



DR. T. WESLEY MILLS.

THE
CANADIAN RECORD
OF SCIENCE

VOL. IX.

SEPTEMBER, 1916

No. 8

DR. T. WESLEY MILLS.

By ROBERT CAMPBELL, M.A., D.D.

Dr. T. Wesley Mills was a native of the town of Brockville, Ontario, where he was born on 22nd February, 1847. He enjoyed the great advantage of a university course in Arts before entering upon the study of medicine, in that respect resembling some of the most eminent of the physicians of Montreal and of the professors of the Medical Faculty of McGill, Dr. G. W. Campbell, Dean of that Faculty, half a century ago, Dr. R. P. Howard, who succeeded him in that distinguished office, Dr. George Ross, also, his successor, were graduates in Arts as well as in Medicine, as was also Sir William Osler. The sharpening of the intellect, the acquisition of powers of observation, and of habits of close reasoning, the widening of view, the refinement of taste, all that is implied in culture and thoughtfulness, constitute a fine foundation for professional studies to rest on, and Dr. Wesley Mills acquired these qualifications in full measure by his Arts' course in Toronto University, in which he graduated B.A. in 1871, and M. A. in 1872. All the productions of his pen have a distinct literary flavour.

Making choice of the physician's profession, he took his course of training therefor in the Medical Faculty of McGill, which then, as to-day, was manned by a body of

distinguished professors; and being naturally an ardent student, he drank in eagerly the instruction which they imparted and graduated with the highest honours, in 1878, receiving the degree of M.D.C.M. He became a Doctor of Veterinary Surgery in 1890. As he progressed in knowledge, gradually extending his reputation, honours came pouring in upon him, and when the Royal Society of Canada was founded by the Marquis of Lorne he was named a Fellow thereof. Other distinctions reached were membership in the British Medical Association, in the Canada Medical Association, the Natural History Society of Montreal, and in the American Physiological Society. He was chosen also a Vice-President of the Society of American Naturalists. He founded in this city a society for the study of Comparative Physiology about the year 1885. While still a student, he became greatly enamoured with the wonders of the human body, its structure and the laws governing it, and he acquired such a reputation for knowledge of this subject that, in 1882, he was appointed demonstrator in Physiology in the Medical Faculty of McGill. Whole-hearted enthusiasm in his work characterized his intercourse with the students while serving in this capacity, so that, in 1884, he was promoted by the Faculty to the position of Lecturer in the same subject. In 1886 he succeeded to the full dignity of Professor of Physiology. He continued in that office, which he filled with illustrious success, until the year 1910. His prelections were marked by great originality, as the result of profound and careful personal research. Obligated to resign on account of failing health he retired that year with the rank of Professor Emeritus.

Dr. Wesley Mills wielded a facile pen and was a prolific writer. No graduate of the Medical Faculty of McGill has so many publications to his credit as he. His first book, "Outlines of Lectures on Physiology," was issued in 1886. It was followed by a "Text Book in Animal Physiology," in 1889, and that by a "Text

Book on Comparative Physiology," in 1890. His next publication was on "How to Keep a Dog in the City," in 1891, and this was succeeded by a volume on "The Dog in Health and Sickness," in 1892. No one was ever a greater lover of dogs than he and no one ever got deeper into the secrets of the dog's nature. Indeed, he was known as the friend and champion protector of all animals. An ancient poet-philosopher took credit to himself that he counted nothing relating to man foreign to him. The range of Professor Mills' interest and sympathies was vastly more comprehensive: it embraced everything that had life. To him no bird or beast was an object of indifference. And this is a prime qualification in one who would interpret animal life. To understand the creatures about us we must love them, as love is the true organ of man's perception and of his interpretation of the entire field of his observations. Longfellow ascribes the remarkable skill in various kinds of woodcraft of his Indian hero, Hiawatha, to the tenderness of his sympathies with the tenants of the forest; in consequence they readily yielded up their secrets to him: He "learned of every bird its language, where they built their nests in summer, where they hid themselves in winter." According to this law, while the knowledge of that most sagacious animal and companion of man, the dog, Dr. Wesley Mills made peculiarly his own, all animal nature was to him an open book.

When he entered upon the domain of Comparative Physiology, he extended the scope of his energies and thought, and the fruit of his new studies was given in his next publication, "The Nature and Development of Animal Intelligence," a work of rare charm, issued in 1898. Speculation along the line of evolution was rife at this time, and Dr. Mills' work gave tokens that he had come largely under the fascinating spell of Darwin, Huxley, Spenser, and Hæckel. These great masters had an unquestioned influence upon his views. His studies were conducted under the same thorough fashion as

theirs. The scientific spirit was pre-eminently his. How earnestly he planned and how patiently he waited and worked to get at the truth this volume makes clear. While accepting evolution as a working theory, he put fact above theory. Nothing was taken for granted, and no detail was deemed unimportant in his observations on the development of the intelligence of the animals under study. No portion of this delightful book more conspicuously displays his love of truth than the correspondence regarding "instinct" with which it concludes. He would not bind himself to any hard and fast theory which would not take in the facts which he had personally collected.

Having established that animals have mind, which usually goes by the name of instinct, he proceeds to show that their mental powers are capable of great expansion from the moment of the creature's birth until the time it has reached full growth and maturity. He concluded that individuals sometimes went beyond the stage of intelligence attained by the mass of the species. He thought this an important fact bearing upon the evolutionary theory. Henri Fabre, in his studies on insect life, pointed out similar instances of the acquisition of knowledge by individuals in advance of that reached by the species as a whole; but neither of them was able to assert that the offspring of these more intelligent individuals had any advantage over the offspring of the common herd. They all started with the same degree of intelligence. So that the link is wanting, postulated by the theory of evolution, that habits acquired by individuals in their passage through life are transmitted to their offspring, and become the basis for subsequent general advancement of the species. Proof is lacking that special acquirements of individuals are inherited by their descendants.

His last publication was on the somewhat curious subject of "Voice Production in Singing and Speaking on Scientific Principles." He would appear to have

pursued the consideration of this practical question either as the result of his second marriage or as a step leading up to it. His first wife died at Leipsic in 1901, and in September, 1903, he married Kate Samuels, of Bendigo, Australia, a distinguished operatic singer, known on the stage as Madame Benda. His highly susceptible nature was attracted by her splendid musical qualities, and the double result followed: he married her and took up, with fresh eagerness, a line of study to which he had previously given some attention, and the outcome of his fuller and later researches on the subject we have in the volume mentioned.

Dr. Wesley Mills early connected himself with the Natural History Society, which was at the height of its prosperity and usefulness about the time he entered upon his public career. He contributed many valuable papers to its transactions, especially in the line of his professional studies; and the Society showed its appreciation of his scientific attainments, and of the obligations under which he had laid it by his demonstrated interest in its work, by his presence at its meetings and the numerous papers he had read before it, by raising him to the Presidency of the Society in May, 1893, and elected him again to the same office in May, 1894.

The Natural History Society has been largely beholden to McGill University, during the last sixty years, for its success as a scientific institution; and not the least of the members of the distinguished staff of the college who have afforded efficient help to it, was Dr. Wesley Mills. To the last he remained on the list of its Vice-Presidents, and continued to be interested in its work. It was with much regret that the members of the Society learned of the resignation of his professorship on the score of ill-health; although the hope was entertained that the enjoyment of leisure might help his recovery, and specially that receiving treatment from the most eminent skill which London could afford would result in the re-establishment of his impaired health.

They counted on seeing his genial presence among them after a short interval.

When he left the city, he looked forward with eagerness to taking up his abode in the great Metropolis, not only on account of the surgical aid he counted on, but also by reason of the numerous general advantages which the culture, art and science of the world's capital afforded. Among others residing therein whose society he specially valued was the friend and companion of his youth, Dr. Crozier, formerly of Galt, Ontario, the eminent philosophic-litterateur, and then his quondam colleague and distinguished friend, Sir William Osler, of Oxford, was within easy reach of London. In close intercourse with these and other men of learning, of artistic and of scientific eminence, he expected to spend many happy days; but it was not to be: he was cut off on the 15th day of February, 1915, within a week of the completion of his 68th year.

On March 6th, 1915, the Faculty of Medicine of McGill University, adopted the following resolution on the death of Prof. T. Wesley Mills:

"That the members of the Faculty of Medicine desire to place on record an expression of their sincere regret at the death of their former colleague, Professor J. Wesley Mills.

"Prof. Mills had been associated with the teaching staff of the Medical Faculty of McGill University for more than thirty years, first as Demonstrator in 1882, then as Lecturer, and from 1886 to 1910 as Professor of Physiology. From the time of his resignation he has been Professor Emeritus.

"He had taken part in the extraordinary development of the Faculty in all its branches and at a time when none of its members were active writers he had brought credit to the Faculty by his textbooks upon Animal Physiology and Comparative Physiology.

"It was hoped that with his liberation from the bur-

den of routine professorial duties he would have regained his health and vigor after his prolonged illness and serious operation and that he would be spared for many years to continue his studies upon those special branches of physiology and medicine in which he was so much interested and which he had made so particularly his own."

A LIST OF THE TYPE FOSSILS IN THE PETER
REDPATH MUSEUM, (McGILL UNIVERSITY).

By EDMOND ARDLEY,

Assistant Curator of Peter Redpath Museum.

PART I.

PROTOZOA.

Cryptozoon occidentale, Dn.

Lower Cambrian.

Grand Canon, Arizona.

Collector—Dr. Charles D. Walcott.

Canadian Record of Science, Vol VII, 1889.

Cryptozoon lachutense, Dn.

Calciferous.

Lachute, Pro. Que.

Collector—Sir W. Dawson.

Canadian Record of Science, Vol. VII., 1889.

Cryptozoon boreale, Dn.

Siluro. Cambrian (Ordovician).

Lake St. John County.

Collector—E. T. Chambers.

Canadian Record of Science, Vol. VII., 1889.

Dentalina priscilla, Dn.

L. Carboniferous.

Windsor, Nova Scotia.

Collector—C. F. Hartt.

Museum No. 3050, Acadian Geology, 1878, p. 285.

Megastroma laminosum, Dn.

L. Carboniferous.

Brookfield, N.S.

Collector—Sir W. Dawson.

Museum No. 3047.

Report on the Peter Redpath Museum, McGill University, No. II, p. 12, 1883.

PORIFERA.

Trachyum vetustum, Dn.

L. Cambrian.

Little Metis, Que.

Collector—Sir W. Dawson.

Mss. "The Fauna of the Lower Cambrian or Odenellus Zone," p. 598, by Charles D. Walcott.

Palæosaccus dawsoni, Hinde.

Quebec Group (Ordovician).

Little Metis, Que.

Collector—Sir W. Dawson.

Geological Magazine, Decade III, Vol. X., No. 344, p. 56, February, 1893.

Protospongia tetranema, Dn.

Quebec Group (Ordovician).

Little Metis, Pro. Que.

Collector—Sir W. Dawson.

Trans. Royal Society of Canada, Vol. VII., Section IV., 1889.

Protospongia coronata, Dn.

Quebec Group (Ordovician).

Little Metis, Prov. Que.

Collector—Sir W. Dawson.

Trans. Royal Society of Canada, Vol. VII., Section IV., 1889.

Protospongia mononema, Dawson.

Quebec Group (Ordovician).

Little Metis, Prov. Que.

Collector—Sir W. Dawson.

Trans. Royal Society of Canada, Vol VII., Section IV., 1889.

Protospongia polynema, Dn.

Quebec Group (Ordovician).

Little Metis, Prov. Que.

Collector—Sir W. Dawson.

Trans. Royal Society of Canada, Vol. VII., Section IV., 1889.

Protospongia cyathiformis, Dn.

Quebec Group (Ordovician).

Little Metis, Prov. Que.

Collector—Sir W. Dawson.

Trans. Royal Society of Canada, Vol. VII., Section IV., 1889.

Protospongia delicatula, Dn.

Quebec Group (Ordovician).

Little Metis, Prov. Que.

Collector—Sir W. Dawson.

Trans. Royal Society of Canada, Vol. VII., Section IV., 1889.

Cyathospongia (ryathophycus) quebecense, Dn.

Quebec Group (Ordovician).

Little Metis, Prov. Que.

Collector—Sir W. Dawson.

Trans. Royal Society of Canada, Vol. VII., Section IV., 1889.

Acanthodictya hispida, Hinde.

Quebec Group (Ordovician).

Little Metis, Prov. Que.

Collector—Sir W. Dawson.

Trans. Royal Society of Canada, Vol. VII., Section IV., 1889.

Hyalostelia metissica, Dn.

Quebec Group (Ordovician).

Little Metis, Prov. Que.

Collector—Sir W. Dawson.

Trans. Royal Society of Canada, Vol. VII., Section IV., 1889.

Lasiothrix curvicostata, Hinde.

Quebec Group (Ordovician).

Little Metis, Prov. Que.

Collector—Sir W. Dawson.

Trans. Royal Society of Canada, Vol. VII., Section IV., 1889.

Stephenella hindii, Dn.

Quebec Group (Ordovician).

Little Metis, Prov. Que.

Collector—Sir W. Dawson.

Trans. Royal Society of Canada, Vol. II., Section IV., Second Series, 1896-97.

Halichondrites confusus, Dn.

Quebec Group (Ordovician).

Little Metis, Prov. Que.

Collector—Sir W. Dawson.

Trans. Royal Society of Canada, Vol. VII., Section IV., 1889.

Craniella (Tcthea) logani, Dn.

Post Pliocene, Montreal, Que.

Collector—Sir W. Dawson.

Museum No. 6545, "Ice Age of Canada," p. 217.

CELENTERATA.

Graptolites.

Dictyonema websteri, Dn.

Upper Silunan.

New Canaan, Nova Scotia.

Collector—Dr. Webster.

Marked "A," Acadian Geology, 1868, 2nd ed., p. 563.

ACTINOZOA.

Tabulata.

Stenopora exilis, Dn.

L. Carboniferous.

Shubenacadie, Nova Scotia.

Collector—Sir W. Dawson.

Museum No. 3041.

Acadian Geology, 1878, p. 287.

RUGOSA.

Lithostrotion pictocense, Billings.

L. Carboniferous.

East River, Pictou, N.S.

Collector—Sir W. Dawson.

Museum No. 3034.

Acadian Geology, 1878, p. 285.

Cyathophyllum billingsi, Dn.

L. Carboniferous.

Stewiack, Nova Scotia.

Collector—C. F. Hartt.

Museum No. 3037.

Acadian Geology, 1878, p. 287.

Zaphrentis minas Dn.

