The Seal of the Royal Society of Canada Founded MDCCCLXXXII
Sapientia Gubernator habena torquet, non valentia

MÉMOIRES

ET

COMPTES RENDUS

DE LA

SOCIÉTÉ ROYALE

DU

CANADA

TROISIÈME SÉRIE—TOME IV

SÉANCE DE SEPTEMBRE 1910

EN VENTE CHEZ
JAS. HOPE ET FILS, OTTAWA; LA CIE COPP-CLARK (LIMITÉE), TORONTO
BERNARD QUARITCH, LONDRES, ANGLETERRE.
1911

PROCEEDINGS

AND

TRANSACTIONS

OF THE

ROYAL SOCIETY

OF

CANADA

THIRD SERIES—VOLUME IV

MEETING OF SEPTEMBER, 1910

FOR SALE BY
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1911

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THE ROYAL SOCIETY OF CANADA.

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(WHEN GOVERNOR-GENERAL OF CANADA IN 1882.)

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1887–1888	Dr. G. Lawson.
1888–1889	Sir Sandford Fleming, K.C.M.G.
1889–1890	L'abbé Casgrain.
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1894–1895	Sir J. Macpherson LeMoine.
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1904–1905	Benjamin Sulte, Litt.D.
1905–1906	Dr. Alex. Johnson.
1906–1907	Dr. Wm. Saunders, C.M.G.
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1908–1909	Dr. J. Edmond Roy.
1909–1910	Rev. Dr. Geo. Bryce.
1910–1911	R. Ramsay Wright, M.A., B.Sc.

ROYAL SOCIETY OF CANADA

PROCEEDINGS FOR 1910

TWENTY-NINTH GENERAL MEETING

SESSION I. (Tuesday, 26th September).

The Royal Society of Canada held its twenty-ninth annual meeting in the Normal School Building, Elgin St., Ottawa.

The President, the Rev. Dr. George Bryce, took the chair at 10 a.m. and, having called the meeting to order, requested the Honorary Secretary to call the roll.

The following members answered to their names or arrived later during the session:—

General Officers of the Society.

The President, Rev. Dr. George Bryce.
Vice-President, Prof. R. Ramsay Wright.
Honorary Secretary, Dr. W. D. LeSueur.
Honorary Treasurer, Mr. Lawrence M. Lambe.

Section I.—MM. Bouchette, Errol; DeCelles, A. D.; Gérin, Léon,; Myrand, Ernest; Roy, l'Abbé Camille; Roy, J. Edmond; Sulte, Benjamin.

Letters of excuse were received from His Grace Archbishop Bégin, M. L'Abbé A. H. Gosselin, Monsignor Paquet, and M. Adjutor Rivard.

Section II.—Campbell, W. W.; Coyne, J. H.; Denison, G. T.; Doughty, A. G.; Lighthall, W. D.; Morgan, H. J.; Raymond, Rev. W. O.; Wood, William.

Letters of excuse were received from Judge Longley, Dr. John Reade and Col. E. A. Cruikshank.

Section III.—Baker, Alfred; Barnes, H. T.; Dawson, W. Bell; Eve, A. S.; Girdwood, G. P.; Glashan, J. C.; Hoffman, G. C.; King, W. F.; Klotz, Otto; McLennan, J. C.; Plaskett, J. S.; Shutt, F. T.; Wilson, Harold A.

Letters of excuse were received from Messrs. E. Deville, Sir Sandford Fleming, and Alex. Johnson.

Section IV.—Buller, A. H. R.; Ells, R. W.; Hay, G. U.; Lambe, Lawrence M.; Macallum, A. B.; Macoun, J.; MacKay, A. H.; MacKenzie, J. J.; Nicholls, A. G.; Saunders, William; Tyrrell, J. B.; Wright, R. Ramsay.

Letters of excuse were received from Messrs. H. M. Ami, L. W. Bailey, Robert Bell, C. S. J. Bethune, and T. J. W. Burgess.

After a few introductory remarks by the President, it was moved by Dr. W. F. King, and seconded by Dr. W. Saunders, that the minutes of the Annual Meeting of last year, as contained in the printed Proceedings in the hands of members be confirmed.—Carried.

The Annual Report, printed copies of which were in the hands of members, was then read by the Honorary Secretary, certain portions, by consent, being omitted. The Report was as follows:—

REPORT OF COUNCIL

To the Members of the Royal Society of Canada.

In presenting their report on the operations of the Society during the past year the Council feel it their duty to refer, in the first place, to the event of world-wide import which caused the postponement of the Annual Meeting to the late date at which it is now being held, the death, namely, of his late Most Gracious Majesty, King Edward the Seventh. The meeting, as the members are aware, was to have been held in the third week of May; but as it was during that week that the funeral obsequies of his late Majesty were appointed to take place it was felt that it would be entirely unsuitable to hold the meeting then. For reasons into which it is not necessary to enter, no other date in May appeared to be convenient or available, and, as many members travel during the summer months, it was thought best, on the whole, to choose a date in September sufficiently late to permit of their return in time for the meeting.

It is needless to say how profoundly your Council participated in the general sentiment of sorrow created by the death of a monarch beloved in no ordinary degree by his own people, and honoured and esteemed by the whole civilized world—one who was regarded as wielding the most potent influence for peace and good-will among the nations which, perhaps, it had ever been given to sovereign or statesman to exert. This Society, enjoying by express permission of the illustrious mother of our late King, the designation of "Royal", felt, it is not too much to say, that in her son and successor its headship in a certain sense resided, and that in *his* son and successor it now resides. It would seem fitting, therefore, that the sentiments of the Society in regard to the death of our late sovereign and the accession of His Majesty King George the Fifth should be expressed in an address to his present Majesty to be adopted at this meeting.

Apart from the grave event which caused the postponement of the meeting, the Council had much reason to regret the change of arrange-

ments which they were compelled to make. The programme prepared for the occasion announced, it will be remembered, that the annual popular lecture would be delivered by one of the most distinguished men of the British Empire, the Right Honourable James Bryce, British Ambassador to the United States, who had chosen for his subject the deeply interesting one of "The Changing East." Owing to anticipated absence from the country, Mr. Bryce could not engage himself to us for this meeting, and we must only hope that on some future occasion, possibly, the Society and the community may have the great pleasure and advantage of greeting him as our lecturer. It will doubtless gratify the Society to learn of the kindly and appreciative terms in which His Excellency the Ambassador acknowledged the invitation: "I have the honour," he wrote on March 5th, "to acknowledge and thank you for your letter conveying to me the invitation of the Council of the Royal Society of Canada that I should come to attend their annual meeting next May, to deliver the annual public lecture on the evening, of Wednesday the 18th of May. I am very sensible of the high compliment of this invitation and it would give me great pleasure to accept it." After a reference to some possible difficulties in the way, the letter concludes as follows: "I need hardly say that, if I found I could come, it would be a great pleasure and honour to me to address so distinguished a body as the Royal Society in the capital of Canada." After some further correspondence, Mr. Bryce found it possible to engage himself to us definitely for the date mentioned.

1.—Proceedings and Transactions of the Society.

Notwithstanding the wish expressed in last year's report to restrict the limits of our annual volume of Proceedings and Transactions, the volume lately put forth has again exceeded 1200 pages, the exact number being 1220. This, however, was in part due to exceptional circumstances, one of which was the inclusion in the Proceedings of a very full report of the special meeting held at Quebec in the month of July, 1908. Additional need has now arisen for the restriction proposed, inasmuch as owing to the general advance in prices, which has affected the printing business in a very marked manner, higher rates will have to be paid in future for the printing of the volume. The Council did not yield to this necessity without making an effort to avert it. Tenders were invited from a certain number of responsible and well-equipped firms; but the lowest rates obtainable were sensibly in advance of those hitherto paid. It has been decided, therefore, that the next volume should not exceed 1000 pages, and the Society, it is hoped, will see that the decision is a necessary one.

In addition to the volume as printed and bound, 4,200 authors'

separates were struck off and 3,100 bulletins, making 7,300 separate papers in all. The maps and illustrations produced numbered 143.

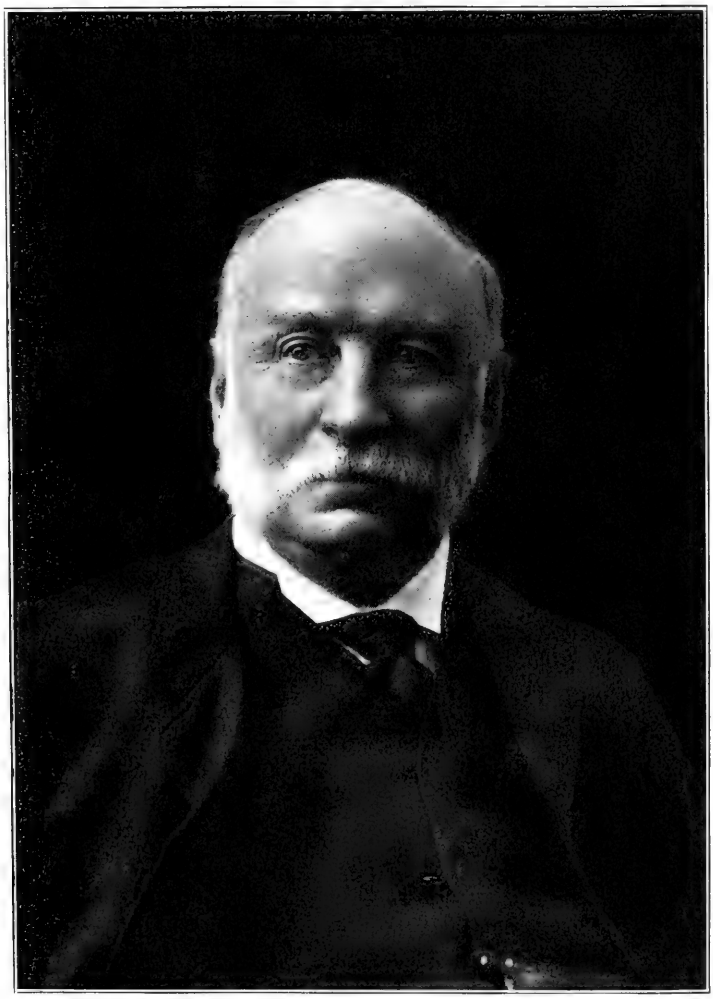
The distribution of the Transactions was practically the same as in the preceding year, though a few additional exchanges were established. At the request of the Superintendent of Public Instruction of the Province of Quebec the Transactions are now being sent to all the Normal Schools in that Province.

2.—Deceased Members.

This year as last, the Society has to lament the loss by death of three of its active members. These, naming them in the order in which they passed away, were, Dr. J. F. Whiteaves of Ottawa, who died on the 8th of August, 1909, Dr. James Hannay, of St. John, N. B., who died on the 12th January, 1910, and Mr. George Murray, whose death took place on the 13th of March, 1910. Two of these, Dr. Whiteaves and Mr. Murray, were amongst the eighty members first enrolled in the Society on its formation in the year 1882; and all three were men of mark in their several lines of activity. Unhappily, the Society year on which we have entered has already been marked by another death and one to be profoundly regretted, that of Mgr. J. C. K. Laflamme, which occurred at Quebec on the 7th of July, as also by that of one of the most distinguished of our retired members, M. Hector Fabre, C.M.G., which took place at Paris on the 2nd September. As these dates did not fall within the period to which the present report properly applies, the usual notices will be deferred till the report for 1910–11 is presented at our General Meeting next May. Of our other three departed members it is fitting that some words should be spoken.

(1.) J. F. Whiteaves, LL.D., F.G.S.

The late Dr. Whiteaves, though primarily a man of science—zoologist and palæontologist—was at the same time a man of wide reading in literature and of a refined taste in art. He was happy in having both a vocation and avocations. By the former he won a distinguished position in the scientific world; by the latter he gained versatility of mind and geniality of disposition. The Ovidian line—"Abeunt studia in mores, artesque magistrae"—is of wider application than perhaps the poet had in view. The studies and pursuits to which we give ourselves undoubtedly tend to form character. In the case of our departed colleague liberal studies had formed a liberal and most interesting character—a savant of a high order for those who wished to consult him on matters scientific, or draw on his copious stores of knowledge; a courteous, kindly and well-informed companion for those who would discuss literature or art or any of the broader topics of



Dr. J. F. Whiteaves

the day. His mind had become an instrument of precision for the discovery of scientific truth; but the rigour of his methods in that region had cast no fetters on his heart. How greatly such a man will be missed in the circle of his friends and associates it is needless to say, and many years must elapse before his memory and influence cease to be operative in the life of this Society.

We have fortunately available an excellent notice of our late colleague, contributed to the Ottawa Naturalist of September, 1909, by a member of this Society who was intimately associated with him in his scientific labours, as well as in the work of Section IV, Mr. Lawrence M. Lambe. From this we permit ourselves to quote:

"It is difficult to realize that the distinguished Palæontologist of the Geological Survey, Joseph Frederick Whiteaves, has passed from amongst us! By his death, which occurred on Sunday, the 8th of August, after an illness of some months' duration, the Geological Survey has lost one of the ablest of its members, and Canada one of her best known workers in geological science.

Dr. Whiteaves was born in Oxford, England, in 1835, and first came to this country in 1861 on a short visit. The following year he again crossed the Atlantic, this time to remain in Canada, taking up his residence in Montreal. Here he was for twelve years officially connected with the Montreal Natural History Society as its recording secretary and scientific curator of its museum.

In 1876 he was appointed to the staff of the Geological Survey as Palæontologist in succession to the late Mr. E. Billings, the first Palæontologist to the Survey. How wise a selection this was, after years amply proved. He was made one of the Assistant Directors in 1877 and Zoologist in 1883.

As a boy he attended private schools in Oxford and London, and early developed a liking for natural science. Following the bent of his inclinations, he studied the fauna and flora of Oxfordshire, and became deeply interested in the geology of the neighbourhood of Oxford. At this time he took advantage of lectures to advanced students delivered by eminent professors of the day in the university of his native town.

At the age of twenty-two, his first paper "On the Land and Fresh Water Mollusca inhabiting the neighbourhood of Oxford," was published by the Ashmolean Society, of which he was shortly after made an honorary member. In 1859 he was elected a Fellow of the Geological Society of London. Two years later, as the result of his study of fossils of his own collecting, he established his reputation as a Palæontologist by the publication of two palæontological papers, one "On the

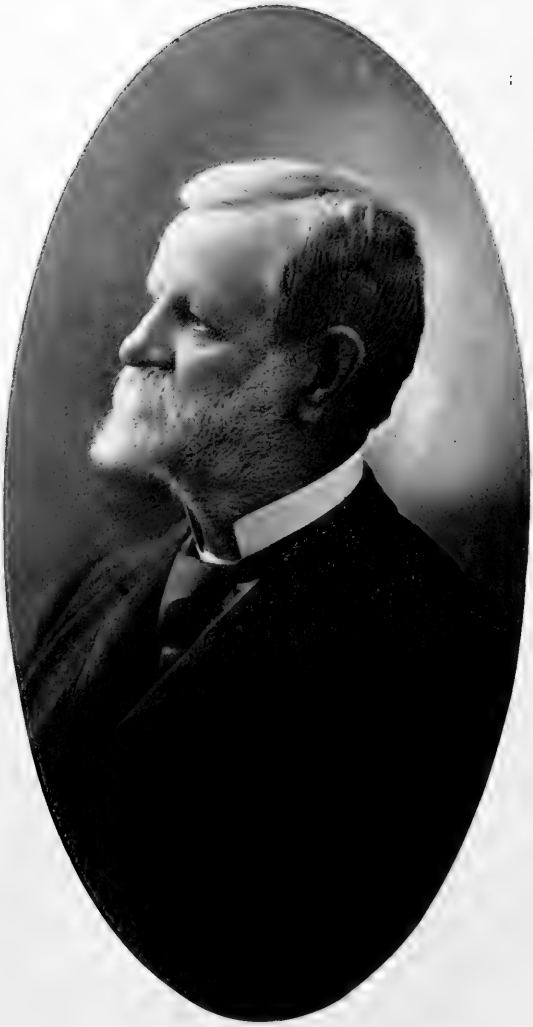
Invertebrate Fauna of the Lower Oölites," the other on the fossils of the Coralline Oölites.

Coming to Canada and residing at Montreal, he pursued his zoological and palæontological studies in a vastly enlarged field. Between the years 1863 and 1875, whilst connected with the Natural History Society of Montreal, besides publishing papers on the fossils of the formations of the island of Montreal and vicinity, he produced a number of valuable reports on the results of deep sea dredging operations conducted by him in the Gulf of St. Lawrence, the cost of which was defrayed by the Dominion Government.

It was, however, when he was appointed Palæontologist to the Geological Survey, in 1876, that his mental energy and natural aptitude for palæontological research found full scope. The long list of his official reports and papers contributed to scientific journals during the last thirty-three years of his career proves him to have been a most worthy successor to the distinguished scientist who had preceded him in office. His volume of "Contributions to Canadian Palæontology," his monumental works on the Palæozoic and Mesozoic Fossils of Canada, and his splendid descriptions of the fossil fishes of Quebec and New Brunswick, would alone have earned for him a world-wide reputation as a careful observer, a close reasoner and a lucid writer. Space admits only of a brief reference to the published results of his studies of the recent marine invertebrata of the Atlantic and Pacific coasts of the Dominion. The wide scope of his palæontological and zoological writings can be fully realized only after reading through a list of his many publications. These number nearly one hundred and fifty, in which over four hundred and fifty genera, species and varieties are described as new to science.

The benefit resulting from the application of his palæontological knowledge to the solving of geological problems in this country cannot be overestimated. His untiring industry, backed by a clear perception and thorough grasp of the essentials of palæontology in its relation to geology, has given us enduring results which will carry his name down to posterity inseparably linked with those of Logan, Selwyn, Dawson, George Dawson and Billings. His scientific reputation is world-wide.

In addition to being one of the original Fellows of the Royal Society of Canada, Dr. Whiteaves was also a Fellow of the Geological Society of London, an honorary member of the Yorkshire Philosophical Society, England, a member of the Manitoba Historical and Scientific Society, of the Montreal Natural History Society, and of the American Association for the Advancement of Science. In 1900 the honorary degree of LL.D was conferred on him by McGill University, and in 1907 he was awarded the "Lyell" Medal by the Geological Society of London.



Dr. James Hannay

His death is a national loss; the Geological Survey of Canada in particular will feel the adverse effect of his removal; his name will ever remain emblematic of all that is honourable, true and upright in a man."

(2.)—JAMES HANNAY, D.C.L.

For the interesting notice which follows of our late colleague, Dr. James Hannay, we are indebted to the able pen of his fellow member in Section II, and fellow-citizen of St. John, N.B., the Venerable Archdeacon Raymond.

James Hannay was born April 22, 1842, at Richibucto, Kent Co., N. B., where his father, the Rev. James Hannay was a Presbyterian minister. His mother, Jane Salter, was a native of Hants Co., N.S. His father was of an old Scottish family, belonging to Sorbie in Wigtownshire, in which county he was born. James Hannay, the critic and author, and friend of Thackeray was of the same family. The late Dr. Hannay was educated in Scotland and at the St. John, N.B., Grammar School. He took up the study of law, and in October 1866, was admitted attorney. A year later he was admitted barrister, and in March of the same year was appointed official reporter of the Supreme Court of the Province, a position that he held until 1873. He published two large volumes of reports covering the decisions of the Court during this period. The practice of law, however, was not very congenial to his taste and he early abandoned it for the profession of journalism. From 1872 to 1883 he was associated with the late Hon. Wm. Elder in the editorial management of the St. John *Telegraph*. He then went to Montreal and for eighteen months occupied an editorial chair on the Montreal *Herald*. Then for a short time he made the United States his home, and was employed in various capacities on the Brooklyn *Eagle*, passing through the stages of general writer, literary editor and associate editor. In 1888 he returned to St. John to assume the editorial chair on the staff of the St. John *Gazette*, and in 1893 accepted the chief editorship of the St. John *Telegraph*, which he held until 1901. His election as a member of Section II of this society took place in the year 1906.

A patient and uncommonly industrious student of events and policies of an earlier day, and a vigorous and graceful writer on the topics of his time, Dr. Hannay's pen constructed for him a monument that will long command attention in his native province. History, poetry, prose, editorial work, research—to all of these he turned his hand from time to time, and in each he displayed marked ability. Optimistic by nature, quick in perception, and a ready writer, he supported that which seemed to him for the advantage of his native country. In the field of literature he attained success, writing now an easy, flowing and spirited ballad;

now a bright racy magazine article; now an historical work. Under the *nom de plume* of "Saladin" he contributed verse to the St. John *Courier* and other papers. Later he wrote a number of ballads relating to Acadia. When Stewart's Quarterly was established in St. John by the late George Stewart, he became one of its most valued contributors. His first attempt at historical writing was a series of sketches of early forts in New Brunswick. This was followed by "The Captivity of John Gyles among the Malicetes from 1689 to 1698," published in 1875, with an introduction and annotations by himself. In the same year he wrote an historical sketch of the City of Saint John, N. B., but the work which chiefly made his reputation as an historian was his "History of Acadia," published in 1879, which obtained high commendation at the hands of reviewers. Its pages display the research of a careful student and the facile style of the *littérateur*. His next historical work, his "History of the Queen's Rangers," appeared in the St. John *Sun* in 1883. He continued from time to time to contribute to various periodicals including the "New Brunswick Magazine," the "Collections of the New Brunswick Historical Society," Hay's "Canadian History Readings" and Jack's "Acadiensis." He also wrote a "History of the Loyalists," which ran through the St. John *Telegraph* in 1894. Later the following volumes appeared from his pen, "History of the War of 1812," (1901); the "Life and Times of Sir Leonard Tilley," (1897); the volume on "Wilmot and Tilley" in the "Makers of Canada" series (1907), in which an account is given of the development of responsible government and also of the carrying of Confederation in New Brunswick; and his two volume "History of New Brunswick," (1909).

Dr. Hannay was connected with several literary and historical societies, the New Brunswick Historical Society, the Loyalist Society, the Literary and Historical Society of Quebec, and the Nova Scotia Historical Society. He was elected a Fellow of the Royal Society of Canada in 1906, and Acadia College conferred on him the honorary degree of D.C.L. in 1899.

In the year 1905, Dr. Hannay was engaged to act as a representative of the Canadian Achives department in the maritime provinces, with instructions to calendar and report upon public and private collections of papers bearing on Canadian history. During the last four years he calendared the principal papers in Halifax, St. John and Fredericton, and made reports on smaller collections. In 1907–8, he paid a visit to the Pacific Coast, and copied a number of journals and miscellaneous papers relating to British Columbia; and prepared a catalogue of the printed books of special interest in the library at Victoria. He also visited the chief places in Alberta, Saskatchewan and Manitoba, collecting historical material relating to the Northwest, which was

George Murray, B.A., (Oxon.)

found to be most useful. Dr. Hannay died very suddenly on the 12th of January, 1910, and was interred at Fredericton.

(3.)—George Murray, B.A. (Oxon.)

The third member whose loss the Society has to deplore was one who, though not an active contributor to its Transactions, lent it no small measure of distinction by his acknowledged talents and scholarship. The late Mr. George Murray was born in Regent Square, London, on the 23rd of March, 1830, and died in Montreal on the 13th of March of the present year, being thus only ten days short of eighty years of age. The last paper read by him before the Society was one on "Sydney Smith" the celebrated essayist and wit and (somewhat *invita Minerva,*) moral philosopher. This was at the meeting held at St. John in the year 1904. For some reason the paper, which was written with all the author's usual grace of style, was not handed in for publication, and does not therefore, appear in the Transactions.

Mr. Murray was the son of a scholarly father, Mr. James Murray, who coming from Scotland to London became connected with the London *Times*, then at the height of its authority and power, as foreign correspondent and contributor. In this capacity he travelled much on the Continent. It is stated that he was versed in seventeen languages. From him his son, our late colleague, may well have inherited the great interest in language as an instrument of thought and culture, which through life he manifested. His earliest education was obtained at a school at Walthamstow in Essex. Thence he passed to King's College, London, where he quickly gained distinction by his proficiency in the classics and his decided talent for versification both in English and in Latin. After winning various prizes at this institution, he received, on the recommendation of the learned principal Dr. Jelf, the highest honour it could bestow by being made an Associate (A.K.C.) He went to Oxford, entering Hertford College, and began his career there by carrying off from thirty competitors the Lusby scholarship of the value of £80 a year for three years. Other successes were to follow, and finally he graduated with honours. It is not, perhaps, surprising that later he did not care much to obscure a B.A. so won by any less significant degree. Amongst his college friends were two with whom he formed a life-long attachment, F. W. Farrar and Edwin Arnold. Both, it is needless to say, became distinguished in later life, Farrar as Dean of Canterbury and the author of important works in philology and theology, and Arnold as poet and journalist. A few years ago the latter passed through Montreal on his way from the East, and, as the writer of an admirable notice of Murray in the Montreal *Gazette* says, "it was a gala day for the two elderly poets—a day rich in memories." Murray himself

was fond of telling how, on one occasion, he won some important college prize over the head of Farrar, but was unaware of his success till Farrar himself called to give him, with the news, his warm and generous congratulations.

It was in the year 1859 that Murray, who had meantime been doing a little private tuition in England, came to Canada. His bent seems to have been towards educational work, and for over three years he taught in public schools in Upper Canada, the present Province of Ontario. Coming to Montreal in 1862 he secured the position of classical master in the High School which he retained for thirty years. To quote again from the article in the Montreal *Gazette* already referred to, which may, without indiscretion, be attributed to the pen of our highly esteemed colleague Dr. John Reade, "How many men and women are there to-day in the Dominion and beyond its borders who learned from him to distinguish the true from the false, the decorous from the meretricious in literature!" Murray's methods were exact and thorough; he understood things himself and laboured to make others understand them. It was understanding he aimed at and, with understanding, appreciation. That was his idea of education. It was in no perfunctory spirit that he taught the classics; but as one who had the firmest belief in their efficacy in awakening the mind and forming the character.

Mr. Murray's first journalistic connection in Montreal was with *The Gazette*, for which he wrote book reviews. He also contributed to a number of literary journals which sprang up successively in that city, and having had their day, ceased to be. A more permanent connection, was that which he formed with the Montreal *Star* in the year 1882, when he took charge of the literary department of that paper including the "Notes and Queries," a department which he made famous. Here he had found an occupation which lasted the rest of his life; for up almost to the day of his death he was writing for the *Star*—his last work appeared in the issue of the 26th February—and also for the *Standard*, a literary journal which had its birth in the *Star* establishment and which, in a manner, was brought out under his literary auspices, the company which controlled it, and of which Murray was made President, being called "The George Murray Publishing Company." His page in the *Star* at once won popular favour. His book reviews were fair, moderate, judicious and often very telling; while, in the management of his "Notes and Queries," he exhibited a wealth of knowledge, and a patience and kindliness in imparting it which were wholly admirable. He was made the arbiter of countless disputes as to modes of speech, rules of grammar, and historical and literary questions of all kinds. Even in matters of which he was not specially master he would generally contrive to obtain for his correspondents the information they required. The classical

master in the High School thus became a schoolmaster for thousands who never saw his face; and so gentle and kindly were his methods that one is led to believe that he must have done much to cultivate a similar temper amongst those who were thus brought within the sphere of his intellectual influence.

