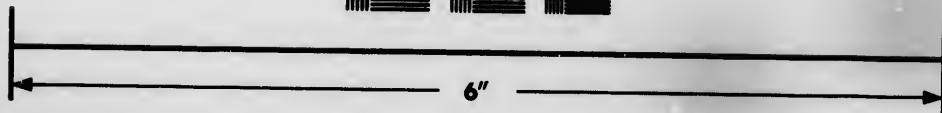
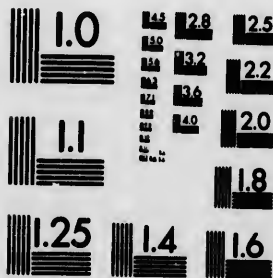


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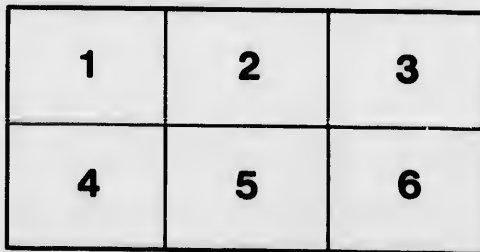
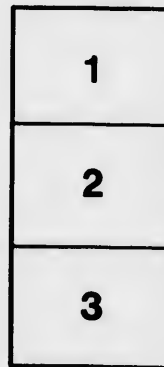
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ELEVENTH MEETING

OF THE

AMERICAN ASSOCIATION

FOR THE

ADVANCEMENT OF SCIENCE:

COMMENCING

WEDNESDAY, AUGUST 12, 1857.

AT THE

COURT HOUSE IN THE CITY OF MONTREAL, C.E.

MONTREAL:

JAMES FOTTS, PRINTER, HERALD OFFICE.

1857.

OFFICERS OF THE ASSOCIATION.

Professor J. W. BAILEY,* Elected President.
Professor ALEXIS CASWELL, Vice President.
Dr. JOHN LECONTE, General Secretary.
Professor JOSEPH LOVERING, Permanent Secretary.
Dr. A. L. ELWYN, Treasurer.

STANDING COMMITTEE.

EX-OFFICIO FROM THE LAST YEAR.

Professor J. W. BAILEY.* Professor JOHN LECONTE.
Professor JOSEPH LOVERING. Professor JAMES HALL.
Professor ALEXIS CASWELL. Dr. B. A. GOULD.
Dr. A. L. ELWYN.

ELECTED BY BALLOT AT MONTREAL.

Professor J. W. DAWSON. Professor BENJAMIN PIERCE.
Professor DANIEL WILSON. Professor DENISON OLMSTED.
Professor JOSEPH HENRY. Rev. P. N. LYNCH, D. D.

EX-OFFICIO AS PERMANENT CHAIRMEN OF SECTIONS.

Professor A. D. BACHE, L. L. D. Professor J. D. DANA, L. L. D.

LOCAL COMMITTEE.

Sir WILLIAM E. LOGAN, F. R. S., L. L. D., President.
A. N. RENNIE, Esq., Secretary.

HIS WORSHIP THE MAYOR OF MONTREAL.
REAL.
THE LORD BISHOP OF MONTREAL.
THE PRESIDENT OF THE BOARD OF TRADE.
THE PRESIDENT OF THE MECHANICS' INSTITUTE.
THE PRESIDENT OF THE INSTITUT CANADIEN.
THE PRESIDENT OF THE MERCANTILE LIBRARY ASSOCIATION.
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C. E. BELLE, Esq.
WM. BRISTOW, Esq.
HON. P. J. O. CHAUVEAU, L. L. D.
HENRY CHAPMAN, Esq.
REV. J. CORDNER.
BROWN CHAMBERLIN, M. A., B. C. L.
C. S. CHERRIER, Esq.
C. J. COURSOL, Esq.
PROF. J. W. DAWSON, L. L. D., F. G. S.
A. A. DORION, M. P. P.
HON. JUDGE DAY, L. L. D.
J. J. DAY, Esq.
W. H. A. DAVIES, Esq.
C. DUNKIN, M. A.
HON. S. DE BEAUJEU.
JACOB DEWITT, M. P. P.
HON. L. T. DRUMMOND, M. P. P.
A. H. DAVID, M. D.
A. M. DELISLE, Esq.
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IRA GOULD, Esq.
LUTHER H. HOLTON, M. P. P.
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N. S. WHITNEY, Esq.
HON. JOHN YOUNG, M. P. P.