L. Carboniferous.

Kenneteook, Nova Scotia.

Collector—Prof. How.

Museum No. 3042.

Acadian Geology, 1878, p. 286.

VERMES.

Sabellarites phosphaticus, Dn.

Quebec Group (Ordovician).

Kamouraska, Que.

Collector—Sir W. Dawson.

Museum No. 580.

Quart. Journal Geological Society, 1890, Vol. XLVI,
p. 608.

Sabellarites trentonensis, Dn.

Black-river (Ordovician).

Point Claire, Que.

Collector—Sir W. Dawson.

Quart. Journal Geological Society, 1890, Vol. XLVI,
p. 608.

Serpulites annulatus, Dn.

L. Carboniferous.

Windsor, Nova Scotia.

Collectors—H. Poole and C. F. Hartt.

Museum No. 2711.

Acadian Geology, 1878, p. 312.

Serpulites hortonensis, Dn.

L. Carboniferous.

Half-way River, Nova Scotia.

Collector—Prof. How.

Museum No. 2720.

Acadian Geology, 1878, p. 312.

Serpulites murrayi, Dn.

L. Carboniferous.

Port-au-Port, Newfoundland

Collector—Dr. R. Bell.

Museum No. 2719.

Report on the Peter Redpath Museum, McGill Uni-
versity, No. 11, p. 13, 1883.

Spirorbis carbonarius, Dn.

Carboniferous.

S. Joggins, Nova Scotia.

Collector—Sir W. Dawson.

Museum No. 3102.

Quart. Journal Geological Society, Vol. I., p. 326.

Acadian Geology, 1878, p. 205.

Spirorbis angulatus, Dn.

L. Carboniferous.

Windsor, Nova Scotia.

Collector—Sir W. Dawson.

Museum No. 2717.

Acadian Geology, 1878, p. 312.

BRACHIOPODA.

Spirifer montrealensis, Williams.

Devonian.

St. Helen's Island, Montreal.

Collector—Ed. Ardley.

Number 252-1-17.

Trans. Royal Society of Canada, Third Series, Vol. III., section IV., 1909-10.

Spirifer montrealensis, Williams.

Devonian.

St. Helen's Island, Montreal.

Collector—Ed. Ardley.

Number 252.1-14, Card No. 5379.

Trans. Royal Society of Canada, Third Series, Vol. III., Section IV., 1909-10.

Spirifer concinnus, var *Helcnæ*, Williams.

Devonian.

St. Helen's Island, Montreal.

Collector—Ed. Ardley.

Number 252-2-23, Card No. 5378.

Trans. Royal Society of Canada, Third Series, Vol. III., Section IV., 1909-10.

Rhynchonella dawsoniana, Davidson.

L. Carboniferous.

Windsor and Lennox Passage, C.B.

Collector—Sir W. Dawson.

Museum No. 2905.

Acadian Geology, 1878, p. 294.

Rhynchonella acadensis, Davidson.

L. Carboniferous.

Windsor, Nova Scotia.

Collector—Sir W. Dawson.

Museum No. 2908.

Acadian Geology, 1878, p. 295.

ECHINODERMATA.

Palæaster parviusculus, Billings.

Upper Silurian.

Arisaig, Nova Scotia.

Collector—Dr. Honeyman.

Museum No. 1586.

Canadian Naturalist, Vol. V., p. 69; Acadian Geology, p. 594.

MOLLUSCA.

Lamellibranchiata.

Actinopteria (Pterinea) fronsacia, Clarke.

Gaspé Sandstone (Devonian).

Gaspé Basin, Que.

Collector—Sir W. Dawson.

Museum No. 1942.

Memoir 9, Early Devonian History of New York and Eastern North America, by John M. Clarke.

Palaeoncolo (cf. Maxima Clarke) helena, Williams.

Devonian.

St. Helen's Island, Montreal.

Collector—Ed. Ardley.

No. 2521, 1, 23, Card No. 5546.

Trans. Royal Society of Canada, Third Series, Vol. III., Section IV., 1909-10.

Modiomorpha helena, Williams (cf. concentrica).

Devonian.

St. Helen's Island, Montreal.

Collector—Ed. Ardley.

No. 2521, 1, 22, Card No. 5545.

Trans. Royal Society of Canada, Third Series, Vol. III., Section IV., 1909-10.

Naiadites carbonarius, Dn.

Carboniferous.

So. Joggins, Nova Scotia.

Collector—Sir W. Dawson.

Canadian Record of Science, Vol. VI., 1894.

Naiadites longus, Dn.

Carboniferous.

So. Joggins, Nova Scotia.

Collector—Sir W. Dawson.

Quart. Journal, Geological Society, 1894, Plate XX., Fig. 1.

Naiadites mytiloides, Dn.

Carboniferous.

Chimney Corner, Cape Breton.

Collector—Mr. Neighswander.

Canadian Record of Science, Vol. VI., 1894.

Anthracoyma elongata, Dn.

Middle carboniferous.

So. Joggins, Nova Scotia.

Collector—Sir. W. Dawson.
Canadian Record of Science, Vol. VI., 1894.

Anthracomya arenacea, Dn.

Upper carboniferous.

Pictou, Nova Scotia.

Collector—Sir W. Dawson.

Museum No. 3131.

Supplement to Acadian Geology, last edition, Canadian Record of Science, Vol. VI., 1894.

Anthracomya ovalis, Dn.

L. Carboniferous.

Parrsboro, Nova Scotia.

Collector—Sir W. Dawson.

Acadian Geology (second edition), p. 205, Canadian Record of Science, Vol. VI., 1894.

Anthracomya obtenta, Dn.

M. Carboniferous.

Mabou, Cape Breton.

Collector—Sir W. Dawson.

Acadian Geology, second edition, p. 205. Canadian Record of Science, Vol. VI., 1894.

Carbonicola (Naiadites) angulata, Dn.

L. Carboniferous.

Parrsboro, Nova Scotia.

Collector—Sir W. Dawson.

Museum No. 3132.

Acadian Geology, second edition, p. 205, Canadian Record of Science, Vol. VI., 1894.

Modiola polli, Dn.

L. Carboniferous.

Shubenacadie, Nova Scotia.

Collector—Sir W. Dawson.

Museum No. 2811.

Acadian Geology. 1878. p. 301.

Modiola avonia, Dn.

L. Carboniferous.

Windsor, Nova Scotia.

Collector—Prof. Hartt.

Museum No. 2801.

Acadian Geology, 1878, p. 301.

Macrodon hardingi, Dn.

L. Carboniferous.

Windsor, Nova Scotia.

Collector—Sir W. Dawson.

Museum No. 2820.

Acadian Geology, 1878, p. 302.

Macrodon shubenacadiensis, Dn.

L. Carboniferous.

Shubenacadie, Nova Scotia.

Collector—Sir W. Dawson.

Museum No. 2818.

Acadian Geology, 1878, p. 303.

Macrodon elegans, Dn.

L. Carboniferous.

Windsor, Nova Scotia.

Collector—Sir W. Dawson.

Museum No. 2822.

Acadian Geology, 1878, p. 303.

Edmondia harttii, Dn.

L. Carboniferous.

Windsor, Nova Scotia.

Collector—C. F. Hartt.

Museum No. 2815.

Acadian Geology, 1878, p. 303.

Cardinia sub-angulata, Dn.

L. Carboniferous.

Pugwash, Nova Scotia.

- Collector—Sir W. Dawson.
Museum No. 2826.
Acadian Geology, 1878, p. 304.
- Cardinia antigonesensis, Dn.*
L. Carboniferous.
Antigonish, Nova Scotia.
Collector—Sir W. Dawson.
Museum No. 2825.
Acadian Geology, 1878, p. 304.
- Conocardium acadianum, Hartt.*
L. Carboniferous.
Windsor, Nova Scotia.
Collector—C. F. Hartt.
Museum No. 2812.
Acadian Geology, 1878, p. 305.
- Anthracosia bradorica, Dn.*
L. Carboniferous.
Baddeck, Cape Breton.
Collector—J. Barnes.
Museum No. 2834.
Acadian Geology, 1878, p. 314.
- Aviculopecten lyelli, Dn.*
L. Carboniferous.
Windsor—Nova Scotia.
Collector—Sir W. Dawson.
Museum 2831.
Acadian Geology, 1878, p. 305.
- Aviculopecten reticulatus, Dn.*
L. Carboniferous.
Gay's River, Nova Scotia.
Collector—Sir W. Dawson.
Museum No. 2837.
Acadian Geology, 1878, p. 306.

Aviculopecten simplex, Dn.

L. Carboniferous.

Shubenacadie, Nova Scotia.

Collector—Sir W. Dawson.

Museum No. 2832.

Acadian Geology, 1878, p. 306.

Aviculopeten cora, Dn.

L. Carboniferous.

Shubenacadie, Nova Scotia.

Collector—Sir W. Dawson.

Museum No. 2833.

Acadian Geology, 1878, p. 307.

Aviculopecten debertianus, Dn.

L. Carboniferous.

De Bert River, Nova Scotia.

Collector—Sir W. Dawson.

Museum No. 2842.

Acadian Geology, 1878, p. 307.

Cardimorpha vindobonensis, Hartt.

L. Carboniferous.

Nova Scotia.

Collector—C. F. Hartt.

Museum No. 2850.

Acadian Geology, 1878, p. 305.

Sanguinolitea brookfieldianus, Dn.

L. Carboniferous.

Brookfield and Windsor, Nova Scotia.

Collector—Sir W. Dawson.

Museum No. 2830.

Report on the Peter Redpath Museum, McGill University. No. II. p. 11, 1883.

Tellina nanaimöensis, Whitaves.

Upper Cretaceous.

Nanaimo, British Columbia.

Collector—Dr. F. D. Adams.
Mss.

MOLLUSCA.

Gasteropods.

Platyceras dawsoni, Walcott.

Lower Cambrian.

St. Simon, Quebec.

Collector—Sir W. Dawson.

The Fauna of the Lower Cambrian or Olenellus
Zone, p. 618, 1892, by Charles D. Walcott.

Strophites grandæva, Dn.

Devonian.

St. John, New Brunswick.

Collector—Dr. G. F. Matthew.

Museum No. 2384.

American Journal of Science, Vol. XX., p. 413.

Pupa vetusta, Dn.

Carboniferous.

So. Joggins, Nova Scotia.

Collector—Sir W. Dawson.

Sir C. Lyell and Dr. Dawson, Journal of Geological
Society, Vol. IX., 1832; Acadian Geology, 1855. p
160; Air-breathers of the Coal Period. 1863; Ameri-
can Journal of Science, Vol. XX., p. 405.

Pupa bigsbyi, Dn.

Carboniferous.

So. Joggins, Nova Scotia.

Collector—Sir W. Dawson.

Museum No. 3122.

American Journal of Science, Vol. XX., p. 401.

Zonites (conulus) priscus, Carpenter.

Carboniferous.

So. Joggins, Nova Scotia.

Collector—Sir W. Dawson.

Museum No. 3116.

Quart. Journal of Geological Society, Nov., 1867,
 Acadian Geology, 1868, p. 385; American Journal of
 Science, Vol. X., p. 411.

Pleurotomaria acadica, Dn.

L. Carboniferous.

Windsor, Nova Scotia.

Collector—Prof. C. F. Hartt.

Report on the Peter Redpath Museum, McGill Uni-
 versity, No. II, p. 11, 1883.

Pleurotomaria ignobilis, Dn.

L. Carboniferous.

Stewiacke, Nova Scotia.

Collector—C. F. Hartt.

Museum No. 2769.

Acadian Geology, 1878, p. 310.

Pleurotomaria dispersa, Dn.

L. Carboniferous.

Windsor, Nova Scotia.

Collector—H. Poole.

Museum No. 2770.

Acadian Geology, 1878, p. 310.

Murchisonia gypsea, Dn.

L. Carboniferous.

Windsor, Nova Scotia.

Collector—H. Poole.

Museum No. 2762.

Acadian Geology, 1878, p. 310.

Platyschisma dubia, Dn.

L. Carboniferous.

Windsor, Nova Scotia.
Collector—H. Poole.
Museum No. 2765.
Acadian Geology, 1878, p. 309.

Naticopsis dispassa, Dn.
L. Carboniferous.
Windsor, Nova Scotia.
Collector—Sir W. Dawson.
Museum No. 2753.
Acadia Geology, 1878, p. 309.

Naticopsis howi, Dn.
L. Carboniferous.
Windsor, Nova Scotia.
Collector—Sir W. Dawson.
Museum No. 2752.
Acadian Geology, 1878, p. 309.

Euomphalus exortivus, Dn.
L. Carboniferous.
East River, Pictou, Nova Scotia.
Collector—D. Fraser.
Museum No. 2751.
Acadian Geology, 1878, p. 309.

Macrocheilus terranovicus, Dn.
L. Carboniferous.
St. George's Bay, Newfoundland.
Collector—Dr. R. Bell.
Museum No. 2763.
Report on the Peter Redpath Museum, McGill University, No. II, p. 14, 1883.

Macrocheilus acadicus, Dn.
L. Carboniferous.
Pugwash, Nova Scotia.

Collector—Sir W. Dawson.
 Museum No. 2781.
 Acadian Geology, 1878, p. 309.

Choristes elegans, Carpenter.

Pleistocene.
 Montreal, Que.
 Collector—Sir W. Dawson.
 Museum No. 6240.
 The Ice Age in Canada, p. 251.

MOLLUSCA.

Cephalopoda.

Piloceras amplum, Dn.

Calciferous.
 Lachute, Prov. Que.
 Collector—Mr. Macpherson.
 Museum No. 438.
 Canadian Naturalist, Vol. X., No. 1.

Actinoceras inops, Dn.

L. Carboniferous.
 East River, Pictou, Nova Scotia.
 Collector—D. Fraser.
 Museum No. 2724.
 Acadian Geology, 1878, p. 314.

Orthoceras perstrictum, Dn.

L. Carboniferous.
 Windsor, Nova Scotia.
 Collector—C. F. Hartt.
 Museum No. 2723.
 Acadian Geology, 1878, p. 312.

Orthoceras laqueatum, Hartt.

L. Carboniferous.

Windsor, Nova Scotia.

Collector—C. F. Hartt.

Museum No. 2731.

Acadian Geology, 1878, p. 312.

Orthoceras vindobodonense, Dn.

L. Carboniferous.

Windsor, Nova Scotia.

Collector—Sir W. Dawson.

Museum No. 2730.

Acadian Geology, 1878, p. 311.

Discites (Gyroceras) harttii, Dn.

L. Carboniferous.

Brookfield, Nova Scotia.