For ten years after accepting this position Mr. Murray retained his mastership in the High School. In 1892 he resigned it and devoted himself thereafter wholly to literary and journalistic work. In 1891 he published a collection of his writings under the title of "Verses and Versions," in which were many very happy renderings from French and Latin into English verse and from English into Latin verse, in addition to a number of entirely original poems, some of which are not likely soon to be forgotten. Amongst these is the versified story of the heroism of Daulac and his band at the Long Sault, and a legendary ballad entitled "The Thistle." In the difficult art of verse translation Murray has probably not had an equal in Canada, though the late William McLennan, one of our own members, lost all too soon to the Society and to Canadian letters, had also a singular gift in that direction.

It is impossible to do justice to our late friend and colleague without speaking of his special devotion to the poet Horace. The *parcus deorum cultor et infrequens* has himself received from posterity, as he confidently prophesied, a worship, neither scant nor infrequent, and probably among his votaries, few have been more fervent or faithful than George Murray. He knew his Horace from cover to cover, and was always ready to prolong the night, if one were so minded, in exchanging quotations from, and discussing the merits and characteristics of, his favourite bard. The two indeed were kindred spirits though separated in time by nearly two millenniums. Both were kindly and urbane, honorably independent, with a cheerful and not over-severe philosophy of life. Both also possessed one of the noblest of human endowments, a marked capacity for friendship. On the intellectual and æsthetic side both had an innate sense of style and a love of moderation and proportion. As no unworthy worshipper, therefore, did Murray come to the Horatian shrine. As we recall our friend, humanity was written large in the lineaments of his face; spoke in the tones of his voice, a voice vibrant with sincerity; breathed in all his actions. With him has disappeared a wealth of scholarship, good sense, and good taste; but the spirit of the man is with us: it has gone forth as a liberalizing, humanizing influence through the length and breadth of our land.

3.—Resignation.

The Society had the pleasure last year of electing as a member Professor Ernest W. McBride, then of McGill University, Montreal.

The acceptance of a position in London, England, almost immediately afterwards rendered his resignation necessary, and this was conveyed to the Honorary Secretary in the following letter:—

Royal College of Science
South Kensington
London, S. W.
November, 24, 1909.

Dear Sir,

I beg to acknowledge, with many thanks, the receipt of a volume of the Proceedings of the Royal Society of Canada, and also the diploma of fellowship certifying my membership of the Society.

It is a source of the deepest regret to me that my election to fellowship in a society including so many of the learned men of Canada should have coincided with my acceptance of a post in London. I should have greatly enjoyed participating in the annual meetings in Ottawa, from which I am now precluded by a distance of 3,000 miles. As residence in Canada is one of the necessary conditions of membership, it is my painful duty to resign my membership. Please convey to the President and Fellows my deep sense of the honour which has been done me.

And believe me,

Yours sincerely,

E. W. MacBride.

4.—Members Who have left the Country.

While only one letter of resignation has been received, the following members, whose names are still on our roll, are stated to have left Canada permanently:—

Section I.—The Rev. Paul V. Charland, now resident at Fall River, Massachusetts, U.S.A., and M. Paul De Cazes, now resident at Paris, France.

Section III.—Prof. H. T. Bovey and Prof. John Cox, both now resident in England, and Prof. R. B. Owens, now resident in the United States.

The usual course would be to place these gentlemen, as well as Prof. MacBride, on the retired list.

5.—Election of New Members.

On the 1st of March last the usual papers were sent out for the election of new members, with the following result:

In Section I, there was no election, no candidate receiving a majority of the votes of the Section.

In Section II, one candidate, Dr. Andrew MacPhail, received a majority of the votes of the Section and was therefore elected, subject to confirmation by the Society.

In Section III, four candidates, Messrs. A. S. Eve, Otto Klotz J. S. Plaskett and Harold A. Wilson, received each a majority of the votes of the Section and, subject to confirmation, were duly elected.

In Section IV, Mr. J. B. Tyrrell, received a majority of the votes of the Section and, subject to confirmation, was duly elected.

A resolution confirming these elections will be in order.

It may be explained that in Section I, the present legal number of which is thirty, while the number of members on the roll at the time was twenty-eight, the Honorary Secretary announced two vacancies; while in Sections, II, III and IV, which have severally adopted the higher limit of forty, not more than four new members to be elected annually, he announced four vacancies. It is true that, apart from the four additions to be made to these Sections, there existed vacancies caused by death, resignation or removal from the country; but the Secretary, not being sure whether any of the Sections concerned would wish to bring in more than four new members in one year, and one Section (III) having by resolution expressed its desire not to elect more than four at one time, thought it well to limit the number to four in all three cases.

6.—New Corresponding Member.

The Society, it will be remembered, elected at its last meeting Sir Joseph J. Thomson, of Cambridge, England, as an Honorary Member. To a letter informing him of the fact, Sir Joseph replied as follows :—

Cavendish Laboratory,
Cambridge.
January 11, 1910.

Dear Sir,

I feel it a very great honour to have been made a Corresponding Member of the Royal Society of Canada, and I should esteem it a great favour if you would convey to the Fellows of that Society my hearty thanks for the honour they have conferred upon me.

Yours very sincerely,

Dr. W. D. LeSueur. J. J. Thomson.

7.—Meeting of British Association at Winnipeg.

At our last annual meeting a resolution was adopted appointing a number of members of this Society a delegation to proceed to Winnipeg and welcome, in the name of the Society, the British Association for the Advancement of Science, which was to hold its annual meeting in that city in the month of August. The members of the proposed

delegation were duly notified by the Honorary Secretary under date the 15th of July, the date for the opening of the meeting being the 25th August. The Honorary Secretary of the British Association was also notified of the action the Society was taking. Twenty-two members in all of this Society attended the meeting, and, at the first public lecture delivered, the Rev. Dr. George Bryce, our President, moved, in accordance with arrangements previously made, a resolution of welcome to the British Association for the Advancement of Science. Having himself been the chief agent in inducing the Association to come to Winnipeg, he expressed the hope that the visit might be a pleasant one and that their coming would have the effect of greatly advancing the interests of science, and be the means of binding closer the ties between the Mother Country and Canada. The motion was seconded by Dr. Alexander Johnson, F.R.S.C., and carried with great enthusiasm.

8.—Darwin Celebration, June, 1909.

It was mentioned in last year's Report that the President (Dr. J. E. Roy) had authorized Prof. W. H. Ellis, of Toronto, a member of Section III, to represent this Society at the celebration at Cambridge, England, of the hundredth anniversary of the birth of Charles Darwin and the fiftieth of the publication of his "Origin of Species." A copy of the report made by Prof. Ellis in his capacity as delegate is subjoined.

Toronto, December 31st, 1909.

The President of the Royal Society of Canada,
Ottawa.

Sir,

I beg to report that, in accordance with instructions received from the Council, I attended, as a delegate from the Royal Society of Canada, the Darwin Celebration held at Cambridge, June 22-24, 1909.

The proceedings comprised the reception of Delegates by the Chancellor, the presentation of addresses by the Delegates; the conferring of honorary degrees upon eminent naturalists, a banquet and various entertainments given by the Universities and Colleges.

On the evening of the 22nd June the Delegates and invited guests were received in the Fitzwilliam Museum by the Chancellor of the University, Lord Rayleigh, O.M., F.R.S., Sc. D.

On the following day presentation of addresses by delegates of Universities, Colleges, Academies and Learned Societies took place in the Senate House.

In the evening a banquet was held in the new Examination Hall, at which the Chancellor presided. A toast "To the Memory of Charles Darwin" was proposed by the Right Honourable A. J. Balfour, seconded by Dr. Svante Arrehenius, and acknowledged by Mr. William Erasmus Darwin.

The Vice-Chancellor stated that the University had hoped to induce Dr. Alfred Russell Wallace to come and receive an honorary degree at Cambridge. Learning that his state of his health would not permit him to accept the invitation, they had sent him the following telegram:—"The Naturalists assembled at Cambridge for the

Darwin Celebration cannot forget your share in the great work they are commemorating and regret your inability to be present."

On the 24th June Honorary Degrees were conferred in the Senate House upon a number of distinguished foreign naturalists, and also upon Mr. Francis Darwin, described by the Public Orator as "*patris illustris e filiis insignibus unus.*"

In the afternoon the proceedings closed with a Garden Party given at Trinity College by Mr. William Erasmus Darwin, Sir George and Lady Darwin, Mr. Francis Darwin and Miss Frances Darwin, Mr. and Mrs. Horace Darwin, Mrs. Letchfield and Miss Darwin.

I cannot conclude without expressing my thanks to the University of Cambridge and, in particular, to the Master and Fellows of Magdalene College, for much courtesy and kindness extended to me as your representative.

I enclose a copy of the address which I presented on behalf of the Royal Society of Canada; a list of those who received Honorary Degrees, and a list of the Delegates of the Universities, Colleges, Academies, and Learned Societies.

I have the honour to be, Sir,

Your obedient servant,

W. H. Ellis.

Address of Professor Ellis.

To the Chancellor, Masters and Scholars of the University of Cambridge.

The Royal Society of Canada esteems it a high privilege to be permitted to join in the commemoration of the Centenary of the birth of Charles Darwin and the fiftieth anniversary of the publication of the Origin of Species.

It was only last year that Canada celebrated her three hundredth birthday as marked by the anniversary of the founding of Quebec. During those centuries the world has made greater strides in scientific progress than in any previous period of like duration.

As contributors to this progress two men, both sons of the Univerity of Cambridge, stand head and shoulders above their fellows—Isaac Newton and Charles Darwin.

The first was a great Natural Philosopher, the second a great Philosophical Naturalist. Without attempting in any way to compare their intrinsic merits it would not perhaps be too much to say that the course of philosophic inquiry, and the intellectual point of view of the civilised world have been more profoundly modified by Darwin than even by Newton.

The Royal Society of Canada has both a scientific and a literary side. It is fitting therefore that the Society should place on record its recognition of the literary value of Darwin's Works, and especially of the Origin of Species. The success of that work in winning the world's assent to views already foreshadowed by the great French Naturalist Lamarck and by others is due not only to the wealth of patient and accurate observation there recorded and to the soundness of the conclusions adduced, but also, in no small measure to the excellence of the literary form in which those observations and conclusions were given to the world.

W. H. Ellis,
Delegate.

The Council feel that the thanks of the Society are due to Professor Ellis for his very satisfactory discharge of his duties as their delegate on the interesting and important occasion referred to and for the ex-

cellent and appropriate address which he delivered on their behalf. A resolution to this effect is suggested.

Inasmuch as the Society, by sending a delegate, participated in the celebration, it may be of interest to state that other Canadian institutions which did so were: the University of New Brunswick—delegate, C. C. Jones, Chancellor; Queen's University, Kingston—delegate, Prof. N. F. Dupuis, F.R.S.C.; McGill University, Montreal—delegate, Prof. E. W. McBride, F.R.S.C.; University of Toronto—delegates, President R. A. Falconer and Prof. T. G. Brodie; University of Manitoba—delegate, Prof. A. H. R. Buller, F.R.S.C.

It may, perhaps, not be out of place to quote a reference made to this celebration in the presidential address delivered to the Royal Physical Society of Edinburgh on the 25th October, 1909, by Prof. J. Graham Kerr, of Glasgow University:—"The occasion has been marked by celebrations all over the world, and the greatest of these, that at Cambridge, was one which will never be forgotten by anyone who was privileged to take part in it. Probably never in the history of human knowledge has there been gathered together such an assemblage to do honour to the memory of any one purely intellectual worker."

9.—Proposal to Create New Sections.

A committee was appointed at our last meeting to consider a motion made for the creation of a Fifth Section of the Society, to be called "The Section of Social Science and Economics." To this committee was referred a letter from Dr. T. Wesley Mills raising strong objection to a proposal previously made for the subdivision of Section IV by which the Geological would be separated from the Biological sciences. The committee has therefore considered the general question of the creation of new Sections, and a report will be presented at this meeting by the Secretary, Mr. Errol Bouchette.

10.—Sewage Pollution of Rivers and Streams.

In the report of Section III last year it was requested that the Society should memorialize the Dominion Government and suggest investigation as to the possibility of adopting legal measures to preserve the waterways of the country from contamination by the sewage of cities, towns and villages, and of vessels navigating our rivers. No action in this direction was taken by the Council, partly for the reason that a bill was introduced in Parliament last session to amend the Act respecting the Protection of Navigable Waters, with a view to accomplishing, to a certain extent at least, the object aimed at in the resolution. The bill referred to was not passed; but the subject

has since been engaging the attention of the government, particularly of the lately established Commission of Conservation; and the Council are advised that the Committee on Public Health will shortly report to the Commission as a whole whether the provisions of the Belcourt Amending Act adequately meet the needs of the situation. The Council will, nevertheless, be happy to act on any further instructions they may receive from the Society in the matter.

11.—Memorial Tower at Halifax.

On the last day of our last Annual Meeting a letter was laid on the table from Mr. John E. Wood, Honorary Secretary of the Canadian Club of Halifax drawing the attention of the Society to the project of erecting at Halifax a National Memorial Tower to commemorate the first establishment, on the 2nd October 1758, of parliamentary representative government in Nova Scotia, which was also its first establishment in any part of what is now Canada, or, with one or two exceptions of minor importance, in any of the present outlying possessions of the British Crown[1]. No action was taken by the Society as a whole upon this letter; but the proposal was one which appealed to several of its members, and the Society will be pleased to learn that one of its members, Sir Sandford Fleming, took it up with great interest and zeal, and apart from contributing substantially to the enterprise, represented and advocated it in various influential quarters in such a way as to place it upon a broader basis and gain for it a largely increased support. Not only have nearly all the Provinces of Canada, as well as the Dominion Government, expressed their interest in the scheme and given it practical assistance—the last contribution and expression of sympathy having come from the distant territory of the Yukon—but many of the autonomous possessions of the British Empire beyond seas have also lent their countenance and aid, and there is now a prospect that, in the end, the Halifax Memorial Tower, initiated in a spirit of enlightened patriotism by the Canadian Club of that city, will be the joint expression of the interest in popular representative institutions of the whole circle of British self-governing communities clustering round the parent state. A resolution of sympathy and congratulation by this Society would, the Council cannot doubt, be favourably received by those who have the enterprise in charge.

12.—Reform of the Calendar.

This is a subject on which action has been suspended since the Annual Meeting of May 1908, when a report of Section III was adopted

[1] The exceptions referred to are certain of the West India islands.

in which it was recommended "that the Council be instructed to memorialize the Governor General asking His Excellency to bring the subject of the Reform of the Almanac to the attention of the Imperial Government with the view of steps being taken to obtain the assent of all civilized nations thereto."

In the month of March last the Honorary Secretary received a letter from Sir Sandford Fleming K.C.M.G., part of which it may be well to quote. "The Royal Society of London," wrote Sir Sandford, "founded about two and a half centuries back, has during that long period enjoyed a reputation of a semi-official character in initiating useful measures or aiding and advising the government on a great many important public questions of a scientific or general character. May not the Canadian Royal Society embrace in its aims a similar function or activity. I enclose some papers which came by the last mail from England which go to show that the subject of the Reform of the Calendar already brought before our Royal Society is beginning to attract attention in Europe."

The writer proceeds to recommend that the Society as a whole should memorialize the Government to suggest to the Home authorities that the question should be referred to an international conference whose sittings might be held in London, unless the initiative thus taken by Canada might justify its being held in Ottawa.

As Sir Sandford mentions, the matter is being mooted in many different quarters; and it is almost impossible for any one who has looked into the question to doubt that a change will be made in the direction of simplification at perhaps no very distant day. It will be remembered that the movement to establish a Time standard for the world took its origin in Canada, though the international conference which decided on the adoption of Standard Time sat at Washington. Would it be too much to hope that a similar conference on the subject of the Calendar might hold its sittings at Ottawa?

Amongst those who have communicated with this Society on the subject, and submitted plans, are Mr. Moses B. Cotsworth, formerly of York, England, now of British Columbia, who contributed a paper to the Transactions of 1908; Mr. Alexander Philip, of Brechin, Scotland, who sent to the Society some time ago a dozen copies of his pamphlet entitled "A Proposal for a Simplified Calendar"; Mr. Charles A. Hesse, of Iquique, Chile; Mr. John C. Robertson of Kirkcaldy, Scotland; and the Permanent Committee of the International Congresses of Chambers of Commerce, Brussels. At the London meeting of this Congress in June last the question was brought up by the delegate of the Society of Industry at Haarlem, Holland, and after some iscussion a resolution was adopted favouring the establishment of a

fixed international calendar, and instructing the permanent committee "to instigate one of the Governments to convoke an official diplomatic conference with a view to bringing about a fixed date for Easter and a reform of the calendar." The question now is, what action, if any, should be taken by this Society in the matter.

13.—Collection of Numerical Data and Physical Constants as Aids to Research.

A communication was received in the month of April last from the Department of Agriculture, transmitting copy of a circular letter addressed by the British Foreign Office to the Colonial Office, and of a letter from the Colonial Secretary to the Governor General of Canada, respecting a resolution agreed to at the meeting of the Congress of Applied Chemistry in London in the month of June, 1909, authori ing the formation of an International Commission for the collection and publication of Physical-Chemical constants. This matter was referred by the Honorary Secretary to Section III, and will doubtless receive the attention of that Section.

14.—Moscow Society for the Development of Experimental Sciences and their Practical Applications.

The Society has also been apprised of the formation, by means of a liberal private bequest, of a society at Moscow, Russia, in connection with the Imperial Moscow University, the objects of which are declared to be:

1. To assist discoveries and experiments in connection with Natural Science.
2. To develop technical inventions and improvements.
3. To investigate and apply to practical use any scientific or technical discovery or improvement.

The advantages of the Society do not appear to be subject to any national restrictions whatever. It appears rather to be one of those institutions aiming at a world-wide diffusion of their benefits which do honour to the present age.

15.—Zoological and Physiological Maritime Laboratory at Concarneau, France.

The Director of the "Laboratoire et de Physiologie Maritimes de Concarneau," in the Department of Finistère, France, in acknowledging a copy of the Transactions of the Society, writes: "Je vous prie de

vouloir bien être mon interprète auprès des membres de votre Société pour les remercier de l'honneur qu'ils font à l'établissement de Zoologie et de Physiologie Maritimes, qui est le plus ancien du monde entier, et qui, récemment réorganisé, est en mesure d'aider les savants de toute nationalité dans les recherches les plus diverses. Inutile de vous dire que, le cas échéant, les membres de la "Royal Society" y seraient les bienvenus, et que tous les moyens d'investigation dont dispose le esrvice seraient à leur disposition."

This letter was duly acknowledged, and in the name of the Society the Secretary thanked the writer for the very kind terms in which he had placed the resources of the Concarneau laboratory at the disposal of its members.

16.—The Founder of the Royal Society of Canada.

The Honorary Secretary has had the pleasure of receiving, during the past summer, a number of letters from His Grace, the Duke of Argyll, under whose auspices, and through whose initiative this Society was founded in the year 1882. These letters express a lively interest in the welfare of the Society, and make suggestions which the Council have now under consideration and to which they hope it may be possible to give practical effect.

17.—The Press.

In connection with our meeting of last year it was noticed that the Press paid more than usual attention to the proceedings of the Society, and showed every disposition to represent in a favorable light the work in which the Society is engaged. The Council desire to express their appreciation of this useful service, and their hope that there may always be harmony of effort between the Society and the Press in the interest of the public.

18.—Finances of The Society.

In accordance with a resolution adopted at the last Annual Meeting the Council appointed a committee of its own members to consider what measures might be adopted to improve the financial position of the Society. The only recommendation which the Committee was able to make, bearing directly on the object desired, was that the annual membership fee should be increased from two dollars to five dollars. Considering the character and status of the Society the present fee is certainly a low one. The proposed increase would help to create a fund which might be applied, for example, to a partial payment of the travelling expenses of members residing at distant points who desire to attend the annual meeting. The members to whom such pay-

ments were made would thus receive back more than the total amount of the fee, and others, residing at Ottawa, or at places so near to Ottawa as not to call for any contribution towards expenses, would have the satisfaction of seeing the fund employed for the very useful purpose of increasing the attendance at our meetings. How important an object this is must be apparent to everyone. The recommendation of the Committee is supported by the Council, and in accordance with a notice in the hands of members, a motion to alter the existing regulation accordingly will be made at this meeting. Appended is the Honorary Treasurer's statement, showing revenue and expenditure from the Government Grant during the year ended 30th of April, last.

REVENUE AND EXPENDITURE (GOVERNMENT GRANT).

1909.			
Apr. 27	—To amount on account of Government Grant		$1,250 00
May 1	—North British and Mercantile Insurance Co.	$75 00	
" 6	—R. J. Taylor—printing circulars	14 00	
" 6	—Canadian Express Co.	1 27	
" 6	—James Hope & Sons—stationery	75	
June 10	—Attendance, etc., Annual Meeting	8 00	
" 10	—Telegram, freight charges and postage	3 88	
" 10	—R. J. Taylor—printing circulars, programmes, and motion slips, Annual Meeting	36 00	
" 14	—H. O. Hewit—messenger service	65	
" 14	—Crown Lithographing Co.	16 80	
" 14	—Dominion Express Co.	4 44	
" 19	—The Mortimer Co. Ltd.—printing and binding	345 43	
" 22	—James Hope & Sons—stationery	6 25	
July 2	—Ottawa Despatch and Agency Co.	80	
" 2	—L. F. Brien—typewriting	1 65	
" 2	—The Ottawa "Citizen"—advertising Annual Meetings, 1907 ($15.00), 1909 ($7.00)	22 00	
" 2	—"The Journal"—advertising Annual Meeting	6 00	
" 2	—Ottawa "Free Press"—advertising Annual Meeting	6 00	
" 2	—J. Weilbrenner—copying	2 00	
" 9	—Caledonia Insurance Co.	18 50	
Aug. 31	—The Mortimer Co. Ltd.—binding, etc., on account	400 00	
" 31	—Montreal "Gazette"—printing Transactions—on account, vol. II, 3rd series	400 00	
" 31	—Auditing printing account	10 00	
" 31	—Ottawa Despatch and Agency Co.	75	
" 31	—Dominion Express Co.	5 54	
Sept. 10	—"Grip, Limited"—illustrations	100 70	
" 15	—Crown Lithographing Co.—illustrations	42 38	
" 20	—Crown Lithographing Co.—illustrations	19 30	
Oct. 7	—To amount on account of Government Grant		3,750 00
" 7	—Disbursements on behalf of Society	2 02	
" 7	—The Mortimer Co. Ltd.—printing, binding, etc.	330 81	
" 7	—"Grip, Limited"—illustrations	23 75	
" 7	—R. J. Taylor—printing	2 50	

Oct. 7	—Ottawa Despatch and Agency Co.	40	
Nov. 8	—F. W. Myers & Co.—freight charges	12 65	
" 8	—Montreal "Gazette"—printing Transactions—completing vol. II, 3rd series	501 26	
" 8	—Montreal "Gazette"—printing Transactions—on account, printing vol. III, 3rd series	1,000 00	
Dec. 16	—Ottawa Despatch and Agency Co.	55	
" 16	—L. F. Brien—typewriting	50	
" 16	—Delivery of postal parcels by letter carrier	4 00	
1910.			
Jan. 12	—Wm. Notman & Son—photograph	50	
" 12	—R. P. King—engrossing diplomas	2 75	
" 12	—The Copp, Clark Co., Ltd.—printing map	56 00	
Feb. 4	—Crown Lithographing Co., Ltd.—stationery	11 00	
" 4	—Express charge, telegram	54	
" 15	—One copy vol. II, 2nd series of Transactions	4 00	
Mch. 22	—John Robertson—storage and cartage	49 00	
" 22	—Typewriting and postage	2 50	
" 22	—Geo. W. Wheatley & Co.—freight, European exchanges (£23 1s. 2d.)	112 21	
Apr. 19	—L. F. Brien—typewriting	1 00	
" 19	—North British & Mercantile Insurance Co.	75 00	
" 19	—Ottawa Despatch and Agency Co.	1 10	
" 20	—The Toronto Engraving Co. Ltd.—illustrations	100 00	
" 20	—Canadian Express Co.	1 00	
" 20	—The Mortimer Co. Ltd—printing, binding, etc.	210 55	
" 26	—James Hope & Sons—stationery	7 95	
		$4,061 63	
	Unexpended at close of financial year, and to be revoted [1]	938 37	
		5,000 00	5,000 00

The whole is very respectfully submitted.

W. D. LeSUEUR,
Honorary Secretary.

GEORGE BRYCE,
President.

At the conclusion of the reading it was moved by Dr. Saunders, and seconded by Dr. MacKay, that the report be received and that the question of its adoption be voted on to-morrow, when the members shall have had time to acquaint themselves fully with its contents.

With reference to a recommendation in the Report that the Society should take occasion of this, its first meeting since the death of his late

[1] In explanation of this item it should be stated that, at the close of the financial year, certain printing accounts relating to the past year, and considerably exceeding in amount the unexpended balance, had not been rendered, and therefore could not be paid.

Majesty, King Edward the Seventh, and the accession of his present Majesty, King George the Fifth, to present to his Majesty King George an Address expressive of their sentiments in connection with these events, it was

Moved by Dr. James H. Coyne and seconded by Dr. J. Edmond Roy, that the President be requested to nominate a committee to prepare such an Address, as recommended by the Council.—Carried.

Moved by Dr. James H. Coyne and seconded by Dr. Roy, that the election of the following gentlemen named in the report as having each received the votes of a majority of the members of the Sections to which they were severally nominated, viz:

Section II.—Dr. Andrew Macphail,

Section III.—Prof. A. S. Eve, D.Sc., Dr. Otto Klotz, J. S. Plaskett, B.A., Prof. Harold A. Wilson, F.R.S.,

Section IV.—J. B. Tyrrell, M.A.,

be confirmed.—Carried.

Messrs. Eve, Klotz, Plaskett, Wilson and Tyrrell, were then introduced to the President, the first four by the President of Section III, Dr. W. Bell Dawson, and the last mentioned by the Secretary of Section IV, Prof. J. J. MacKenzie. The President expressed in fitting words his pleasure at receiving them into the ranks of the Society.

Mr. Ernest Myrand (Section I,) elected in 1909, and the Rev. Dr. W. O. Raymond (Section II,) elected in 1906, who had not previously attended a meeting of the Society, or been formally received as members, were in like manner introduced, the former by Messrs. Sulte and Roy, and the latter by Dr. W. Wilfred Campbell, Secretary of Section II, and were cordially welcomed by the President.

Moved by Dr. Glashan and seconded by Dr. Ells, that the following members be a committee on Nominations for the present year, namely Messrs. MacKay, Wright, Roy, King and the mover.—Carried.

Moved by Dr. Glashan and seconded by Dr. Campbell, that the name of Dr. Coyne be added to the Nominating Committee.—Carried.

