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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. on Wednesday, September 3rd.
By Order of the COUNCIL.

MONTREAL, 1884.

BRITISH ASSOCIATION

FOR THE

ADVANCEMENT OF SCIENCE.

FIFTY-FOURTH MEETING, 1884.

JOURNAL

—OF—

SECTIONAL PROCEEDINGS

No. 5.

ISSUED MONDAY MORNING, SEPT. 1,

AT EIGHT A.M.

MEMBERS WHO PROPOSE TO READ PAPERS to any Section of the Meeting are requested to forward or deliver the same immediately to the Secretaries of that Section, and to arrange without delay with those Officers, by Letter, as to the time and manner of reading the communication (see page 10).

LETTERS AND OTHER COMMUNICATIONS for the General and Sectional Officers and other Members of the Association may be left in the care of the CLERK AT THE POST OFFICE.

MEETINGS THIS DAY.

SECTIONAL COMMITTEES..... at 10 A.M.—THE COMMITTEE ROOMS.
SECTIONS..... at 11 A.M.—THE SECTION ROOMS.
DR. DALLINGER'S DISCOURSE.... at 8.30 P.M.—THE QUEEN'S HALL.

PRINTED UNDER THE SUPERINTENDENCE OF THE SECRETARY.

GAZETTE PRINT, MONTREAL.

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PAPERS TO BE READ ON MONDAY,

SEPTEMBER 1st, 1884.

[AT THE MORRICE HALL.]

Section A. — Mathematical and Physical Science.

1. Special Discussion on *The connexion of Sun-Spots with Terrestrial Phenomena*, to be opened by *Professor A. Schuster*.
2. *Professor Balfour Stewart* and *W. Lant Carpenter*.—On certain short periods common to solar and terrestrial phenomena.
3. The Report of Committee on the Harmonic Analysis of Tidal Observations.
4. Report of Committee on Tidal Observations in the English Channel.
5. *Professor A. Johnson*.—On the importance of Tidal Observations in the Gulf of St. Lawrence and the adjacent Atlantic coast.
6. Report of Committee on the Measurement of Solar Radiation.
7. Report of Committee on Meteoric Dust.
8. *Professor H. A. Rowland*.—Recent progress in photographing the Solar Spectrum.
9. *Rev. S. J. Perry*.—On the Spot-Spectrum from D. to B.
10. *C. Carpmael*.—On a new form of Induction Inclinator.
11. *The Earl of Rosse*.—An Electrical control for Equatorial Driving-Clocks.
12. *The Earl of Rosse*.—On the Polishing of Specula.
13. *Professor James Thomson*.—On Whirlwinds and Water-spouts.

14. *Professor Douglas Archibald*.—On some preliminary experiments with Anemometers attached to kite-wires.
15. *Professor Douglas Archibald*.—The recent Sun-Glows and Halo in connexion with the eruption of Krakatoa.
16. *G. H. Henshaw*.—On the formation of "frasil" ice.
17. *H. S. Poole*.—Note on the internal temperature of the earth at Woolville, Nova Scotia.
18. *Dr. H. Muirhead*.—On the formation of mackerel-Sky.

Section B.—Chemical Science.

[AT THE CHEMICAL CLASS ROOM. MCGILL COLLEGE.]

1. *Professor W. Chandler Roberts*.—Report of the Committee on Spectrum Analysis.
2. *Harold B. Dixcn*.—Report of the Committee on Chemical Nomenclature.
3. *Dr. Perkin*.—On Coal Tar colouring Matters.
4. *W. Weldon*.—On the Manufacture of Soda and Chlorine.
5. *Professor J. Sterry Hunt*.—On the Chemistry of the Natural Silicates.
6. *Professor Dewar*.—On the Liquefaction of Oxygen and the Density of Liquid Hydrogen.
7. *Professors Goodwin and Marshall*.—On the Physical constants of Solutions.
8. *Dr. Stevenson Macadam*.—On the production of Permanent Gas from Paraffin Oils.
9. *Sir H. E. Roscoe*.—On the diamondiferous Deposits of South Africa and the Ash of the Diamond.
10. *F. Robinson*.—On a Redetermination of the Atomic Weight of Cerium.

Section C.—Geology

1. *Professor James Hall*.—On the Fossil Reticulate Sponges constituting the Family *Dictyospongidae*.