Collector—Sir W. Dawson.

Museum No. 2742.

Acadian Geology, 1878, p. 311, Report on the Peter Redpath Museum, McGill University, No. 11, p. 10, 1883.

Pteropoda.

Tentaculites helena, Donald.

L. Helderberg.

St. Helen's Island, Montreal.

Collector—Sir W. Dawson.

Canadian Naturalist, 1880, Vol. IX., p. 302.

Conularia planicostata, Dn.

L. Carboniferous.

Irish Cove, Cape Breton.

Collector—Sir W. Dawson.

Museum No. 2749.

Acadian Geology, 1878, p. 307.

*Polyzoa.**Fenestella lyelli, Dn.*

L. Carboniferous.

Windsor, Nova Scotia.

Collector—Sir W. Dawson.

Museum No. 2974.

Acadian Geology, 1878, p. 288.

Berenicea insucta, Dn.

L. Carboniferous.

Windsor, Nova Scotia.

Collector—Prof. C. F. Hartt.

Report on the Peter Redpath Museum, McGill University, No. II, page 12, 1883.

THE EVENING GROSBEEK IN THE EAST.

The past winter has been a memorable one for our bird-lovers through the presence in large numbers of that rare visitant, the Evening Grosbeak (*Hesperiphona Vespertina*). This beautiful bird with its strikingly variegated costume of yellow, white, brown and black, attracted much attention in our streets. Comparatively few had ever seen or heard of such a bird. One listening to the comments from a group watching a flock feeding in the trees on the street, would hear references to "wild canaries," "winter goldfinches," "yellow robins," etc.

Like its relative, the Crossbill, the Evening Grosbeak is somewhat erratic in its movements. Nesting in the far Northwest, it usually migrates in Autumn to the plains of Manitoba, Saskatchewan, Alberta and of the states immediately to the south. Occasionally, however, it continues its way far down into the western Mississippi Valley, and at infrequent intervals extends its range as far east as the province of Quebec and the North Atlantic States.

The first great recorded migration into the east occurred in the winter of 1889-90. I remember counting at least forty on a bitterly cold winter morning, twittering contentedly in the trees just in front of the McGill Arts' Building. Since that date, I know of no record of its appearance here, although Dionne reports it in numbers at Quebec in the winter of 1903-4. It has been occasionally seen in Ottawa, at Guelph, Parry Sound, and at other points in Western Ontario. There was a visitation of the eastern states in 1910.11.

This year the Evening Grosbeaks appeared in numbers towards the end of February and were reported from time to time in almost every part of the city and its suburbs. They were seen in St. Lambert, Ste. Anne de Bellevue, Morin Heights, Ste. Agathe, Grand'Mere, and doubtless at many other points in the province. They remained here for nearly two months, being observed on

Esplanade Avenue in the city and at Ste. Anne de Bellevue about April 22nd.

In the April number of *Bird Lore*, the organ of the Audubon Society, are given reports on the visit of the Grosbeaks to various localities across the border, as Saratoga Springs, Poughkeepsie, Glen's Falls, Boston, Lexington, etc. The observer in the last mentioned place, Winsor M. Tyler, M.D., gives an account of its eating habits, which is of sufficient interest to quote:

"Having detached it (the seed) from the stem, (to do this the bird merely leans downward and pulls off the husk and its wing) the Grosbeak cuts through the husk as far as the kernel and allows the wing to drop to the ground; this it does with a fluttering motion suggestive of a small moth. The remainder, the whole kernel and perhaps two-thirds of the husk, the Grosbeak mumbles in his bill, and in an incredibly short time discards from the sides of his beak the more or less macerated remains of the husk. Some of these particles fall to the ground. some cling for a time to the beak. The bird swallows the kernel. Upon examining the wings which the birds have clipped off, it was apparent that the birds had bitten directly over the kernel itself at a point rather nearer the wing than the centre of the kernel. But, although by this incision the kernel was exposed, it was never severed and allowed to fall with the wing, as would have been the case had the beak been closed and the bite completed. The cutting process was always arrested at the point after the casing had been divided, and before the meat had been severed. All this, although the process involved the nicest precision, was accomplished with great rapidity,—the wing fluttering to the ground within a second or two after the fruit was plucked from the stem."

The seeds referred to are of the Manitoba maple and are apparently the Grosbeak's first choice for food. Wherever this tree has been planted in our streets there the birds were first seen. They seldom left before the

supply was fully exhausted, when they sought the ash, the locust or the rowan tree. Often the unusual carpeting of the husks of these seeds on the snowy street was the first indication to passersby of the presence of the birds in the trees above.

These birds are remarkably gentle and unobtrusive in their ways. They make little noise, whispering softly to each other, somewhat after the manner of cedar waxwings. When they first came, they appeared quite tame, and apparently were quite ignorant of any danger in the proximity of man.

Unfortunately, their confidence was frequently misplaced. Many were slaughtered in some parts of the city, apparently from the mere lust of killing. Others were captured and exposed in various bird shops for sale. Through the prompt efforts of the Women's Council and of the Society for the Prevention of Cruelty to Animals, however, the law protecting song birds was enforced, and the captives were freed.

I. GAMMELL.

The High School of Montreal.

SOME RECENT CHANGES IN THE FLORA OF
MONTREAL AND ADDITIONS THERETO.

By ROBERT CAMPBELL, M.A., D.D.

Ornithogalum umbellatum L.—Found in marshy little bay on north bank of St. Lawrence River, opposite Verdun Hospital; and also near the Victoria Bridge, on the St. Lambert side of the St. Lawrence. August.

Serapias Helleborine L. (*Epipactis Viridiflora* Rich-
enb), was first found by Dr. Herbert Cushing in Mount Royal Park, Montreal, in 1894, a few specimens confined to one spot. The writer discovered specimens in another part of the mountain the following year. Since then it has multiplied so rapidly that thousands of specimens of it are to be found on and around the mountain, the debris of the *banc rouge* composing the rocky framework of Mount Royal seeming to afford the plant suitable soil. July and August.

Aristolochia clematitis L.—A fairly large colony of this plant the writer discovered five years ago, near the Montreal Water Works Reservoir, Cote des Neiges Road. It is maintaining itself in competition with grass and other plants. May-July.

Amaranthus blitoides Wats.—This weed has been introduced along the line of the Grand Trunk Railway, and seems to flourish among cinders. All summer.

Dianthus deltoides L.—A small colony of this European plant was found on the Cote des Neiges side of Mount Royal by Mr. Lachlan Gibb some years ago, and it persists. May-August.

Sisymbrium altissimum L.—This troublesome plant came originally from Europe, but it has reached Canada by way of British Columbia, travelling eastward by the Canadian Pacific Railway. The writer first found it at

Yale, B.C., nearly twenty years ago; but now, wherever the Canadian Pacific road goes, there it grows in thousands, and is carried by the wind "tumbling" and spreading its seeds. All summer.

Gymnocladus dioica (L.) Koch.—Only a few specimens of this tree, Kentucky Coffee Tree, used to be found on the Island of Montreal, but it has taken root in Mount Royal Cemetery and bears fruit so well in its large pods that it is multiplying rapidly. May-June.

Euphorbia hirsuta (Torr.) Wiegand.—This little prostrate spurge was somewhat rare in and around the city twenty years ago, but the railways have carried it far and near. Like the *Amaranthus blitoides* it flourishes where the ground is mixed with cinders. June-September.

Acer negundo L.—The Manitoba maple, as it is called, has made itself very much at home in the Montreal district, into which it was introduced about thirty years ago. It is a great fruit-bearer and requires no help to get itself distributed. It has the advantage of being a quick grower, and so it is useful in bare places in which trees are wanted soon, vying with the poplar in the rapidity of its growth. The grosbeak, which visited Montreal last winter, found in the fruit of this tree its chief sustenance although it did not disdain the barberry. April.

Egopodium podagraria L.—This European umbel has established itself very thoroughly in the writer's back yard. It requires no nursing to get on. How it got there no one can tell. May-June.

Grindelia Squarrosa (Pursh) Durial.—This western (gum) plant owes its distribution also to the Canadian Pacific Railway. Only a single plant so far came under the eye of the writer, and it was found on a vacant lot in the heart of the city; but doubtless more have taken

hold of the soil if one could only come across them. July-October.

Galinsoga parviflora Cav.—This Mexican plant was first reported in Canada by the writer, in 1893, a small colony of it being observed in September of that year, on McGill College Campus. Now it is in full possession of every uncared for space in front of people's houses, and can be counted by hundreds of thousands. August-October.

Artemisia biennis Willd.—This westerner has also found evidently a congenial home in Montreal, for it, too, numbers hundreds of thousands of specimens everywhere in waste ground about our streets and lanes, although it was rarely seen thirty years ago. August-October.

Ambrosia psilostachya D. C.—The railways are to be credited also with introducing this "ragweed." It is making its way rapidly near railway stations. August-October.

Echinops sphaerocephalus L.—A colony of this plant has maintained itself for several years alongside the street railway track, near the junction of Westmount Boulevard with Cote des Neiges Road, and seems likely to extend itself, so large are its heads of achenes. July-September.

Cirsium horridulum Michaux.—This yellow thistle is not found in any portion of Eastern Canada besides the Island of Montreal and the district lying immediately around. Thirty years ago it was to be met with occasionally on the roads leading to St. Michael, and elsewhere, between the city and Riviere des Prairies; but today thousands of specimens may be seen wherever there are quarries, and it has made its way across the two rivers to Rosemere. August-October.

Cirsium Arvense (Scop.) setosum.—A small colony of this plant has been in existence for some years among

shrubs in a vacant lot on St. Catherine Street, Westmount, not far from the M. A. A. grounds. It belongs to the Middle States of the Union, and has not been hitherto reported from Canada. July-September.

Sonchus arvensis L.—This worst of weeds, although of European origin, has, like one or two others mentioned above, invaded Eastern Canada by way of Manitoba and the Western Provinces, where it is a dreadful scourge, much of the land on the Red River being virtually valueless, it has so thoroughly taken possession of the soil. Being a great seeder it makes its way rapidly when care is not taken to destroy it before the seed is ripe. Farmers in the East must vigilantly combat it, if they would escape the endless trouble which it causes to their western contemporaries. July-October.

Latuca Scariola Var-*integrata* Gren. Godr.—This is also a Western invader that has taken firm hold in the district of Montreal; but it is not yet among us the terrible nuisance it is in Ottawa. In all the ruins left by the great fire near the Chaudiere in that city it fairly covers the ground.

Hieracium aurantiacum L.—The devil's paintbrush is better known and more dreaded in the Eastern Townships than in Montreal and vicinity, on which, however, it is gradually encroaching. It has an attractive blossom, but it should be pulled up wherever met with. Vast territories in the State of New York are rendered useless by it. August-October.

NOTE ON THE DISCOVERY OF A SKELETON OF
BELUGA CATODON (WHITE WHALE) IN
THE PLEISTOCENE (LEDA CLAY)
AT THE TOWN OF MONTREAL
EAST, QUEBEC.

By EDWARD ARDLEY, Peter Redpath Museum, McGill
University.

During the present summer, while the Queen City Oil Company were making excavation for a drain in connection with their works at Montreal East, they laid bare a nearly perfect skeleton of a white whale. Before the attention of Mr. Forman, the Superintendent of the works, had been drawn to this interesting discovery the specimen had been somewhat broken by the workmen, but he at once recognizing its scientific value had the greater part of the skeleton carefully removed and a notification of the occurrence sent to the manager of the company.

The writer, at the request of Dr. Frank D. Adams, visited the locality and removed the skeleton to the Peter Redpath Museum, where it is now being set up, and he desires to extend his thanks to the authorities of the Queen City Oil Company for the facilities which they placed at his disposal, and the help which they extended to him in the recovery of this interesting skeleton. The clay in which the skeleton was found is a typical leda clay, bluish-grey in colour towards the bottom, changing to rusty grey or brown towards the top. It shows no evidence of stratification. When dry, it breaks into joint blocks. It contains a few small boulders of limestone. The excavation was 12 feet in width. The skeleton was 10½ feet in length. When found it was lying at right angles to the cut, with its head pointing towards the west, at a depth of 12 feet below the surface. The locality is approximately 15 feet above the St. Lawrence. Associated with the skeleton were

shells of the *Natica clausa*, *Leda glacialis*, *Macoma proxoma*, *Macoma graenlandica*, also sepicules of a sponge, *Tethea logani*, and fragment of wood.

The following parts of the skeleton have been recovered:

Cranium and lower jaw.

Teeth—only three were found.

The Hyoid.

The vetrebral column—forty-two of the vertebrae were found.

Chevrons—only one.

The sternum.

The ribs—of these there are several pairs complete, the others are more or less broken.

The Scapula—the right complete; the left broken.

The Humerus—both right and left.

The Ulna—both right and left.

At the time this animal perished, and its remains were imbedded in the *Leda* clay, Mount Royal was a small rocky island in a wide inland sea, extending from the Laurentian Hills on the north to the higher ground of the Eastern Townships on the south; communicating with the Atlantic not only by the Gulf of St. Lawrence, but also by the strait between the hills of New England and the Adirondacks, and extending west ward at least as far as the Thousand Islands.

This arm of the sea was inhabited by a rich boreal fauna, consisting of species now found in the colder waters of the Gulf and Lower St. Lawrence, and in the Greenland Seas. Remains of these animals may be seen in the collection at the Peter Redpath Museum.

There was thus wide sea room and probably abundant food, on what is now the fertile plain of the Province

of Quebec for the Belugu and for the Greenland Seal, whose bones are found associated with it in the Leda clay,

The following is a list of all the known specimens which have been found in North America, up to the present date:

1849—A nearly complete skeleton.

Charlotte, Vermont.

Z. Thompson.

In State Museum, Montpelier, Vermont.

1858—Twenty vertebræ, mostly caudal.

Sir J. W. Dawson.

Geological Survey Museum, Ottawa, Ont.

1864—A few detached bones.

Riviere de Loup, Que.

Sir J. W. Dawson.

Peter Redpath Museum, Montreal, Que.

1870—A nearly complete skeleton.

Cornwall, Ont.

Mr. E. Billings.

Geological Survey Museum, Ottawa, Ont.

1874—An imperfect skeleton.

Jacquet River, New Brunswick.

Provincial Museum, Halifax, N.S.

1883—A few vertebræ and fragment of a rib.

Smith's Falls, Ont.

Sir J. W. Dawson.

Peter Redpath Museum, Montreal, Que.

1891—A part of the lower jaw (11 feet) of a large whale.

Little Metis, Que.

Sir J. W. Dawson.