In accordance with a notice in the hands of members the Honorary Treasurer then moved, seconded by M. Léon Gérin, that, with a view to increasing the revenue of the Society, rule 7, which provides that $2. shall be the amount of the annual subscription of members, and $20 the sum payable for life membership, be amended by the substitution of $5 for $2, and of $50 for $20.—Carried.

Moved by Dr. Saunders, seconded by Dr. King, that the President be requested to nominate the general Printing Committee.—Carried.

Mr. Errol Bouchette, as Secretary of the Committee appointed last year to consider the question of increasing the number of Sections, by

creating a separate section for Social and Economic studies and assigning the Geological and the Biological sciences to separate Sections, reported that he had obtained by correspondence the views of the members of the Committee on the question and he would move, seconded by Dr. Glashan, that, in the absence of Sir Sandford Fleming, Chairman of the Committee named to consider the proposal to add new Sections to the Society, the report of said committee be not received now, but that the written opinions of the different members be printed for the information of the Society.—Carried.

Mr. Bouchette also moved, seconded by Dr. King, that the name of Mr. Léon Gérin, be added to the Committee referred to.—Carried.

Moved by Dr. Coyne, and seconded by Dr. Raymond, that, in the opinion of the Society, the General Printing Committee should, as far as practicable, allot to each Section the number of pages in the Transactions to be at the disposal of such Section, and the Printing Committee of the Section should select the papers to be printed in that Section, within such limitation.—Carried.

The meeting then adjourned to 11 a.m. next day.

At 8.15 p.m. on Tuesday, the Presidential Address was delivered in the Assembly Hall of the Normal School, by the Rev. Dr. George Bryce, the subject being "The Canadianization of Western Canada." (See Appendix A.) The chair was occupied by the Vice-President, Professor R. Ramsay Wright. At the conclusion of the address, a vote of thanks to the President, moved by Mr. Barlow Cumberland, and seconded by Dr. Sulte, was unanimously carried.

SESSION II, (Wednesday, 28th September.)

The chair was taken by the President at 11 a.m. The President read the names of the Committees he had appointed in accordance with resolutions passed the previous day. These were as follows:—

Committee on Address to His Majesty the King;—Dr. J. H. Coyne, Col. William Wood, and M. Benjamin Sulte.

Committee on Printing;—Dr. W. F. King, C.M.G., Chairman, Dr. W. D. LeSueur, Dr. Benjamin Sulte, Dr. W. W. Campbell, Dr. W. Bell, Dawson, Mr. L. M. Lambe.

The reports of the following Associated Societies were then read:

Natural History Society of Montreal, by Mr. Harry Bragg, M.J.I., delegate.

Ontario Historical Society, by Mr. Barlow Cumberland, President and delegate.

Elgin Historical and Scientific Institute, by Dr. J. H. Coyne, F.R.S.C., delegate.

The Huron Institute, by Dr. J. H. Coyne, F.R.S.C., delegate.

British Columbia Academy of Science, by the Honorary Secretary.

Royal Astronomical Society of Canada (Ottawa Meetings), by Mr. Carl Engler, delegate.

Nova Scotia Institute of Science, by Dr. A. H. MacKay, F.R.S.C., delegate.

Nova Scotian Historical Society, by Dr. A. H. MacKay, F.R.S.C., delegate.

New Brunswick Natural History Society, by Dr. G. U. Hay, F.R.S.C., delegate.

New Brunswick Loyalists' Society, by Ven. Archdeacon W. O. Raymond, F.R.S.C., delegate.

The Women's Canadian Historical Society of Ottawa, by Mrs. J. B. Simpson, delegate.

Manitoba Historical and Scientific Society, by Rev. Dr. Bryce, F.R.S.C., President and delegate.

The reports of the following Societies, which were not represented by delegates, were accepted as read:—

Société de Géographie de Québec.
Institut Canadien d'Ottawa.
Ottawa Field Naturalists' Club.
New Brunswick Historical Society.
Entomological Society of Ontario.
Numismatic and Antiquarian Society of Montreal.
Niagara Historical Society.

Moved by Dr. Coyne, seconded by Dr. Roy, that the report of the Women's Historical Society of St. Thomas, which had been accidentally delayed, but which will be forwarded in a few days, shall be taken as presented and read.—Carried.

Moved by Prof. Shutt, and seconded by Prof. MacKenzie, that the thanks of this Society are due and are hereby tendered, to Prof. W. H. Ellis, for the services rendered by him as its delegate at the Darwin Celebration at Cambridge, England, in June 1909, and for the excellent report he has made of the proceedings on that occasion, and the part taken by him, as delegate, therein.—Carried.

Moved by Prof. Ramsay Wright, and seconded by Dr. Roy, that this Society is pleased to hear of the marked success that is attending the efforts of the Canadian Club of Halifax to awaken interest in, and obtain support for, their patriotic project of the erection of a Memorial Tower to commemorate the first establishment of representative government

in Nova Scotia in the year 1758, a date which stands also for its first establishment in any part of the present Empire outside the British Isles. The Society learns with extreme satisfaction that the wider scope which the movement has lately assumed is due in no small measure to the well directed and untiring efforts of one of its own most honoured members, whose absence from this meeting on account of illness is deeply regretted, Sir Sandford Fleming, K.C.M.G. The Society desires to express its sympathy with the Canadian Club of Halifax, in the good work it has undertaken, and its high appreciation of the important part taken therein by its own distinguished member whose name has been mentioned.—Carried.

The following report from Section III was presented by Dr. W. F. King, C.M.G.:—Section III recommends that professors Bovey, Cox and Owens, who have left the Dominion of Canada, be placed on the retired list of members of this Society, retaining in each case the right to use the title of Fellow of the Society.

Dr. King moved, seconded by Dr. Glashan, that the report be adopted.—Carried.

The session was then adjourned till the afternoon at 4 o'clock.

AFTERNOON SESSION. (Wednesday, 28th September, 1910)

The President took the chair at 4 p.m. Col. Wood from the Committee on the Address to the King presented the draft of an address which had been approved by the committee and which was as follows:

To the King's Most Excellent Majesty—

May it Please Your Majesty:—

We the President and Fellows of the Royal Society of Canada, now assembled in Annual Meeting, humbly approach your Majesty to offer our sincere condolence for the loss your Majesty has suffered by the death of your Royal Father, His Majesty King Edward VII, and to assure you of our most respectful sympathy. We have long felt as individuals the sense of keen personal loss which we are only now able to express, for the first time, as a corporate body. We likewise beg leave to assure your Majesty that this great loss has touched us in another most intimate way, since King Edward was the author of the Anglo-French entente, which naturally struck every sympathetic chord between the Anglo- and French-Canadians under the British Crown.

May it also please your Majesty to accept the heartfelt assurance of our most devoted loyalty to your Throne and Person. We take the greatest pride in the honour of being one of your Majesty's "Royal" Societies. We shall never forget the interest that Her Royal Highness

the Princess Louise took in our foundation by His Excellency the Marquis of Lorne, under the patronage of Her Majesty Queen Victoria of happy memory. And we most respectfully beg leave to express the special satisfaction we feel in being now under the exalted patronage of a Sovereign whose own career has done so much to confirm our devotion. Your Majesty's wide and comprehensive knowledge of the Empire of which we so gladly form a part, and your recent visit to Canada, which added so greatly to the significance of the Quebec Tercentenary, a celebration designed to commemorate the heroes of both races, have endeared you to our people as a whole and, we rejoice to believe, have sensibly strengthened the ties which bind our Dominion to the Parent State.

The Address having been read, Dr. Coyne moved, seconded by Mr. Sulte, that it be adopted.—Carried.

It was also agreed that the Address should be drawn up in both languages.

Referring to the fact that the International Geological Congress is to meet at Toronto in 1913, Mr. J. B. Tyrrell moved, seconded by Prof. MacKenzie, that the following members be a committee to take such action as may be necessary in connection therewith: Dr. F. D. Adams, Dr. A. P. Coleman, Prof. W. Lash Miller, Dr. R. W. Ells, Dr. A. E. Barlow and the mover.

REPORTS OF THE SECTIONS.

Rapport de la Section I, présenté par M. Errol Bouchette.

Ottawa, 28 septembre, 1910.

La Section a l'honneur de soumettre le procès-verbal de ses délibérations:—

Assistaient aux séances:—Messieurs l'Abbé Camille Roy, A. D. DeCelles, J. Edmond Roy, Léon Gérin, Benjamin Sulte, Ernest Myrand, Errol Bouchette.

En l'absence du président, l'honorable Rodolphe Lemieux, M. J. Edmond Roy est appelé au fauteuil.

M. A. D. DeCelles et M. B. Sulte remettent certains manuscrits sur la Gaspésie rédigés par Mgr. F. X. Bossé, curé de Sainte Adélaïde de Pabos. Ces manuscrits seront examinés par MM. Sulte, DeCelles et Roy, qui formeront le comité de lecture pour l'année 1910–1911.

On trouvera ci-après la liste des travaux lus et acceptés.

Les officiers suivants sont élus pour l'année 1910-1911:—

Président, Sir François Langelier.

Vice-président, M. Adjutor Rivard, M.A.
Secrétaire, M. Errol Bouchette.

J. Edmond Roy,
Président Intérimaire.

Errol Bouchette,
Secrétaire.

Liste des Travaux Lus et Acceptes.

Les études suivantes sont acceptées sauf revision par le comité de lecture:—

1. *L'Oeuvre de Louis Fréchette* par M. l'abbé Camille Roy.
2. *Les Bretons au Canada*, par M. Benjamin Sulte.
3. *Les Ecossais du Cap-Breton*, par M. Errol Bouchette.
4. *Morts et blessés français aux plaines d'Abraham, etc.*, par M. Ernest Myrand.
5. *La baie d'Hudson*, par M. le Juge Prudhomme.
6. *Un poète illettré*, par M. Adjutor Rivard.
7. *Les anciennes archives françaises du Canada*, par M. J. Edmond Roy, Litt.D.

On motion of Mr. Bouchette seconded by Dr. J. Edmond Roy, the Report of Section I was adopted.

Report of Section II, presented by Dr. W. W. Campbell:

I have the honour to report that Section II has held four meetings.

The members in attendance were Messrs. Bryce, Campbell, Coyne, Denison, LeSueur, Lighthall, Morgan, Raymond and Wood.

A list of the papers read in whole, in part, or by title, is subjoined.

One member only having been elected in the balloting preceding the Annual Meeting, while seven had been nominated and four were eligible, the Section took up the question of electing three others from the list of nominees, and begs leave to present to the Society as having received the requisite proportion of votes for election the following gentlemen, namely, the Hon. W. L. Mackenzie King, P.C., C.M.G., Ph.D., of Ottawa, the Rev. Arthur E. Jones, S.J., of Montreal; and Mr. Edward William Thomson, F.R.S.L., of Ottawa.

The following officers were elected for the ensuing year:—

President, Dr. James H. Coyne.
Vice-President, Rev. Archdeacon W. O. Raymond.
Secretary, Dr. W. Wilfred Campbell.

The following members were appointed to form the Printing Com-

mittee for the year: Dr. A. G. Doughty, C.M.G., Dr. H. J. Morgan, Dr. W. Wilfred Campbell and Mr. W. D. Lighthall, K.C.

It is the desire of the Section to elect four new members in 1911.

WILFRED CAMPBELL,
Secretary.

LIST OF PAPERS PRESENTED IN SECTION II.

1.—Colonel Alexander McNutt and the pre-Loyalist Settlements of Nova Scotia, by the Ven. Archdeacon W. O. Raymond.

2.—The Documents in the Debate on the Romance of the Rose in the Fifteenth Century, by Prof. C. F. Ward, B.A., of Wesley College, Manitoba. Communicated and read by the Rev. Dr. Bryce.

3.—Lawrenciana. By Lt.-Col. William Wood.

4.—The Loyalists in Prince Edward Island. By Professor Wilbur H. Siebert and Florence E. Gilliane, of Ohio State University. Communicated by Dr. A. G. Doughty, C.M.G.

5.—Notes and Comments on a Tragedy entitled "Liberty Asserted," by John Dennis, played at the New Theatre, Lincoln's Inn Fields, 1704, and found in the Canadian Archives, by Mrs. George Bryce, member of the Manitoba Historical Society. Communicated and read by the President.

6.—With Col. Peacock's Column in the Fenian Raid of 1866, by Barlow Cumberland, M.A., President of the Ontario Historical Society. Communicated by Dr. W. Wilfred Campbell. Read by the Author.

On the motion of Dr. Coyne, seconded by Dr. Campbell, the report of Section II, was adopted.

The report of Section III was presented by Dr. W. Bell Dawson, President of the Section, and was as follows:—

The Section held four sessions, two on Tuesday, the 27th September, and two on Wednesday, the 28th; at these there were present twelve members, viz.:—

Dr. W. Bell Dawson, President; Prof. J. C. McLennan, Vice-President; and Prof. Baker, Prof. Barnes, Prof. Girdwood, Dr. Glashan, Dr. Hoffmann, Dr. King, Dr. Otto J. Klotz, Mr. Plaskett, Mr. Shutt, and Prof. H. A. Wilson.

A letter was read from Mr. R. F. Stupart expressing regret that his official duties would prevent him from attending the meeting.

The President delivered an address on "Methods of Investigation of Tides and Currents." The address presented an outline of the

Dominion Survey of Tides and Currents during the last sixteen years, with the object of explaining the general methods adopted in this new field of investigation. An appended list gave references to the Reports and Papers in which the results of the investigations have from time to time been published.

A list of the papers presented is subjoined.

J. C. Glashan,
Acting Secretary.

List of Papers Presented in Section III.

"On the Analysis and Resolution of some Spectral Lines." By Prof. J. C. McLennan, Ph.D.

"On a Fatigue Effect observed in Metals under Bombardment by Alpha Rays." By V. E. Pound, M.A. Communicated by Prof. McLennan.

"On the Rate of Diffusion of the Emanation of Actinium." By W. F. Kennedy, M.A. Communicated by Prof. McLennan.

"Some Measurements on the Electrical Conductivity of Air by means of a Wilson Electrometer." By A. Thomson, B.A. Communicated by Prof. McLennan.

"A Note on Recoil Phenomena in Connection with the Radiation from Uranium." By G. A. Cline, B.A. Communicated by Prof. McLennan.

"Ice Formation on the St. Lawrence and Methods of Prevention." By Prof. H. T. Barnes, D.Sc.

"On the Terminal Expansion of some Rocks at high Temperatures." By A. E. Wheeler, B.Sc. Communicated by Dr. H. T. Barnes.

"On the Amount of Radium and Radium Emanation present in the Water and Gases of Caledonia Springs." By. Prof. A. S. Eve, D.Sc.

"On the Influence of Acids and Salts on the Amount of Emanation Liberated from a Solution of Radium." By A. S. Eve and D. McIntosh.

"On the Radium Contents of Specimens from a Deep Boring at Beachville, Ont." By A. S. Eve, D.Sc., and D. McIntosh, Ph.D.

"The Chinook in Southern Alberta and Temperature Inversions at Sulphur Mountain, Banff." By R. F. Stupart, Director of the Meteorological Service.

"Observations of Atmospheric Electricity and Conductivity of the Air at Melville Island" (Arctic Ocean). By W. E. W. Jackson, M.A. Communicated by R. F. Stupart.

"Water Vapour Lines in the Sun's Spectrum." By U. R. Gillis, M.Sc., Lecturer in Physics, McGill University. Communicated by Dr. H. T. Barnes.

"The Nitrogen Compounds in Rain and Snow." By Frank T. Shutt, M.A., F.I.C.

"Probable Errors of Radial Velocity Determinations." By J. S. Plaskett, B.A.

The Papers above mentioned were read and discussed; the following were presented and taken as read:—

"Recent Work in Russia on the Formation of Frazil and Anchor Ice." By Prof. H. T. Barnes, D.Sc.

"Mathematical Instruction in France." By Prof. R. C. Archibald." Communicated by Dr. E. Deville.

"The Reform of the Calendar." By Alexander Philip, Esq., of Brechin, Scotland. Communicated by Sir Sandford Fleming, K.C.M.G.

The Section adopted a resolution recommending to the Society that Professors Bovey, Cox and Owens, having left the country, be placed on the retired list of members of the Society, retaining in each case the right to use the title of Fellow of the Society.

It was resolved that four new members of the Section be elected next year, these to include elections to fill vacancies.

Officers for 1911 were elected as follows:—

President—Prof. J. C. McLennan, Ph.D.

Vice-President—J. C. Glashan, LL.D.

Secretary—E. Deville, LL.D.

The Officers and Dr. Barnes were elected as the Publication Committee of the Section.

On motion of Dr. W. Bell Dawson, seconded by Dr. W. F. King, C.M.G., the report was adopted.

The Report of Section IV was presented by Professor Mackenzie, Secretary of the Section, and was as follows:—

The Section desires, in the first place, to put on record its deep sense of the loss it has sustained in the death of its eminent President of last year, Monsignor J. C. K. Laflamme, a charter member of this Society, a man of many accomplishments and most estimable character, whose career and services it trusts will be fittingly commemorated at our next Annual Meeting.

The meetings of the Section were attended by twelve members and a number of visitors. Ten papers were read, either in full, or in abstract, or by title. Keen discussion followed most of the papers read.

The following gentlemen who had been duly nominated for election to the Society, viz.: Professor B. A. Bensley, University of Toronto; Professor F. C. Harrison, Macdonald College; Mr. J. White, Secretary

of the Conservation Commission, Ottawa, were proposed for election in the Section and received the requisite proportion of votes. Their election to the Society is consequently recommended.

The election of Officers for the ensuing year resulted as follows:—

President—Mr. Lawrence M. Lambe.
Vice-President—Dr. A. G. Nicholls.
Secretary—Professor J. J. Mackenzie.

The following members were nominated for the Sectional Printing Committee:—

Mr. Tyrrell.
Professor Buller.
The Secretary.

All of which is respectfully submitted.

JOHN J. MACKENZIE,
Secretary, Section IV.

LIST OF PAPERS PRESENTED.

1.—"Analysis of the Flora of the Little River Group," by G. F. Matthew, D.Sc.

2.—"The Formation of Coal," by D. B. Dowling, B.A. Sc.

3.—"Place Names of Northern Canada," by James White, F.R.G.S.

4.—"Upon the Function and Fate of the Cystidia of Coprinus Atramentarius," by A. H. R. Buller, D. Sc.

5.—"The Number of Micro-organisms in Air of Winnipeg," by A. H. R. Buller and C. W. Low.

6.—"The Actiniæ of Passamaquoddy Bay with a Discussion of their Synonomy," by J. Playfair McMurrich, M.A.

7.—"Some Observations on the Nature and Significance of the Calcium Content of the Blood," by A. G. Nicholls, M.A., M.D.

8.—"Bibliography of Canadian Zoology for 1909 (exclusive of Entomology"), by Lawrence M. Lambe, F.G.S.

9.—"Bibliography of Canadian Botany for the years 1907–8–9," by A. H. MacKay, LL.D.

10.—"Bibliography of Canadian Entomology of the year 1909," by Rev. C. J. S. Bethune, M.A., D.C.L.

On motion of Professor Mackenzie, seconded by Professor Buller, the report was adopted.

Moved by Professor Mackenzie and seconded by Dr. A. H. MacKay, that the election as members of the Society of Messrs. B. A. Bensley, F. C. Harrison, and James White, be confirmed.—Carried.

It was stated from the Chair that Section I would it leave to the Council to take action regarding members of that Section referred to in the Annual Report as having ceased to reside in Canada.

Moved by Dr. Hay and seconded by Dr. MacKay, that the Annual Report of the Council be adopted.—Carried.

Moved by Dr. MacKay, seconded by Dr. King, that the Council take such action as it may consider expedient with reference to previous resolutions of the Society on the subjects of the Reform of the Calendar and the Protection of Rivers and Streams from pollution by sewage.

Moved by Dr. MacKay, seconded by Mr. J. B. Tyrrell, that a committee consisting of Messrs. J. B. Tyrrell, Dr. Wilfred Campbell and James White, be appointed to consider the matter of a memorial to David Thompson the astronomer, and to report at the next Annual Meeting.—Carried.

The report of the Committee on Nominations was presented by Dr. Glashan and was as follows:—

The Committee on Nominations beg leave to recommend that the following officers be appointed for the ensuing year:—

President—Professor R. Ramsay Wright.
Vice-President—Dr. W. F. King, C.M.G.
Honorary Secretary—Dr. W. D. LeSueur.
Honorary Treasurer—Mr. Lawrence M. Lambe.

On motion of Dr. Glashan, seconded by Dr. Coyne, the report was adopted.

Moved by Dr. Campbell and seconded by Prof. Baker, that the hearty thanks of the Society be tendered to Dr. J. F. White, Principal of the Normal School, for his kindness in again providing accommodation for the general and sectional meetings of the Society in the Normal School building.—Carried.

It was announced from the Chair that the business of the Society and the work of the Sections had, on this occasion, been concluded in two days, and that an adjournment would be in order.—Adjournment carried.

In the evening of Wednesday, the Annual Popular Lecture was delivered in the Assembly Hall of the Normal School by Professor Charles M. McKergow of McGill University, Montreal, the subject being "Aviation." There was a good attendance. The lecture was illustrated by lantern views and mechanical models, and excited much interest. At the close a vote of thanks was moved by Dr. H. T. Barnes, seconded by Dr. Otto Klotz, and carried unanimously.

APPENDIX A

PRESIDENTIAL ADDRESS

ON

THE CANADIANIZATION OF WESTERN CANADA

By the

REV. GEORGE BRYCE, D.D., LL.D.

PRESIDENTIAL ADDRESS

The Canadianization of Western Canada

Canadian national life may be said to have begun with the Confederation of 1867. Before that time our country, with its *disjuncta membra*, gave occasion, in its six divided provinces and vast unorganized territory, for a Brito-Canadian writer—who has never done us justice—to call it: "A mere fringe along the north of the American Republic."

But the fiat went forth: Let the dry bones live; and bone was fitted to its bone; and muscle joined with muscle to make the union strong; and the winds of kindly Heaven blew upon it, and there stood on the first "Dominion Day" a great army of stalwart northern men, ready for exploits, waiting to subdue the wilderness and make the desert a beautiful garden.

Our poets are the singing birds of the Confederation Era of "Union and Progress," and they sang of the rise of the new nation.

Because it was British born, one said:

> "This Canada shall be
> "The worthy heir of British power and British liberty."
> (*Machar*).

and again the sweet poetess sang:

> "We are put for the right to keep
> Unbroken still the cherished filial tie
> That binds us to the distant sea-girt isle."
> (*Machar*).

and because we are free-born Britons came the boast of another:

> "Come of right good stock to start with,
> Best of the world's blood in each vein;
> Lords of ourselves and slave to no one,
> For us or from us, you'll find we're MEN."
> (*Robert Reid*).

Moreover the bards did not forget that we are a vast Composite, to be more firmly knit together:

"Where Celt and Saxon hand in hand
Hold sway from sea to sea."
(*Edgar*).

and another added:

"The Saxon force, the Celtic fire;
These are thy manhood's heritage."
(*Roberts*).

Then a prayer:

"Father of Unity! Make this people one!
Weld; interfuse them in the patriot's flame!"
(*Roberts*).

All have a strong hopefulness:

"Voices are calling, where silence has been;
Look to thy future, thou Mother of men."
(*McManus*).

The true Canadian note rings out from a Fellow of this Society:

"From Breton to Vancouver strand
The great refrain: 'A native Land.' "
(*Lighthall*).

Who can fail to catch the impulse of confidence in this glowing sunrise of our nation:

"How on thy breast and on thy brow
Bursts the uprising Sun!"

Forty-three years of Confederation life have fully justified these hopes, anticipations and prayers.

The especial subject, however, of to-night's address is:

"The aggressive and patriotic spirit of Canada in occupying and developing that part of the Canadian west lying between Lake Superior and the Rocky Mountains, with some reference to the Province and Territory on the Pacific Coast."

In other words:

The Canadianization of Western Canada.

The writer has, however, to ask the indulgence of this distinguished audience, in making the personal allusion that, as a native-born Cana-

dian, he is dealing with the subject largely at first hand, as having entered this western Canada in 1871, the year of the first Queen's Message there, and the year when the first resounding of cannon was heard, west of Lake Superior, by a body of elected British freemen.

The Fall of Monopoly.

The high wall of the Hudson's Bay Company monopoly had held fast Rupert's Land and the Indian Territories for two centuries. But in the middle of the Nineteenth Century assaults were beginning to be made from the outside, and these were responded to from within. The discovery of the Northern Magnetic Pole by Commander James Ross, led to the sending of Capt. Lefroy to make a Magnetic, but really a Topographical, Survey, of the vast possessions of the Fur Traders in 1842. Five years later a dispute, as to the rights of natives to trade, convulsed the Red River community, now grown to number several thousand souls. The distinguished Isbister, one of themselves who had risen to note in England, became the defender of his countrymen and succeeded in carrying their complaint to the foot of the throne. A petition of nearly one thousand Metis, of French origin, with their requests expressed in classic French, came to Her Majesty, and lest these appeals should fail, more than half-a-thousand English speaking whites and natives of Red River Settlement approached Canada for relief. In 1849 the Sayer outbreak took place and Governor, Judge and Council of Assiniboia took fright.

The British House of Commons Committee of 1857, led by Roebuck and Gladstone, held a searching examination and from this time onward it was clear that the monopoly of two centuries' duration was doomed. At the sessions of this great Committee Canada was represented by Chief Justice Draper. Coincident with the sittings of the Committee, two great expeditions, one British, the other Canadian, the former that of Palliser and Hector, the latter that of Hind and Dawson, had gone forth to view the resources of this hitherto hermit country. They were soon followed by the independent expedition of Lord Milton and Dr. Cheadle. In the year following the Confederation, the Honourable William McDougall and Honourable George Cartier, representing the two sections of Canada, crossed the ocean, and found that the country might become Canadian were the Hudson's Bay Company to receive compensation. The fates were with Canada, and so monopoly at length fell down and a new community arose. These are the commonplaces of history, but they bespeak the rise of a new entity—the Canadian West.

Canada Seeks a New Home for Her Children.

It was a momentous year for Canada when the Wolseley Expedition of British and Canadian troops forced its way in 1870 through the trackless rockland of thirteen hundred miles to the flowery prairies of the west. Before the force started it was known that there would be no blood shed, for the Riel rising, brought on by misunderstanding and governmental maladministration had largely subsided, but the expedition meant the occupation of a good land by a determined people. It gave confidence to a young nation on the outlook for homes for its children. Their land had been too strait for the growing Canadian families. By tens, if not hundreds, of thousands they had been drifting to the open lands of the Western United States. Now, many of the young Canadian soldiers, on receiving their discharge, remained in the country and laid the foundations of Winnipeg. They brought kindred spirits after them, they were followed by wives, sisters and daughters and made strong settlements of intelligent, energetic and moral people. Winnipeg was for many years a distributing point for the new settlements. The new communities were loyal. On their journey westward they had passed in thousands through the United States— a foreign country—had resisted all blandishments and inducements to remain by the way, had journeyed keeping their eye on the North Star. Thus grew Manitoba. The people, like the colonizing party of the old patriarch of Ur of the Chaldees, took with them to their western homes their traditions, their courage and their faith. The weak, the half-hearted and the extremely poor could not go, for the journey was long and expensive, the stories of the dangers of the new lands, its cold, its wolves, its plagues of locusts, and its unfriendliness were alarming. It was four hundred miles from a railway, and an impassable barrier of Laurentian rocks prevented, it was declared, its ever being connected directly with Canada. It is said that an eloquent Canadian orator spoke then of Manitoba as "A Hyperborean Land, fit neither for man nor beast." But Hudson's Bay Company vaticinations, United States hostility, the long and wearisome journey, the spectre of ice and snow, and the fear of ostracism and banishment proved insufficient to restrain the movement to what was a good land, a land of sunlight, a land of good health, a land of fertility, a land of wonderful resources, and a land of great opportunities.