2. ————On the Lamellibranchiate Fauna of the Upper Helderberg, Hamilton, Portage, Chemung and Catskill groups (equivalent to the Lower, Middle and Upper Devonian of Europe); with especial reference to the arrangement of the Monomyaria, and the development and distribution of the species of the genus *Leptodesma*.
3. *Prof. T. G. Bonney*, D.S.C., F.R.S.—On the Archæan Rocks of Great Britain.
4. *Dr. T. Sterry Hunt*, F.R.S.—The Eozoic Rocks of North America.
5. *Professor J. F. Blake*.—First impressions of some Pre-Cambrian Rocks of Canada.
6. *Professor J. D. Dana*, LL.D.—On the Southward Ending of a great Synclinal in the Taconic Range.
7. *Johnston-Lavis, H. J.*—Notice of a Geological Map of Monte Somma and Vesuvius.
8. *Topley, W.*, *Geological Survey of England*.—Report upon the National Geological Surveys of Europe.
9. *Whitaker, W.*, B.A., *Geological Survey of England*.—The Value of Detailed Geological Maps in relation to Water-Supply and other Practical Questions.
10. *Ball, V.*, M.A., F.R.S.—On the Mode of Occurrence of Precious Stones and Metals in India.
11. *Dr. C. Le Neve Foster, H. M.*, *Inspector of Mines*.—What is a Mineral Vein or Lode?

Section D.—Biology.

[MEDICAL DEPARTMENT, MCGILL COLLEGE.]

1. *Prof. D. J. Cunningham*.—On the value of Nerve-supply in the determination of Muscular Anomalies.
2. *Prof. A. M. Marshall*.—On the mutual relation of the recent groups of Echinoderms.
3. *W. H. Caldwell*.—On the Fœtal Membranes of the Marsupials.
4. *W. H. Caldwell*.—A letter on the progress of his investigations in Australia.

5. *Dr. G. E. Dobson.*—An attempt to exhibit diagrammatically the several stages of the Evolution of the *Mammalia* as defined by Huxley.
6. *Dr. G. E. Dobson.*—On some peculiarities in the Geographical distribution and habits of certain Mammals inhabiting Continental and Oceanic Islands.
7. *Howard Saunders.*—On the Geographical distribution of the *Laridæ* (Gulls and Terns) with special reference to Canadian species.
8. *W. B. Hemsley.*—Result of the investigations of Insular Floras.
9. *G. P. Hughes.*—Some observations on the direct descendants of *Bos primigenius*, in Great Britain.
10. *Dr. W. Fraser.*—On Natural Co-ordination as evinced in Organic Evolution.

SUPPLEMENTARY MEETING—PHYSIOLOGY.

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

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

1. *Professor H. M. Martin and W. H. Howell.*—On the Coagulation of Blood.
2. *Francis Gotch and J. P. Laws.*—On the Blood of *Limulus polyphemus*.
3. *Professor H. P. Bowditch.*—On Vaso-motor Nerves.
4. *Professor T. W. Mills.*—On the Secretion of Oxalic Acid in the Dog.
5. *Professor T. W. Mills.*—Demonstration of the Co-ordinating Centres of Kronecker.
6. *Professors Kronecker and Mills.*—On the Cardiac Nerves of the Turtle.
7. *V. Horsley and Professor Schäfer.*—On the functions of the Marginal Convolution.
8. *Professor McKendrick.*—Remarks on the Problem of Aquatic breathing.
9. *Professor Schäfer.*—Demonstration of an Apparatus for recording changes of volume.

Section E.—Geography.

[GYMNASIUM, MANSFIELD STREET.]

1. *James Glaisher, F.R.S.*—Report on the Committee for promoting the Survey of Palestine.
2. *Dr. J. Beaufort Hurlbert.*—Comparison of the climates of the Eastern and Western Hemispheres.
3. *Dr. J. Beaufort Hurlbert.*—Some peculiar Storms on the North American Continent.
4. *E. T. Fletcher.*—The Crown Land Surveys of the Province of Quebec.
5. *Trelawney Saunders.*—Dominion Surveys.
6. *James Dillon.*—An Automatic Sounder.
7. Memorandum on the proposed British Commercial Geographical Society.

Section F.—Economic Science and Statistics.

[AT THE SYNOD HALL.]

1. Report of Committee for the purpose of defraying the expenses of completing the final Report of the Anthropometric Committee.
2. Report of Committee on teaching of Science in Elementary Schools.
3. *Stephen Bourne.*—Independence of several portions of the British Empire.
4. *Cooke Taylor.*—Factory Arts.
5. *R. C. Adams.*—Phosphates of Canada.
6. *L. Z. Joncas.*—Fisheries.
7. *J. P. Hughes.*—Forestry.
8. *A. T. Drummond.*—Distribution of Canadian Trees.
9. *Dr. Bell.*—Forests of Canada.