Peter Redpath Museum, Montreal, Que.

1895—A nearly complete skeleton.

Smith's Brickyard, Papineau Road, Montreal.

Sir J. W. Dawson.

Peter Redpath Museum, Montreal, Que.

1901—Ten vertebræ, ribs and part of cranium.

Smith's Brickyard, Papineau Road, Montreal.

Peter Redpath Museum, Montreal, Que.

1901—A few bones, hyoid, etc.

Wiliamstown, Ont. .

Ed. Ardley.

Peter Redpath Museum, Montreal, Que.

1906—Most of the skull and several vertebræ.

Pakenham, Ont.

Dr. J. F. Whitecaves.

1916—A nearly complete skeleton.

Queen's City Oil Company, Montreal East.

Peter Redpath Museum, Montreal, Que.

Montreal, September, 1916.

HENRI FABRE.

There passed away a few months ago, at Orange, France, in his ninety-second year, one of the most remarkable scientific men that the world has ever seen, Henri Fabre. He remained almost unknown to the world until he was over 80 years old, when suddenly he became recognized as one of the greatest scientists of the times. He spent his long life exploring the insect world. "Entomology is not, I know, to the taste of everybody," he said, in speaking of his success. "To the terrible utilitarian, a bushel of peas preserved from the weevil is of more importance than a volume of observations which bring no profit. It is by the accumulation of ideas that humanity has done, and will continue to do, better to-day than yesterday, and better to-morrow than to-day."

Fabre's life was one of poverty, sacrifice, struggle and perseverance. He was born of humble and illiterate parents at Saint Leons, France, in 1823. His youth was a constant struggle for education. His first adventure into Nature's secrets began at his fifth year, when he sought to learn how the cricket produced its chirping sound. His interest in insects never flagged, although he started his career as teacher of mathematics in a school at Ajaccio. It was there he met the celebrated botanist, Moquin-Tandon, who gave him this advice: "Leave your mathematics and get to the beast." He followed the advice, but directing his attention to insects, and after years of study he wrote the "Life of the Spider," and other books on insects, some in as entrancing a vein as a novel.

Though Fabre veritably loved his insects, he realized and deplored their deeds of lust, cruelty and murder. "Crime is the 'note' of insect life," he once said. "Cannibalism is incidental in many instances. The story of that unspeakable hypocrite, the praying-mantis, is one of cruelty, license and grotesque horror, such as human annals cannot match."

Speaking of his own life, the aged scientist said: "Because I have stirred a few grains of sand on the shore, am I in a position to know the depths of the ocean? Life has unfathomable secrets. Human knowledge will be erased from the archives of the world before we possess the last word that the gnat has to say to us. Scientifically, Nature is a riddle without a definite solution to satisfy man's curiosity. Hypothesis follows hypothesis; the theoretical rubbish heap accumulates, and truth ever eludes us. To know how not to know might well be the last word of wisdom."

Darwin, Mistral, Maeterlinek, all masters in their sciences, were his friends. Maeterlinek, in speaking of Fabre, declares him to be "one of the most profound scholars, the purest writer, and one of the finest poets of the century just past."

Although poverty and care had dogged Fabre's life, the last years of it were provided for by a pension from the French Government. It was Frederic Mistral, the great French poet, who urged this relief to the man "to whom France owes every assistance from every point of view." Before his death a monument had been erected in his honour in Avignon.

The following sketch of Fabre and his work is from the pen of a British Naturalist, who heads his article, "The Stupidity of Insects: Ingenuity Without Intelligence":

For over half a century Henri Fabre has been writing and publishing his epoch-making works. The ten volumes of the "Souvenirs Entomologiques" have not been written in vain, so far as English students are concerned, though we are at the tail of the vast procession which is wending its way to do homage to the sage of Serignan.

Years ago, in admiration of the then few papers published by Henri Fabre, Darwin had called this man "that inimitable observer." Henri Fabre has travelled far since then, and altogether out of the line of vision

attributed to Darwin. As far back as 1881, we find the philosopher of Down writing anxiously to Romanes and asking him to discuss in a forthcoming work some of the astonishing experiments of Fabre. Unfortunately, he died before he could be initiated into the secrets Fabre was yearly solving, and all discussion of what views he would have taken are futile. But the work of Fabre went on, and to-day the world calls him "Master."

A MODEST GENIUS.

"Unluckily for us and for himself Henri Fabre is possessed of such a modest and retiring character that his studies did not become known for many years. In the little villave of Serignan, in the South of France, he lived only to work. All he asked was leisure to fulfil his self-appointed task, profits and honours left him cold. And there he is to-day, as keen to work as ever, but the weight of his ninety-one years chains him to a couch in the dining-room of his little home.

"An example of his work and a brief summing up is all that I can gather within the compass of a short article. It only remains to say that each example is based on countless experiments. The following is from Vol. IV. of the "Souvenirs Entomologiques":—

The "Pelopæus" wasp, the "mud dauber" of warm climates, captures small spiders with which she provisions her cells of mud. After inserting the first spider, she lays an egg on it and proceeds to gather more spiders until the cell is full. It is then sealed up and another commenced, and so on until the ovaries of the wasp are exhausted.

Fabre took away the first spider with the egg attached and watched the wasp bring another. Without noticing the robbery, the wasp inserted a second spider and again set out for more. Fabre took the spiders away as fast as the wasp inserted them. At last, though there was not a single spider in the nest, the wasp sealed

it up. Now, if she had any gleam of intelligence she must have noticed the cell was empty. How does it happen that she did not discover that her egg was missing? But there is more yet. Fabre took away the whole series of cells, which were attached to a wall. The *Pelopæus* has the habit of plastering her cells all over with a coating of mud when the series is complete. And on the bare wall, where once her cells had been, the wasp Fabre was examining proceeded to neatly plaster a covering which had no meaning or use.

NOT AN EXCEPTIONAL CASE.

“What kind of an intelligence is that? Is it an isolated case of aberration? By no means. Henri Fabre proved by the closest of experiments that all insects act in the same way. Gladly would he have shown that such cases are caused by distractions, that they are only exceptional. But, alas! as he says, every species of insect tested by this method committed similar stupidities. The inexorable logic of the facts caused him to draw up the following conclusions:—

“The insect is neither free nor conscious in its industry. For it the external functions are regulated with almost as much rigour as the internal functions, like those of digestion, for example. It builds, it spins, it hunts, it stings, it paralyses just as it digests, just as it secretes the venom of its weapon or the silk of its cocoon—always without knowing anything about the means or the goal. It is as ignorant of its marvellous talents as the stomach is ignorant of its own chemistry. It can neither add nor subtract anything essential to its work any more than it can increase or diminish the pulsations of its dorsal vessel.

“Experience teaches it nothing. Time can never succeed in enlightening the obscurities of its unconsciousness. Its art, perfect in its speciality, but useless before novel difficulties, transmits itself unchangingly as the art of suckling is transmitted to the nursling. To expect

the insect to modify the essential points of its industry is to hope that one day the nursling will change its way of suckling.

“The insect lacks any re-erecting powers. A blind impulse sends it from one act to another and yet to another until the work is finished, without any possibility of going back to an interrupted act if accidents happen. The cycle accomplished the work appears highly logical, but the work is done by a workman without logic.

THE PURSUIT OF PLEASURE.

“And the stimulus of this labour is the pursuit of pleasure, that main motive spring in the animal world. The mother insect has no foresight of the future larvæ. She does not hunt, nor build, nor provision with any conscious view of the family which will be raised. Her real goal is occult. For her what drives her on as sole guide is the pleasure derived accessory to the work. The *Pelopæus* wasp feels great satisfaction in filling her cell with spiders even when her egg has been extracted. Imperturbably she continues to hunt, though her work is useless. It appears insane to us, but she gets her fun out of it. To reproach the insect for such aberration is to suppose it endowed with the little gleam of intelligence which Darwin wished to establish for it. If it is deprived of any such gleam, the reproach cannot lie, and its acts of aberration are the inevitable resultants of an unconsciousness pushed aside from its normal paths.

“A thousand theoretical views do not equal in value one fact. Scientific solutions of problems call for an enormous number of well-established facts, “and that is why I have observed, and above all experimented,” says Henri Frabe: “To observe, although something, is not enough; one needs must experiment; that is to say, one must intervene oneself and make artificial conditions which will put the animal to the necessity of unveiling what would not happen in the normal course of events. Formerly zoology was denied any title to experimental

science. The reproof was justified so long as zoology only described or classified. But these are the very least parts of its rôle. It is capable of much higher flights. Observation proposes the problem. It is solved, if it is capable of being solved, by experiment. In my modest sphere I should have deprived myself of the most powerful aid to study if I had neglected experiment. And in its modest outlook entomology has given its share of proofs.”

REPORT OF THE PROCEEDINGS OF THE
NATURAL HISTORY SOCIETY OF
MONTREAL.

From May, 1910, to May, 1911.

The monthly meetings for the reading of papers and the transaction of the business of the Society were held regularly from October to May, as in former years.

The following subjects were dealt with at those meetings:

1910.

Nov. 7.—“The Aims and Objects of the Society and its Future Policy,” by the President, Dr. Milton L. Hersey, M.Sc.

Nov. 28.—“The Latest Developments in the Peace River Country,” by Frederick L. Lawrence, F.R.G.S.

Jan. 30.—“The Methods Employed for the Detection of Adulterants in Food,” by Charles R. Hazen, B.Sc.

1911.

Feb. 27.—“Some Animal Resemblances,” by Prof. A. Willey, D.Sc., F.R.S.

Apr. 3.—“The Charm of Wild Birds,” by Herbert K. Job, Esq.

May 1.—“A Glimpse of Aural Mexico and its Sugar Industry,” by Charles F. Bardorf, Esq.

The following course of free lectures was given under the auspices of the Society in terms of the Somerville Foundation:

Thursday, February 2nd, 8 p.m.—“A Trip Through the Peace River Country by a Pioneer,” Frederick S. Lawrence, F.R.G.S.

Thursday, February 9th, 8 p.m.—“The Roman Wall in Britain,” Theo. H. Wardleworth, F.L.S.

Thursday, February 16th, 8 p.m.—“The Electric Furnace and its Uses,” Alfred Stansfield, D.Sc., A.R.S.M.

Thursday, February 23rd, 8 p.m.—“The Production of Sound,” (illustrated by numerous experiments), Dr. Howard T. Barnes, F.R.S.C. (By the courtesy of McGill University, this lecture was delivered in the Physics Building, Sherbrooke Street.)

Thursday, March 2nd, 8 p.m.—“Northern Lights,” Dr. A. S. Eve, M.A., F.R.S.C. (By the courtesy of McGill University this lecture was delivered in the Physics Building, Sherbrooke Street.)

Thursday, March 9th, 8 p.m.—“Heredity and Environment,” Prof. Carrie M. Derick, M.A.

All of the above lectures were illustrated with lantern slides.

An important movement was started about ten years ago to create a taste for the study of Natural History among the children of the city. This has been attended with good results. The following were the subjects of the addresses delivered on successive Saturday afternoons:

Saturday, February 4th, 3 p.m.—“Beautiful British Columbia,” I. Gammell, B.A.

Saturday, February 11th, 3 p.m.—“A Cup of Cocoa,” Prof. Carrie M. Derick, M.A.

Saturday, February 18th, 3 p.m.—“Trees and What They Mean to Canada,” Harry Bragg, M.J.I.

Saturday, February 25th, 3 p.m.—“Volcanoes,” Prof. J. Austen Bancroft, M.A., Ph.D.

Saturday, March 4th, 3 p.m.—“Mammoths and Mastodons,” Prof. J. C. Simpson, B.Sc.

Saturday, March 11th, 3 p.m.—“Diamonds,” Prof. Nevil Norton Evans, M.A.Sc.

All of the above lectures were illustrated with lantern slides.

The Society consists of 200 local members besides a number of corresponding members. Sixteen names were added to the list during the year now ending. The following members died during the year: Prof. D. P. Penhallow, D.Sc., ex-President, who died at sea, October 20th, 1910; Hon. J. K. Ward, M.C.L., Honorary Vice-President; Mr. J. T. Molson, and Mrs. J. H. R. Molson, a warm friend of the Society.

The Annual Excursion of the Society took place to the Boys' Farm at Shawbridge, June 4th, 1910. This farm is situated at the foot of the Laurentian Hills, and afforded a profitable day's outing to the members of the Society and their friends.

It is a matter of regret that the report has again to be made that the interesting and valuable Museum of the Society is still stored in cases, and has been since the sale of the old property in University Street. The crying need of a museum for the instruction of the people is deeply felt in a city the size of Montreal, which at present is without such an institution. A valuable site has been secured on Mountain Street, out of part of the proceeds of the sale of the University Street property; and plans have been prepared for the erection of a suitable building thereon, but thus far it has not been found practicable to procure the funds required for the purpose. This is much to be regretted, as through the museum the Society used to do its most effective educational work. It is hoped that the citizens will realize the loss from which Montreal is suffering for want of a

building in which to exhibit the priceless collection of the Society.

Another regret has to be expressed, namely, the continued suspension of the publication of the RECORD OF SCIENCE, the Society's quarterly journal, which for so long a period had rendered signal service to science. The Government of the Province has been appealed to, to aid in reviving this periodical which with its predecessor, "The Canadian Naturalist and Geologist," did so much in the half century of its history, to set forth the natural resources of the province, and good hopes are entertained that such financial assistance shall be obtained from this quarter as will enable the Society to resume the publication.

Otherwise, the Society is in a flourishing condition. It continues to receive most valuable assistance and encouragement, in prosecuting its work, from the scientific staff of McGill University. Their presence at the Society's meetings and on its lecture platform affords a wonderful stimulus to the amateur scientific workers of the Society. The Society also highly appreciated the privilege extended by the university authorities in permitting two of the Somerville lectures to be held in the Physics Building.

Mr. Alfred Griffin, the old and tried superintendent of the Society's premises and property, continues to efficiently discharge the important duties of his office.

The following are the present officers of the Society:

Patron—His Excellency the Governor-General of Canada.

Hon. President—Lord Strathcona and Mount Royal.

President—Milton L. Hersey, M.Sc, LL.D.

Hon. Vice-President—Hon. J. K. Ward.

Vice-Presidents—Frank D. Adams, Ph.D., F.R.S.C., J. A. U. Beaudry, C.E., J. S. Buchan, K.C., B.C.L.,

Rev. Robert Campbell, M.A., D.D., Miss Carrie M. Derick, M.A., John Harper, C. S. J. Phillips, Major G. W. Stephens, Miss Van Horne.