Enough of time has now elapsed to show it to be a land of stalwart young men, of comely daughters, of sturdy boys and girls—a land to produce the farmer, the athlete and the soldier—a land of cheerful homes, of churches and of schools.

British Paternalism.

But the Canadian sentiment of western Canada has been from the first of a decidedly British flavour. And this is not surprising.

The Hudson's Bay Company, whatever may be said of it as a governing body, for a century and a half, since it carried its trade into the interior of North America, has been a steadfast British influence. At every fort the Indian was taught to reverence the British ensign, with the cabalistic H.B.C. upon it. The Indian of the far west gloried in his great silver medal with King George's head upon it, and spoke of the Britisher as a "Kingchautshman," *i.e.*, a King George man. The officers and men of the Hudson's Bay Company were chiefly British. They for many years traded exclusively with British goods brought in by way of Hudson Bay, and many of the Chief Factors and Traders and other officers retired to Britain to spend their last days.

When the writer went to Manitoba in 1871, the post office in Winnipeg was still Fort Garry. There was no bank except the Hudson's Bay Company. Accounts were still kept in sterling pounds, shillings and pence, and the writer remembers well Lord Strathcona, then Donald A. Smith, in heading a subscription, saying "Always put it in pounds; you know it does not look so big as in dollars." Hudson's Bay blankets, *i.e.*, pound and even shilling notes, were still in circulation. Everything was British, except a troublesome little knot of Americans in Winnipeg, and even they, by obverse, emphasized everything British as good.

The tradition and recollection of the superior and reliable men of the Company still live. Winnipeg has to-day more real British sentiment than the good City of Toronto.

This British aroma of western Canadianism was strengthened by the great interest taken in the west by British explorers, hunters, and writers. Franklin, Back, Richardson, Thomas Simpson, Lefroy, Palliser, Hector, Milton, Cheadle, Butler, Southesk and many others were filled with the glamour of the vast prairies and kept us in touch with the Mother Country.

One author—Ballantyne—by his books of travel, so universally read, has made fur-hunting, trapping and sledging known to all British boys and created a vision for them of that British land from Fort Garry to ice-bound Ungava.

British capitalists for the last generation have paid great attention to western Canada, and have bound the west with golden chains to the motherland.

But perhaps more than any other British influence, apart from the large influx of British settlers, has been the paternal care shown to western Canada by the splendid men who have filled the office of Gov-

ernor General of Canada. We can never forget the inspiration of the visit of Lord Dufferin, with his eloquent Irish tongue and grace of manner—the first Governor General to visit Manitoba and the man who did much to reconcile British Columbia to Confederation. His progress through Manitoba was unique, and Lady Dufferin in Belfast three years ago, expressed to the writer her memory of the visit to Manitoba as being one of the brightest of her life.

Nor was less good done by the notable visit of the Marquis of Lorne in his famous drive for a thousand miles through the prairies of the Rocky Mountains. The Marquis of Lorne represents to the Canadians the modification of the Downing street policy toward Canada, and it was fitting that he should so thoroughly visit the wide west, when the railroad era had but come in. The great leader of the House of Lords to-day—Lord Lansdowne—with his genial, high-spirited and marked judicial attitude, left the best of recollections in the prairies of western Canada. So with Lord Stanley. The frequent visits of Lord and Lady Aberdeen belong to a period when the great engine of civilization—the railway—had conquered distance; and their interest in all things Canadian cannot be forgotten, nor can the memory of the service and advice on the Northwest battlefields of the soldier Governor—Lord Minto.

But no representative of Queen Victoria or King Edward has shown so intelligent, sympathetic and penetrating an interest in all things western as the present Governor General. Lord Grey and his hospitable family have visited every part of the wide Dominion, and held a modified Canadian Court in all our principal cities. Thus we have been taught to be thoroughly Imperialistic Colonials or Colonial Imperialists. We sincerely regret his departure from us, but we shall not forget how thoroughly he has identified himself with everything national, social, and religious in our Canadian life. We know that when he again climbs the white cliffs of old England he will receive from His Majesty, King George, the hearty commendation of being the most successful Canadian Governor.

No young nation of the Empire could have had viceroys more suited mentally, socially, or politically to draw closer this eldest daughter of the Empire to the Motherland. There can be no doubt that the paternal interest of the Governors sent us, let us say from "Home," especially in Western Canada, has done a vast deal to strengthen our attachment to the Empire and at the same time allow a self-respecting Canadianism.

The Canadian Parliament.

But it needed also rulers who knew the inner life of our people, who sympathized with our difficulties, and who would not crush our aspirations —a governing body which would remember that we had to subjugate the earth, meet its wildness and make a living for ourselves. On the whole we have had a kind and wise nursing mother in our Canadian Parliament. It is just forty years since the Canadian Parliament began to legislate for western Canada. The Manitoba Act was passed under conditions of great stress, and a large amount of legislation since that day has had to do with Manitoba and its sister western provinces. Taken altogether the Dominion Houses have done this with caution, and yet in a progressive spirit, and the legislation of the local governing bodies has been based very largely on Canadian models.

Questions of land tenure and sale, forestry, agriculture, seed advances, care of the Indians, native rights, immigration, education, banks and finance, customs, railways, provincial subsidies, post offices, lawlessness and insurrection, police and military, have supplied a fertile field for differences of opinion, and at times of angry remonstrance, for we are made up of many mixed races and varied interests.

It is quite true that according to the jurists, "Government is founded on the rights of men." According to the evolutionary philosophy, when races and communities are brought together, they must work out their struggle in the survival of the fittest. Fortunately that is not a complete philosophy. Benjamin Kidd has shown in his "Social Evolution," and the late Professor Drummond in his "Ascent of Man," that there are other principles deeply imbedded in human nature, such as religious feeling, humanity and affection, which modify the struggle which the stern bed of Procrustes would demand.

Canada with its nine or ten communities, different races, different languages, different religious conceptions and different habitats and environments can only be successfully governed under this wider philosophy, by sympathetic dealing and patient forbearance, rather than by a hard and fast logic.

The task of gathering the scattered units of Canada and welding them together in these forty years has been done chiefly by two great leaders, though they have been aided most ably by other men of the highest ability.

These two men of different shades of politics agreed especially in one thing: *they both believed in Western Canada.*

To deal with two insurrections in the west, to unite hostile and diverse elements, to allay discontent on railway questions, and to grapple with the building of the Canadian Pacific Railway from the Atlantic

Ocean to the Pacific, was the task of the late Sir John A. Macdonald, a Canadian man of the hardy British race that leads the world. He could deal with men, suggest plans of co-operation for those of opposite views, grapple successfully with bitter prejudices and if not able always to settle questions, at least could propose and carry out a *modus vivendi.* To accomplish all this, preserve a balance between east and west, and yet develop the west, was a mighty achievement.

Sir John was leader under Confederation for some nineteen years. The other leader, likewise a Canadian, who caught the "vision splendid" of a great west, belonged to the other renowned race of Europe that of "La belle France," celebrated earlier than Britain in Art, Science, Literature and War—and which has made in Canada the thrifty, peaceful and religious French Canadian element of our country—we refer to the Premier of to-day—distinguished and beloved in Britain as well as in his native Canadian land—Sir Wilfrid Laurier. His principle, like that of his great predecessor, is "*Conciliation*"—not a conciliation of apathy and Lethean repose, but *Conciliation with Progress.*

He, too, will have a great Transcontinental railway to his credit and the formation of two great Canadian provinces—Saskatchewan and Alberta—each of them as large as an European Kingdom; and these, with the love of a great young nation from the Atlantic to the Pacific, will be to him a Crown of Honor. Canadian harmony must be the cardinal principle of any great leader who will rule Canada successfully. Sir Wilfrid Laurier has been our national leader for fourteen years, and is with us still.

Law and Order.

One true test of government is its firm administration of law and success in preserving order. The Hudson's Bay Company had an unexceptional record for the high character of its officers and men, and for a noble desire to deal fairly and justly with all classes. But they did not rest on the will of the people. They were autocrats; although they had not the necessary weapons of the successful autocrat—a force to carry out the autocratic will and a police organization to maintain order. The last twenty years of the Company's administration of justice in Assiniboia was a miserable succession of tumults, illegal imprisonments, forced jail delivery, and a consequent distrust of authority among all the people.

With this state of things western Canada had to deal immediately in 1870.

In the lawlessness of the period of the gold fever in British Columbia in 1858 Judge Begbie had bravely grappled with disorder. He was a terror to evil-doers and he won the day.

Similarly the presence of a Canadian military force in Winnipeg in 1870, the organization of regular courts and the firm administration of justice had their due effect.

Once in an Indian scare in western Manitoba a detachment of troops was sent by the Governor to Gladstone. Again to protect a company of peaceful Mennonites from unruly natives a military force hurried west from Winnipeg to Baie St. Paul, thirty or forty miles from Winnipeg. The emphatic and almost despotic action of Chief Justice Wood stamped out for all time in Manitoba the senseless contempt for law.

In the first decade of Canadian rule in western Canada rose the grave question of preserving order in the Territories and of dealing with 68,000 Indians east of the Rocky Mountains. This included the management of several bands of Sioux refugees—some of them desperadoes who had taken part in the bloodly Minnesota massacre of 1862. These had come within the bounds of Manitoba, and were a menace to the white settlers. In what is now southern Saskatchewan and Alberta were thousands of prairie Indians who lived on the buffalo, who were dashing horsemen and were used to firearms. Along the American border these tribes were in touch with a reckless and desperate band of whiskey traders, who frequented their camps and incited them to vice and bloodshed. Travellers of to-day can have no conception of what elements of danger there were in the tribal feuds, drunken revels and ignorant superstitions of these wild tribes. Few things are more unlikely in these piping times of peace than to meet, as the writer once did, a band of Sioux going on the war path against the Sauteaux, and this at a time when the Sioux war and Custer massacre were taking place in the United States. It took all the courage and resourcefulness of Canada to deal successfully with these conditions. But it was done.

Treaties at 1. Stone Fort; 2. Manitoba Post; 3. Northwest Angle; 4. Qu'Appelle; 5. Winnipeg; 6. Carlton and Pitt (a large treaty) including large parts of Manitoba, Keewatin and Saskatchewan, and especially that with the Great Nations of the Blackfoot, Blood, Sarcee and Piegan Indians, were notable. While in the former treaties the Hon. Alexander Morris was prominent, in these it is the Hon. David Laird, first resident Governor of the Northwest Territories, known by the Indians as "the man whose tongue is never forked;" *i.e.*, Indian for the man who keeps his word. But treaties though written on parchment are not always fulfilled. It is to the Royal Mounted Police and its officers, as a strong executive, that highest credit belongs.

The Provisional Northwest Council suggested the establishment of a mounted police force, and this was carried out by the Dominion Government in 1874. This was one of the greatest achievements of the first

decade of western government. It was a great experiment, in striking contrast to the policy of the United States in dealing with its Territories. A thousand men—each with the drill and uniform of a soldier, and yet merely a civil officer, the mounted policeman is the startling figure who meets the new immigrant from Montana or Idaho and convinces him that Brito-Canadian law is a reality.

A recent writer, Miss Agnes Deans Cameron, gives her hearty tribute to the efficiency of the Royal Northwest Mounted Police, seen to the very mouth of the Mackenzie river and, we may add, found as a protecting force in the turbulent Yukon and among the scattered Muskegons of Hudson Bay. Captain, afterwards General Butler, a British officer and Canadian Commissioner, author of the "Great Lone Land" and "Wild North Land," wrote in 1871 "Law and order are wholly unknown in the region of the Saskatchewan." Five years afterward an intelligent Indian trader—himself an Indian—said "Before the Queen's government came we were never safe," and now, he continued, "I can sleep in my tent anywhere, and have no fear. I can go to the Blackfoot and Cree camps and they trust me as a friend."

And the men of western Canada have iron in their blood still, and will support the law and do any needful work for King and country. Western Canada was born amid the throes of military conflict. In the first year of its history it rose to throw back the Indian intruder; when the Empire needed them it sent its voyageurs to ascend the Nile at Lord Wolseley's request; in the Saskatchewan Valley, without distinction of class or creed, it rose to crush the rebellion; to South Africa it sent the Strathcona Horse, and its sons sleep under the veldt of the Transvaal. Its regiments, whether dressed in the garb of old Gaul, as English Grenadiers, or as mounted scouts or cavalry, are ready whenever Canada herself or the Motherland may call.

The National Highway.

Another important element in the western development is our National Highway. The writer first saw the rocky shores of Lake Superior in the special steamer "Algoma," which took a Press Excursion in 1868 to Fort William and Port Arthur—or, as the latter was first called, Prince Arthur's Landing. There was then a small canal on the American side of Sault Ste. Marie, connecting Lake Superior with Georgian Bay. Fort William was about four hundred and fifty miles from Fort Garry and between them was a constant succession of forest, muskeg, rock and rapid. The loneliness, the difficult transit and the complete stoppage of communication in winter filled a Canadian with the sense of hopelessness of ever being able to transport men or material

from Montreal to Fort Garry. Perhaps a summer route by water, with railway from Fort William to Fort Garry might be maintained, but there were probably not six people in Canada who thought a through route a possibility. But first, after a terrific struggle with nature, the section of the Canadian Pacific Railway from Lake Superior to Red River was secured, and this was looked upon as a doubtful experiment, merely an engineering triumph accomplished by the explosives—dynamite and nitro-glycerine. The attempt to build a railway along the rugged shore of Lake Superior was plainly an afterthought. But Canadian pride and patriotism were rising; the journey to Manitoba by way of the western States was slow and tedious; the delays and drawbacks were annoying. Thus the American route became intolerable.

A brave coterie of Canadians in Montreal came to the assistance of Sir John A. Macdonald and his cabinet, and undertook to build, not only the railway from Lake Superior to the Pacific Ocean, beginning at both ends, but also to complete it through the Laurentian tunnels of the North Shore, along the rocky cliffs and over bottomless muskegs to Montreal.

The leading spirit of that work of Hercules was a man upwards of sixty years of age—Donald A. Smith—a man of vision and confidence, of conciliating and attractive manner, but a man who held fast to his purpose with the tenacity of steel, and the man who drove the last spike to complete the through line in 1886, five years before the time bargained for in the contract had transpired. The future Lord Strathcona did this at the station of Craigellachie—fitting name borrowed from "Stand fast Craigellachie," the battle cry of his Highland kinsmen—the Grants.

The following words were written in that year in commendation of this example of Canadian pluck: "The explanation of this courage and determination of the Canadian people is that Confederation introduced a larger life; the continued rivalry of the United States awakened in Canadians the desire to 'hold their own;' the possession of wide territorial interests, the sense of their land bordering on three oceans, and the realization of the fact that nearly half of the continent is their heritage might well awaken dreams of national greatness in a people less emotional than Canadians."

No doubt Canada might have been deterred by the cry of the pessimist, "So loyal is too costly," but she was not.

The first through railway train passed Winnipeg on its way from Montreal to Vancouver on Dominion Day, 1886, and the west felt that this Canadian Pacific Railway was the iron band that joined the confederated provinces into one great Dominion.

Canadian Unity.

All civilization, as has been said of legislation, must be a compromise. A compromise is not necessarily a disgraceful thing. Mind and body are of different composition, different qualities, different purposes, and yet in the one human being they are mysteriously interrelated and blended so that they act together, sympathize with one another, rejoice in the same good fortune or lament and suffer in the same misfortunes. So a country made up of different elements, composed of different local sections, even having different interests, can be skillfully bound together to make a substantial working unity.

And so, while our key-note of progress in Canada is unity, yet, as these parallels show, this does not require an absolute uniformity. A forced unity might destroy effort and check progress.

Unity with diversity is surely the true watchword for Canada.

(*a*) *Economic Conditions.*—Kipling may say "O, East is east, and west is west", but if Canada is to be a nationality, full-pulsed and dominant, there must be some "juste milieu," some fair average of business community—of trade interest—between east and west. We cannot all live by shop and factory; we cannot all live as town or city middlemen or capitalists; we cannot all live from the school, the university, the church; nor can we all live from the farm or ranch, which is the hope of western Canada.

But it is the duty of statesmen to help us all live by a comprehensive east-west or west-east policy, growing out of consideration of one interest for the other.

Time was when Manitoba was dissatisfied and rebellious toward the Dominion. "Manitoba First!" was the cry. "Appeal to the foot of the throne!" "Strike for an independent West!" These were heard in the western air.

But wisdom sent forth her voice, and thoughtful, patriotic men of the west said "No! The east will deal justly with us. Our motto is 'An United Canada.'" This was the answer of the wise.

Patriotism, persistence and patience won the day, and we have to-day a satisfied and hopeful western Canada. Unity of spirit grows from equality of opportunity. Class privilege and the tyranny of capital have had their day. Character and achievement should be the true basis of respect between man and man, and between province and province. "Sense and worth" must be the binding tie of east and west.

(*b*) *Political differences.*—Canadian unity, however, is quite compatible with political difference. Party government seems the best expedient yet devised for the combination of a strong executive with a critical opposition, to correct mistakes and suggest alternative lines

of action. A bitterness of party strife and a dissatisfaction with party subserviency have led a number of well-meaning people to advocate no-party government. "No-partyism" where tried has generally led to secret combinations of localities or cliques to obtain certain local and sectional advantages which might not be for the public good. The elevation of one important reform in contradistinction to another, such as is seen in the French and German parliamentary bodies, seems to throw legislative bodies at times into chaos. The good old dignified style of party government along the lines of general policy, which we have learned from the mother of parliaments at St. Stephen's, seems the best. However, even this may be abused. Policies, not men and not party watchwords or hereditary bias, should be our method. Western Canada has been of service to Canada in supplying new questions. New issues may disturb the partisan, but awaken the interest and supply field for the activity of the patriot. Western Canada, to use the picturesque western idiom, does not afford "an easy proposition" to the professional or "dyed in the wool" politician. The City of Winnipeg, which usually has voiced the mind of the west, has for forty years of its existence fairly divided its representation between Liberals, Conservatives and Laborites. The provincial representation of Manitoba had been "no-party" at first, and then was Liberal and Conservative in alternation. The Northwest Territories up to the time of the formation of the new provinces had a no-party government. In civic matters, Winnipeg and the other towns and cities of western Canada have given remarkable instances of a determination to subordinate class, political party, religious differences and even trade policy to the general city welfare.

It is a hopeful thing for a country when city, town and country can say to the political parties—Whig or Tory—whichever of you will present us the best policy, the best executive ability, the most progressive and most patriotic programme, will have our support. The people may at times make a mistake, but the writer is not yet prepared to give up the old maxim: *Vox populi, vox Dei.*

(*c*) *Language.*—What about the vexed question of language, as affecting Canadian unity?

One salient feature in the diversities of our Canadian life is the difference of the English and French languages among the original Canadian population which has prevailed for one hundred and fifty years since Canada or New France became English. The mere logician demands uniformity, and says that equality of treatment would require that German, Scandinavian and Galician should have, because they are spoken by large bodies of our western people, the same official recognition as French. But treaty rights, a century and a-half of usage, and a

large native-born section of more than two and a-half millions of French Canadians, place their claim upon a distinctly different plane from that of any others of our people of non-English nationality.

It was a great surprise to the writer—a western Canadian—on being at one time a resident of old Quebec, to hear the English-speaking Quebecer talk of the "Canadians," meaning the French Canadians, and however much it has now been widened, we must admit their priority of right to its use. French is one of the classical languages of the world; it has a worthy, a brilliant literature; it is the European language of treaties. Such difference of language does not interfere with our unity of action and is entirely compatible with our Canadian unity. What does history show? The small but brainy land of Scotland—which has worked out a good many world-questions—shows us that one hundred and fifty years ago there were hostile races, speaking different tongues. Culloden was a Saxon victory over the Highlander, as the taking of Quebec was over the French Canadian. The linguistic difference was probably more marked in Scotland than it was in Quebec. The Highlander is intensely fond of his Gaelic tongue. There was largely a religious difference at that time as well. But in the battles of the empire, in the struggle for political liberty, and in the advance of education, the Highlander with a rocky and unresponsive soil, has made the nation as truly his own as has his Lowland fellow subject. The difference between the Gael and Sassenach still continues; but they both sing with equal intensity "Lochaber no more" or "Scots wha hae." There is a substantial unity.

A still older parallel is at hand. William the Conqueror captured England, and he and his nobles held it with a military grasp, severe almost beyond conception. The French language was used in the English parliament for three hundred years to the exclusion of English. Large numbers of Angevins occupied England; Mary of Guise brought many French people and French customs to Scotland. Thousands of French refugees carried their language and their industrial arts to England in the 17th century, but English and French were thus united in making the dominant race of the world. The descendants of the French colonists are still allowed their worship in the crypt of Canterbury Cathedral. Manitoba University is a union of interests which allows the use of French to its students in their examinations, and this Royal Society is a union of Literary and Scientific interests which shows the principle of a unity with diversity. Bound as we are to work for Canadian unity, we will not listen to the mere doctrinaire who forgets the old alliance, the old understanding, and the joint sacrifices in defending one's native land. The old custom has not lost its fragrance. There is room for it yet even in a busy, practical, non-poetic age.

(*d*) *Religious divisions.*—Nor is this national unity in any way inconsistent with religious differences, unless these be fierce, unreasonable and unchristian. Liberty of conscience, within the limits of national safety, is the right of every Canadian. The right to worship God, unmolested and uncontrolled, is our British heritage.

At the same time experience proves that, to be a strong people, religion must be an element of the national life. General Wallace in his Mexican story "The Fair God," shows how the discouraged Aztecs had no cohesion and no courage to face the Spanish invader Cortez, until religious fervor—though a false and bloody belief it was—was kindled to give inspiration. A nation of atheists cannot continue to be a great nation. True, some tell us that there may be different religious ideals adapted to different casts of mind. Whether this be so or not there must be protection by the state of religious rights.

It is generally recognized that the voluntary determination of the different religious bodies of eastern Canada to follow those of their own faith with the means of religious worship, in the Canadian west, has been one of the strongest bonds of union between east and west. In the rush of population westward in the United States the immigration exceeded the efforts of the churches to follow it, and anarchy, violence, and uncontrolled vice brought shame on that nation. It has not been so in western Canada. The great churches of Canada, on the best of terms with one another, have kept up with the foremost advance of settlement, even to the British Columbian valleys and the miners' camps of the Yukon. In western Canada the men of every church who are true to the spirit of their office, who are self-sacrificing and broad-minded, have the respect of the whole community and have co-operated in charities, education, public morals, and in national and patriotic movements—all tending to a Canadian unity.

(*e*) *Education.*—But the great national unifier is the Public School and the College. Here we are on debatable ground. It is perfectly easy for anyone to see the difference of ideal, according as we give greater importance to education by the church, the guardian of religion, or to the state, as requiring for its welfare an intelligent electorate. We are dealing at present, however, not with the system, but looking at education as the agency for building up an united and powerful state. All the provinces of western Canada have looked at education—and this includes provincially-provided or church-provided schools—as a most important agency in unifying our people. The one fact that the English language is taught in our schools of every class is a proof of this. A visit paid by His Excellency, Earl Grey, a few months ago, to the Winnipeg schools, which are famous for their efficiency, was a surprise to him. There are probably more than 4,000 children of foreigners,

speaking some twenty different languages in these schools. They are there by right. His Excellency described to the Canadian Club of Winnipeg the neatness, "set up," air of self-respect and sprightliness of these pupils. There was a Russian boy who had only been half-a-year in the country commanding with distinction one of the companies of the splendid body of 1,500 cadets of the Winnipeg schools. In these schools the children sing the patriotic songs of Britain and Canada, and over every public school in Manitoba the Union Jack is hoisted on every school day. The reading books in all of the provinces are full of patriotic selections. There is no honor more regarded by these young foreigners of Icelandic, Scandinavian, German or Ruthenian blood than to be called Canadians. These diverse nations are forming one nation. So in the higher educational institutions. The University of Manitoba, formed by a union of religious bodies, under the ægis of the state, which this year examined upwards of 1,200 candidates, finds some of its best students among these foreign immigrants. In 1909 the Rhodes scholar of Manitoba was Skuli Johnson, son of an Icelandic immigrant, and again in 1910 the Rhodes scholar is Joseph Thorson, who last year, in receiving a gold medal for public speaking from the hand of the writer, afterward objected to the reference to his Icelandic origin, maintaining that he was born and educated in Winnipeg and was therefore a Canadian.

Problems.

In this discussion of Canadian unity there are, however, two problems which cannot be avoided. The first of these is :

(*f*) *The Foreigners.*—Canadian legislation very distinctly provides for excluding unsuitable immigrants. But this must be done with reason, for it will be remembered that the chief reason of the South African war was to compel the Transvaal to be just to the Uitlanders.

Will the foreigners make intelligent and useful Canadians? With the Mennonites and Icelanders, who came a third of a century ago and have answered this question satisfactorily, we need not deal.

The two bodies of foreigners from the Continent of Europe—the Doukhobors and Ruthenians—are those about whom the controversy rages.

Of the Doukhobors, a sect similar to the Quakers who came from the Russian Caucasus, and number from eight to ten thousand, it may be said that they are a stalwart race, are communists, vegetarians, live normally in villages, and are as a rule a moral and religious people. Under the persuasion of the Government one-third of them have given up the village system and are settled on their homesteads. A portion of them have removed from Saskatchewan, where they were all settled, to the

fruit lands of British Columbia. They are successful farmers, have means, take large railway contracts, and are very reliable. The writer a few months ago, coming through Saskatchewan on the Canadian Northern Railway where the train crossed the North Saskatchewan River, was conversing with the western Superintendent of the railway. He remarked, "This division of the railway is entirely manned by Doukhobors, and it is the best managed division on the line." True, a group of these people, of one or two hundred, are enthusiasts, believe in going back to nature in dress, went on a pilgrimage eastward to convert the Canadian people, and are troublesome to the Government and the police. But the vagaries of this band should not condemn seventy or eighty times their number who are industrious, law-abiding and well-to-do people.

The other and largest body of foreigners who have been settling in the three prairie provinces, for the past ten or fifteen years, are the Ruthenians, including the Galicians, Bukowinians and other relatives of the Poles. It is claimed that there are 100,000 of these in western Canada. They are scattered on many reserves and in almost every city and town where labor is required. They are Slavonian in race, are active, quick-tempered and industrious people. They are exceedingly economical and thrifty. They are largely of the Greek Church in religion, though some of them are Roman Catholics. They are excellent linguists, many of them speaking several languages. They far excel the English-speaking people in this faculty. They learn English very rapidly and are anxious to do so.