* Deceased.
Members will find their letters at the Post Office in the Court House.

RULES OF MEMBERSHIP.

RULE 1—Those persons whose names have already been enrolled in the published Proceedings of the Association, shall be considered Members on subscribing to the Rules.

RULE 2—Members of Scientific Societies, or Learned Bodies having in view any of the objects of this Society, publishing transactions, shall likewise be considered members on subscribing to the Rules.

RULE 3—The Collegiate Professors of Natural History, Physics, Chemistry, Mathematics and Political Economy, and of the Theoretical and Applied Sciences generally, also Civil Engineers and Architects who have been employed in the Construction and Superintendence of Public Works, may become members on subscribing to the Rules.

RULE 4—Persons not embraced in the above provisions may become members of the Association upon nomination by the Standing Committee, and by a vote of the majority of the members present.

RULE 5—The amount of the annual subscription by each member of the Association shall be two dollars; and one dollar in addition, shall entitle him to a copy of the proceedings of the annual meeting.

NOTICE.

The Court House will be open for the meetings of the Association. The general meeting will be held in the Circuit Court Room—the section meetings in other convenient rooms of the Court House.

A register will be placed in the Hall of the Court House, in which members are requested to record their names as early as convenient after their arrival.

Members of the Local Committee will be in attendance at the Court House during the meeting, to give such information as may be desired.

Members will direct their correspondents to address "AMERICAN ASSOCIATION, &c.," and their letters will be delivered from the post-office in the Court House.

PROGRAMME
FOR
WEDNESDAY, AUGUST 12, 1857.

General Session at 10 o'clock.

- 1.—Prayer by the Right Rev. FRANCIS FULFORD, D.D., Lord Bishop of Montreal.
- 2.—Meeting opened by Professor A. CASWELL, Vice-President of the Association.
- 3.—Address of Welcome in behalf of the Local Committee and the Citizens, by Sir W. E. LOGAN, F.R.S., L.L.D.
- 4.—Address in behalf of the Natural History Society, by its President, Principal DAWSON, L. L. D.
- 5.—His Excellency the Administrator of the Government, General Sir WM. EYRE, K. C. B., is expected to be present, and will be requested to address the Meeting.
- 6.—General Business.
- 7.—Adjournment for one hour to organize in sections.

PROGRAMME
OF
THURSDAY, AUGUST 13, 1857.

GENERAL SESSION AT TEN O'CLOCK.

SECTION A: MATHEMATICS, PHYSICS AND CHEMISTRY.

Meeting in Superior Court Room, Second Story, 10 A. M.

PROFESSOR A. D. BACHE, PERMANENT CHAIRMAN.

Papers Read.

- 1.—On the Zodiacal Light. By CHARLES WILKES. [Time 8 minutes.]
- 2.—On the vibrations of the Fall over the Dam at Holyoke, Mass.—By E. S. SNELL. [15 min.]
- 3.—Hypothesis concerning Meteoric Stones. By ROBERT BURNS. [5 min.]
- 4.—Notes on the Measurement of a Base Line on Epping Plains, Washington County, Maine, for the Primary Triangulation of the Eastern Section of the Coast of the United States.—By A. D. BACHE. [30 min.]
- 5.—Solar Eclipse of March 14-15, 1858. By THOMAS HILL. [1 min.]
- 6.—A Note on Arithmetical Complements. THOMAS HILL. [2½ min.]
- 7.—On System of Co-ordinates in Analytic Geometry. By THOMAS HILL. [1 min.]
- 8.—Note on the Gyroscope. By Prof. B. PEIRCE of Harvard.
- 9.—On the Diverse Weights employed in Modern Coinage Part I. Troy Weight. By J. H. GIBBON. [45 min.]
- 10.—On the Winds of the Pacific Coast of the United States. By A. D. BACHE.