Secretary—Alfred Griffin.

Hon. Corresponding Secretary—F. W. Richards.

Hon. Treasurer—Jas. W. Pyke.

Hon. Librarian—Harry Bragg.

Hon. Curator—A. E. Norris.

Members of Council—John Harper, Chairman; Chas. S. M. Brown, Hilder Daw, C.E., Prof. Nevil Evans, S. W. Ewing, Joseph Fortier, Albert Holden, H. Lampard, Alex. Robertson, B.A., Farquhar Robertson.

Superintendent—Alfred Griffin.

All respectfully submitted,

ROBERT CAMPBELL,

Delegate to the Royal Society.

REPORT OF THE NATURAL HISTORY SOCIETY
OF MONTREAL.

Presented by Alfred E. Barlow, F.R.S.C., Delegate.

On behalf of the Natural History Society of Montreal, I beg to submit the following report for the consideration of the Royal Society of Canada.

Pending the erection of the new building, which will include halls, library and museum, the work of the Society, during the season 1911-12, has been practically confined to giving successful courses of lectures.

The following communications were read at the monthly meetings:

Monday, Nov. 6th, 1911.—“Some Hungarian Plants,”
by Rev. Robert Campbell, M.A., D.D.

Monday, Nov. 27th, 1911.—“The Dry Rot of Timber,”
by Miss Carrie M. Derick, M.A. “Notes on the
Recent Exposure of Rock, corner of Drummond
and Sherbrooke Streets,” by H. Lampard, Esq.

Monday, Jan. 29th, 1912.—“Explorations in North-East
Quebec,” by Dr. Alfred E. Barlow. “Some Re-
cent Additions to the Flora of Montreal,” by Rev.
Robert Campbell, M.A., D.D.

Monday, February 26th, 1912.—“Some Rare Fungi
at St. Andrew’s, N.B.,” by Miss Van Horne.
“Mountain Building,” by Dr. J. Austen Ban-
croft.

Monday, March 25th, 1912.—“A Peep at One of Na-
ture’s Laboratories,” by Albert G. Nicholls, M.D.

Monday, April 27th, 1912.—“The Algal Flora of the
Island of Montreal,” by Miss Clare G. Nicholls,
M.A.

The Somerville Course of Free Lectures, delivered in

the Lecture Hall of the Young Men's Christian Association, was as follows:

Thursday, Feb. 8th, 1912.—“Anchor Ice and Its Influence on the Development of Water Power,” by Prof. H. T. Barnes, D.Sc., F.R.S.C.

Thursday, Feb. 15th, 1912.—“Some Facts and Myths About Animals in the East,” by Prof. Arthur Willey, D.Sc., F.R.S.

Thursday, Feb. 22nd, 1912.—“The St. Lawrence and the Great Lakes,” by John Kennedy, Esq.

Thursday, Feb. 29th, 1912.—“The Natural History of the Slum,” by Harry Gragg, M.J.I.

Thursday, March 7th, 1912.—“Some Phases of Economic Botany,” by S. Kirsch, Ph.D.

Thursday, March 14th, 1912.—“Certain Diseases of Plants,” by Miss Carrie M. Derick, M.A.

The following Half-Hour Talks to Children were given in the hall of the Y. M. C. A.:

Saturday, Feb. 3rd, 1912.—“Flowers and Their Insect Visitors,” by Miss Carrie M. Derick, M.A.

Saturday, Feb. 10th, 1912.—“Volcanoes of New Zealand,” by J. G. Ross, B.Sc.

Saturday, Feb. 17th, 1912.—“Creatures of Other Days,” Prof. J. Austen Bancroft, M.A., Ph.D.

Saturday, Feb. 24th, 1912.—“A Piece of Paper,” by S. Kirsch, Ph.D.

Saturday, March 2nd, 1912.—“Some of Our Lilliputian Friends and Foes,” by Dr. A. G. Nicholls.

Saturday, March 9th, 1912.—“The Birds of Montreal,” by I. Gammell, B.A.

Saturday, March 16th, 1912.—“Our Trees in Winter,” by Rev. Robert Campbell, M.A., D.D.

The Society would especially thank McGill University and its professors for valuable assistance given in connection with the courses.

The Annual Field Day was held at Phillipsburg, on the shores of Missisquoi Bay. Its success was in a great part due to Mr. Henry Timmis, who kindly gave the Society the freedom of the quarries and works of the Missisquoi Marble Co. The judges of the botanical and geological specimens were Miss Van Hornè and Dr. Milton Hersey.

The press of Montreal has continued generously to give notices and reports of meetings.

The Society records with deep regret the death of three highly valued members, Dr. J. C. Cameron, Wm. Cauldwell and H. Markland Molson.

Eighteen new members were elected during the session.

The officers for 1911-12 are:

Patron—His Royal Highness the Duke of Connaught, K.C., Governor-General of Canada.

Hon. President—The Right Honourable Lord Strathcona and Mount Royal, G.C.M.S., LL.D.

President—Milton L. Hersey, M.Sc., LL.D.

Vice-Presidents—Frank D. Adams, Ph.D., *F.R.C.S.*, Dr. Howard T. Barnes, *F.R.S.C.*, J. S. Buchan, K.C., B.C.L., Rev. Robert Campbell, M.A., D.D., Miss Carrie M. Derick, M.A., J. C. Holden, *F.R.G.S.*, Robert Job, Major G. W. Stephens, Miss Van Horne.

Secretary—Alfred Griffin.

Hon. Corresponding Secretary—Fred. W. Richards.

Hon. Treasurer—Jas. W. Pyke.

Hon. Curator—Prof. Nevil Norton Evans, M.Sc.

Members of Council—John Harper, Chairman; J. A. U. Beaudry, C. E. Bardorf, Chas. S. M. Brown, T. L. Crossley, S. W. Ewing, Joseph Fortier, H. Lampard, C. S. J. Phillips.

Superintendent—Alfred Griffin.

REPORT OF THE NATURAL HISTORY SOCIETY
OF MONTREAL.

Presented by Dr. A. G. Nicholls, Delegate.

The Natural History Society of Montreal leg to submit this their Annual Report of the year ending May 31st, 1913, being the 86th Annual Report of this Society.

We are pleased to be able to state, notwithstanding some disadvantages, the past year has been one of substantial progress. The various courses of lectures as stated below, including the Somerville Course and the Saturday Afternoon Talks to Children, have been continued and the attendance showed improvement over the previous year. So great indeed was the interest shown that in each of the above courses seven lectures were given instead of six as in former years.

The papers presented at the Monthly Meetings were of an original character, and of an unusual order of excellence, many of the subjects treating of matters of great economic importance to Canada.

The following is the list:

- Monday, Nov. 4th, 1912.—“A Biography of the Beaver,” Dr. Arthur Willey.
- Monday, Nov. 25th, 1912.—“The Fungi of the Past Season,” Rev. Robert Campbell, M.A., D.D.
- Monday, Jan. 27th, 1913.—“The Geology of the Island of Montreal,” Prof. John Stansfield.
- Monday, Feb. 24th, 1913.—“Forest Products,” Simon Kirsch, M.A., D.Sc.
- Monday, March 31st, 1913.—“Oyster Development, and Oyster Culture in Canada,” Dr. Joseph Stafford.
“The Fig Moth,” H. Lampard, Esq.

Monday, April 28th, 1913.—“Mount Royal, an Active Volcano,” J. S. Buchan, K.C., B.C.L.

The Somerville Course of Lectures were as usual well attended, the subjects being particularly interesting. Four of these lectures were given in the Y. M. C. A. Hall, and three in McGill University. We take this opportunity of tendering to the Governors of McGill the deep gratitude of the Society for the use of the lecture halls, and to its professors for valuable lectures and assistance so cheerfully given at all times.

The following is the list:

Friday, Feb. 7th, 1913.—“The Canadian Fisheries,” Prof. E. E. Prince, LL.D., F.R.S.C.

Thursday, Feb. 13th, 1913.—“Icebergs,” Prof. H. T. Barnes, D.Sc., F.R.S.C.

Thursday, Feb. 20th, 1913.—“The Ottawa Valley, the French River Waterway, (Georgian Bay Canal),” W. J. Poupore, Esq., Ex-M.P.

Thursday, Feb. 27th, 1913.—“Radium,” Prof. A. E. Eve, D.Sc.

Thursday, March 6th, 1913.—“Rubber and Rubber Plants,” Prof. F. E. Lloyd, M.A.

Thursday, March 13th, 1913.—“Biology and Social Reform,” Prof. Carrie M. Derick, M.A.

Thursday, March 20th, 1913.—“The Place of Nitrogen in Nature,” Dr. A. F. Ruttan, B.A., F.R.S.C.

The Half-Hour Talks to Children were appreciated better than ever, judging by the attendance and the rapt attention with which these lectures were received. The subjects were well chosen, as the following list will show, and the attendance was a very encouraging feature.

Saturday, Feb. 15th, 1913.—“Icebergs,” Prof. H. T. Barnes, D.Sc., F.R.S.C.

Saturday, Feb. 22nd, 1913.—“The Birds of Canada,” Dr. W. G. M. Byers.

Saturday, March 1st, 1913.—“A Lead Pencil,” Chas. S. J. Phillips, Esq.

Saturday, March 8th, 1913.—“Glaciers,” Prof. J. Austen Bancroft.

Saturday, March 15th, 1913.—“Glass,” Prof. Nevil Norton Evans.

Saturday, March 22nd, 1913.—“Moulds, Some Humble Forms of Plant Life,” Dr. A. G. Nicholls, D.Sc., F.R.S.C.

Saturday, March 29th, 1913.—“Indian Corn,” Prof. Carrie M. Derick, M.A.

The Annual Field Day was held at Belœil Mountain (St. Hilaire) on the 22nd of June and was a most successful function.

The Society hopes shortly to proceed with the erection of a new building especially adapted to its purposes, through which even greater success may be expected in its work.

It would not be fair to close this report without paying a well deserved tribute to our Secretary, Mr. Alfred Griffin, for his energy and loyalty in all matters concerning the Society. He has completed twenty-five years of service, and the fact that the Society is existing to-day is in no small measure due to his efforts.

OBITUARY NOTICES.

During the last two years, the Natural History Society of Montreal has sustained very heavy losses in its membership, as is indicated in the following obituary notices:

SIR WILLIAM C. VAN HORNE, K.C.M.G.

The Natural History Society of Montreal, meeting this evening for the first time since the lamented death of Sir William Van Horne, on the 11th of September, 1915, takes the opportunity of recording its deep sense of loss in his removal, the esteem in which he was held by the members of the Society, and its appreciation of his kindness in recently agreeing to accept the position of its Honorary President.

The Society was glad to recognize that Sir William added to his many accomplishments that of being an ardent and enthusiastic lover and student of nature. In the midst of an unusually busy life, and while occupied with vast projects, he found time to cultivate a taste for art and science. A keen observer of men and things, the glories and wonders of creation, as displayed in the lofty mountains and rapidly flowing rivers, with which his calling made him familiar, greatly moved him. At the same time, he had an eye for the smallest objects, the perfection of whose curious structure engaged his attention. He had a keen perception of what was symmetrical and beautiful in nature and art; and found his chief pleasure and recreation in placing on canvas the impressions which his sensitive and susceptible mind had received in his large and varied converse with the works of God.

Sir William in later years gave special attention to the Fungi of the Dominion, in the knowledge of which he became expert. For many years, while occupying the practical oversight of the Canadian Pacific Railway,

he laid the Society under obligations by generously providing for the comfort and pleasure of the guests of the Society in its annual scientific excursions; and in recently electing him to the highest distinction in its gift, that of Honorary President, it sought to make acknowledgment of the valued favours and services which he had rendered to it in the past, while hoping that he might yet be spared for many years to reflect honour upon it and promote its usefulness. It has seemed good to the Lord of Life that it should be otherwise, and the Society bows to the Divine will.

But while making mention of its own sorrow and sense of loss in Sir William's decease, the Society would express its special and profound sympathy with Lady Van Horne, and Miss Van Horne and the other members of his family, in the great sorrow with which they have been visited, praying God to abundantly sustain them in their grief.

The Secretary is instructed to communicate to Lady Van Horne a copy of the foregoing resolution.

Yours very sincerely,

Hon. Corresponding Secretary.

LIEUTENANT-COL. JEFFREY BURLAND.

The Natural History Society of Montreal is called upon to mourn the sudden death of one of its most prominent members, the late Lieutenant-Colonel Jeffrey Hale Burland, which took place on October 9th, 1914. This Society was one of the numerous activities, commercial, benevolent, social and scientific, to which Lieutenant-Colonel Burland's public spirit and versatile talents were directed. He was specially interested in the question of the proper housing of the Society, with its library and museum. Being an honour man in

Natural Science of McGill University, he was also interested in the scientific work of this Society, and encouraged those who were prosecuting original research in the domain of nature. The Society records its profound sympathy with Mrs. Burland and the other members of his family in the acute bereavement which has befallen them; but feels satisfaction, as they doubtless also do, in the fact that at the time of his decease he was busily engaged in the benevolent and patriotic task of providing for the care of sufferers in the dreadful conflict in which the British Empire is struggling.

He was son of the late George Burland, and was born in Montreal, March 19th, 1861. After his father's death he became President and Manager of the British-American Note Company. He was President of the Montreal Board of Trade in 1911, a Life Governor of the Montreal General Hospital, also of the Hospital for the Insane and the Western Hospital. He founded the Royal Edward Tuberculosis Institute. He commanded the 6th Fusiliers in 1892; and, in 1897, took part in the late Queen Victoria's Jubilee. He had undertaken the charge of Red Cross arrangements and died suddenly at his post in England.

MR. JOHN HARPER.

The Natural History Society of Montreal would place on record its sense of the heavy loss it has sustained in the death, on August 2nd, 1914, of Mr. John Harper, one of its oldest and most honoured members, who occupied for several years the responsible position of Chairman of the Council of the Society, the duties of which he discharged with singular fidelity and zeal. Mr. Harper was specially interested in Botany, his work as a scientific drug manufacturer involving necessarily a large acquaintance with plant products. Mr. Harper was born at Hurstbourne, Hampshire, England, October

18th, 1837, and he was therefore in his 77th year when he died. He came to Canada in 1857, and for 57 years he was in the employment of Carter, Kerry & Co., drug manufacturers. Mr. Harper for many years held the position of Treasurer of the Mechanics' Institute of Montreal, as well as of the evening technical schools of the city, so that he is gratefully remembered as a most useful citizen.

PROFESSOR JOSEPH BEMROSE.