The chief question with us is, Will they obey our laws, accept our customs and our political system? The vast majority of them are peaceful and industrious. They are essential to the development of the country. They dig the sewers, build the streets, labor on the railways, do the heavy work in the towns and cities. Their young women go by thousands through the whole country as domestics and carry back to their homes ideas of the dress, manners, and views of the Canadian farmers whom they serve. The women are invaluable household workers in the cities and towns where domestics are scarce. Without doubt, judging from their desire to learn Canadian ways, and if they have schools, they will form a useful element in our nation-building. The same might be said of Hungarians, Scandinavians, and other European peoples.

Take a historical parallel from our own Canadian life. Is Ontario the worse because hundreds and thousands of the Hessian and Swiss foreigners from central Europe settled in Prince Edward county and the Bay of Quinte district? Would we not have been poorer in different ways if the larger settlements of Germans, Mennonites and Tunkers

which are north of Toronto had not been? Had we not in Ontario whole townships of Highland and Irish fisher-folk, who were unskilled in agriculture, who became, at any rate in their children, farmers and business men of the best type? What shall we say of companies of immigrants of four and five hundred families coming at one time, who in early Ontario had rations issued to them for eighteen months, and contrast this with the immigrant of to-day who must have money in his pocket? What can Nova Scotia and Ontario say, when the former had hundreds and hundreds of Maroons, brought from Jamaica, reaching 7,000, and when the latter had in its western peninsula 12,000 Africans just brought from the grasp of slavery to be assimilated?

Those who come to us are our fellow men. If they obey our laws and our customs they have a right to come. We are only entitled to possess what we can use. The great vacant prairies we have are God's land, and they are for his poorer children of whatever race. Let us not be wiser than our fathers. They were made up of swarthy Iberians, and ruddy Picts, and stalwart Britons, of masterful Dalriads and staid Angles, Jutes and Saxons, of blue-eyed Norsemen, of enterprising Danes, of Norsemen and Angevin conquerors, of French refugees, Jewish merchants—a great strong composite.

Can we do better than they have done?

(*g*) The second problem is that of the great influx of Americans into western Canada. It is well to be watchful; but before we can judge of this it is essential that we should know the character and motives of those who are coming in so great numbers to Canada from the United States. Late statistics by men in authority state something like the following figures as to the origin of the American immigrants coming to us:

English speaking	Germans, &c.	15%
	Scandinavians	25%
Returned Canadians or their children		40%
Native born Americans		20%

These figures are intended to include the three western Canadian prairie provinces. In Manitoba alone, lying as it does alongside of North Dakota, which for thirty miles along the boundary was settled entirely by Canadians, the proportion of Canadians coming to us would probably reach forty or fifty per cent. In Manitoba almost all who come purchase farms, as homesteads are not available.

Manitoba.—It may be well to give details of a few settlements as illustrations. These are all within forty miles of Winnipeg:

A. Numbers of American families making up one-half of one church were returned Canadians and their children from

Dakota, who originally came from Huron, Peterboro and Glengarry. One of these families gave four children University education, one daughter taking the classical medal and travelling scholarship for two years.

B. Leading farmer born in England. Came from Missouri. Thorough Britisher.

C. Forty families of English-speaking Scandinavians from Minnesota; Lutherans. Merchants in town; and farmers. Well-to-do.

D. Seventeen families; two from Kentucky, English-speaking. Remainder English-speaking Norwegians, chiefly Lutherans. Farmers—each farms from 600 to 2,000 acres. Six steam ploughs in settlement.

E. Several families, all returned Canadians.

Almost every settlement within sixty miles of Winnipeg has American families—well-to-do; law-abiding; mixed in religious denominations. In all these settlements there are good schools.

Saskatchewan.—(All within sixty miles of Moose Jaw).

A. Large settlement—forty families. Several Canadian merchants in the town—come as repatriated settlers chiefly from Iowa. Follow dry farming. All satisfied. Half of them were returned Canadians. A large connection originally from Richmond, Quebec. Fine schools erected; eleven denominations united in erecting a church costing $6,000, virtually paid for.

B. Considerable town. Families from Dakota, Nebraska, &c. Large Nova Scotia element. Returned Canadian from Dakota—a Councillor; another of the same—notary public and capitalist.

C. New town on Outlook branch. Large settlement, chiefly Canadians from Minnesota; eleven cars took the party from Park River, Minnesota—half way between Winnipeg and St. Paul. Had been thirteen years on poor soil, sandy. Informant had not been able to visit home in Stormont, while in the United States, in thirteen years. Has been four years in Saskatchewan and will visit home next year. Have schools, religious services and progressive settlement.

Alberta.—A. Mormon town—1,500 people, chiefly Americans. Large beet sugar refinery. For four or five miles around town a continuous beet field. Only eighty Gentiles altogether in the town. These are Canadians: Irrigation Company Manager, Doctor, Editor, Minister. Good schools; four school

teachers. Town and fields irrigated with water brought in a canal forty miles. Large Mormon church in which writer, at their request, lectured on "Mound Builders."

B. Town between Calgary and Edmonton. Majority Americans. Several years ago, at public gathering on 4th July, trouble about raising stars and stripes above British building. Never attempted since. Good schools and churches.

C. Many Germans. Americans numerous. Best school building between Calgary and Edmonton.

Salient Points.

1. American settlers without exception declare their preference for Canadian laws. They declare that there is a plenty of laws in the United States, but they are not enforced.
   In each town a mounted policeman (in Saskatchewan and Alberta) is found. The Americans all express satisfaction at this protection unknown to them in their own country.
2. Sunday laws are lax in the United States.
   Case after case is given of these settlers beginning work on Sundays in Manitoba having been stopped—only warning is necessary.
3. All want schools. They say our Canadian schools are more thorough than their own were.
4. They declare that Canada gives greater advantages to the farmer; Taxes less; land cheaper; railways better controlled.
5. Merchants are more reliable.
6. Church attendance is better in Canada.
7. Almost all become British subjects and become voters.
8. Coming from the far western states they have taught Canadians many things about dry farming, &c.

An induction from facts such as these shows that the American is a most valuable, peace-loving, law-abiding immigrant.

Conclusion.

In closing take a historical parallel. The following are quotations from standard works:—

"After the year 1800 all parts of Ontario open to settlers became the favorite hunting ground for homes."

It is interesting to note that the Loyalists were displeased with Governor Simcoe for encouraging Americans to come. "The counties

of Haldimand, Norfolk, Wentworth, and Welland were largely settled by Americans from New York State, New Jersey and Pennsylvania."

"The influx of immigrants," says a writer, "took place across the Niagara River even up to the London District." It is declared that "the Quakers, Mennonites and Tunkers and such settlers from the United States, while a pacific and desirable element, yet held principles entirely at variance with those of the Loyalists."

"The Pennsylvania Dutch opened up Waterloo district and were joined by Mennonites."

"The eastern townships in the Province of Quebec were occupied by an industrious and intelligent class of Americans."

Even later, a much less desirable class of Americans came to Ontario. These were squatters, frequenters of the wayside taverns, with children unclad, and their parents utterly illiterate. They were profane, dishonest and irreligious. They are strongly spoken of by Talbot, McTaggart, Bennycastle, Mrs. Moodie and other writers; and yet from such materials, by the aid of the school and the church, were some parts of the Dominion built up.

We rely in western Canada on the same intensity of conviction on the part of loyal Canadians as there was in the days of yore. We have advantages of education and religion that the early Canadians had not. We have now an immensely stronger Canadianism than ever existed before. The foreigners are attracted now as never before by the strong Canadian sentiment in all parts of the country and want to be with us.

If Ontario with much greater early disadvantages has become so loyal, and so true, shall not we as a nation lift up our banners and stand as steadfast British Canadians from Sydney to Victoria? Hear the words of our late Laureate, and we may read into them any kind of Imperialism we wish:—

"Shall not we through good or ill
Cleave to one another still?
Britain's myriad voices call,
'Sons, be welded, each and all,
Into one Imperial whole,
One with Britain, heart and soul!
One life, one flag, one fleet, one throne.' "

APPENDIX B

MARINE BIOLOGICAL STATIONS OF CANADA

By

E. E. PRINCE

Commissioner of Fisheries

MARINE BIOLOGICAL STATIONS OF CANADA.

The three Biological Stations at St. Andrews, N.B., at Go Home, Georgian Bay, Ont., and at Departure Bay, near Nanaimo, B.C., have continued their active operations under the Department of Marine and Fisheries during the past year.

The fine and commodious permanent buildings in the estuary of the St. Croix River, Passamaquoddy Bay, N.B., about 2 miles out of St. Andrews, proved admirably adapted to the purpose of marine biological and fishery investigation, and, during the season of 1909, Professors and University Assistants from the various Canadian Colleges have pursued important investigations, all having more or less direct bearing upon the fisheries of the Dominion. Professor Penhallow of McGill University, Montreal, was again Director of the Station, and under authority from the Biological Board he supervised the researches carried on by the staff. The problems taken up included the following:—

Experiments with traps made with wide slats, to decide if lobsters under 9 or 8½ inches escape if captured in such traps.—Retaining lobsters in enclosure to decide growth in course of season.—Rearing experiments on Dr. Mead's plan.—Retaining live squid or cuttle fish in floating cars for bait.—How long will they live when fed and thus confined?—Continued Plankton work.—Breeding for Mollusks.—Do shad occur in herring weirs?—Breeding of smelts, eggs and young.—Continuation of studies on food of fishes.—Algal studies, Diatoms and lowly plant life.—Information as to St. Croix salmon, ascent, and descent of smelts, &c. —Land-locked salmon and other fish in Chamcook Lakes.—Food of herring off Grand Manan, large shrimp-like forms, &c.—Experiments in marking fish planned last year; fish to be taken by Station Staff and liberated after marking.—Faunistic work continued.—Food of Shad samples from up the Bay of Fundy.—Marine Algae of the Bay.

Several members of the Staff pursued additional researches, and one of them, Professor E. W. MacBride, spent some time on Prince Edward Island, completing the oyster-culture experiments, which have for several seasons been conducted at Baltic River in the province named. The Provincial Government had kindly granted a reserved area on Baltic River for scientific oyster experiments by the Staff of the Station. Much of the work done during the last three or four years is now sufficiently advanced to enable printed reports to be issued, and the following list of valuable reports and memoirs, illustrated by over twenty plates, will appear shortly as Volume III of "Contributions to Canadian Biology."

I. Report on the Atlantic Biological Station of Canada. By Professor D. P. Penhallow, D.Sc., F.G.S.A., &c., Professor of Botany, McGill University, Montreal, Director of the Station, 1908-9.

II. Fishery Bait Experiments. A Report on the Comparative Merits of Different Kinds of Bait used in Codfishing along the Gaspé Peninsula. By Professor A. P. Knight, M.A., M.D., &c., Professor of Animal Biology, Queen's University, Kingston.

III. Observations on the Actinias occurring in the neighbourhood of the Biological Station, St. Andrews, New Brunswick. By Professor J. Playfair McMurrich, M.A., Ph.D., Professor of Anatomy in the University of Toronto.

IV. On the Fauna of the Atlantic Coast of Canada, Second Report (Malpeque, 1903-04). By Dr. Joseph Stafford, M.A., Ph.D., Lecturer in Zoology, McGill University, Montreal, Curator of the Station.

V. On the Fauna of the Atlantic Coast of Canada, Third Report. By Dr. Joseph Stafford, McGill University, Montreal.

VI. On the Fauna of the Atlantic Coast of Canada, Fourth Report. By Dr. Joseph Stafford, McGill University, Montreal.

VII. Notes on the Fishes of Tignish, Prince Edward Island. By George A. Cornish, B.A., University of Toronto.

VIII. On a Collection of Crustacea made at St. Andrews. By D. L. MacDonald, B.A., McGill University, Montreal.

IX. Parasitic Copepods from Nanaimo, British Columbia, including eight species new to Science. By Dr. Charles Branch Wilson, Sc.D., Department of Biology, Normal School, Westfield, Mass.

X. Holostomatous Ascidians from the Coast of Western Canada. By Dr. A. T. Huntsman, B.A., M.B., &c., Lecturer on Biology, University of Toronto.

XI. Preliminary List of the Decapod Crustaceans of British Columbia By Rev. George W. Taylor, F.R.S.C., F.Z.S., &c., Curator of the B.C. Biological Station, Nanaimo, B.C.

XII. A New Genus and Species of Cottoid Fish from Departure Bay, Vancouver Island, B.C. By Professor Charles H. Gilbert, Ph. D., &c., Leland Stanford Junior University, California.

XIII. Oyster Culture and the Clam Fishery, Prince Edward Island. By Professor E. W. McBride, M.A., D.Sc., F.R.S., London, lately Professor of Zoology, McGill University, Montreal.

XIV. On the Recognition of Bivalve Molluscan Larvae in Plankton Collections. By Dr. Joseph Stafford, M.A., Ph.D., McGill University, Montreal.

XV. Contributions to the Physiology of the American Lobster.
1. The Physiology of the Intestine. By Dr. F. P. Miller B.A., M.B., Demonstrator of Physiology in the University of Toronto.

XVI. Some Recent Diatoms, fresh-water and marine, from the vicinity of the Atlantic Biological Station, St. Andrews, N.B., By Professor L. W. Bailey, LL.D., F.R.S.C., University of New Brunswick.

XVII. Notes on the Flora of the St. Croix River Valley and Passamaquoddy Station, New Brunswick. By A. B. Klugh, M.A., Queen's University.

XVIII. The Temperatures and Densities of Passamaquoddy Bay Waters and Environs, with notes on allied subjects and the bearing of the same on the Oyster Industry. By C. G. Copeland, B.A., University of Toronto.

XIX. The Geological Environment of the Pacific Biological Station, Departure Bay, B.C. By Professor E. M. Burwash, M.A. B.D., New Westminster, B.C.

XX. Methods of Marking Fish for the Determination of Migration. By Professor Edward E. Prince, F.R.S.C., Dominion Commissioner of Fisheries, Canadian Representative on the International Fisheries Commission, Vice-President of the International Fishery Congress, Washington, D.C., and Chairman of the Biological Board of Canada.

Two smaller fasciculi have previously appeared, in the year 1901 and 1907 respectively, as Appendices to the Fisheries Report of the Department of Marine and Fisheries.

It is with regret that the serious illness of Professor Penhallow is recorded in this place. There can be little doubt that, apart from the strain of academic and scientific work, his heavy and assiduous labours in connection with the Atlantic Biological Station, did much to bring about this unhappy result. The staff of the Station join in the wish of all Dr. Penhallow's scientific *confrères* that he may have an early and complete recovery. The Pacific Biological Station, admirably situated in the beautiful bay near Nanaimo, Vancouver Island, called Departure Bay, was again in charge of a distinguished Fellow of the Royal Society of Canada, the Rev. George W. Taylor. Mr. Taylor himself made remarkable collections of fishes and marine invertebrates, and prepared

a report on the crabs, shrimps and decapod crustaceans of British Columbia; but among the staff of workers were Professor J. Playfair McMurrich, Dr. A. T. Huntsman, both of Toronto University, and Professor Burwash of New Westminster. In connection with this station Dr. Charles B. Wilson, the recognized expert on Copepod Crustaceans in the United States, has completed a splendid report, with fine series of drawings, of the Parasitic Crustaceans collected at Nanaimo; while the eminent fishery authority, Dr. Charles H. Gilbert, of Leland Stanford University has contributed a description of a new fish captured near the Station.

During the season of 1909 President David Starr Jordan, of California, visited the Station, and in September a large party of members of the British Association made a two days' stay there, and expressed themselves astonished with the exceptional facilities offered for original work in science, and at the fine buildings and equipment, for which the Dominion Government provided funds. To the Rev. G. W Taylor is due the great credit of the initiation and completion of this notable scientific laboratory in British Columbia.

The party, who journeyed from the Winnipeg meeting of the British Association to Nanaimo, included Professor Starling, F.R.S., London; Professor Stanley Gardiner, Cambridge, England; Professor Jungersen, Copenhagen; Professor A. B. Macallum, F.R.S., Toronto; Professor Harold Wager, Leeds; Dr. Marett Tims, Cambridge, and others; and among the non-professional visitors were Sir Mackenzie Bowell, the Mayor and City Council of Nanaimo, and others.

The Great Lakes Station, at Go Home Bay, Georgian Bay, was open for research under the superintendence of Dr. B. Arthur Bensley, Assistant Professor of Biology, Toronto University, and an efficient staff, chiefly from the University of Toronto, who collected material in the waters of the Bay, and conducted original investigations on the rate of growth of black bass; the effect of various meshes of nets in fishing, and other interesting subjects. Several reports are nearing completion, embodying the results reached by the staff at the Station.

APPENDIX C

THE METEOROLOGICAL SERVICE OF CANADA

By

R. F. STUPART
Director Dominion Meteorological Service

THE METEOROLOGICAL SERVICE OF CANADA.

A fairly comprehensive report of the system of weather forecasts and storm warnings in connection with the Meteorological Service was given in last year's Proceedings, and the description therein will apply equally well to the past year, during which there has been no break in the work of the Service. An important extension of the boundaries within which the forecasts and storm warnings are disseminated has, however, been made by the inclusion of Newfoundland, which colony has since February received Meteorological bulletins quite similar to those distributed in the Canadian Provinces. For the purposes of forecasting Newfoundland is not quite as well situated geographically as are the Maritime Provinces, inasmuch as a certain percentage of high and low areas approach the island from the territory between Labrador and Hudson's Bay, while others move northward from the Atlantic; and it is only from barometric changes occurring at Bermuda and Sable Island that their approach may be suspected. The Newfoundland Government has established valuable stations at Pointe aux Basques in the extreme west and at Burin in the south, both of which forward bi-daily reports to Toronto. Other stations in the north are desirable, and it is hoped that a station will shortly be placed near the mouth of Hamilton Inlet, to give indication of barometric changes occurring on the Labrador Coast. During the past year the percentage of verification of storm warnings issued to Canadian ports has been 92.0, which is 2.2 per cent higher than in the previous year, and the percentage of verification of the daily forecasts issued at 10 p.m. has been 86.3.

The barometric stations which were established in the summer of 1908 in the valley of the Mackenzie River are furnishing most valuable observations of atmospheric pressure in the far north, and while as yet the data available are insufficient to allow of definite conclusions as to the cause of the formation of anti-cyclones in high latitudes, it is obvious that important progress has been made towards filling the gap in a region hitherto furnishing only scattered and occasional reports.

It is doubtful whether there is any other region of the globe where the distribution of atmospheric pressure has so pronounced an effect on weather conditions as in Southern Alberta, and this because a barometric gradient for northerly winds in winter means the transference of air from continental high latitudes across this country, while a westerly gradient means the flow of mild ocean air still further raised in temperature by the chinook effect. Within the boundaries of this region a high level Meteorological station was established about ten years ago, on

Sulphur Mountain, Banff, at an altitude of 7,484 feet; and this observatory begins to yield a harvest of facts concerning the movements of the upper strata of the atmosphere. The marked contrast in the character of the vertical temperature gradient, as indicated by observation at Sulphur Mountain and Calgary in warm seasons and cold seasons, is instructive, and cannot fail to be of value in the solution of problems connected with the physics of the atmosphere and in the study of the climate of our western plains.

A further extension of the work of the Central Office is now proposed, and with this end in view the services of a highly trained physicist have been obtained, and investigation of atmospheric currents will shortly be made by kite and sounding balloon, and observations of atmospheric electricity and conductivity and ionization will be carried on concurrently with the study of pressure changes.

Magnetic Observations.

The instruments at the Magnetic Observatory, Agincourt, have been kept in operation throughout the year. Weekly determinations of the absolute values of declination and dip and bi-monthly determinations of the horizontal force have been made, and, from the results obtained, the values of the photographic records of the variometers have been computed.

During the month of October the observer in charge took simultaneous observations of declination, inclination, and horizontal, force with an officer of the Dominion Astronomical Observatory; and during November observations were taken with two officers of the Department of the Interior in order to determine the constants of dip circle No. 77.

The Surveyor General having inaugurated the taking of compass determinations of declination by certain surveyors, it became necessary to establish the index corrections of these instruments, and, in accordance with his instructions, sixty-two instruments have been sent at various times to this Observatory by surveyors engaged in the work.

The index corrections to these instruments have been established by comparison with our Standard declinometer, two sets of observations being taken for each instrument. Duplicates of these observations have been sent to the officer of the Topographical Branch who has charge of this work, together with such comments as were deemed necessary. It is very obvious that the observatory holds an important place as a base station for the science of Terrestrial Magnetism in Canada, and also as a centre at which the standard instruments of other countries may be compared with those of the Dominion. Within the past year determination of the Magnetic values have here been made

with the instruments loaned by the Carnegie Institution for Scientific Research for use on the D.G.S. "Arctic" during the year 1908-9, thus affording a very satisfactory comparison between the instruments used in Canada and those used in the United States.

During the year the Magnetic declination has increased by 4′.2; from 5°, 58′.2 west to 6°. 2′.6. The horizontal component has diminished slightly, and the mean inclination of the needle has changed from 74° 37′.4 to 74° 38′.6. A number of important Magnetic disturbances have been recorded, the most important one occurring on September 25th, coincidently with strong earth currents which seriously affected the working of ocean cables and telegraphs. The most recent disturbance occurred on March 27th., when the declination Magnetic ranged through an arc of 2°, 12′.

The officer of this Observatory assigned for special duty on the D.G.S. "Arctic," in the summer of 1908, obtained the Magnetic values at the following points: *Winter Harbour, Melville Island, Beechy Point, Dealy Island, Cape Bounty, Bridport Inlet, Griffith's Point, Point Gillman, Byam Martin Island, Point Hotspur, Bathurst Island, Browne Island, Barrow Strait, River Clyde, Baffin Island, Blacklead Island, Cumberland Gulf, Port Burwell* and *Ashe Inlet.*

The Milne Seismographs at Victoria, B.C., and Toronto have been kept in successful operation throughout the year: 71 disturbances were recorded by the former instrument and 65 by the latter, the number of large disturbances being somewhat less than for several years past.

The Mexican disturbance of July 30th, was the largest of the series, and vibrations on the seismographs at Victoria exceeded the scale of the instrument, shewing a tilt of over 15″.2, in striking contrast to the small movement recorded at Toronto. In the larger number of cases the other disturbances were indicated by a mere thickening of the line. On September 30th, the Toronto seismograph was installed in the basement of the new Meteorological Office in what appears to be a most satisfactory position, as there is no indication of air tremors which so frequently vitiate seismograph records.

APPENDIX D

THE DOMINION ASTRONOMICAL OBSERVATORY

By

W. F. KING, C.M.G., LL.D.

THE DOMINION ASTRONOMICAL OBSERVATORY.

In previous reports descriptions of the instruments in the Observatory have been given, and the nature of the work done has been explained.

During the past year the work has followed the same general lines. There has been no important addition to the instrumental equipment, though several minor improvements to the existing apparatus have been made.

In the Division of Astrophysics the determination of the velocities of stars in the line of sight has been the principal work. During the year ending March 31st last, the number of stellar photographs taken for this purpose averaged 76 per month. These are all measured here with special micrometric instruments, and the results deduced. Seven orbits of spectroscopic binaries were thus determined during the year, and seven more in part.

In the use of the spectrograph in these observations a weakness of the spectra at the violet end was observed. This was traced to error in collimation of the correcting lens, the supports of which within the telescope tube are subject to a slight degree of flexure in different positions of the telescope. The resulting collimation error has the effect of spreading out the star image on the slit unequally, as regards rays of different refrangibility. Since, during the exposure, the visible part of the star image is held on the slit, the visual part of the spectrum is intensified at the expense of the actinic. As it is impossible to prevent this flexure, the collimation has been made adjustable, and the best adjustment for different positions of the telescope has been determined experimentally.

An investigation of the effect of width of slit on the accuracy of line of sight determinations has shown that equal accuracy may be obtained with the slit one-twentieth of a millimetre in width, as with the usual slit of half that width.

The accuracy with different dispersions has also been the subject of investigation, and it has been found that the probable error of the velocity determined does not increase as rapidly as the dispersion decreases, but at a less rate. Thus dispersions of 10 and 33 tenth-metres to the millimetre gave velocities with probable errors of 0.5 and 0.7km. per second respectively. Against this slight decrease in accuracy there is the important advantage in using the lower dispersion, that the exposure need not be so long, and fainter stars may be observed.

The grating at first used in connection with the coelostat gave very imperfect definition unless a considerable part of it was covered. This has been replaced by a new grating which gives much better results.

The lens of the stellar camera has been refigured to get rid of spherical aberration which produced halos about the star images. Its performance is now very good. For photographing comets, a special camera with a wide angle lens has been procured. In use this is attached to the upper end of the telescope of the equatorial.

The stellar camera and the spectrograph are both attached to the large equatorial, and can seldom be used at the same time. Thus the full use of either instrument is hindered. To obviate this, it is proposed to procure a separate equatorial mounting for the camera. A small building to accommodate it is in course of erection on the Observatory grounds.

Two outside azimuth marks for the meridian circle are also in course of construction. The reference marks will be underground.

Continuous records of earth movements have been kept with the seismograph. This instrument is a highly sensitive one, and its records, being made photographically, indicate many minute movements which are lost through friction in instruments having mechanical registration. Moreover the time scale of the records is accurate, being operated in connection with the time distribution system, whereby no correction for clock error is needed. It is believed that in these respects the installation cannot be equalled on this continent.

Continuous records also have been kept, with the self registering instruments, of the small changes of air temperature and pressure. It is proposed to add to the equipment an electric self-registering anemograph, to record direction, velocity, and pressure of the wind. A structure to carry it is being erected on the Observatory roof.

The operations of the magnetic survey of Canada during 1909 comprised observations at 33 stations along the north shore of the River and Gulf of St. Lawrence, extending as far as Blanc Sablon. At each station the declination, inclination and horizontal force were observed, as well as the diurnal variation in declination. The results of this expedition will be the more valuable, in that hitherto few magnetic observations have been taken in that region.

During the present season magnetic observations are being made at frequent intervals along the main line of the Canadian Pacific Railway from Lake Superior to Regina, also at many points in the Province of Ontario.

Astronomical latitudes and longitudes were determined for geographical purposes at fifteen stations, including seven in the Maritime

Provinces, four in Ontario, and two each in Saskatchewan and Alberta. The time signals for longitude were exchanged with the Observatory except in the case of the four western stations, the basal point for which was a small transit house erected on Fort Osborne barrack ground, Winnipeg. To determine the longitude of this station, time signals have been exchanged between it and the Observatory this summer. Other western stations are now being observed at.

The International Boundary Surveys have made considerable progress. Two hundred and fifty miles, or thereabouts, of the 141st meridian, from the St. Elias Alps to and across Yukon River, are practically completed, and active operations are in progress in the projection of the line north of this towards the Porcupine. The survey of that part of the boundary of the Alaska Coast Strip, which was dealt with by the agreement of 1905, has been completed, and the survey of the remainder of this boundary is approaching completion. The survey of water boundary along the Straits of Georgia and Fuca was undertaken last year, and is nearly finished.

