the Fossil Phyllopora of the Palaeozoic Rocks.
9. *Mackay, A. H., D.A., A.Sc.*—A Preliminary Examination of the Siliceous Organic Remains in the Lacustrine deposits of the Province of Nova Scotia.
10. *De Rance, C. E.*—Tenth Report of the Committee upon the Underground Waters in the Permeable Formations of England and Wales, and the Quantity and Character of the Water supplied to various Towns and Districts from those Formations.
11. *Vine, G. R.*—Fifth Report on Fossil Polyzoa.
12. *Davis, J. W.*—Report upon the Exploration of Raygill Fissure in Lothersdale, Yorkshire.

Section D.—Biology.

1. Report on the Elimination of Nitrogen.
2. Remarks on the Caldwell Automatic Microtome.
3. *Prof. R. Ramsay Wright.*—On Sensory Nerve sacs in the skin of *Amiurus*, a Siluroid fish.
4. *Prof. R. Ramsay Wright.*—On the Function of the Air-bladder in *Amiurus*, and its relationship to the Auditory Organ.
5. *Albert S. Bickmore.*—On the Jessop Collection to illustrate the Forestry of the United States, in the New York Natural History Museum.
6. *S. F. Harmer.*—On the development of *Polyzoa*.
7. *Professor Shepherd.*—On Anatomical Variations. 1. Paramastoid process occurring in Man. 2. Secondary Astragalus. 3. Persistence of the left duct of Cuvier in Man.

8. *Prof. Moseley.*—On the Eyes and other Sense Organs in the Shells of the *Chitonidæ*.
9. *Prof. Moseley.*—On the Structure and Arrangement of the Feathers in the Dodo.
10. *William Bateson.*—The presence in the *Enteropneusta* of a structure comparable with the Notochord of the *Chordata*.
11. *Prof. P. McMurrick.*—A Contribution to our knowledge of the *Phytophi*.
12. *A. H. Mackay.*—On the Diatomaceous remains in the Lake-deposits of Nova Scotia.

SUPPLEMENTARY MEETING—PHYSIOLOGY.

In the Chemistry Lecture Room, at 11 o'clock.

Prof. SCHAFER, V.-P., in the Chair.

1. *Professor Schäfer.*—Demonstration of an Apparatus for recording changes of volume.
2. *Professor McKendrick.*—Remarks on the Problem of Aquatic breathing.
3. *Dr. G. Harley.*—On Biliary concretions; demonstrating a uniformity in the construction of concretions in the Animal, Vegetable and Mineral kingdoms.
4. *Professor Mills.*—On the Secretion of Oxalic Acid in the Dog.
5. *Professor Schäfer.*—On the Mechanism of Absorption.
6. *Rev. Dr. Dallinger.*—On a method of studying the behaviour of the germs of septic organisms under changes of temperature.
7. *A. W. Bennett.*—A Vegetable organism which separates Sulphur.
8. *Dr. W. Alexander.*—The Physiology of Therapeutics of the Chloral Hydrate, and Anæsthetics generally.
9. *C. S. Minot.*—On the Growth of Children.
10. *W. B. Halliburton and Professor Schafer.*—On the Proteids of Serum.
11. *W. H. Hingston.*—Climate of Canada, and its relations to life and health.

Section E.—Geography.

1. *Lieut. P. H. Ray*, U.S.A.—Arctic experiences at Point Barrow.
2. *Lieut. A. W. Greely*, U.S.A.—Recent Discoveries in Northern Greenland and in Grinnell Land.
3. *R. G. Haliburton*.—A search for lost Colonies of Northmen and Portuguese in British North America.
4. *Rev. Abbé J. C. R. Laflamme*, (*Professeur à l'Université Laval*).—Notes sur quelques grands Bassins Hydrographiques du Dominion Oriental.
5. *Professor W. Boyd Dawkins*, M.A., F.R.S.—The former connection between North America and the Eastern side of the Atlantic.
7. *J. S. O'Halloran*.—A communication on Winnecke's explorations in Central Australia, with notes on the employment of camels.

Section F.—Economic Science and Statistics.