The Natural History Society of Montreal has suffered a great loss in the death of Professor Joseph Bemrose, which occurred on May 25th, 1914. An Englishman by birth, he had long resided in this city, being consulting and scientific chemist in the extensive drug firm of the Lymans. When the former Medical Faculty of Lennoxville University required the services of a Professor of Chemistry, the position was tendered to Mr. Bemrose, and he filled it with eminent ability and to the satisfaction of all concerned. After the Lennoxville Medical Faculty was merged in that of McGill, Professor Bemrose accepted engagements as Consulting Chemist to any that needed his services.

Prof. Bemrose long occupied a seat on the Council of the Natural History Society, and was a most useful member of it. He was specially interested in the botanical side of the Society's work, being directed to it by the knowledge of officinal plants which he obtained in his chemical studies. He brought to bear upon the counsels of the Society wide scientific knowledge, both theoretical and practical, and until the end of his life, notwithstanding failing health, continued to attend the meetings of the Society. The members recall with pleasure the qualities of mind and heart which he displayed

in his intercourse with them, and express deep sympathy with his relatives in their affliction.

DR. C. E. BARLOW.

The Natural History of Montreal records the profound sorrow which it felt when the startling news reached the city of the fact that Dr. C. E. Barlow, one of its most distinguished members, along with his wife, perished by the sinking of the *Empress of Ireland*, on the 29th day of May, 1914. Dr. Barlow was a native of Montreal, where he was born 17th June, 1861, and early entered the service of the Geological Survey of Canada. He was specially expert as a mineralogist, and the numerous reports which he drew up of the geological resources of the Dominion are of outstanding value. Dr. Barlow contributed many scientific papers of importance to the transactions of the Natural History Society. He was one of the Society's Somerville lecturers, and was always ready to further its interests by speech and pen when called upon to help in the prosecution of its work. Not this Society alone but also the entire community in which he was known mourn the tragedy by which a life of such great promise as his was prematurely cut off. The Society begs to tender its warmest sympathy to the members of his family on the sad calamity.

His father, Robert Barlow, under whom he received his early training, had been engaged in the offices of the Ordnance Survey, London. Coming under the influence of Principal Dawson and Dr. Harrington while at college, Charles took up the subject of Natural Science and especially Geology, in which he graduated with honours. The Temiskaming region was the chief scene of his explorations and he became the recognized authority on nickel, copper, silver, cobalt, iron, gold and other ore deposits in the territory north of the great lakes.

MR. HENRY HERBERT LYMAN, B.A.

In common with the citizens of Montreal in general, the members of the Natural History Society were shocked to learn that one of its most learned members, Mr. Henry Herbert Lyman and his wife, were among the passengers who lost their lives by the sinking of the ill-fated steamship, "Empress of Ireland," on the 29th day of May, 1914. Equally prominent as a merchant and a man of science, his loss is deeply felt. Being one of the most skilled Entomologists of the Dominion, Mr. Lyman was a frequent contributor to the transactions of the Natural History Society, and was also one of its Somerville lecturers. Only a couple of days before his lamented death he had presented to the Royal Society of Canada the annual report, which the Entomological Society is wont to make to the Royal Society, this being his last public act. The Natural History Society is specially gratified to learn that he has left a legacy of \$10,000, conditionally, to the Society, thus showing the depth of his interest in its operations. The Society expresses its deep sympathy with his relatives in the acute sorrow which has overtaken them.

He was son of the late Henry Lyman of Montreal and was born here on 21st December, 1854. He was educated at the High School and McGill University, receiving the Logan Medal when he graduated B.A., in 1876. He took his Master's degree in 1880. He was trained in the office of Lymans, Clare & Company, of which his father was the senior partner, and, in 1885, became a member of the firm. He was President of the Entomological Society of Ontario, F.R.G.S., Senior Major of the Royal Scots, a strong imperialist and one of the originators of the Imperial Federation League.

MR. GUY DRUMMOND.

The Natural History Society of Montreal has again to mourn the loss of a valuable member, in the person of

Mr. Guy Drummond, who died gloriously, fighting for the rights of humanity, and the liberties of the Empire, on the field of Langemarck. Although still but a young man he had already made his influence deeply felt in all circles in his native city. Having entered upon what promised to be a brilliant commercial career, having barely tasted of the joys of his own home, and having in possession and prospect everything calculated to make life dear to him, he yet, on the call of duty, patriotically risked the sacrifice of all, and when he came to face the enemy died heroically, making, with others who shared his fate, the name of Canada famous. Mr. Drummond took an intelligent interest in the work of this Society, and his cordial support of it for many years to come was confidently counted on. The Society extends its profoundest sympathy to his bereaved widow and to Lady Drummond and her family.

MR. THOMAS CRAIG.

On March 29th, 1915, at a meeting of the Natural History Society, held in the Physics Building of McGill University, on motion of Mr. J. S. Buchan, K.C., seconded by Mr. W. Drysdale, a cordial vote of thanks was recorded to Mr. Leslie Craig, who has donated to the Society his late father's scientific library, consisting of 225 volumes and a very large, classified collection of cuttings on numerous subjects in several hundred large envelopes with an index.

The Society takes this opportunity, when thanking Mr. Leslie Craig for this valuable donation, which will be carefully preserved in the Museum of the Society, of recording its sincere sorrow at the death of his father, Mr. Thomas Craig, which occurred on June 20th, 1915. A resolution to that effect was passed by the Society at its opening meeting on October, 1915, but was omitted to be placed in the Society's Minutes.

Mr. Craig, senior, was for many years a valued mem-

ber of the Natural History Society, having been elected in January, 1902. He took an active and interested part in the Society's proceedings, always ready out of his large range of knowledge of scientific subjects, to contribute to the discussions of the Society. He was especially helpful to the Microscopical Section of the Natural History Society, of which he was for several years President. He had the honour of being elected a Fellow of the Royal Microscopical Society in 1889. He was also a member of the American Microscopical Society, and his name was held in high regard also in other microscopical societies. He was a deep and earnest student of nature; of a genial temperament and generous disposition, he was never too busy to help the struggling enquirer materially as well as in sharing with him his extensive knowledge.

The Society records its deep sympathy with his son, Mr. Leslie G. Craig, on the death of his honoured and much-mourned father.

MR. JONATHAN HODGSON.

DEAR MRS. HODGSON,—

I am directed by the Natural History Society of Montreal to communicate to you the following resolution passed by the Society at its last meeting:

The Natural History Society of Montreal places on record the deep sense of loss which it has sustained in the decease of Mr. Jonathan Hodgson, one of its life members. He was one of the oldest members of the Society, and was interested in it as he was in all institutions which had for their aim the enlightenment and betterment of the community. The Society sympathizes with his mourning family in their great sorrow and commends them to the compassions of the God of all consolation. It is ordered that a copy of this resolution be sent to his family. On behalf of the Society,

ROBERT CAMPBELL, Vice-President, presiding.

BOOK NOTICES.

'The Canadian Oyster; Its Development, Environment and Culture,' by Jos. Stafford, M.A., Ph.D., Ottawa. The Mortimer Co., Ltd., 1913.

This volume is included in the report of the Committee on Fisheries, Game and Furbearing Animals, a department of the Commission of Conservation of Canada, to the Government of the Dominion. It deals with a subject of great popular interest. There are many among us who appreciate the succulent bivalve and we are anxious that its continued production shall be secured.

The Natural History Society has been kept tolerably well informed on the subject. Some years ago Professor MacBride read an interesting paper before it, the result of his observations at the Biological Station at Malpeque. Dr. Stafford has from time to time made communications to the Society of his studies on the subject, and last year Dr. Willey gave an interesting paper on the Pacific Coast Oyster, *Ostrea lurida*. Dr. Stafford, in this treatise, gives the results of his observations on the Canadian Oyster, *Ostrea Virginiana*, up to the date of the submission of the report, and we are indebted to him for a considerable advance in the knowledge we have hitherto had of the subject.

He introduces the discussion of the matter in these terms: "A knowledge of the normal development of a young oyster from the egg is of fundamental importance in formulating any national scheme of artificial propagation, as well as in framing suitable laws for the protection and encouragement of the oyster industry as a source of wealth to the country." He then goes on to deplore that though this shellfish was well-known to the ancient Greeks and Romans, and was greatly esteemed by them and *bon vivants* all along the ages, "yet we have not a single, concise, direct, intelligible, true and satisfactory account of *where, when* and *how* an egg becomes

an oyster." Dr. Stafford now, in some measure, supplies the desiderata. Part I. of his book is devoted to a consideration of these points. The details given throw much light on the anatomy of the oyster, and the gradual development of its organic parts. In the plankton stage, it is not easy to distinguish it from other embryo bivalves; but careful and continued observation had enabled him at length to detect the difference between the oyster larva and the oyster spat, an important advance in the knowledge of the subject. The former are developed in the month of July and the latter in the month of August. His observations were made at the Biological Stations on the coasts of New Brunswick and Prince Edward Island, in the years 1904 to 1909. He visited British Columbia with a view to studying conditions there in 1910.

Part II. is taken up with the discussion of the environment, culture and biological and physical phenomena of the oyster, and deals with such matters as tide, depth of water, fresh water, salinity, lime, temperature at the bottom, and the structure of the typical oyster bays, contrasted with the Bay of Fundy.

He devotes a chapter to the consideration of the practicability of transplanting the oyster *virginiana* to Pacific waters. Several attempts in this direction did not meet with much success; but his search after specimens resulting from those attempts encourages him in the belief that, with proper care and previous examining of the grounds to which the eggs are committed, success may attend further future efforts.

The volume is very finely provided with illustrations, seven plates in all, with a map of Malpeque Bay. It concludes with a full bibliography of the subject.

R. C.

SUMMARY REPORT OF THE GEOLOGICAL
SURVEY.

DEPARTMENT OF MINES FOR THE YEAR 1915.

This volume contains brief reports on the work of all the divisions of the Geological Survey. The economic side is, of course, given prominence, that is, the Geological and Mineralogical Department, as it is in these the people are chiefly interested. Fuller reports are to follow. Although geological investigations and topographical mapping naturally occupied the first place in the work of the survey, attention was also given to other branches of science—Botany, Zoology, Anthropology, Archæology, and their various subdivisions. The relative importance attached to the different sections of natural science may be gathered from the fact that the Geographical Staff includes 33 members, besides 3 palæontologists, while only 3 botanists and 1 ornithologist were employed.

Of course, the newer western provinces receive most attention, notably Alberta and British Columbia and the Yukon Territory, because of the immense rock formations to be found in the vast mountain ranges of those provinces. But some work was done in all the provinces, our friend, Mr. J. A. Dresser, devoting his attention and time to the Lake St. John Basin, in the Province of Quebec.

Our octogenarian naturalist, Professor John Macoun, now permanently residing on Vancouver Island, where, owing to the mildness of the climate, he is able to prosecute field work throughout the year, reports 826 species of flowering plants from the island, and more than a thousand species of mosses, seaweeds and fungi. Mr. Harold St. John, temporary botanist, spent the season collecting in the County of Saguenay, and reports finding 50 species, which he is studying under the direction of Prof. M. L. Fernald, of Harvard University. The result of the naming and describing of this collection will be looked forward to with interest by botanists.

Although only one ornithologist was employed, a goodly number of birds was reported, Mr. Taverner having volunteer workers corresponding and co-operating with him, and sending him specimens. Perhaps the most valuable of the list of birds is that collected by Capt. Joseph Bernard, on the Arctic Coast, N.W.T. They number 33 in all.

CANADA DEPARTMENT OF MINES, GEOLOGICAL SURVEY, MUSEUM BULLETIN No. 12,
ON *EOCERATOPS CANADENSIS*, WITH
REMARKS ON OTHER GENERAL GENERA
OF CRETACEOUS HORNED DINOSAURS.

By LAWRENCE M. LAMBE.

This Bulletin embraces, in detail, the report of the veteran Vertebrate Palaeontologist, Mr. Lambe, of which an outline is given in the volume of the Geological Survey Report noticed above.

The following is a brief description of the ancient inhabitant of the Red Deer region of Alberta: "*Eoceratops* appears to have had a short skull, compact and deep in front, and tapering behind. The lower jaw is robust, the nasal bones are remarkably deep and the supra-orbital horncores are large in comparison with the inconspicuous nasal horncore. This compactness of the anterior half of the skull with great depth is also found in *Brachyceratops*, a form in which the nasal horn was the principal weapon of defence. In comparison with *Eoceratops*, the later *Triceratops* has lengthened the face and added greatly to the size of the supraorbital horncore to the neglect of the nasal horn. In *Diceratops*, with the enlargement of the browhorns, there is the concomitant non-development of the nasal one." The Bulletin is illustrated with eleven plates, which enable the reader the more clearly to grasp the contents of the valuable report.

ABSTRACT FOR THE MONTH OF AUGUST, 1914.