On the re-survey of the 49th parallel, eastward from the Rocky Mountains, it is anticipated that by the close of the present surveying season 700 miles will have been completed. The re-survey of the boundary between New Brunswick and Maine, following the River St. John, is in progress, as well as the survey of the St. Croix River, also a boundary between Maine and New Brunswick.

The treaty of 1908, under which these boundary surveys along the southern boundary of Canada are made, left the boundary line undefined for a short distance in Passamaquoddy Bay.

This piece has been covered by another treaty recently entered into, which finally defines the line there.

The operations of the Geodetic Survey have comprised measurements of angles of the triangulation in Ontario and Quebec and at the Bay of Fundy. Reconnaissance for triangulation has been carried on in the western peninsula of Ontario and in the Maritime Provinces. Precise levelling was performed last year in New Brunswick, Quebec and Ontario by two parties. This year three of these parties are in the field in the Maritime Provinces, in Ontario and in Manitoba. A base line has been measured with invar tapes near Coteau Junction, Que.

APPENDIX E

REPORTS OF ASSOCIATED SOCIETIES

I.—*Report of the Natural History Society of Montreal,*

Presented by Mr. Harry Bragg, M.J.I., Honorary Librarian and Delegate.

The Natural History Society of Montreal, which is now in the eighty-fourth year of its age, is pleased to be able to state that its work during the past year, so far as the regular courses of Free Public Lectures are concerned, has been carried on energetically and successfully, and that the larger attendance of the public has shown ever increasing interest in the questions chosen for these lectures. The Saturday afternoon lectures for Children were so popular that a larger room had to be secured to accommodate the audiences, while the large Hall of the Y. M. C. A. Building was crowded at several lectures of the Somerville Course.

The Programmes of the Three Courses given by the Society were as follows:—

Regular Monthly Meetings of the Society.

"The Work of the St. Andrew's Biological Station," by Dr. D. P. Penhallow.

"Animal and Plant Life in the Mackenzie Basin," by Fred St. Lawrence, F.R.G.S.

"The Natural History of Death," by Prof. J. C. Simpson.

"The Mineral Resources of Northern Ontario and Quebec," by Dr. Alfred E. Barlow,

"The Sleeping Sickness," by Dr. John L. Todd, M.D.

Somerville Lectures.

"Halley's Comet," by Rev. I. J. Kavanagh, S.J., M.A.

"The Ice Problem in the St. Lawrence," by Dr. Howard T. Barnes, F.R.S.C.

"The Nature and Origin of Ore Deposits," by Dr. Frank D. Adams, Ph.D., F.R.S., F.R.S.C.

"The Quebec Bridge," by Henry Holgate, C.E.

"Eight Months in the Swamps of West Africa," by Hilder Daw, C.E.

"Heredity and Environment," by Prof. Carrie M. Derrick, M.A.

"Darwin's Centennial," by Rev. Robert Campbell, D.D.

SATURDAY HALF HOUR TALKS TO CHILDREN,

"The Story of a Dandelion," by Prof. Carrie M. Derrick, M.A.
"The Story of a Glacier," by J. O'Neil.
"The Ferns of Montreal," by Rev. Robert Campbell, D.D.
"Mushrooms and Toadstools," by Mrs. F. H. Pitcher.
"The Story of the Coral Builders," by Harry Bragg, M.J.I.
"Some Birds of the Sea," by J. Gammell, B.A.

The annual picnic of the Society was held at Grand'Mère, and a very pleasant feature of the day was the presentation of a Silver Medal to Mr. Alfred Griffin, the only permanent official, in commemoration of the completion of twenty-one years service for the Society, and as a small recognition of his zealous and devoted work.

The Society has made another important move by purchasing the lot of land facing on Drummond St., immediately behind its new property. The Society consequently now owns about twenty thousand square feet, with frontage on both Mountain and Drummond Streets, midway between St. Catherine and Sherbrooke Streets. This property is most desirable for the purpose for which it has been secured, and is centrally situated, with a good car service near to it, yet not near enough to cause annoyance.

What is lacking now is a suitable building, where the splendid collection of specimens could be seen free of cost, every day in the year; where the fine library of books would be available to the student; and where the courses of free lectures could be delivered in properly designed halls, all the property of the Society.

This is a consummation devoutly to be wished, for the commercial capital of the Dominion is incomplete as a great city without a Free Natural History Museum; and the Society, the oldest in Canada, and the parent of the Geological Survey, and of other kindred societies, should be housed in a home suitable to its history and traditions.

The Directors live in hope that sufficient public spirit may be found to secure this desirable object within a short time.

The Officers for the current year are as follows:—

Honorary Patron.—His Excellency Earl Grey, Governor General.

Honorary President.—The Rt. Hon. 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., 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.; Mis Carrie M. Derrick, 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.—J. W. Pyke.

Hon. Librarian, Harry Bragg, M.J.I.

Hon. Curator.—A. E. Norris.

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

II—Report of the Ontario Historical Society, Toronto

Presented by Mr. Barlow Cumberland, M.A., President and Delegate.

The Ontario Historical Society is glad to be able to report to the Royal Society of Canada continued progress in its work in the Province of Ontario. It is the central society of the affiliated local Historical Societies established in most of the districts of the Province, from Prescott in the east to Fort William, Thunder Bay, in the west. Its Headquarters are in the Department of Education at Toronto, and the Minister of Education of Ontario is its Honorary President Under a special Act passed by the Legislature of Ontario each of the Local Societies becomes, by affiliation, an incorporated body entitled to hold property, such as Historical Libraries and Museums The President of each Society becomes ex-officio a Vice President, and an additional member of the Council of seven elected by the members of the Ontario Society, and the Delegates from the Local Societies, at the Annual Meeting. The scope of the Ontario Historical Society is to promote in every way study and research in Canadian History, not only in this Province, but throughout the Dominion, the collection of local memorabilia of early settlements, and the preservation of historic memorials.

The Annual Report for the year 1909 and Volume IX of the "Papers and Records of the Ontario Historical Society" are herewith presented.

We shall be glad, on application to exchange with any Historical Society or Literary or Library Association not now on our list.

During the past year, in addition to advancing the interests of our Affiliated Societies, the Central Society has devoted much attention to the recovery and restoration of visible evidences of early days in various parts of the Province.

The Dominion Government has been strongly urged to repair Fort Malden at Amherstburg, and set it apart as an historic site.

Situated in the centre of earliest French settlement, where the French language is yet prevalent, and the ancient religious establishments are still maintained, it became the starting point for the men of the locality with the forces under General Brock, for the capture of Detroit in 1812. Again in 1837–38 it was the scene of gallant defence against invasion from the other side of the river. A site to which such memories attach should not remain unmarked.

The recovery of Fort York at Toronto as an historical memorial, was mentioned in the report of last year. The restoration of the ramparts has not yet begun, as the military authorities are still in occupation of the buildings.

A Memorial Hall to Laura Secord at Queenston Heights is in progress. Some ancient graveyards of the 1812 period have received attention.

The Society is in conference with the Dominion authorities for the repair of what remains of Navy Hall, at Niagara-on-the-lake, the ancient Newark, the head quarters of Governor Simcoe, in which he received the Duc de Liancourt in 1795, and in which the first Parliament of Upper Canada held its sittings. The ramparts of Fort George are, it is hoped, also to be restored, and the precincts of the original and earlier fort again outlined. The history of 1776-1815 centres about this neighbourhood, and in one of the bastions of the Fort the remains of General Brock were first interred, prior to their removal to the monument at Queenston Heights. These memorials deserve recognition.

It is satisfactory to report that the monument at Stoney Creek, over the trench in which a number of the soldiers who fell in the action of 6th June, 1813, were buried, has been completed by the energy of the Wentworth Veterans' Association, and was unveiled in August. The marking of not a few other historic sites is in contemplation.

In this revival of memories all our Provinces from the Atlantic to the Pacific have their part, particularly those of Quebec and Ontario, which were the principal scenes of strife.

The Ontario Historical Society earnestly hopes that these days may be remembered, and trusts that all societies in the Provinces may turn the attention of their people toward the foundations upon which our United Canada has been laid and our Nationality as Canadians made possible and secured.

III.—*Report of the Elgin Historical and Scientific Institute.*

Presented by Dr. J. H. Coyne, F.R.S.C., Delegate.

The Elgin Historical and Scientific Institute has the pleasure of reporting another successful and prosperous year.

1.—Six meetings were held. The membership list includes 187 names, an addition of seven during the year 1909-1910. The number is inclusive of the Women's Auxiliary, the membership of which is limited to 100.

2.—The sum of One Hundred Dollars was received from the Provincial Government, and the Institute hopes that the grant may be continued from year to year.

3.—The survey of Talbot Road having begun in 1809, and the same year having witnessed the beginning of settlement at St. Thomas, the Institute marked the centenary of these important events by the publication in 1909 of an illustrated record of the celebration held in the year 1903 of the Centennial of the Talbot Settlement, which was begun at Port Talbot on May 21st, 1803 by Colonel Thomas Talbot.

4.—Representatives of the Institute attended the Annual Meetings of the Royal Society of Canada and The Ontario Historical Society.

5.—The interest of members in the work of the Institute has been well maintained. The attendance at the monthly meetings was highly satisfactory.

6.—Papers, addresses and readings were presented as follows:—

Dec. 6.—"Henry Hudson, his life and discoveries," by W. H. Murch.
Jan. 10.—Readings from Poems of William Kirby and Le Roy Hooker, on the U.E. Loyalists, by The President.
Feb. 7.—"Historic Niagara and its Golf Links," by Judge Ermatinger.
Mar. 7.—"The United Empire Loyalists and The Niagara District," by Rev. R. I. Warner, M.A., D.D., Principal of Alma College.
"Sir Alexander Mackenzie's Explorations," by C. C. Lumley, B.A., D.D.S.
Address by F. G. Macdiarmid, M.P.P.
May 2.—"The Municipal Development of Dunwich and Aldborough," by Colin St. Clair Leitch.

7.—The Institute has taken preliminary steps for the purpose of securing permanent quarters for its meetings, library and museum.

8.—A picnic excursion to Niagara Falls, Lundy's Lane and Queenston Heights was largely attended and much enjoyed. Short addresses were delivered on the battle fields by the President.

9.—The Officers for 1910-1911 are as follows:—

President.—James H. Coyne, M.A., LL.D., F.R.S.C.
Vice-Pres.—Mrs. John Henry Wilson.
Secretary.—Herbert S. Wegg.
Treasurer.—William H. Murch.

Editor.—Judge Ermatinger.

Curator.—Mrs. W. St. Thomas Smith.

Councillors.—Judge C. W. Colter, Dr. Charles W. Marlatt, C. St. Clair Leitch, K. W. McKay, Mrs. C. O. Ermatinger, Mrs. J. B. Morford, Mrs. C. St. Clair Leitch, Mrs. T. W. Duncombe.

10.—Receipts for the year were $177.09. After providing for all expenditures, a balance of $59.24 remains in the Treasury. These receipts and expenditures do not include those of The Women's Auxiliary.

St. Thomas, July 8th, 1910.

IV.—*Report of the Huron Institute, of Collingwood, Ontario.*

Presented by Dr. J. H. Coyne, F.R.S.C., Delegate.

Another twelve months has passed, and during that time the Huron Institute has continued the progressive policy that has marked the six years since its organization, and it may be truly said that it holds to-day a more important place among the public institutions of the town than at any previous period of its existence.

During the past year eight meetings were held, three of the Institute and five of the executive, and all were well attended.

At one of our regular meetings, our old and respected townsman, Mr. George Moberly, contributed an interesting paper on "The Early Militia of Collingwood," placing on record much historical information not hitherto available. Further contributions along this line have been promised by other members of the Institute, who, owing to their long residence in Collingwood, are in a position to continue the work so well begun by Mr. Moberly.

At another of the regular meetings, the Secretary, Mr. David Williams, gave an address on "The History of Collingwood," illustrated with upward of one hundred lantern views showing the rise and progress of the town, besides pictures of many of the early residents.

Another address was given before the Institute by Mr. A. Knetchel, Inspector of Dominion Forest, Fish and Game Preserves. This was on the forests of Canada, and the subject, though not in the line of local history, with which the Institute more particularly concerns itself, proved of great interest, Mr. Knetchel exhibited many lantern views, which greatly assisted to impress upon the audience the important changes that have been and are taking place, and also the necessity of an active and energetic campaign of conservation. The address was a valuable one.

During the past year the Institute issued its first publication, Papers and Records, Vol. 1. This appeared in August and was well re-

ceived by those interested in historical work, and was noticed favourably in the public press. The volume contains ten papers, also the curator's report for 1908-09, and the constitution of the Institute. A number of photographs of early Collingwood add to its value as an historical publication.

The papers contained in the volume are: Exploration of Petun Indian Village Sites; Samuel de Champlain; Shipping on the Upper Lakes; Where is the Standing Rock? Local Geographical Formations; Presbyterian Church in Collingwood; Roman Catholic Church in Collingwood; Charles Garnier; Negro Population in Collingwood, and the Methodist Church in Collingwood.

Copies of the volume have been placed in the libraries of the Collegiate Institute, public schools and separate school, and also in the archives of the Town Council.

The Civic Improvement Department again took up the work under their special charge, in conjunction with a Committee from the Board of Trade. The Institute appropriated twenty-five dollars towards this work, as also did the Board of Trade.

The museum continues to expand, the number of exhibits showing a steady increase.

David Williams,
Secretary.

Collingwood, June 27th, 1910.

V.—*Report of the Meetings at Ottawa of the Royal Astronomical Society of Canada.*

Presented by Carl Engler, B.A., Delegate.

At the Annual General Meeting held on the 16th December, 1909, the following officers were elected for the ensuing year.

Chairman.—Otto Klotz, LL.D., F.R.A.S.
Vice-Chairman.—J. S. Plaskett, B.A.
Secretary.—Carl Engler, B.A.
Treasurer.—C. C. Smith, B.A.
Council.—C. M. Stewart, M.A., F. A. McDiarmid, B.A., J. J. McArthur, D.L.S.

The following is the programme of lectures for the Fall and Spring terms, 1909-1910, with a brief synopsis of each of the papers given.

The afternoon, or technical lectures, were all given in the lecture room of the Observatory, while the evening or popular lectures were given either in the Normal School or in the hall of the Young Men's Christian Association.

1909. FALL TERM.

Oct. 11.—"Phases of Work in a Modern Observatory," by Prof. E. B. Frost, Director Yerkes Observatory.

Oct. 21.—(1) "Collimation of Correcting Lenses," by J. S. Plaskett, B.A.

(2) "Determination of a Comet's Orbit from Three Observations," by R. M. Motherwell, M.A.

Nov. 4.—"Some Scientific Crumbs from Europe," by Dr. Otto Klotz, F.R.A.S.

Nov. 18.—"The Winds of the Globe," by R. F. Stupart, Director Meteorological Service.

Dec. 21.—"The Gyroscope and Gyroscopic Action," W. F. King, C.M.G., LL. D.

Dec. 16.—Annual Meeting.

1910. SPRING TERM.

Jan. 13.—"A Comparison of Astronomic and Geodetic Survey Data and the deduced truths therefrom," by W. Maxwell Tobey, B.A.

Jan. 27.—"Our Earth in the Universe," by Dr. Otto Klotz, F.R.A.S.

Feb. 10.—"How the Camera is Applied for Topography," by J. J. McArthur, D.L.S.

Feb. 24.—"Optics of the Telescope and Spectroscope," by J. S. Plaskett, B.A.

Mar. 10.—(1) "Flexure in the Axis of a Meridian Circle," by R. M. Stewart, M.A.

(2) "Latitudes," by F. A. McDiarmid, B.A.

Mar. 24.—"Determination of the Constitution and Radial Motion of the Stars," by J. S. Plaskett, B.A

Apr. 7.—"Measurement of Geodetic Base-Lines with invar tapes and wires," by P. A. Carson, B.A

Apr. 21.—"Stellar Evolution and Theories of World Building," by J. S. Plaskett, B A

May 3.—(1) "Diffraction Grating of the Solar Spectroscope," by R. E. DeLury, Ph. D.

(2) "Effect of Slit Width in Spectroscopic Work," by J. S. Plaskett, B.A.

May 19.—"Comets and Halley's Comet," by Otto Klotz, LL.D.

This address was the last of the series for the autumn and spring terms, and it remains but to say that the course of lectures and addresses, scientific ones in the afternoon and popular ones in the evening, was highly successful and undoubtedly had the effect of creating an increased interest in astronomical studies.

VI.—*Report of the Nova Scotian Institute of Science, Halifax, to the Royal Society of Canada.*

Presented by A. H. MACKAY, ESQ., LL.D., F.R.S.C., Delegate.

The Nova Scotian Institute of Science begs to present the following report on its proceedings during its forty-eighth annual session (1909-10).

The following officers were elected for the year 1909-10:—

President.—Prof. Ebenezer MacKay, Ph.D., *ex-officio*, F.R.M.S.

First Vice-President.—Watson L. Bishop.

Second Vice-President. — Prof. A. Stanley MacKenzie, Ph.D. F.R.S.C.

Treasurer.—Maynard Bowman, B.A.

Corresponding Secretary.—A. H. MacKay, LL.D., F.R.S.C.

Recording Secretary.—Harry Piers.

Librarian.—Harry Piers.

Other members of Council.—Alexander MacKay; Professor Frederic H. Sexton, B.Sc.; Philip A. Freeman; F. W. W. Doane, C.E.; A. L. McCallum, B.Sc.; Donald M. Fergusson, and Parker R. Colpitt.

Auditors.—William McKerron and H. W. Johnston, C.E.

The library of the Society has continued its rapid growth. During the year 1909, 1,754 books and pamphlets were received, catalogued and arranged. The total number of books and pamphlets received for the year by the Provincial Science Library, with which that of the Society is incorporated, was 2,204. The total number of books and pamphlets in the Provincial Science Library on the 31st December, 1909, was 38,988. Of these, 8,401 belong to the Science Library proper and 30,587 (or 78 per cent.), to the Institute. The library, which is numerically the largest one in Nova Scotia, is free to all residents of the province.

The old library room over the Provincial Museum had become greatly congested, and in May and June the books were moved to the new stack-room provided for them in the Nova Scotia Technical College, where 3024 feet of shelving is available for them, which is probably sufficient accommodation for seventeen or eighteen years at the present rate of increase. Advantage was taken of the removal to rearrange the publications of societies, etc., a thing that had been impossible of late years owing to the overcrowded state of the shelves. While the library will still continue to be primarily a free public library for the use of any person in the Province, its location in the Technical College will place it where it will be of special service to that institution and its students, and will assist in increasing the use of the books.

The Proceedings and Transactions, Vol. XII, part 2, have been published and distributed; and part 3 is now in press and will soon appear.

Meetings were held from October, 1909, to May, 1910, at which the following papers were presented:—

1.—Presidential Address, by Prof. Ebenezer MacKay, Ph.D.

2.—"A new Nova Scotian Insect, the birch-leaf saw-fly (*Phlebotrophia Mathesoni*), MacGillivray," by H. A. MacKay, LL.D., F.R.S.C.

3.—" On a New Method of Estimating Iodides," by H. S. Davis and H. W. Matheson

4.—"Notes on the Recent Earthquake of 20th December, 1909, in Cape Breton, N.S.", by D. S. MacIntosh, B.A., B.Sc.

5.—"Variation of the Hill Effect with the Temperature and Previous Heat Treatment in the Use of Magnetic Metals," by Thomas C. McKay, M.A., D.Sc.

6.—"The History of Erosion in the Cornwallis Valley, N.S.," by Professor Ernest Haycock, B.A.

7.—"Recent Results in Wireless Telegraphy," by Thomas J. McKavanagh.

8.—"The Rusts of Nova Scotia," by William P. Fraser, M.A.

9.—"Action of Organo-metallic halides in Quinone," by C. C. Wallace, B.A.

10.—"A Possible Change in the Concentration of Solutions due to Gravity," by Harold S. Davis, B A.

11.—"The Occurrence of Opal at Lake Ramsay, Lunenburg County, N.S.," by Harry Piers.

Halifax, Nova Scotia, 22nd September, 1910.

VII.—*Report of the Natural History Society of New Brunswick.*

Presented by Dr. G. U. Hay, F.R.S.C., Delegate.

The Natural History Society of New Brunswick reports with satisfaction, a year of unusual activity and growth. The membership is now 654. The donations to the library and museum have been unusually large and valuable. There have been 5,384 visitors to the museum during the past twelve months.

Several members of the Society have been actively engaged in field work, the results of which are published in the bulletin of the Society.

Regular monthly Lectures were delivered as follows:—

1909.

Jan. 5—(*a*) Forestry Work in Southern Pine Districts.—Professor R. B. Miller, D.Sc.
(*b*) On Forestry Conservation.—Prof. W. F. Ganong, Ph.D.

Feb. 2—(*a*) Stone Craft of the New Brunswick Indians; (*b*) Preliminary List of the Beetles of New Brunswick. — Mr. William McIntosh.

March 2—Early Spring Flowers of England and Eastern Canada.—G. U. Hay, D.Sc.

April 6—(*a*) Physical Evolution of Acadia: Continental Phase; (*b*) Phosphate Beds in South Carolina and New Brunswick. —G. F. Matthew, D.Sc., F.R.S.C.

May 4—(*a*) Mines and Mining; (*b*) History of Currie's Mountain, (read by title)—L. A. Bailey, Ph.D., F.R.S.C.

June 1—Report of Delegate to Royal Society. Outline of Summer's Work Discussed.

Oct. 5—(*a*) Tides of the Bay of Fundy, G. F. Matthew, D.Sc. F.R.S.C; (*b*) Dadoxylon sandstone (read by title).

Oct. 19—Annual Meeting. Reports Election of Officers.

Oct. 26—Conversazione.

Nov. 2—The Interpretation of Natural Scenery, L. W. Bailey. LL.D., F.R.S.C.

Dec. 7—The Mammals of New Brunswick, Mr. W. H. Moore.

1910.

Jan. 4—The Physiographic Characteristics of Cain's River, Professor W. F. Ganong, Ph.D.
Discussion on Some Results of Dr. Ganong's Work in New Brunswick.

Feb. 1—Insect Enemies. (Illustrated), Mr. Wm. McIntosh.

March 1—Our Native Trees, G. U. Hay, D.Sc., F.R.S.C.

April 5—Benefactors in Feathers, Mr. A. Gordon Leavitt.

May 3—Nature Study in the Public Schools, J. Vroom, A.M.

June 7—History of Rockwood Bog, Dr. G. F. Matthew, F.R.S.C.

On intermediate evenings lectures of a more distinctly popular character were given. These were well attended and much appreciated.

The Ladies' Association in connection with the Society provided the following lectures, as well as a course of nine on travel in different countries.

1910

Jan. 14—The Ideals of William Morris in Household Decoration. Mrs. Joseph Westra B. Stewart.

Jan. 21—Renewed Impressions of English Rural Life. Mrs. Arthur Kirkpatrick.
Jan. 28—A Visit to the West Indies. Miss Alice Fairweather.
Feb. 4—Schools of Dickens. Mrs. R. Chipman Skinner.
Feb. 11—London Through the Centuries. Mrs. John Sealy.
Feb. 18—A Month in Charleston. Mrs. George F. Matthew.
Feb. 25—Home Economics. Miss Katharine R. Bartlett.
Mar. 4—Another Word about English Songbirds. Mrs. G. U. Hay.
Mar. 11—Quebec and the Tercentenary. Mrs. Thos. H. Bullock.
Oct. 28—The Coming of the French. Miss E. R. Scovil.
Nov. 4—The French in New Brunswick. Mrs. Sarah Gronlund.
Nov 11—The Jesuit Missions. Mrs. A. Coster.
Nov. 18—The French in Quebec. Mrs. Lawrence.
Nov. 25—The French in Louisiana. Miss Whittaker.
Dec. 2—The French Habitant. Mrs. A. R. Melrose.

The following is the list of Officers:—

President—Hon. Senator J. V. Ellis, LL.D.
Vice-Presidents—G. F. Matthew, D.Sc., F.R.S.C.
G. U. Hay, D.Sc., F.R.S.C.
Treasurer—A. Gordon Leavitt.
Corresponding Secretary and Curator—William McIntosh.
Recording Secretary—J. G. MacKinnon
Librarian—W. L. McDiarmid.
Additional Members of Council—H. G. Addy, M.D., T. H. Estabrooks, Jas. A. Estey, W. F. Burditt, J. Roy Campbell.

LADIES' ASSOCIATION.

President—Mrs. G. F. Matthew.
Vice-Presidents—Mrs. G. U. Hay, Mrs. G. F. Smith, Mrs. J. H. Thomson.
Treasurer—Miss Grace W. Leavitt.
Recording Secretary—Mrs. Chas. A. Macdonald.
Corresponding Secretary—Miss F. A. Hoyt.

VIII.—*Report of the New Brunswick Loyalists' Society.*

Presented by Ven. Archdeacon RAYMOND, F.R.S.C., Delegate.

Since the date of the last Report of the New Brunswick Loyalists' Society, the meetings of this Society have been regularly held and well attended. There has been a steady increase in membership, and of late a much more active interest has been displayed in the objects for which the Society was organized.

During the present year the Historian of the Society spent a month at the Archives Department at Ottawa, in a search for historical and biographical data concerning Loyalists who settled in New Brunswick at the close of the War of the American Revolution. His report to this Society was to the effect that he received every courtesy and assistance from the Chief Archivist and staff, but that, while a large and valuable collection of historical material is being rapidly gathered by the department, the collection is still painfully incomplete as regards the records needful for furthering the aims and objects for which this Society was organized. Accordingly a series of resolutions was passed at a largely attended meeting of our New Brunswick Loyalists' Society, held on the fourth day of May last, inviting the attention of the Minister of Agriculture and of the Manuscripts Commission, including the Dominion Archivist, to the following facts: namely, that there are in the Public Record Office in London, England, a number of bundles of valuable papers known as the Loyalist Series, relating to the claims of the American Loyalists at the close of the American Revolution; that in the event of the destruction by fire or otherwise of the said records an irreparable loss would ensue to the student of Canadian history; that over 100,000 Loyalists left what is now the United States of America at the close of the Revolutionary War, the greater number of whom settled within the territory now known as the Dominion of Canada, where their descendants to-day constitute a large and influential section of the population; that the historical data relating to the Loyalists available for the purpose of the student of Canadian history on file at the Canadian Archives is meagre in comparison with the very valuable and rapidly growing collection relating to the French period, the value and importance of which this Society does not by any means desire to belittle.

In accordance with a further resolution passed at the same meeting, our Secretary communicated with the Minister of Agriculture, and also with the various other members of the Manuscripts Commission, urging that immediate action be taken to have copies made of these Loyalist records, such copies to be available at the Archives Department at Ottawa for the purposes of the Canadian student.

During the present month, a movement inaugurated some years ago by our Society, was, thanks to the generous financial assistance given by the Government of the Dominion of Canada and others, carried to a successful issue. On the 8th instant a bronze statue of the late Sir Samuel Leonard Tilley, for many years Governor of New Brunswick, one of the Fathers of Confederation and the first President of this Society, was unveiled in the presence of a large gathering and with appropriate ceremonial at King Square in the City of Saint John.

During the past year the Society has lost by death one of its most

valued members in the person of Willam P. Dole, LL.D., who at the time of his death filled very efficiently the office of President. He had always been an active member of the Society, of which he was one of the founders.