1. *Cornelius Walford*.—Internal Communication by Land and Water.
2. *Ed. Wragge and Alex. McDougall*.—Transport by Land and Water.
3. *Emile de Laveleye*.—On Land Laws.
4. *Miss Maria Rye*.—Female Emigration.
5. *Mrs. Burt*.—Female Emigration.
6. *Mrs. Joyce*.—Female Emigration.
7. *J. Lowe*.—Population, Immigration and Pauperism in Dominion of Canada.
8. *T. B. Sprague*.—On the probability that a marriage entered into at any age will be fruitful, and that a marriage which has been childless for several years will subsequently become fruitful.
9. *C. Le Neve Foster*.—On the relative dangers of Coal and Metal Mining.

Section G.—Mechanical Science.

1. Report of the Patent Law Committee.
2. Report of the Screw Gauge Committee.
3. Report of the Sea-Coast Erosion Committee.
4. *Professor S. P. Thompson.*—Some points in Dynamo-Electric Machines.
5. *G. Forbes.*—The Heating of Conductors by Electric Currents.
6. *C. J. H. Woodbury.*—Automatic Sprinklers for Fire Extinction.
7. *Professor Osborne Reynolds.*—The Friction of Journals.
8. *V. C, Van Horn.*—Grain Elevators.
9. *Arthur Rigg.*—Flow of water through Turbines and Screw Propellers.
10. *A. T. Smith.*—Ventilation of Ocean Steamers.

Section H.—Anthropology.

1. Report of Committee for the purpose of defraying the expenses of completing the final Report of the Anthropometric Committee.
2. *A. Neubauer.*—Notes on the Races of the Jews.
3. *Dr. Daniel Wilson.*—On a Skull from the Löss of Podbaba, near Prague, and a Skull found in Alluvium at Kanakee, Illinois, along with a Tooth of the Mastodon.
4. *Rev. H. H. Winwood.*—Recent Excavations in Pen Pits, Somersetshire.
5. *Horatio Hale.*—On some Doubtful or Intermediate Articulations.
6. *Professor G. Lawson.*—On Food Plants used by the Indians.
7. *Lieut. A. W. Greeley, U.S.A.*—Evhicitioid of photographs of Eskimo relics.
8. *Lieut. P. H. Ray, U.S.A.*—Habits and Customs of the Inu of the Western Shore and Point Barrow.

9. *Jean L'Heureux*—Oontes on the Astronomical customs and religious ideas of the Chokitapia or Blackfeet Indians. Communicated by *R. G. Haliburton*.
10. *Jean L'Heureux*.—The Kekip-Sesovators or Ancitnt Sacrificial Stone of the Lorth-Western Tribes of Canada. Communicated by *R. G. Haliburton*.
11. *C. Staniland Wake*.—Race elements of the Malagasy.
12. *Hyde Clarke*.—Notes on Researches as to American Origins.