SECTION B.—NATURAL HISTORY, GEOLOGY & CHEMISTRY

Meeting Circuit Court Room (First Story.)

PROFESSOR J. D. DANA, PERMANENT CHAIRMAN

Papers Read.

- 1.—On the Flexures of the Strata in the Broadtop Coal Field, Pennsylvania.—By J. P. LESLIE.
- 2.—On the Variety and Preservation of the Sternbergia.—By J. W. DAWSON.
- 3.—On the division of the Azoic Rocks of Canada into Huronian and Laurentian.—By SIR W. E. LOGAN.
- 4.—On some Mineral Waters, and on the origin of Magnesian Rocks.—By T. STERRY HUNT.
- 5.—On a subsidence of the Coast of New Jersey and of some of the adjoining States.—Prof. GEO. H. COOK, Rutgers' College.

PROGRAMME

OF

FRIDAY, AUGUST 14, 1857.

General Session at 4½ P.M.

SECTION A—MATHEMATICS AND PHYSICS,

Meeting in Superior Court Room, Second Story, 10 A.M.

PROF. A. D. BACHE, PERMANENT CHAIRMAN.
PROF. J. D. CHERRIMAN, SECRETARY.

SECTIONAL COMMITTEE.

W. M. GILLESPIE, CHAIRMAN.
JOHN JOHNSTON,
FAIRMAN ROGERS.

Papers Read.

- 1.—Observations on the Zodiacal Light at Quito, Ecuador, with deductions.
By Rev. GEO. JONES, U. S. N.
- 2.—On the Winds of the Pacific Coast of the United States.—By A. D. BACHE.
- 3.—On a New Source of Electrical Excitation.—By Mrs. ELISHA FOOTE.
- 4.—On the Physical conditions determinate of the climate of the United States.—By Prof. JOSEPH HENRY.
- 5.—On the Influence of the Gulf Stream upon the Climate of the Atlantic Coast of the United States.—By DR. WYNNE.

**SECTION B: NATURAL HISTORY, GEOLOGY AND
CHEMISTRY.**

Meets in the District Court Room at 10 o'clock, A.M.

**PROF. J. D. DANA, PERMANENT CHAIRMAN.
T. STERRY HUNT, SECRETARY.**

SECTIONAL COMMITTEE.

**COL. CHARLES WHITTLESEY, CHAIRMAN,
I. A. LAPHAM, Esq.,
PROF. C. DEWEY.**

Papers Read.

- 1.—On the Parthenogenesis of Animals and Plants.—By **BERTHOLD SEEMANN.**
- 2.—General Considerations on the Metamorphism of the Sedimentary Rocks.
By **T. STERRY HUNT.**
- 3.—On the probable sub-division of the Laurentian series of Canadian
Rocks.—By **Sir W. E. LOGAN, F.R.S.**
- 4.—Notice of a New System of Dressing Metallic Ores.—By **B. SILLI-
MAN, Jr.**
- 5.—On some Debatable Points in Natural Science.—By **Prof. E. J. CHAP-
MAN, Toronto.**
- 6.—Species of Trilobite from the Potsdam Sandstone of New York.—By
J. D. DANA.
- 7.—On the place in the Geological series of the masses of Crystalline or
Sub-Crystalline Stratified Rocks, in the North Highlands of Scotland.
By **Sir RODERICK MURCHISON, F. R. S.,** with a note on the Fossils by
S. W. SALTER, F.G.S.