Meteorological Observations, Taken at McGill College Observatory. Height above sea-level, 187 feet. C. H. McLEOD, *Superintendent.*

DAYS.	THERMOMETER				*BAROMETER				† Mean relative humidity.	WIND		Per cent. of possible Sunshine	Rainfall in inches.	Snowfall in inches.	Rain and snow melted.	DAYS.
	† Mean.	Max.	Min.	Range.	† Mean.	Max.	Min.	Range.		General direction.	Mean velocity in miles per hour					
1	68.9	75.9	63.3	12.6	29.89	29.95	29.83	.13	60	NW	11.0	26	T	...	T	1
SUNDAY.....2	68.7	82.0	60.3	21.7	29.83	29.88	29.74	.14	68	W	10.0	53	.20	...	.20	2.....SUNDAY
3	60.9	68.2	54.0	14.2	29.99	30.11	29.88	.23	51	NE	9.0	80	.08	...	.08	3
4	64.2	74.5	52.3	22.2	30.13	30.17	30.09	.08	51	NE	5.4	94	...	...	...	4
5	69.8	82.0	57.7	24.3	30.10	30.16	30.03	.13	60	SE	6.4	92	...	...	...	5
6	73.9	85.4	62.0	23.4	30.00	30.07	29.93	.14	58	SW	10.4	78	T	...	...	6
7	75.5	86.7	66.5	20.2	29.95	30.01	29.89	.12	61	SW	9.2	44	T	...	T	7
8	68.3	73.8	64.2	9.6	30.05	30.09	29.98	.11	55	NE	9.5	0	...	...	...	8
SUNDAY.....9	69.4	81.6	55.6	26.0	30.05	30.10	29.95	.12	54	S	4.3	73	...	...	...	9.....SUNDAY
10	74.9	91.0	62.0	29.1	29.92	29.98	29.85	.13	74	SW	10.2	25	.07	...	.07	10
11	70.8	77.4	62.8	14.6	29.91	30.03	29.83	.26	74	SW	12.9	22	.22	...	.22	11
12	62.4	70.2	53.0	17.2	30.14	30.20	30.08	.12	51	NE	9.6	93	...	...	...	12
13	64.7	74.2	54.3	19.9	30.04	30.11	29.92	.19	53	NE	6.5	78	...	...	...	13
14	65.3	78.0	58.4	19.6	29.79	29.87	29.72	.15	73	SW	11.6	31	1.09	...	1.09	14
15	65.8	76.2	58.5	17.7	29.83	29.90	29.75	.12	64	NW	12.0	67	T	...	T	15
SUNDAY.....16	65.5	73.2	56.3	16.9	29.98	30.02	29.91	.11	63	NW	11.5	75	.01	...	.01	16.....SUNDAY
17	68.6	77.0	61.3	15.7	29.95	30.00	29.91	.09	66	W	7.2	61	...	...	...	17
18	68.5	75.3	62.9	12.4	29.86	29.91	29.83	.08	79	SW	11.9	23	.25	...	.25	18
19	69.6	78.4	63.5	14.9	30.02	30.11	29.92	.19	58	NE	7.3	57	...	...	...	19
20	67.6	77.3	59.0	18.3	30.08	30.16	29.99	.17	57	SE	6.1	46	T	...	T	20
21	64.1	69.9	59.9	9.0	29.84	29.93	29.76	.17	81	NW	8.3	0	.28	...	.28	21
22	64.9	73.0	57.3	15.7	29.97	30.01	29.89	.12	58	NW	10.6	86	.11	...	.11	22
SUNDAY.....23	66.9	78.6	55.9	20.7	29.78	30.01	29.56	.45	69	SW	11.6	23	...	...	...	23.....SUNDAY
24	60.4	64.3	55.0	9.3	29.86	30.06	29.61	.45	55	NW	13.0	73	...	...	...	24
25	56.2	63.7	49.0	14.7	30.17	30.26	30.08	.18	50	NW	12.1	98	...	...	...	25
26	54.9	62.6	47.5	15.1	30.27	30.31	30.21	.10	59	NE	5.2	56	...	...	...	26
27	59.3	67.6	50.0	17.6	30.19	30.28	30.10	.18	56	SE	5.5	69	...	...	...	27
28	62.7	72.8	52.3	20.5	30.08	30.11	30.05	.06	54	NE	9.1	87	...	...	...	28
29	57.9	61.3	54.8	6.5	29.97	30.07	29.80	.27	81	SE	11.0	0	1.08	...	1.08	29
SUNDAY.....30	62.8	70.0	56.6	13.4	29.82	29.88	29.71	.17	72	NW	9.7	36	1.42	...	1.42	30.....SUNDAY
31	67.0	75.0	58.5	16.5	29.93	29.97	29.86	.11	69	W	10.2	74	T	...	T	31
Means.....	65.830	74.65	57.00	17.05	29.980	30.058	29.894	.164	62.30		9.31	55.66	4.81	...	4.81	.....Sums
40 Years means for and including this month.	66.46	74.67	58.63	16.01	29.948	.....	.....	.141	72.26		11.598	57.739	3.48	...	3.48	40 Years means for and including this month.

ANALYSIS OF WIND RECORD.

Direction.....	N	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	CALMS
Miles.....	62	1427	194	655	360	1618	844	1735	
Duration in hours...	9	157	33	88	52	152	58	165	
Mean Velocity.....	6.9	9.1	5.9	7.4	6.9	10.8	14.5	10.5	

The greatest mileage in one hour was 18 on the 11th and 23rd.
Total mileage, 6925.
Resultant direction, N 78° 50' W. Resultant mileage, 1600.

The greatest heat was 91.0° above zero on the 10th. The greatest cold was 47.5° above zero on the 26th, giving a range of 43.5°.

The warmest day was the 7th. The coldest day was the 26th.

The highest barometer reading was 30.31 on the 26th. The lowest barometer reading was 29.56 on the 23rd, giving a range of .75 inches.

The minimum relative humidity observed was 25 on the 9th.

Thunderstorms on 6 days.

* Barometer readings reduced to sea-level and temperature 32° Fahrenheit

† Mean of bi-hourly readings taken from self-recording instruments.

‡ Humidity relative, saturation being 100. Mean of readings taken every four hours from self-recording hygrometer.

§ 26 years means.

¶ 33 years means.

ABSTRACT FOR THE MONTH OF SEPTEMBER 1914.

Meteorological Observations, Taken at McGill College Observatory. Height above sea-level, 187 feet. C. H. McLEOD, Superintendent.

DAYS.	THERMOMETER				*BAROMETER				† Mean relative humidity.	WIND		Per cent. of possible Sunshine	Rainfall in inches.	Snowfall in inches.	Rain and snow melted.	DAYS.
	† Mean.	Max.	Min.	Range.	† Mean.	Max.	Min.	Range.		General direction.	Mean velocity in miles per hour					
1	68.5	78.2	53.3	19.9	29.92	29.98	29.83	.15	76	SW	8.8	29	.18	...	.18	1
2	73.9	82.9	63.2	14.7	29.79	29.84	29.73	.11	75	W	11.5	47	.76	...	.76	2
3	66.2	73.9	53.0	15.0	29.88	29.98	29.81	.17	58	W	11.4	94	...	...	...	3
4	61.9	69.2	55.2	14.0	29.84	29.96	29.79	.17	61	W	11.6	68	.10	...	.10	4
5	60.4	69.4	52.0	17.4	30.02	30.07	29.97	.10	60	W	10.5	09	...	...	.10	5
SUNDAY.....6	58.4	62.0	55.6	6.4	29.83	29.98	29.66	.32	79	S	10.5	0	.36	...	.36	6.....SUNDAY
7	58.1	66.0	50.0	16.0	29.73	29.89	29.65	.24	79	NW	9.7	16	.24	...	.24	7
8	51.8	59.3	47.9	11.4	30.04	30.16	29.90	.26	67	NW	11.5	39	.12	...	.12	8
9	51.5	57.2	46.2	11.0	30.23	30.26	30.17	.09	62	NW	9.6	41	...	...	...	9
10	52.5	58.2	47.0	11.2	30.24	30.28	30.19	.09	59	NE	7.0	34	T	...	T	10
11	53.9	62.3	46.4	15.9	30.21	30.24	30.18	.06	62	NE	5.5	79	...	...	...	11
12	55.8	67.2	44.5	22.7	30.30	30.39	30.23	.16	56	W	4.5	93	...	...	...	12
SUNDAY.....13	57.2	69.4	46.6	22.8	30.46	30.51	30.40	.11	60	S	3.6	02	...	...	...	13.....SUNDAY
14	59.6	69.0	48.4	21.5	30.46	30.53	30.38	.15	65	S	5.0	81	...	...	...	14
15	61.7	72.7	49.3	23.4	30.35	30.40	30.32	.08	64	W	6.8	84	...	...	...	15
16	62.1	73.6	50.4	23.2	30.39	30.41	30.34	.10	65	W	5.3	92	...	...	...	16
17	66.0	77.3	51.2	26.1	30.30	30.38	30.21	.17	59	W	8.0	91	...	...	...	17
18	67.0	73.8	60.0	13.8	30.20	30.25	30.16	.09	53	NE	9.5	79	...	...	...	18
19	59.4	69.3	50.9	18.4	30.16	30.23	30.10	.13	55	NE	7.6	97	...	...	...	19
SUNDAY.....20	64.7	74.3	51.5	22.8	29.99	30.10	29.86	.24	65	SW	13.2	57	...	...	...	20.....SUNDAY
21	71.4	79.1	63.8	15.3	29.98	30.03	29.94	.09	64	W	13.5	87	...	...	...	21
22	75.0	84.2	63.5	15.7	29.88	29.97	29.78	.19	61	W	13.9	92	...	...	...	22
23	68.6	78.2	60.0	18.2	29.82	29.88	29.79	.09	75	NW	12.1	40	.01	...	.01	23
24	57.0	60.1	52.5	7.3	29.86	29.89	29.83	.06	81	W	6.5	0	.26	...	.26	24
25	52.7	57.2	46.1	11.1	29.96	30.11	29.84	.27	72	NW	10.5	38	.15	...	.15	25
26	48.0	54.2	41.0	13.2	30.11	30.16	30.03	.13	52	NW	11.3	95	.01	...	.01	26
SUNDAY.....27	46.0	52.6	42.0	10.6	30.12	30.27	29.95	.32	73	N	8.7	35	.35	...	.35	27.....SUNDAY
28	42.5	47.1	36.5	10.6	30.38	30.43	30.28	.15	54	NE	9.1	53	...	...	...	28
29	42.5	51.4	32.1	19.3	30.24	30.43	29.96	.47	62	S	6.8	70	.02	...	.02	29
30	47.8	52.0	44.0	8.0	29.98	30.14	29.87	.27	79	N	8.0	0	T	...	T	30
Means.....	58.759	66.74	50.81	15.93	30.090	30.173	30.005	.168	65.11		9.08	67.35	2.56	...	2.56	.....Sums
40 Years means for and including this month.	58.46	66.24	50.86	15.38	30.021	.....	.....	.192	.....		12.11§	53.12§	3.46	...	3.46	40 Years means for and including this month.

ANALYSIS OF WIND RECORD.

	N	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	CALMS
Direction.....									
Miles.....	232	770	95	112	476	1068	1890	1895	0
Duration in hours...	33	94	17	18	61	108	100	182	17
Mean Velocity.....	7.0	8.2	5.6	6.2	7.8	9.9	9.9	10.4	0

Total mileage, 6538.
Resultant direction, N 76° 9' W.
Resultant mileage, 3365

The greatest heat was 81.2° above zero on the 22nd. The greatest cold was 32.1° above zero on the 29th, giving a range of 52.1°.

The warmest day was the 22nd. The coldest day was the 29th. (28th had the same mean temperature.)

The highest barometer reading was 30.53 on the 14th. The lowest barometer reading was 29.65 on the 7th. This gives a range of .88 of an inch.

The minimum relative humidity observed was 31 on the 26th.

Fog on 2 days.

Hail on 1 day.

Aurora on 1 day.

* Barometer readings reduced to sea-level and temperature 32° Fahrenheit

† Mean of bi-hourly readings taken from self-recording instruments.

‡ Humidity relative, saturation being 100. Mean of readings taken every four hours from self-recording hygrometer.

§ 26 years means.

¶ 33 years means.

ABSTRACT FOR THE MONTH OF OCTOBER 1914.

Meteorological Observations, Taken at McGill College Observatory. Height above sea-level, 187 feet. C. H. McLEOD, *Superintendent.*

DAYS.	THERMOMETER				*BAROMETER				† Mean relative humidity.	WIND		Per cent. of possible Sunshine	Rainfall in inches.	Snowfall in inches.	Rain and snow melted.	DAYS.
	† Mean.	Max.	Min.	Range.	† Mean.	Max.	Min.	Range.		General direction.	Mean velocity in miles per hour					
1	51.7	56.9	47.3	9.6	30.24	30.29	30.16	.13	64	W	9.6	63	...	...	...	1
2	55.6	62.4	46.5	15.9	30.28	30.35	30.22	.13	63	W	11.7	97	...	...	...	2
3	60.1	69.8	50.6	19.2	30.12	30.20	30.05	.15	54	W	12.0	95	...	...	...	3
SUNDAY.....4	62.6	71.2	51.5	19.7	30.06	30.12	30.01	.11	53	SW	10.4	94	...	...	...	4.....SUNDAY
5	62.4	70.4	54.9	15.5	30.02	30.18	29.95	.23	61	W	12.7	80	T	...	...	5
6	45.6	54.9	38.7	16.2	30.35	30.41	30.25	.16	50	NE	10.4	91	...	...	...	6
7	48.1	57.2	35.9	21.3	30.16	30.30	30.00	.30	52	W	7.8	85	...	...	...	7
8	55.8	62.9	52.0	10.9	29.98	29.99	29.96	.03	81	W	8.3	0	.20	...	.20	8
9	54.8	57.6	52.9	4.7	29.99	30.03	29.97	.06	83	NE	7.4	0	.05	...	.05	9
10	60.5	66.2	52.9	13.3	29.90	29.98	29.83	.15	82	SW	11.0	1	.29	...	.29	10
SUNDAY.....11	64.2	71.2	57.0	14.2	29.75	29.82	29.68	.14	60	SW	13.4	54	.07	...	0.7	11.....SUNDAY
12	47.9	59.2	37.6	21.6	30.02	30.28	29.8	.44	60	NW	12.1	64	...	...	...	12
13	37.2	43.0	32.3	10.7	30.48	30.57	30.33	.24	58	E	6.3	92	...	...	...	13
14	42.2	51.1	33.9	17.2	30.51	30.60	30.38	.22	59	S	6.5	92	...	...	...	14
15	48.6	55.2	38.6	16.6	30.16	30.34	30.03	.31	73	SW	10.2	3	.38	...	.38	15
16	52.8	55.7	49.0	6.7	30.06	30.11	29.97	.14	71	NE	9.0	0	.05	...	.05	16
17	54.2	59.2	48.7	10.5	29.81	29.93	29.72	.21	82	S	8.4	0	.76	...	.76	17
SUNDAY.....18	54.5	59.2	49.8	9.4	29.59	29.96	29.79	.17	80	NE	10.3	8	T	...	T	18.....SUNDAY
19	46.8	49.8	44.0	5.8	30.02	30.13	29.95	.18	76	NE	12.4	0	.18	...	.18	19
20	50.1	57.9	42.9	15.0	30.17	30.21	30.13	.08	74	SW	8.2	34	...	...	...	20
21	62.0	69.4	54.8	14.6	30.07	30.15	29.97	.18	56	SW	13.5	89	...	...	...	21
22	49.1	62.0	40.5	21.5	30.35	30.51	30.13	.38	45	NE	11.6	96	...	...	...	22
23	44.2	54.2	34.5	19.7	30.33	30.52	30.01	.51	51	SW	9.3	92	...	...	...	23
24	45.4	50.7	39.2	11.5	30.08	30.17	29.95	.22	53	NE	12.3	73	...	...	...	24
SUNDAY.....25	42.5	48.2	34.8	13.4	29.90	30.16	29.71	.45	54	SW	8.4	35	T	...	T	25.....SUNDAY
26	39.7	48.5	32.0	16.5	29.67	29.85	29.55	.30	67	SW	12.5	0	.10	...	.12	26
27	28.7	32.0	24.8	7.2	29.90	29.94	29.85	.09	52	NW	12.1	41	T	...	T	27
28	37.1	47.2	24.4	22.8	29.77	29.84	29.71	.13	74	SW	12.6	20	.08	0.4	.10	28
29	40.8	42.8	36.8	6.0	29.90	29.96	29.84	.12	71	S	7.2	0	.07	...	.07	29
30	40.9	43.6	35.7	7.9	29.79	29.90	29.71	.19	76	NW	8.1	0	.12	...	.12	30
31	39.7	45.9	30.6	15.3	29.90	30.05	29.86	.19	55	NW	11.1	88	...	...	...	31
Means.....	49.159	55.98	42.10	13.88	30.050	30.156	29.952	.205	61.55	NW	10.22	48.80	2.33	0.0	2.39	.....Sums
40 Years means for and including this month.	46.38	53.23	39.58	13.72	30.014	.....	.....	.225	75.79		13.275	41.725	3.05	0.84	3.13	(40 Years means for and including this month.