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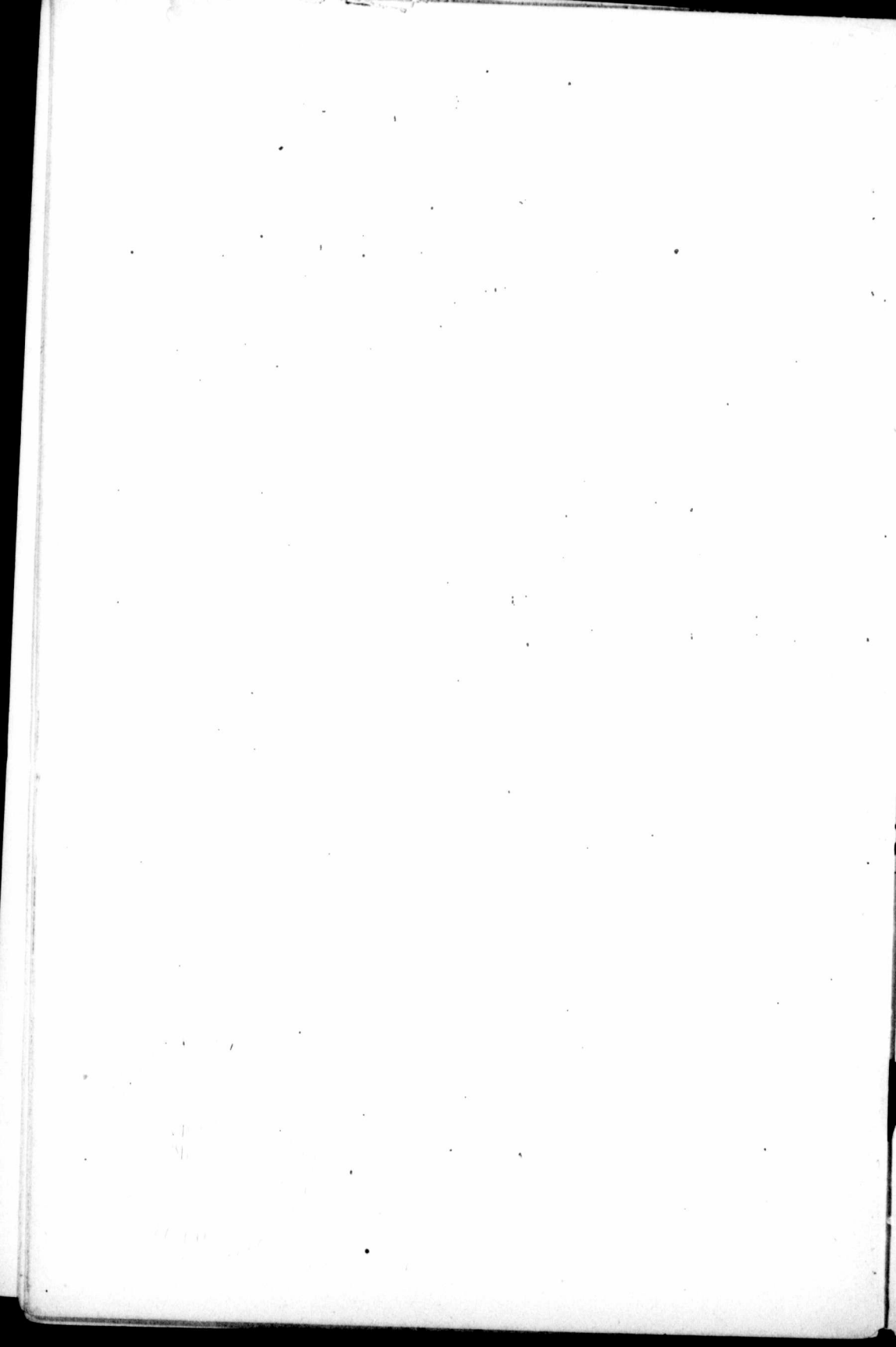
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**MEETINGS OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE,
MONTREAL, 1884.**

HOURS AND PURPOSES OF MEETING, WEDNESDAY, AUGUST 27TH, TO WEDNESDAY, SEPTEMBER 3RD.

DAYS.	COUNCIL. McGill University.	GENERAL COMMITTEE. McGill University.	Committee of Recommendations— McGill University.	Committees of Sections.	SECTIONS.	GENERAL MEETINGS.	SOIREEs.
Wednesday, Aug. 27	10 A.M.	{ 1 P.M. To receive Report of Council. }	2 P.M.	..	{ 8 P.M. The Presi- dent's Address. } { 8-30 P.M. Prof. Oliver J. Lodge's Dis- course on "Dust." }	{ 8 P.M. At McGill University. }
Thursday, " 28	10 A.M.	11 A.M.		
Friday, " 29	10 A.M.	11 A.M.		
Saturday, " 30	10 A.M.	11 A.M.		
Sunday, " 31	10 A.M.	11 A.M.		
Monday, Sept. 1	..	†	..	10 A.M.	11 A.M.	{ 8-30 P.M. Rev. W. H. Dallinger's Dis- course on "The Modern Micros- cope in Researches on the Last and Lowest Forms of Life." }	
Tuesday, " 2	3 P.M.	10 A.M.	11 A.M.	{ 8 P.M. In the Skat- ing Rink. }
Wednesday, " 3	..	{ 1 P.M. To receive Report of Committee of Re- commendations. }	10 A.M.†	{ 2-30 P.M. Conclud- ing Meeting. }	

N.B.—Excursions are proposed for Saturday, August 30th, and Thursday, September 4th, concerning which apply to the Local Secretaries.
 † At this Meeting the Sectional Officers will be elected.
 ‡ Instead of the meeting ordinarily held on this afternoon, there will be one at the Royal Institution, Albemarle street, London, England, on Nov. 11, at 3 p.m., for election of officers, fixing place of meeting in 1885, &c.
 † This meeting is only held in the event of business remaining over from the previous day.