**SUB SECTION : ETHNOLOGY, STATISTICS AND
POLITICAL ECONOMY.**

**DANIEL WILSON, CHAIRMAN.
J. LESLEY, JR., SECRETARY.**

SUB-SECTIONAL COMMITTEE.

PROF. ARNOLD GUYOT.

Papers Read.

- 1.—On the Word Celt.—By J. P. LESLEY.
- 2.—Thoughts on Species.—By JAMES D. DANA.
- 3.—On the supposed Uniformity of Cranial Type throughout all Varieties of the American Race. By DANIEL WILSON.
- 4.—Remarks on the Classification of the Varieties of Man.—By M. B. ANDERSON.

PROGRAMME
OF
SATURDAY, AUGUST 15, 1857.

General Session at 4½ P.M.

SECTION A—MATHEMATICS AND PHYSICS,

Meeting in Superior Court Room, Second Story, 10 A.M.

A. D. BACHE, PERMANENT CHAIRMAN.
J. B. CHERRIMAN, SECRETARY.

SECTIONAL COMMITTEE.

W. M. GILLESPIE, CHAIRMAN.
JOHN JOHNSTON,
FAIRMAN ROGERS.

Papers Read.

- 1.—On the warped surfaces occurring in Road Excavations and Embankments.—By W. M. GILLESPIE.
- 2.—Preliminary Researches on the alleged Influence of Solar Light on the Process of Combustion.—By JOHN LECONTE, of South Carolina College.
- 3.—On some special relations of the Straight Line and the various orders of Curves. By STEPHEN ALEXANDER.
- 4.—On the diverse Weights employed in modern Coinage. PART II.—On Karat Grain Weights.—By J. H. GIBBON.
- 5.—Some of the Phenomena of the Texas "Norther" and Climatology.—By G. C. FORSHAY.
- 6.—On the Heights of the Tides of the Atlantic Coast of the United States. By A. D. BACHE.
- 7.—On some Phenomena of Ice.—By Prof. JOSEPH HENRY.
- 8.—Improvement in the construction of the Achromatic Telescope. By H. L. SMITH, Kenyon Coll., Gambier, O.

SECTION B : NATURAL HISTORY, GEOLOGY & CHEMISTRY

Meeting in the District Court Room at 10 o'clock, A.M.

J. D. DANA, PERMANENT CHAIRMAN.
T. STERRY HUNT, SECRETARY.

SECTIONAL COMMITTEE.

CHARLES WHITTLESEY, CHAIRMAN,
I. A. LAPHAM, Esq.,
C. DEWEY.

Papers Read.

- 1.—On the Newer Pliocene Fossils of the St. Lawrence Valley.—By J. W. DAWSON.
- 2.—On the Fluctuations of Level in the North American Lakes.—By CHAS. WHITTLESEY.
- 3.—On the Parallelism between the Rocks of the Laurentian and Silurian Systems.—By T. S. HUNT.
- 4.—On the Physical Break and the Break in the Succession of Life in the British Rocks.—By A. C. RAMSAY.

**SUB-SECTION: ETHNOLOGY, STATISTICS AND POLITICAL
ECONOMY.**

**M. B. ANDERSON, CHAIRMAN.
J. LESLEY, JR., Esq., SECRETARY.**

SECTIONAL COMMITTEE.

**DANIEL WILSON,
ARNOLD GUYOT,
JOSEPH LESLEY, JR.**

Papers Read.

- 1.—On Arrow-head or Wedge Inscriptions.—By J. H. McILVAINE.
- 2.—On the Ethnological Bearings, of certain Architectural forms.—By
J. P. LESLEY.
- 3.—On a Universal Language.—By HUGO REID.

PROGRAMME

OF

MONDAY, AUGUST 17, 1857.

General Session at 4½ P.M.

SECTION A: MATHEMATICS AND PHYSICS.

Meeting in Superior Court Room, Second Story, 10 A.M.

PROF. A. D. BACHE, PERMANENT CHAIRMAN.

PROF. J. B. CHERRIMAN, SECRETARY.