ANALYSIS OF WIND RECORD.

Direction	N	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	CALMS
Miles.....	501	1513	360	167	385	1081	1581	1118	0
Duration in hours...	54	148	49	20	55	175	143	96	4
Mean Velocity.....	9.3	10.2	7.3	8.3	7.0	11.3	11.1	11.6	0

Total mileage, 7606.
Resultant direction, N 78° W.
Resultant mileage, 2270.

The greatest heat was 71.2° above zero on the 4th and 11th. The greatest cold was 24.4° above zero on the 28th, giving a range of 46.8°.

The warmest day was the 11th. The coldest day was the 28th.

The highest barometer reading was 30.60 on the 14th. The lowest barometer reading was 29.55 on the 26th. This gives a range of 1.05 inches.

The minimum relative humidity observed was 29 on the 7th.

Fog on 4 days.

* Barometer readings reduced to sea-level and temperature 32° Fahrenheit

† Mean of bi-hourly readings taken from self-recording instruments.

‡ Humidity relative, saturation being 100. Mean of readings taken every four hours from self-recording instrument.

§ 27 years means.

¶ 33 years means.

ABSTRACT FOR THE MONTH OF NOVEMBER, 1914.

Meteorological Observations, Taken at McGill College Observatory. Height above sea-level, 187 feet. C. H. McLEOD, Superintendent.

DAYS.	THERMOMETER				*BAROMETER				† Mean relative humidity.	WIND		Per cent. of possible Sunshine	Rainfall in inches.	Snowfall in inches.	Rain and snow melted.	DAYS.	
	† Mean.	Max.	Min.	Range.	† Mean.	Max.	Min.	Range.		General direction.	Mean velocity in miles per hour						
SUNDAY.....1	54.6	62.3	44.1	18.2	29.73	29.84	29.59	.25	53	W	12.9	52	T	...	T	1.....SUNDAY	
2	45.9	54.7	34.6	20.1	29.65	29.92	29.52	.40	65	NW	13.0	16	T	..10	T	2	
3	32.8	35.4	27.9	7.5	29.99	29.99	29.74	.25	62	W	8.0	23	T	...	T	3	
4	41.9	57.2	33.9	23.3	29.57	29.73	29.33	.35	73	NW	10.0	11	T	..16	T	4	
5	42.4	47.1	38.2	8.9	29.64	29.76	29.53	.18	38	W	11.5	37	T	..04	T	5	
6	35.0	38.2	33.5	4.7	29.99	30.17	29.79	.38	35	N	5.9	0	T	..10	T	6	
7	35.7	41.4	30.7	10.7	30.04	30.23	29.69	.54	64	SW	9.6	0	T	0.3	T	7	
SUNDAY.....8	38.8	44.3	32.7	11.6	29.81	29.93	29.71	.22	59	NW	12.8	3	...	...	...	8.....SUNDAY
9	29.8	33.5	25.6	7.9	30.07	30.16	29.96	.20	46	NW	10.5	30	...	...	T	9
10	23.5	26.2	21.2	5.0	30.10	30.17	29.99	.18	50	NE	6.9	14	...	...	T	10
11	24.4	27.6	21.2	6.4	29.56	29.93	29.79	.14	73	E	6.8	0	...	2.2	..10	11	
12	29.6	33.3	25.3	8.0	30.10	30.23	29.89	.34	67	W	9.1	45	...	4.0	..40	12	
13	26.5	42.0	19.4	22.6	29.91	30.25	29.53	.72	73	NE	18.4	009	2.6	..35	13
14	22.4	26.0	17.4	8.6	30.30	30.48	29.98	.50	65	W	18.1	93	...	...	T	14
SUNDAY.....15	28.7	37.8	17.9	19.9	30.07	30.44	29.52	.92	75	SE	14.5	1	1.33	...	1.33	15.....SUNDAY	
16	38.9	48.1	33.1	15.0	29.50	29.68	29.33	.35	68	W	22.0	40	..35	...	..35	16
17	25.5	33.1	12.3	20.8	29.57	30.23	29.71	.52	60	W	24.6	25	...	0.2	..02	17	
18	13.2	22.9	3.3	19.6	30.44	30.52	30.31	.21	47	NW	9.9	72	...	...	...	18
19	28.5	35.0	22.9	12.1	30.24	30.37	30.08	.29	64	S	13.9	55	...	2.5	..15	19	
20	28.8	30.0	24.2	5.8	29.64	29.98	29.48	.50	80	NE	19.8	0	...	8.2	..81	20	
21	25.1	28.6	22.8	5.8	29.56	29.66	29.47	.19	68	W	18.5	69	...	T	T	21	
SUNDAY.....22	25.5	33.8	15.4	18.4	29.77	30.02	29.66	.36	65	SW	20.1	10	...	T	T	22.....SUNDAY	
23	15.2	18.9	12.5	6.4	30.28	30.47	30.06	.41	67	NW	19.4	57	...	...	...	23
24	20.1	29.4	9.2	20.2	30.33	30.54	30.01	.53	68	SW	18.4	48	...	0.3	..02	24	
25	37.7	40.0	29.3	10.7	29.84	29.96	29.75	.21	71	W	26.0	0	..08	...	..08	25
26	43.9	49.2	35.6	13.6	29.56	29.75	29.46	.29	68	W	26.4	0	...	...	...	26
27	34.5	47.4	21.8	25.6	30.00	30.43	29.50	.93	54	NW	15.3	89	...	...	...	27
28	22.2	26.7	17.4	9.3	30.61	30.66	30.46	.20	51	W	6.0	54	...	...	...	28
SUNDAY.....29	29.3	40.1	19.4	20.7	30.60	30.66	30.54	.12	64	S	13.2	88	...	...	...	29.....SUNDAY
30	40.7	46.0	32.9	13.1	30.39	30.53	30.25	.28	64	SW	16.5	0	T	...	T	30	
Means.....	31.33	37.87	24.52	13.35	29.980	30.156	29.791	.365	63.86		14.696	31.66	2.23	20.3	4.14	.....Sun
40 Years means for and including this month.	32.56	31.86	27.07	11.79	30.001	.....	.....	2.72	79.32		15.395	28.169	2.19	13.35	3.56	(40 Years means for and including this month.

ANALYSIS OF WIND RECORD.

	N	NE	E	SE	S	S.W.	W	N.W.	CALMS
Direction.....									
Miles.....	363	553	296	476	1088	1776	3210	2814	0
Duration in hours...	47	38	29	42	87	92	187	180	11
Mean Velocity.....	7.7	14.7	10.2	11.3	12.5	17.9	17.2	15.6	0

Total mileage, 10581
Resultant direction, N 53° 18' W.
Resultant mileage 5129

The greatest heat was 62.3° above zero on the 1st. The greatest cold was 3.3° above zero on the 18th. This gives a range of 59.0°.

The warmest day was the 1st. The coldest day was the 18th.

The highest barometer reading was 30.66 on the 28th and 29th. The lowest barometer reading was 29.33 on the 10th. This gives a range of 1.33 inches.

The minimum relative humidity observed was 33 on the 7th and 18th.

Fog on 1 day.
Hail on 2 days.

* Barometer readings reduced to sea-level and temperature 32° Fahrenheit

† Mean of bi-hourly readings taken from self-recording instruments.

‡ Humidity relative, saturation being 100. Mean of readings taken every four hours from self-recording instrument.

§ 27 years means.

¶ 33 years means.

ABSTRACT FOR THE MONTH OF DECEMBER, 1914.

Meteorological Observations, Taken at McGill College Observatory. Height above sea-level, 187 feet. C. H. McLEOD, *Superintendent.*

DAYS.	THERMOMETER				*BAROMETER				† Mean relative humidity.	WIND		Per cent. of possible Sunshine	Rainfall in inches.	Snowfall in inches.	Rain and snow melted.	DAYS.
	† Mean.	Max.	Min.	Range.	† Mean.	Max.	Min.	Range.		General direction.	Mean velocity in miles per hour					
1	45.2	47.8	42.6	5.2	30.21	30.22	30.19	.03	80	SW	11.0	0	.09	...	.09	1
2	42.8	45.8	39.6	6.2	30.09	30.18	29.97	.21	81	SE	8.7	0	.40	...	.40	2
3	39.2	47.3	33.1	14.2	30.24	30.45	29.98	.47	66	NW	17.5	4	.01	...	.01	3
4	27.8	33.1	24.4	8.7	30.57	30.64	30.48	.16	54	NE	6.5	66	...	...	...	4
5	20.2	24.8	16.3	8.5	30.69	30.72	30.65	.07	53	NE	14.4	89	...	...	...	5
SUNDAY.....6	20.6	25.0	16.0	9.0	30.62	30.68	30.53	.15	57	NE	17.6	88	...	...	...	6.....SUNDAY
7	25.3	30.9	18.8	12.1	30.34	30.52	30.15	.37	46	NE	22.3	33	...	...	...	7
8	25.6	30.0	21.0	9.0	30.12	30.25	30.07	.18	44	NE	26.5	56	...	...	...	8
9	20.8	24.3	18.6	5.7	30.29	30.33	30.26	.07	59	NE	16.5	20	...	...	...	9
10	19.2	23.0	17.3	5.7	30.14	30.25	30.06	.19	57	NE	13.1	11	...	...	...	10
11	19.2	25.1	13.7	11.4	30.05	30.09	30.03	.06	50	NW	14.3	84	...	...	...	11
12	23.9	30.0	17.2	12.8	30.19	30.20	30.10	.10	61	W	13.3	60	...	...	...	12
SUNDAY.....13	30.9	34.6	26.9	7.7	30.00	30.20	29.59	.61	67	S	14.1	0	...	5.8	.25	13.....SUNDAY
14	21.7	31.3	7.4	23.9	29.36	29.58	29.14	.44	67	NW	20.4	30	...	9.1	.91	14
15	8.8	12.6	6.0	6.6	29.76	30.13	29.52	.61	60	NW	26.3	26	...	0.6	.05	15
16	8.8	12.9	2.3	10.6	30.29	30.35	30.19	.16	63	W	15.8	6	...	1.3	.06	16
17	13.9	20.5	4.6	15.9	30.37	30.44	30.33	.11	67	W	17.8	72	...	T	T	17
18	17.8	23.0	11.3	11.7	30.35	30.40	30.25	.15	63	SW	16.9	51	...	T	T	18
19	26.3	34.5	16.9	17.6	29.94	30.20	29.76	.44	69	SW	20.8	0	...	T	3.3	19
SUNDAY.....20	18.1	32.0	13.4	18.6	30.25	30.42	29.87	.55	49	NW	17.0	94	...	...	...	20.....SUNDAY
21	22.9	33.1	10.6	22.5	29.81	30.33	29.47	.86	72	SW	20.6	0	...	T	5.5	21
22	16.4	25.0	0.9	24.1	29.68	29.91	29.53	.38	59	NW	26.6	27	...	0.1	.01	22
23	-1.0	5.0	-4.2	9.2	30.00	30.18	29.82	.26	52	NW	11.4	35	...	T	T	23
24	-4.9	-	-7.7	6.7	30.15	30.22	30.06	.16	59	NE	8.1	0	...	0.3	.03	24
25	-7.2	-2.8	-10.8	8.0	30.23	30.33	30.10	.23	61	W	9.9	72	...	...	...	25
26	-10.0	-7.4	-15.6	8.2	50.53	30.66	30.35	.31	57	W	11.8	86	...	...	...	26
SUNDAY.....27	1.2	18.0	-10.7	28.7	30.33	30.63	30.15	.48	67	S	13.2	0	...	T	T	27.....SUNDAY
28	22.0	28.5	14.0	14.5	30.26	30.31	30.22	.09	64	SW	14.7	0	...	T	T	28
29	26.4	31.5	25.8	7.7	29.88	30.24	29.38	.86	72	S	12.7	0	...	T	1.8	29
30	28.1	39.8	10.8	29.0	29.62	30.13	29.26	.87	64	NW	25.4	20	...	.02	.02	30
31	9.3	12.4	4.0	8.4	30.31	30.37	30.21	.16	56	NW	10.6	72	...	T	T	31
Means.....	18.70	24.81	12.34	12.51	30.152	30.308	29.993	.316	61.18	NW	15.99	35.43	0.52	27.8	2.99	.....Sums
40 Years means for and including this month.	19.21	25.95	12.24	13.72	30.025	.....	.....	.299	82.0	.....	14.788	25.09	1.27	25.04	3.72	{ 40 Years means for and including this month.

ANALYSIS OF WIND RECORD.

	N	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	CALMS
Direction									
Miles.....	33	2967	193	400	700	2132	2327	3144	0
Duration in hours...	7	177	15	33	58	126	147	162	16
Mean Velocity.....	4.7	16.8	10.7	12.1	12.1	16.9	15.8	19.4	0

Total mileage, 11896.
Resultant direction, N 61° 44' W.
Resultant mileage, 3948.

The greatest mileage in one hour was 39 on the 22nd.

The greatest heat was 47.8° above zero on the 1st. The greatest cold was 15.6° below zero on the 26th. This gives a range of 63.4°.

The warmest day was the 1st. The coldest day was the 26th.

The highest barometer reading was 30.72 on the 5th. The lowest barometer reading was 29.14 on the 14th. This gives a range of 1.58 inches.

The minimum relative humidity observed was 33 on the 7th.

Fog on 3 days.

* Barometer readings reduced to sea-level and temperature 32° Fahrenheit

† Mean of bi-hourly readings taken from self-recording instruments.

‡ Humidity relative, saturation being 100. Mean of readings taken every four hours from self-recording hygrometer.

§ 27 years means.

¶ 33 years means.