SECTION G.—Mechanical Science.

[AT THE CONGREGATIONAL COLLEGE.]

1. *W. Smith*.—Light-house system of Canada.
2. *Sir James Douglass*.—Improvements in Coast Signals.
3. *W. H. Preece*.—Secondary Batteries.
4. *W. H. Preece*.—Domestic Electric Lighting.
5. *Professor S. P. Thompson*.—Some points in Dynamo-Electric Machines.
6. *G. Forbes*.—Electric Lighting.
7. *Dr. H. Traill*.—The Portrush Electric Railway.
8. *Holroyd Smith*.—Electric Tramways.
9. *Captain Carden*.—A new Volt-moter.

Section H.—Anthropology.

[AT THE WESLEYAN COLLEGE.]

1. *Mrs. Erminie A. Smith*.—Remarks on the Customs and Language of the Iroquois.
2. *F. H. Cushing*.—On the Development of Industrial and Ornamental Art among the Zuñis of New Mexico.
3. *Dr. Daniel Wilson*.—The Huron-Iroquois a typical race of American Aborigines.
4. *C. A. Hirschfelder*.—Anthropological Discoveries in Canada.
5. *A. Neubauer*.—Notes on the Races of the Jews.
6. *James Dallas*.—On the Primary Divisions and Geographical Distribution of Mankind.
7. *Hyde Clarke*.—Observations on the Mexican Zodiac and Astrology.
9. *Miss A. W. Buckland*.—Facts suggestive of prehistoric intercourse between East and West.

THE SECTIONS DID NOT MEET ON SATURDAY.

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Glaisher, F.R.S.; J. W. L. Glaisher, F.R.S.; O. Henrici, F.R.S., J. C. Hoadley; S. Keefer; E. D. Leavitt, Junr.; L. Lesage; W. P. Marshall; D. Pidgeon; Capt. Bedford Pim, R.N.; Prof. W. A. Rodgers; Prof. O. Reynolds; A. Rigg; G. Russell; Prof. Hele Shaw; W. Smith; T. T. Vernon Smith; Alexr. Tate; Sir W. Thomson, F.R.S.; S. P. Thompson; J. Topham; W. Topley; Prof. J. Burkett Webb; C. J. H. Woodbury; W. Whitaker; T. Wrightson.

Section H.—Anthropology.

President.—E. B. Tylor, D.C.L., F.R.S.

Vice-Presidents.—Professor W. Boyd Dawkins, M.A., F.R.S.; Professor Daniel Wilson, LL.D., F.R.S.E.; Major Powell, U.S.A.; Sir W. Dawson, LL.D., F.R.S.

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Committee.—Professor D. J. Cunningham, M.D.; W. B. Cheadle, M.A., M.D.; Horatio Hale; C. A. Hirschfelder, Professor T. Rupert Jones, F.R.S.; G. H. Kinahan; Kelburne King, M.D.; Professor H. N. Moseley, M.A., F.R.S.; H. Muirhead, M.D.; Captain Bedford Pim, R.N.; F. W. Putnam; Professor J. Struthers, M.D.; D. Hack Tuke; M.D.; Rev. H. H. Winwood, M.A., F.G.S.

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. | SOIRÉES. |
|--------------------|-----------------------------------|---|---|-------------------------------|-----------|---|---------------------------------------|
| Wednesday, Aug. 27 | 10 A.M. | { 1 P.M. To receive Report of Council. } | .. | 2 P.M. | .. | { 8 P.M. The Prosi- dent's Address. } | } 8 P.M. At McGill University. |
| Thursday, " 28 | .. | .. | .. | 10 A.M. | 11 A.M. | .. | |
| Friday, " 29 | .. | .. | 3 P.M. | 10 A.M. | 11 A.M. | { 8-30 P.M. Prof. Oliver J. Lodge's Dis- course on "Dust." } | |
| Saturday, " 30 | .. | .. | .. | 10 A.M. | 11 A.M. | .. | |
| Sunday, " 31 | .. | .. | .. | .. | .. | .. | |
| 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 Resear- ches on the Least and Lowest Forms of Life. } | } 8 P.M. In the Skat- ing Rink. |
| Tuesday, " 2 | .. | .. | 3 P.M. | 10 A.M. | 11 A.M. | .. | |
| 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.