The Historian of this Society has been engaged for some years in the preparation of a Biographical Dictionary of the U. E. Loyalists, but is greatly hampered in his work by the lack of available materials in Canada, suitable for his purpose.

The fiances of this Society are in a healthy condition, but the lack of a publication fund is much to be deplored.

D. R. Jack,
Secretary and Historian, New Brunswick Loyalists' Society.

St. John, New Brunswick, September 23, 1910.

IX —*Report of The Nova Scotia Historical Society.*

Presented by Dr. A. H. MacKay, F.R.S.C., Delegate.

The papers read before the Nova Scotia Society last year were as follows:—

1909

Mar. 9.—"The Annapolis-Royal Ancestry of the late Sir William Fenwick Williams, of Kars," by Judge Savary.

Nov. 9.—"The Influence of the United Empire Loyalists on the Political Life of the Maritime Provinces," by Theodore H. Boggs, Ph.D.

Dec. 14.—"With the 1st (Canadian) Contingent to Pretoria," by Major H. B. Stairs, D.S.O.

1910

Jan. 18.—"The Hydrographical Surveys of Capt. James Cook," by Lieut. John A. Rupert-Jones, R.N.

The following Officers were elected at the annual meeting, held on February 16, 1909:—

President.—Professor Archibald MacMechan, Ph.D.
Vice-Presidents.—Hon. Mr. Justice Longley, Senator Power, Ven. Archdeacon Armitage.
Corresponding Secretary.—Harry Piers.
Treasurer.—R. J. Wilson, M.A.
Recording Secretary.—William L. Payzant.
Auditors.—W. L. Brown, Dr. M. A. B. Smith.

Other Members of Council.—Archibald Frame, A. H. Buckley, G. W. T. Irving and James H. Trefry.

Library Commissioners. —Professor MacMechan, Rev. Dr. Forrest, Dr. A. H. MacKay and James S.MacDonald.

X.—*Report of the Women's Canadian Historical Society of Ottawa.*

Presented by Mrs. J. B. Simpson, Hon'y. Recording Secretary, Delegate.

The season of 1909-10, so auspiciously entered upon, marks the most successful era in our Women's Canadian Historical Society.

Fifteen meetings have been held, nine executive (three of which were special), and six general. The annual meetings of our Society are held each year on the 29th day of March, the anniversary of the passing of the Imperial Act known as "The British North America Act, 1867," which provided for the voluntary union of the whole of British North America into one confederation, under the name of The Dominion of Canada.

On October 8th, the first general meeting (an open one), was held in the Y.W.C A Hall, when a large gathering of members and friends in attendance were favored with an address on the "Ashburton Treaty" by Prof. Adam Shortt, in listening to whom our long-cherished grievances on that famous subject seemed to roll away. Mr. A. E. Fripp, M.L.A., one of the two members so kindly instrumental in obtaining the grant from the Ontario Government for our Society, occupied the chair. At the close of Prof. Shortt's extremely interesting address, a vote of thanks was moved by Mr. James White, Dominion Geographer and seconded by Mr. Benjamin Sulte, after which a very pleasant social half hour was spent.

At the November meeting, the paper of the day, a continuation of the Canadian Battlefield series, was given by the President, Mrs. Ahearn, entitled "The Battlegrounds of the Niagara Peninsula." It was full of interest, covering Queenston Heights, Stony Creek, Chippewa and Beaver Dam, and was illustrated with valuable prints, maps and "A bird's-eye view of the whole Niagara river," through courtesy of Dr. Doughty, Dominion Archivist. The usual Canadian history study followed by Miss Eva Read, period of 1776 to 1783, a charming and instructive verbal *résumé*, from the revolt of the Colonists and "Boston Tea Party" to the signing of the second Treaty of Paris, commonly known as the Peace of Versailles. The second volume of the Transactions of the Women's Canadian Historical Society, entitled "The Waterways of Canada," was laid on the table, the valuable matter

contained in these papers already proving sufficient justification for the Government grant. In preparing the papers read before our Society, the Archives have been our unfailing treasure house for trustworthy originals and our Society would place on record its hearty appreciation of the aid and courtesy of the Dominion Archivist, Dr. Doughty.

In the Normal School Hall on the evening of November 12th, under the auspices of our Society, was held the inaugural lecture of the course arranged by the joint Literary, Scientific and Art Societies of the Capital. "Men I have met," was the subject of the delightfully interesting address by the Hon. Mr. Justice Longley of Halifax. King Edward, Theodore Roosevelt, Sir John A. Macdonald, Goldwin Smith, Joseph Howe, Marie Corelli and others, were all brought before the audience in an inimitable manner. Canon Kittson wittily moved, and Dr. White appropriately seconded the motion of appreciation, Sir Louis Davies proving an ideal chairman.

At the December meeting the paper of the day was given by Miss Amey Horsey, who dealt in a most interesting and comprehensive manner with the "Battle of the Windmill," which took place near Prescott at the time of the Rebellion, 1838. That old windmill is now doing duty as a lighthouse. The Canadian History portion, by Miss Eva Read, referred to the U.E. Loyalists, first so called in 1789, and was most appreciatively received, especially by many among our members who are descendants of the United Empire Loyalists.

On the 14th January the first general meeting of 1910 was held, when a paper on the "Battle and Battlegrounds of St. Denis and St. Charles" was given in an admirable manner by Miss O'Gara, followed by a most interesting reading from Tracey's Tercentenary History of Canada, on the "Constitutional Act," by Miss Lina Rothwell.

February's paper on the "Siege of Louisburg" was ably treated by Miss Eva Read, who dealt with the first siege, that of 1745, describing the splendid old fortress on the southern side of Cape Breton, which had occupied such a prominent place in the world's history. A stone bastion sunk in the ground is now all that is left to mark the spot.

Following the paper, in place of the usual chapter of history, Mrs. J. B. Simpson presented her report as delegate to the Twenty-fifth anniversary celebration of the American Historical Association, held in New York from 27th to 31st, December 1909, the report of which will appear in the printed Annual Report of the Society.

On March 11th, the last paper of the season was given and a digression made from Canadian to British battlegrounds, when Mrs. Somerset Graves, whose husband, Colonel Graves, lived 30 years in India, gave a graphic account of the siege of Cawnpore, having visited the locality

where now a beautiful Memorial Church and monument are erected to the memory of those who lost their lives in that terrible mutiny.

Mrs. D. H. McLean's admirable history study of the period from 1789 to 1835 brought our meetings to a close.

To Madame Rhéaume, the indefatigable convener of our Printing and Programme Committees is due the highest praise for the great success which has attended the work of these committees during the past season, the Printing Committee having given to the public their first printed report and the second volume of Transactions. The third volume is now in the hands of the printer. And with a hearty and united *esprit de corps* the Women's Canadian Historical Society of Ottawa are looking forward, in the coming year, to still better things, bearing in mind our chosen motto:—

"Love thou thy land, with love far brought
From out the storied Past, and used
Within the Present, but transfused,
Through future time by power of thought."

Ottawa, March 29th, 1910.

XI.—*Report of the Manitoba Historical and Scientific Society.*

Presented by the Rev. Dr. Bryce, F.R.S.C., Delegate.

The Society has now satisfactory arrangements made with the City of Winnipeg for the use of a portion of the Carnegie Library for its work.

Its large and valuable library is now carefully arranged as a Reference Library for the use of members and of citizens. It continues to receive the valuable publications of the U.S. and Canadian Governments and of the Smithsonian Institution at Washington. It also receives some 200 exchanges from learned societies.

The meetings of the Society are held in the Reference Library room of the Carnegie Library.

Five public meetings were held during the past year, and much interest was shown in them. The Lecturers and their subjects were as follows:—

1.—"The Canadian Archives," by Professor Chester Martin, Professor of History in Manitoba University.

2.—"The Discovery of the Site of Fort Charles on Lake of the Woods, and of the Remains of the younger Verendrye," by Judge Prudhomme, F.R.S.C.

3.—"An Account of the Discovery of Radium," by Dr. McClung, of Manitoba University.

4.—"Halley's Comet," by Prof. A. D. McLean, of Manitoba University.

5.—"Old Red River Manners and Customs," by Sheriff C. Inkster of Winnipeg.

During the year, at the time of the meeting of the British Association in Winnipeg, a Memorial Brass plate was fixed on Fort Garry Gate, giving some account of the different forts of Winnipeg.

The opening ceremonies, in connection with which the Historical Society took a part, were performed by Lord Strathcona.

GEORGE BRYCE,
President of M. H. & S. Society.

Sept. 27th, 1910.

XII.—*Report of the Women's Historical Society of the County of Elgin,* for 1909–1910.

Presented by Dr. J. H. COYNE, F.R.S.C., delegate.

During the year eight regular meetings of the Society were held, at which the following papers were read:—

"History of the old St. Thomas Church, Miss Hattie Robinson.

"History of the Caughell Family, Mrs. A. E. Marlatt.

"Eleven Years as a Soldier in India," prepared by Mrs. Louisa King, and read by Mrs. Wilson.

"History of the Buffalo Historical Society", Mrs. A. E. Lewis.

"Recollections of Mrs. Wardell," Mrs. Wilson.

"Battle of the Windmill," by Miss Amy Horsey, Ottawa, read by Mrs. J. S. Robertson,

"Talk on Virginia Old Churches," Mrs. Wilson.

"History of the oldest houses on Metcalf Street, St. Thomas," Miss Clara Moore.

Two social gatherings were held during the year. The Society had also a very enjoyable outing at Niagara Falls, and Brock's Monument, and the Annual Social gathering at the Armouries took place on November 23rd.

The membership continues at one hundred, the number to which it is limited.

Officers of the Society for 1909–1910:—

President—Mrs. J. H. Wilson.

First Vice-President—Mrs. J. H. Coyne.

Second Vice-President—Mrs. W. R. Jackson.
Third Vice-President—Mrs. R. H McConnell.
Secretary Treasurer.—Mrs. Graham Symington.
Assistant Secretary—Mrs. F. A. Fessant.
Assistant Treasurer—Miss Florence McLachlin.
Corresponding Secretary—Miss Helena Travers.
Curator—Mrs. C. St. Clair Leitch.

The Society has to its credit $208.91 in the Southern Loan & Saving Company.

XIII.—*Report of the British Columbia Academy of Science.*

Presented through the Honorary Secretary.

On behalf of the British Columbia Academy of Science, I wish to report that during the past year our work has been established on what we trust will ultimately prove to be useful lines. The Academy has obtained incorporation under the Benevolent Societies Act of British Columbia; has adopted a constitution and by-laws, a copy of which is herewith transmitted; and has held regular meetings during the winter as provided therein. A number of original papers have been presented and, it is hoped, will be published within the next few months. These include such diverse subjects as "The Geometridae of British Columbia" and "The Influence of Sunspots on Terrestrial Magnetism." A small beginning has also been made at collecting a library, which we hope to locate in permanent quarters when the Provincial University shall have been established.

We have not, up to the present time, been able to secure financial assistance from the Provincial Government; but it is hoped that this difficulty may be ultimately overcome, and that with increasing membership our income may be sufficient to provide for a considerable amount of publication work.

Our membership at present numbers twenty-three, all active members, and a large increase is confidently expected during this year.

We have to regret very much the severe illness of our first president, Rev. G. W. Taylor, F.R.S.C., to whose deep interest in scientific matters the Academy owes its existence, and sincerely hope that his invaluable advice and assistance may yet be available in many future years.

Lists of the Officers for the two years 1909–10 and 1910-11, are appended.

Officers 1909–10.

President—Rev. G. W. Taylor, Nanaimo.
Vice-President—Prof. J. G. Davidson, Ph.D., Vancouver.

Secretary—Rev. Prof. E. M. Burwash, New Westminster.
Treasurer—E. Baynes Reed, Esq., Victoria.
Editor—Prof. J. Porter, B.E., New Westminster.
Curator—C. McLean Fraser, Esq., Nelson.
Executive Committee—Messrs. T. S. H. Shearman, P. H. Elliott, R. V. Harvey, F. Napier Denison, E. O. S. Schofield, F. Judson Clark.
Librarian—Prof. D. W. Munn, Vancouver.

Officers 1910–11.

President—Prof. J. G. Davidson, Ph.D., Vancouver.
Vice-President—T. P. Hall, M.D., Vancouver.
Secretary and Acting Treasurer—Prof. D. W. Munn, M.A., B.Sc.
Librarian—F. Judson Clark, Ph.D., Nanaimo.
Editor—James Porter, B.E., Vancouver.
Curator—R. S. Shearman, Vancouver.
Executive Committee—Rev. G. W. Taylor, Nanaimo; Prof. E. M. Burwash, New Westminster; C. McLean Fraser, Esq., Nelson; Principal G. E. Robinson, B.A., Vancouver; Ernest Hall, M.D., Victoria; F. B. Dixon, Esq., Nanaimo.

XIV.—*Rapport de la Société de Géographie de Québec,*

Présenté par l'entremise du Secrétaire Honoraire.

La Société de Géographie de Québec a procédé à l'élection de ses officiers au mois de janvier 1910.

La présidence de la Société a échu à l'honorable juge A. B. Routhier, succédant à M. Joseph Edmond Roy, qui avait rempli habilement cette charge durant deux années consécutives.

Comme son prédécesseur, M. le juge Routhier est l'un des membres les plus distingués de la Société Royale du Canada, et l'un des plus fins lettrés de notre pays.

J'ai le plaisir de vous annoncer que la Société de Géographie, s'est présentée au début de l'année 1910, avec un effectif de 200 membres, dont 186 membres actifs.

Ces chiffres, n'est-ce pas, ont leur éloquence. Ils disent mieux que tous les longs discours la marche ascendante de notre association, ils sont la preuve la plus palpable que nos compatriotes s'intéressent davantage aux découvertes qui s'effectuent dans le monde géographique et archéologique, aux conséquences qui en découlent pour le commerce et l'industrie, ils indiquent enfin un retour à des études qui n'étaient dans le passé que l'apanage de quelques hommes d'élite.

Dans une conférence faite, il y a quelques mois, devant la Société

de Géographie de Paris, un professeur de la Sorbonne, M. Marcel Dubois, que nous avons eu l'avantage d'entendre à Québec, disait:

"L'ère des grandes découvertes et de l'appropriation des terres nouvelles est sur le point d'être close. Les derniers vides, existant sur les cartes géographiques, seront bientôt remplis. Au fur et à mesure que le globe terrestre est mieux connu, les problèmes géographiques qui passionnent les esprits se modifient, et, à l'heure actuelle, ceux qui retiennent l'attention des sociétés de géographie sont ceux d'économie politique. C'est qu'en effet de leur solution dépendent la prospérité des nations, la vitalité des peuples et l'avenir des races."

C'est un peu dans les limites de ce programme tracé par l'illustre professeur français que se renferme, à l'instar de ses sœurs d'outre-mer, la Société de Géographie de Québec. Nous cherchons, en toutes occasions, à faire valoir les immenses ressources de notre pays, ressources agricoles, industrielles et minérales, sans cesser pour cela de décrire de temps à autre les coins encore insoupçonnés de notre pays.

Dans la Province de Québec, le mystère le plus profond enveloppe encore certaines régions. Le district d'Abitibi, dont on compare le sol à la fertile vallée d'Outaouais, n'a reçu que depuis quelques années la venue des explorateurs, et il nous reste encore à pénétrer plus avant dans les terrains baignés par la baie d'Hudson sans oublier l'Ungava, aussi étendue que la province elle-même pour en arracher les secrets et étayer un jugement sur leur valeur industrielle ou minière.

Si la Société de Géographie de Québec avait à sa disposition des ressources plus étendues—comme en détiennent par exemple certaines sociétés similaires des Etats-Unis et d'Europe—elle pourrait, au lieu de se confiner uniquement au pays, donner plus d'ampleur à son programme, étendre davantage ses investigations et suivre de plus près le mouvement géographique dans toutes les parties du globe.

Tout de même, comme je l'ai déjà noté, il est un fait acquis qu'on ne saurait convenablement passer sous silence: c'est que dans toutes les sphères de la société canadienne l'on semble saisir plus nettement l'importance des travaux géographiques, et qu'on y attache plus d'intérêt que dans le passé.

En même temps que le chiffre des membres de la Société augmentait, et cela dans une proportion dont nous avons raison d'être fiers, celui de nos échanges avec les autres associations géographiques du continent américain et d'Europe devenait lui-même plus considérable. C'est ainsi que nous échangeons actuellement avec les sociétés géographiques d'Alger, de Tunis, en Afrique, de Tokio, au Japon, avec l'Institut colonial de Londres, avec les sociétés géographiques de Manchester et de Liverpool, en Angleterre, de Philadelphie et de Washington aux Etats-Unis,

de Costa-Rica, dans l'Amérique Centrale, avec les sociétés archéologiques de Narbonne et de Draguignan, en France, et puis avec l'université de Toronto qui publie chaque année deux à trois volumes dans lesquels sont analysés tous les travaux des auteurs canadiens. Notre bibliothèque s'enrichit, grâce à ces échanges, de livres et de collections précieuses que les studieux, ou même les simples amateurs qui s'intéressent au mouvement géographique, peuvent toujours consulter avec profit pour eux et pour les autres.

Je ne saurais clore ce rapport sans présenter à l'un de nos membres, M. le capitaine J. E. Bernier, commandant de *l'Arctic*, nos félicitations pour le succès qui a couronné sa troisième expédition dans les mers arctiques. On sait que c'est la Société de Géographie de Québec qui s'était constituée, dès le début, le parrain de l'intrépide explorateur québécois, et elle n'a pas eu lieu de le regretter, puisque notre compatriote, pour se venger probablement de n'avoir pu pousser une pointe au pôle, a reculé jusque dans l'extrême Nord l'étendue de nos possessions et annexé au Canada plus de cinq cents milles carrés de territoires."

EUG. ROUILLARD,
Secrétaire.

XV.—*Rapport de l'Institut Canadien d'Ottawa,*

Présenté par l'entremise du SECRÉTAIRE HONORAIRE.

En soumettant un exposé aussi bref que possible de ce que notre Institut a fait durant l'année académique 1909–1910, je dois d'abord déplorer avec vous la perte de notre patron Mgr. Joseph Thomas Duhamel, archevêque d'Ottawa, survenue l'automne dernier. Sa mémoire vénérée restera inscrite à la place d'honneur dans nos annales.

L'élection des officiers de l'Institut qui eut lieu le 30 septembre donna le résultat suivant:—

Président d'honneur—Le Très Honorable Sir Wilfrid Laurier.
Vice-président d'honneur—M. le chevalier F. R. E. Campeau.

BUREAU.

Président—M. A. T. Genest
Vice-président—M. F. J. Audet.
Secrétaire-Archiviste—M. Albert Campeau.
Sec.-Corr.—M. Henri Bance.
Trésorier—M. J. E. Marion.
Bibliothécaire—M. J. A. Cantin.
Directeur dramatique—M. F. R. E. Campeau.
Directeur musical—M. A. M. Lafontaine.
Directeur des Cours—M. Gaudiose Matte.

Conseillers—MM. T. Vézina; J. B. St. Laurent, G. L. Barbeau et H. Demers.

Conférencier et professeur—M. l'abbé LeBel.

On apporta un intérêt nouveau dans le bureau de direction en commençant la refonte des règlements. L'homme aime à faire et refaire les lois, surtout celles qui régissent la gouverne d'autrui; cela lui donne l'illusionne qu'il mène. Nous n'avions pas heureusement à proclamer la déclaration des "Droits de l'homme et du citoyen," et ce petit travail n'a entraîné aucune rèvolution.

Notre banquet aux huîtres a eu cette année un succès sans précédent. Comme l'a rapporté le *Temps* d'Ottawa: "On a vu à l'Institut Canadien-Français, depuis sa fondation, beaucoup de belles réunions, entendu d'éloquents discours; mais jamais encore la fête annuelle aux huîtres n'a provoqué d'élans de patriotisme aussi ardente, de déclarations aussi importantes sur l'union des deux races et la nécessité de parler les deux langues dans notre pays. C'était parmi nos compatriotes de langue anglaise présents à cette fête, à qui prononcerait le meilleur discours français et exprimerait de plus beaux sentiments, et de réels désirs de voir l'union des deux grandes races qui habitent le Canada, s'opérer par la dualité des langues: les Anglais parler le français et les Français parler l'anglais."

Je résume ce qui s'est dit des langues anglaises et françaises à cette fête intime

L'anglais est une langue magnifique qui s'est parée, dans son passage à travers les siècles, des joyaux de toutes les langues riches. On peut prier et pleurer en cette langue avec Milton dans le Paradis Perdu; on peut aimer passionnément en cette langue avec Shakespeare dans Roméo et Juliette et le Songe d'Une Nuit d'Eté. C'est aussi par excellence la langue du commerce, l'outil indispensable au travailleur tenace.

Le français est une langue plus souple, plus subtile, plus féconde; elle trouve tout en soi pour exprimer ou cacher la pensée. C'est par excellence la langue des arts, des sciences, de la diplomatie. Douce, claire, flexible, expansive, elle peut rendre les plus grands hommages sans bassesse et dire les plus dures vérités avec délicatesse. Elle peut forcer l'Olympe sans s'exposer aux foudres de Jupiter.

La langue anglaise et la langue française se complètent l'une par l'autre; le lutteur qui sait manier à l'aise ces deux armes formidables, peut défier impunément l'univers.

Cette année, le conférencier M. l'abbé LeBel, agrégé de l'Université de Paris, nous donna 12 études sur les grands classiques.

Il analysa, exposa, interpréta, à tous les points de vue, le Cid, Horace, Cinna, Polyeucte: tout le système dramatique, littéraire, philosophique et religieux de Corneille.

Les Plaideurs, Britannicus, Athalie; tous les traits caractéristiques du talent de Racine.

L'Avare, le Misanthrope, le Médecin malgré lui, le Malade imaginaire: toutes les faces du génie de Molière.

Au club littéraire de l'Institut, le professeur M. l'abbé LeBel a donné en 25 leçons d'une heure et demie, un cours complet de logique formelle et de logique appliquée, ainsi définies:

La logique formelle n'est autre que l'exposé de trois grandes théories: la théorie des termes, la théorie des propositions, la théorie des arguments. Malgré les travaux modernes, il a prouvé abondamment que, dans cette partie, Aristote reste toujours le maître invincible.

La logique appliquée est l'exposé des méthodes scientifiques. Il a rappelé le mot de Bacon que "sur ce point les modernes sont les anciens."

Le professeur a expliqué, au complet, les méthodes employées de nos jours en mathématique, en physique, en histoire naturelle et dans toutes les sciences psychologiques, morales et sociales.

La critique historique a fait l'objet d'intéressantes causeries.

Comme conclusion, trois leçons exposèrent nettement les deux graves questions de la vérité et de l'erreur.

Ces sujets difficiles ont été traités par le digne professeur du Club avec un talent merveilleux et une verve incomparable

Un cours de français pour les Anglais instruits déjà dans notre langue, fut tenté et réussit de manière parfaite.

La méthode du professeur est des plus simples. Tout d'abord, il lit un texte anglais; puis le traduit en français et demande à ses auditeurs de repéter avec lui sa traduction. Secondement, le professeur conjugue les verbes contenus dans la traduction et l'auditoire les répète avec lui. Pour terminer, le professeur parle de 10 à 15 minutes avec lenteur sur des sujets variés.

Plus de vingt personnes, femmes et hommes, suivirent assidûment les leçons, et de leur propre aveu, en retirèrent le plus sérieux profit.

Ungava.—Etude géographique et historique accompagnée d'un petit ouvrage: "La Nuit dans le Nord." Sujet d'une conférence faite à l'Institut, le 2 mars, par M. A. T. Genest, sous la présidence d'honneur de l'honorable Sir Lomer Gouin, premier ministre de la province de Québec. La première partie de ce travail a été publiée dans le Bulletin de la Société de Géographie de Québec, Vol. 4, No. 2.

Enfin, pour divertissement à nos travaux littéraires, nous priâmes Orphée de venir chez nous faire entendre son chant merveilleux, et sous la direction de M. Lafontaine, des artistes distingués donnèrent un concert à l'Institut,—heureux ensemble de morceaux de choix qui furent fort appréciés par une assistance nombreuse.

Tel est le sommaire exact des travaux à l'Institut Canadien Français d'Ottawa, durant l'année académique 1909–1910.

Veuillez croire, messieurs de la Société Royale du Canada, à toute notre reconnaissance de la politesse gracieuse de votre accueil.

A. T. GENEST.
Président.

Ottawa, le 10 juillet 1910.

XVI.—*Report of The Ottawa Field Naturalists' Club.*

On the 15th of March, 1910, the Ottawa Field Naturalists' Club completed the thirty-first year of its existence. Since its inauguration the Club has steadily grown and developed. During the last year 28 new members were elected, making the membership at the close of the year 320, composed of 312 ordinary and 8 corresponding members.

An examination of the programmes for the seasons 1908–9 and 1909–10 will show the varied character of the addresses, lectures, etc., given under the auspices of the Club. In co-operation with other local societies of Ottawa, the Club has now contributed three lectures to the joint winter course established a few years ago in this city. During the past winter six of the meetings were held in the Assembly Hall of the Normal School; and three, including the annual meeting, in the hall of the Carnegie Library.

The lectures, etc., given during the season of 1909–10 were as follows:—

"Home Birds and Wanderers," by Mr. W. E. Saunders, of London.

Conversazione, with exhibition of zoological and botanical specimens, etc.

"Instinct and Education," by Mr. A. E. Attwood, M.A., President of the Club.

"Life," by Mr. A. H. W. Cleave, F.R.M.S. (illustrated by lantern slides).

"Flora and Fauna of the West Coast of Vancouver Island," by Prof. John Macoun.

"House Flies and their Relation to Public Health," by Dr. C. Gordon Hewitt (illustrated).

"A Plant Doctor and his Work," by Mr. H. T. Gussow, F.R.M.S. (illustrated).

The lecture contributed by the Club to the joint winter course was one on "Bacteria in relation to Plant Life," by Prof. F. C. Harrison, of Macdonald College.

The spring and autumn excursions have always been a very attractive feature of the Club's work, but the planning of an excursion

programme is becoming more and more difficult from year to year. The rapid extension of the city and the development of suburban resorts are greatly restricting many of the collecting grounds. Nevertheless, during the year 1909–10 many interesting excursions were held, at which, as has been customary, addresses by leaders of branches and others were given.

Volume XXIII of The Ottawa Naturalist (the official organ of the Club) was published monthly under the editorship of Mr. Arthur Gibson. It contains 230 papers and three full-page plates.

There are Associate Editors for nine departments of Natural History, the names of whom and the branches they represent, for 1910–11, are as follows:—W. T. Macoun, Botany; Rev. G. W. Taylor, M.A., Conchology; W. H. Harrington, Entomology; W. J. Wilson, Ph.B., Geology; Alex. McNeill, Meteorology; J. W. Gibson, M.A., Nature Study; Rev. G. Eifrig, Ornithology; L. M. Lambe, F.G.S., Palæontology; Prof. E. E. Prince, Zoology.