NE.

ms.—By

SECTION COMMITTEE.

W. M. GILLESPIE, CHAIRMAN.
E. S. SNELL,
FAIRMAN ROGERS.

Papers to be Read.

- 1.—On an improved construction of Ruhmkorff's Induction Apparatus—By E. S. RITCHIE.
- 2.—On] the Electrical Hypothesis of the Aurora Borealis—By D. OLMSTED.
- 3.—On the Heights of the Tides of the Atlantic Coast of the United States. By A. D. BACHE.
- 4.—Some observations respecting a Steam Boiler Explosion at Haverill, Mass.—By JAMES R. NICHOLS.
- 5.—Of the Special Harmonics of the Distances and the Periodic Times of the Bodies composing the Solar system, and the Physical Hypothesis to which this state of things seems to be referable.—By STEPHEN ALEXANDER.
- 6.—Note on the Conservation of Force.—By BENJAMIN PEIRCE.
- 7.—On the diverse Weights employed in modern Coinage. PART III—On Avoirdupois Weights.—By J. H. GIBBON.

- 8.—On the Calculating Engine of Mr. Schentz, recently purchased by the Dudley Observatory.—By B. A. GOULD.
- 9.—Remarks upon the Physics of the Mississippi River.—By C. G. FORSHEY
- 10.—On a series of New Meteorological and Physical Tables prepared for the Smithsonian Institution.—By A. GUYOT.
- 11.—On the idea of Physical and Metaphysical Infinity.—By E. B. HUNT, Lieut. U. S. Engineers.

SECTION B: NATURAL HISTORY, GEOLOGY & CHEMISTRY

Meets in the District Court Room at 10 o'clock, A. M.

J. D. DANA, PERMANENT CHAIRMAN.
T. STERRY HUNT, SECRETARY.

SECTIONAL COMMITTEE.

CHARLES WHITTLESEY, CHAIRMAN,
I. A. LAPHAM, Esq.,
C. DEWEY.

Papers to be Read.

- 1.—On a New Method of Determining the Commercial Value of Saltpetre.
By E. N. HORSFORD.
- 2.—Notice of the Occurrence of Chrysolite in Basalt.—By O. P. HUBBARD
- 3.—On the Occurrence of Shark's Teeth in the Drift of the Mississippi.—
By A. H. WORTHEN.
- 4.—Contributions to the Geology of California and the Gadsden Purchase.—
By T. ANTISELL.
- 5.—On the Physical Structure of the Continent of Africa.—By A. GUYOT.
- 6.—On the Direction of Ancient Currents of Deposition and the source
of Materials in the Older Paleozoic Rocks with remarks on the Origin
of the Appalachian Chain of Mountains.—By JAMES HALL.
- 7.—Equine Foot-Prints in the Texas Tertiary.—By C. G. FORSHEY.

SUB-SECTION: ETHNOLOGY, STATISTICS AND POLITICAL
ECONOMY.

Papers to be Read.

- 1.—On the Ancient Mining Operations of Lake Superior.—By CHARLES WHITTLESEY.
- 2.—Remarks on the Collection of Indian Paintings and Antiquities exhibited by Mr. Paul Kane, at the request of the Local Committee.—By DANIEL WILSON.
- 3.—The Behistun Inscription (Arrow-head).—By J. H. McILVAINE.
- 4.—The Laws of Descent among the Iroquois.—1st, Descent in the Female Line.—2nd, Degrees of Consanguinity.—By L. H. MORGAN.
- 5.—On certain peculiarities of the Languages of Southern Africa.—By J. CONSTANTINE ADAMSON.
- 6.—On some Ethnological Specimens from the Island of Aneiteum, New Hebrides.—By J. W. DAWSON.
- 7.—Comparison of the Religious System of the Iroquois with that of the Ancient Persians.—By L. H. MORGAN.
- 8.—The Universal Science.—By CLINTON ROSEVELT.