The bound volumes and exchanges of the Club have been placed in the Carnegie Library, where, through the courtesy of the Librarian, Mr. L. J. Burpee, the members of the Club and others may have ready access to the Club's literature.

The following indicates the organization of the Club for the year 1910–11:—

Patron.—The Right Honourable Earl Grey, Governor-General of Canada.

Council, 1910–11.

President.—Mr. Andrew Halkett.
Vice-Presidents.—Mr. A. G. Kingston, Mr. L. H. Newman, B.S.A.
Secretary.—Mr. J. J. Carter.
Treasurer.—Mr. Herbert Groh, B.S.A.
Editor.—Mr. Arthur Gibson.
Librarian.—Mr. C. H. Young.
Messrs. Alex. McNeill, T. E. Clarke, B.A., J. W. Gibson, M.A., W. T. Macoun, W. J. Wilson, Ph.B., Misses McKay Scott, A. L. Matthews, Q. Jackson.
Past President.—Mr. A. E. Attwood, M.A.

Standing Committees of Council.

Publications.—L. H. Newman, Alex. McNeill, C. H. Young, A. Gibson, Miss McKay Scott.

Excursions.—Andrew Halkett, W. J. Wilson, J. W. Gibson, A. G. Kingston, H. Groh, Miss A. L. Matthews.

Lectures.—A. G. Kingston, T. E. Clarke, L. H. Newman, J. J. Carter, Miss Q. Jackson.

Auditors.—R. B. Whyte, J. Ballantyne.

ANDREW HALKETT,
President and Delegate.

XVII.—*Report of the New Brunswick Historical Society.*

Presented by the REV. DR. RAYMOND, F.R.S.C., Delegate.

Since the last report to the Royal Society the New Brunswick Historical Society has accomplished a good deal of valuable work in various directions. Six years ago, through the Society's afforts, the tercentenary of the discovery of the Harbour and River St. John on the 24th of June, 1604, by the great explorer Champlain, was fittingly commemorated. This was the precursor of other memorable celebrations that have followed, at Quebec and elsewhere. At the time of the celebration it was deemed fitting that some permanent memorial to Champlain should be erected within the limits of the City of St. John, and, after due consideration, the Society approved of a design submitted by Mr. Hamilton McCarthy of Ottawa, for a bronze statue of Champlain of heroic size, to be placed upon a pedestal of native granite on a commanding site overlooking the harbour. After many delays arising from various causes the statue was erected on Queen Square, and unveiled by the mayor of the city on the 24th of June last in the presence of an immense concourse of spectators. Addresses were made by the Hon. J. D. Hazen, premier of New Brunswick, Mr. Clarence Ward, president of the Historical Society, and by the Hon. Dr. Landry, as a representative of the Acadians of the Maritime Provinces.

Since the last report to the Royal Society another number of the Collections of our Society has been published, containing three valuable papers. The first of these tells the story of General Monckton's Expedition to the River St. John in 1758, and the establishment of Fort Frederick on the site of the Old French fort on the west side of St. John Harbour. From this we date the period of English occupation. The publication of the paper not inappropriately marked the one hundred and fiftieth anniversary of the first permanent settlement of the English in New Brunswick. The region had previously for an equal period been under French domination.

The second contribution, is a continuation by our indefatigable corresponding member, Dr. W. F. Ganong, of his valuable series of "Historical Geographical Documents relating to New Brunswick." The paper comprises the journals of the British and American Surveyors

of the Magaguadavic river in connection with the determination of the international boundary in 1797. The documents are annotated in the careful and thorough manner which characterises Dr. Ganong's work, and are illustrated by reproductions of the plans made by the British Surveyor, Dugald Campbell. The third paper by Dr. W. O. Raymond throws new light on the founding of the remarkable settlement made at Shelburne, Nova Scotia, by the Loyalists in 1783. The basis of this paper is the diary of Benjamin Marston, the Chief Surveyor, which has been preserved among the papers in possession of the descendants of the late Judge Edward Winslow. The Journal has not been published in full; but the quotations are such as to supply everything of importance, and the writer of the paper has supplied, from Marston's private correspondence and from other sources, a vast amount of additional information serving to illumine the obscurities that have heretofore puzzled those who have studied the romantic tale of the founding of ancient Shelburne.

The Society continues to accumulate historic documents and other materials of interest from time to time. Under the capable supervision of Mr. Jonas Howe, the Muster Rolls of the Loyalist Regiments, which served during the American Revolution on the side of the Crown, are being bound in volumes for more convenient reference and for better preservation.

St. John, N.B., Sept., 1910.

XVIII.—*Report of the Niagara Historical Society.*

Presented through the Honorary Secretary.

We are glad to be able to report that, as a Society, we have had a year of continued prosperity. As regards membership, papers read, sale of pamphlets, visitors, additions to our collection, we have not fallen behind the reports of other years.

There were held during the winter months six regular meetings at which the following papers were read:

Reminiscences of the Fenian Raid, Parts I, II and III, by Charles Hunter of Toronto.

"Reminiscences of Life in Niagara and St. David's," by Mrs. J. G. Currie, St. Catharines.

"Translation of the Journal of Thomas de Boucherville relating to events from 1802 to 1814, in the Niagara peninsula", by Miss Carnochan.

"Canadian Confederation in the making, with some Glimpses of he Confederators," by Rev. A. F. MacGregor, M.A.

The Society's room was open once a week, in the winter months, and during Camp everyday, and in the summer months at least twice a week. Many visitors have recorded their names and expressed their appreciation of the collection. Thework begun last year of placing panels on the walls, in memory of the early settlers and regiments on duty here, is being continued, and already twenty-three of these have been placed. Last year we met at Queenston Heights, and it is intended to visit in succession other historic spots in the neighbourhood. With regard to publications we last year printed two pamphlets, this year number 19 has been added, a double number; No. 10, "Inscriptions in Graveyards," has been reprinted with additions, the first edition having been exhausted, and many demands for it having been made. Many letters of commendation have been received since its issue. It contains 126 pages and has four illustrations.

The 14th Annual Report was issued, and of these 400 have been distributed, while 500 pamphlets have been sent out or sold.

A valuable collection of coins was given by Mrs. J. G. Currie; almost a complete file of the Niagara Mail by Mr. John Kirby, and many articles, documents, military accoutrements, books, and articles of china, have been given during the year.

The preparation of a Catalogue has proved a heavier task than was anticipated; but it is at length approaching completion, and we hope will soon be printed. It will embrace over 5,000 items, and will contain notes explanatory of the more interesting.

During the year ten members have been added and we now number 160, many in distant parts as England, British Columbia, Alberta, Manitoba, New York, Pittsburg, Chicago, Pennsylvania.

We now exchange with forty-five Societies, and receive letters of inquiry which we are often able to answer from information in our documents.

The President attended the annual meeting of the Ontario Historical Society at Toronto, and read a paper on "History as Sometimes Given," as well as certain letters furnished by Col. Cruikshank, hitherto unpublished, of Sir Isaac Brock.

We have to deplore the loss of a valuable member, Mr. Charles A. F. Ball, our Honorary Vice-President, who had been a faithful member since the organization of the Society in 1895, and whose generosity in contributing articles to the collection was an example and incentive to others.

We acknowledge with thanks the usual grants from the Provincial Government and the County Council, and we also thank all who are aiding us in any way.

The officers of the Society are:—

Honorary President.—Col. Cruikshank, F.R.S.C.

Hon. Vice-Presidents.—Mrs. P. Roe, Henry Paffard, Mrs. E. J. Thompson.

President.—Miss Carnochan.

Vice-President.—Rev. J. C. Garrett.

Secretary.—John. Eckersley.

Treasurer.—Miss W. B. Servos.

Curator and Editor—Miss Carnochan.

Asst. Curator.—Mrs. E. J. Thompson.

Committee.—Mrs. T. F. Best, W. B. McClelland, F. J. Rowland, Alfred Ball, Wm. Ryan.

Life Members.—T. K. Thomson, C.E., Nicol Kingsmill, K.C., Mrs. J. G. Wilson.

JANET CARNOCHAN, *President.*

XIX—*Report of The Entomological Society of Ontario.*

Presented through the HONORARY SECRETARY.

This Society held its forty-sixth annual meeting in the Ontario Agricultural College, Guelph, on the 4th and 5th days of November last. There was a large attendance, members from Ottawa, Toronto, Montreal, Port Hope, Trenton, Grimsby and Guelph being present. Important subjects were brought before the meeting by the district directors and discussed: the destruction of the cut-leaf birch trees by the Red-necked Borer; attempts to control the Tussock Moth; the extension of the San José Scale to Prince Edward County; the work of the Blackberry Saw-fly; that of the Spruce Gall-louse; the importation of Brown-tail Moth larvæ on French nursery stock; and other matters of interest to fruit growers and foresters.

In the evening a public meeting was held in the Massey Hall Auditorium, which was well filled with students of the College, both male and female, and a number of visitors from the town, together with members of the Society, gathered in session. "Dr. C. Gordon Hewitt, the newly-appointed Entomologist of the Experimental Farms of the Dominion, gave a highly interesting and instructive address, illustrated by a series of admirable lantern pictures, on 'House Flies and Their Allies.' The College orchestra added much to the enjoyment of the evening by the musical selections they rendered." (*Can. Ent. Vol. XLI, p.* 429.)

In the forthcoming Annual Report of the Society the papers read before the meeting will be found in full. The titles of them denote

their interest to naturalists and to the agricultural community. They are:

"Observations on Insects of the Season," by L. Cæsar.
"Injurious Insects of Ontario," C. J. S. Bethune.
"Injurious Insects of Ottawa," A. Gibson.
"Injurious Insects of Quebec," Prof. W. Lochhead.
"The Origin and Diffusion of Entomological Errors," H. H. Lyman.
"Some Guests at the Banquet of Blossoms," F. J. A. Morris.
"Nests of the Brown-tail Moth," A. Gibson.
"Nursery Inspection Work in Ontario," R. C. Treherne.
"House Flies and their Allies," Dr. G. C. Hewitt.
"The Larch Saw-fly," Dr. C. G. Hewitt.
"Conflicts between Two Species of Ants," G. E. Sanders.
"Snowy White Linden Moth," A. F. Winn.
"Adaptations of Insect Structure," T. W. Fyles.
"The Life-history of Anisota Viriniensis," T. W. Fyles.
"The Acarina found in Ontario," T. D. Jarvis.
"Notes on Fruit Tree Scolytids," J. M. Swaine.
"Entomological Record for 1909," A. Gibson.
"The Spruce Bud-worm Tortrix," A. Gibson.
"Memoir of Dr. Brodie," F. J. A. Morris.

The Report is illustrated with a portrait of the late Dr. Brodie and with five half-tone plates. There are also thirty-nine illustrations in the text.

"The Canadian Entomologist," the monthly organ of the Society, maintains its well-earned reputation. From its mail list for last month it appears that the magazine is not only circulated in Canada, but is taken in the United States, in fourteen countries of Europe, in India, Japan, the Philippine Islands, Egypt, Cape Colony, Natal, Portuguese E. Africa, Australia, New Zealand, Tasmania, Brazil, the Argentine Republic, Uruguay, Hawaii, and in five of the West-Indian Islands. The volume for 1909—the Forty-first Volume—contains articles from seventy-three contributors. Amongst these are correspondents in Calcutta, Honolulu, Panama, and St. Petersburg. These facts show how widely the influence of the Society extends. In this volume no less than one hundred and twenty-eight newly discovered species of insects are brought into notice and named, together with fourteen sub-species and eight varieties. It also contains obituary notices of Mr. G. W. Peck and Professor M. V. Slingerland, and a memoir of William Henry Edwards—all well known Entomologists.

Eleven plates and thirteen other illustrations add interest to the volume.

At the close of last year the Rev. C. J. S. Bethune, who had conducted the *Canadian Entomologist* for many years with great care and ability, found it necessary to retire from active editorial work, much to the concern of the members of the Society, who have highly appreciated his services. However, a worthy successor in the editorship of the magazine has been found in Dr. E. M. Walker, of the Biological Department of Toronto University.

Dr. Btehune has been appointed *Editor emeritus* by the Executive of the Society.

In the Society's library, at Guelph, there are more than two thousand bound volumes, and a very large number of unbound publications—bulletins, proceedings of societies, etc.

The Society's cabinets contain a very complete collection of the Lepidoptera and Coleoptera of the Provinces of Ontario and Quebec and a good number of representatives of the other orders. In addition there are many very beautiful specimens of exotic Lepidoptera.

The Branch Associations connected with the Society are doing excellent work. They spread the knowledge of Economic Entomology to the great benefit of the farmers, horticulturists and fruit growers in their several localities.

THOMAS W. FYLES.

Hull, Que., May, 1910.

XX.—*Report of The Numismatic and Antiquarian Society of Montreal*,

Presented by W. D. LIGHTHALL, F.R.S.C., delegate.

The past year has not been especially eventful with our Society. The additions to the Museum have been ten Canadian antiquities and several coins and medals; those to the National Portrait Gallery, several oil portraits: of the Honourable William McGillivray of the North West Company, founder of Fort William, by whom Fort William was named, Isaac Todd, Lafontaine, Baldwin and Lord Elgin: in the library, shelving has been put up, in the upper storey sufficient to hold about fifty thousand volumes; a commencement has been made in cataloguing, and ten thousand subjects have been catalogued so far. The additions to the Library have been some 400 books and pamphlets.

The *Canadian Antiquarian Journal* continues to be published regularly; extensive repairs have been made to the outside of the Chateau and also to the vaults.

About 100,000 visitors, from all parts of the world annually pass through the Chateau.

During the year 1909 eight meetings of the Society were held and nine meetings of the Council, at which much business was transacted and seven papers were read.

A proposal has been favorably received by the Society for a celebration in some public manner of the 250th anniversary of the establishment of Montreal as a trading post, by Samuel de Champlain in 1611. The form has not yet been fixed.

The officers for the year 1910, are

President—Judge L. W. Sicotte.

Vice-Presidents—W. D. Lighthall, K.C., James Reid, Chs. T. Hart, Ludger Gravel, L. G. A. Cressé, K.C., Mr. Justice Eug. Lafontaine.

Honorary Treasurer—George Durnford, F.C.A.

Honorary Curator—R. W. McLachlan.

Honorary Recording Secretary—C. A. Harwood, B.C.L.

Honorary Corresponding Secretary—Pemberton Smith.

Honorary Librarian—Victor Morin, LL.B.

Council—P. O. Tremblay, A. S. Hamelin, G. N. Moncel, A. Chaussé S. M. Baylis, J. C. A. Heriot, R. Pinkerton, Rev. N. Dubois, S. W. Ewing.

XXI.—*Report of the Botanical Club of Canada for* 1910.

Presented by Dr. A. H. MacKay, F.R.S.C.. General Secretary, and Delegate.

Table I., Nova Scotia Phenochrons, 1908–9.

The first table contains the summary of about three hundred schedules of observations made in as many of the public schools of the province by the pupils attending school, from a radius of about two miles around each school. The observations are proved and recorded by the teacher, who transmits the schedule with the regular school return to the inspector for the Superintendent. The Superintendent sends the schedules from each region of the province to a staff of phenologists. Their general reports can be found in the April *Journal of Education for Nova Scotia,* 1910, from pages 85 to 97. They also compile the schedules showing the average dates (phenochrons) of the various phenomena for the coast belt, the low inland belt and the high inland belt, of each special region of the province. These schedules are compiled finally into the nine regions of the province, shown on the said first table by Mr. James Mac. G. Stewart, B.A. The Nova Scotian phenological staff is as follows:—

Region I. (Yarmouth and Digby Counties), A. W. Horner, Principal of Seminary School, Yarmouth.

Region II. (Shelburne County), E. C. Allen, Principal Public School, Yarmouth.

Region II. (Queens County), Minnie C. Hewitt, Science Teacher, Lunenburg Academy.

Region II. (Lunenburg County), Burgess McKittrick, B.A., Principal, Lunenburg Academy.

Region III. (Kings and Annapolis Counties), Ernest Robinson, B.A., Principal, Horton Academy.

Region IV. (Hants and South Colchester), J. E. Barteaux, M.A., Inspector of Technical Schools.

Region V. (Halifax and Guysboro Counties), G. R. Bancroft, B.A., Science Master, Halifax County Academy.

Region VI. A and B. (Cobequid Slope), F. G. Morehouse, Principal Public Schools, Springhill.

Region VII. (Cumberland, North Colchester), (Pictou and Antigonish Counties), W. P. Fraser, M.A., Science Master, Pictou Academy.

Region VIII, IX and X. (Cape Breton Island), M.D. Davidson, B.A., Principal Public Schools, North Sydney.

Table II., Canadian Phenochrons, 1909.

The next table gives the dates throughout Canada of the first observance only of each phenochron, except in the cases of the provincial phenochrons which are the averages of the first observances given in the other tables.

The following observers reported directly to me from the following stations —

Princeton, British Columbia: Mrs. Hugh Hunter.
Mistawasis, Saskatchewan: C. W. Bryden, B.A
Aweme, Manitoba: Norman Criddle.
Guelph, Ontario: J. W. Eastham.
St. Stephen, New Brunswick: J. Vroom.
Guelph, Ontario, J. W. Eastham.
St. Stephen, New Brunswick, J. Vroom.

Very full reports worthy of local, and sometimes possibly of general, publication have occasionally been made by some observers. These are carefully filed for future use. For instance, the schedule from Aweme, Manitoba, contained two hundred and seventeen plants on the list, with evidently accurate double observations of "when first seen" and "when becoming common" and fruiting.

TABLE III., CANADIAN PHENOCHRONS, 1909, (METEOROLOGICAL LIST.)

Mr. R. F. Stupart, Director of the Meteorological Service of Canada transmitted the thirty-five reports given in this table—*seven* from British Columbia, *six* from Alberta, *two* from Saskatchewan, *six* from Manitoba, *eleven* from Ontario, *one* from Quebec, and *two* from New Brunswick. The averages of groups of these are given in Table II.

List of Stations and Observers:

Fort St. James, B.C., A. C. Murray.
Goldstream, B.C., R. M. Pope.
Princeton, B.C., Hugh Hunter.
Quesnel, B.C., John Strand.
Big Creek, B.C., H. E. Church.
Ladner, B.C., A. de R. Taylor.
Bittern Lake, Alta., E. C. Roper.
Lion, Alta., Geo. K. Cottman.
Emsburg, Alta., Mrs. W. L. Fulton.
Fort Vermilion, Alta., Rev. O. S. White.
Dorenlee, Alta., C. Nixon.
Ranfurly, Alta., Thomas B. Waite.
Victoria, Alta., G. A. Mitchell.
Gatesgarth, Sask., G. and B. Spring Rice.
Fairfield, Sask., John Kuehne.
Oakbank, Man., Alfred Goodridge.
Cartwright, Man., E. F. Heath.
Aweme, Man., Norman Criddle.
Morden, Man., Miss Laura E. Bradshaw.
Gretna, Man., A. Klaassen.
Norquay, Man., W. H. Hollard.
Lake Talon, Ont., W. T. Gale.
Bruce Mines, Ont., John Nicholas.
Beatrice, Ont., John Hollingworth.
Birnam, Ont., J. S. Mellor.
Cottam. Ont., Thomas Smith.
Woodstock, Ont., A. T. McNeill, M.A.
Lucknow, Ont., W. E. McDonald.
Port Dover, Ont., L. G. Morgan.
Toronto, Ont., F. F. Payne.
Madoc, Ont., C. Young.
Arden, Ont., Thos. Andrew.
Abitibi, Que., Geo. Drever.
Scotch Lake, N.B., Wm. H. Moore.
St. Stephen, N.B., P. G. McFarlane.

Dissolution of the Botanical Club of Canada.

The Club which was organized on the 29th of May, 1891, by a Committee of Section IV of the Royal Society of Canada, at its meeting in Montreal, was formally dissolved at the Ottawa meeting of the Royal Society, on the 28th of September, 1910.

The reasons were: First, the impossibility of holding representative meetings of the Club on account of the great expense of its members meeting annually at one centre from the distant provinces of the Dominion. Second, the only successful work of the Club was the collection of phenological statistics, the expense of which (with the exception of the printing of the phenological summaries by the Royal Society) was borne entirely for many years by the Secretary. Third, this work has now been very successfully undertaken by the Meteorological Service (as indicated above), and it is expected will in future be carried on even more effectively. Fourth, the stimulation of botanical exploration and research, one of the most important original objects of the Club, can now be more effectively guided by the botanical officials at Ottawa.

The dissolution of the Club does not, therefore, indicate retrogression. It indicates evolution—expansion from voluntary club work to the permanently subsidized and well-staffed departments of Meteorology and Biology of the Dominion of Canada.

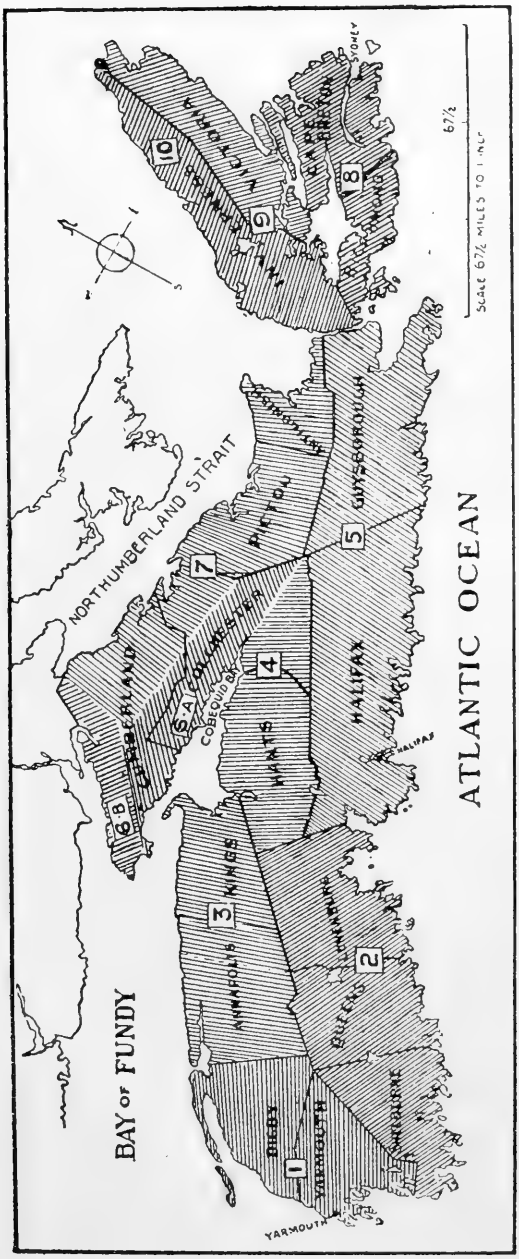
Nova Scotian Phenochrons.

(See Map on next page showing the Counties and the *ten phenological* regions.)

Instructions for the Compilation of the "Region" and "Belt" phenochrons of the Province of Nova Scotia, Canada, which are further averaged so as to give the phenochrons for each region in the following table.

Each province may be divided into its main climatic slopes or regions which may often not be coterminous with the boundaries of counties. Slopes, especially those to the coast, should be subdivided into belts such as (a) the coast belt, (b) the low inland belt, and (c) the high inland belt.

In Nova Scotia the following regions are marked out, proceeding from South to North, and from East to West, as orderly as possible:



Map Showing the Phenological Regions of Nova Scotia.

No.	Regions or Slopes.	Belts.
1.	Yarmouth and Digby Counties	(a) Coast, (b) Low Inlands, (c) High Inlands.
2.	Shelburne, Queen's and Lunenburg Counties,	(a) Coast, (b) Low Inlands, (c) High Inlands.
3.	Annapolis and King's Counties,	(a) South Mts., (b) Annapolis Valley, (c) Cornwallis Valley, (d) North Mts.
4.	Hants and Colchester South of Cobequid Bay.	(a) Coast, (b) Low Inlands, (c) High Inlands.
5.	Halifax and Guysboro Counties,	(a) Coast, (b) Low Inlands, (c) High Inlands.
6.	(A) Cobequid Slope to S. (B) Chignecto Slope to N.W.,	(a) Coast, (b) Inlands.
7.	Northumberland Straits Slope (to the North),	(a) Coast, (b) Low Inlands (c) High Inlands.
8.	Richmond and Cape Breton Counties,	(a) Coast, (b) Low Inlands (c) High Inlands.
9.	Bras d'Or Slope (to South East),	(a) Coast, (b) Low Inlands (c) High Inlands.
10.	Inverness Slope (to Gulf, N.W.)	(a) Coast, (b) Low Inlands (c) High Inlands.

[*When the belts (b) and (c)—Low and High Inlands—are not sufficiently distinct, they may be combined in any "region" into one (belt b c)—Inlands. There will then be but two belts to be considered "Coast" and "Inlands."*]

Note:—The nomenclature of the species of plants in the following tables is contracted from the "observation schedule" which will be found to follow that of the sixth edition of *Gray's Manual*.

I.—FLOWERING AND OTHER PHENOCHRONS FOR THE PROVINCE OF NOVA SCOTIA.

When First Seen. Regions.											Year ended July, 1909.	When Becoming Common. Regions.										
1. Yarmouth and Digby.	2. Shelburne, Queens and Lunenburg.	3. Annapolis and Kings.	4. Hants and South Colchester.	5. Halifax and Guysboro.	6. South Cobequid Slope (S. Cumb. and Col.)	7. North Cumb., Col., Pictou and Antig.	8. Richmond and Cape Breton.	9. Victoria and Inverness.	10.	Average Dates.	Day of the year corresponding to the last day of each month. Jan. 31, Feb. 59, March 90, April 120, May 151, June 181, July 212, Aug. 243, Sept. 273, Oct. 304, Nov. 334, Dec. 365. For Leap Year add one to each except January. Nomenclature as in "Gray."	Average Dates.	1. Yarmouth and Digby.	2. Shelburne, Queens and Lunenburg.	3. Annapolis and Kings.	4. Hants and South Colchester.	5 Halifax and Guysboro.	6. South Cobequid Slope (S. Cumb. and Col.)	7. North Cumb., Col., Pictou and Antig.	8. Richmond and Cape Breton.	9. Victoria and Inverness.	10.
100.2	104.4	102.8	103.1	103.9	109.2	104.3	111.1	109.9	.....	105.4	1 Alnus incana, Wild	111.2	108.6	111.	105.5	108.3	112.	114.3	109.3	116.	115.8	.....
113.5	115.8	118.6	110.	116.9	124.3	117.9	120.	123.5	.....	117.8	2 Populus tremuloides	124.8	128.	120.2	127.	112.5	121.7	135.	123.3	124.6	131.	.....
91.3	98.7	103.6	103.5	103.	115.9	110.8	113.6	116.4	.....	106.3	3 Epigea repens, L.	116.	105.4	109.	114.9	114.7	116.1	121.1	118.7	120.8	123.4	.....
133.3	130.1	125.4	125.9	131.5	126.6	125.7	133.6	130.2	.....	129.1	4 Equisetum arvense	133.3	131.	134.7	130.5	127.6	137.	132.2	131.	140.3	135.6	.....
119.1	127.	.....	130.	.....	130.	126.	.....	126.	.....	126.3	5 Sanguinaria Canadensis	130.3	130.	132.	.....	130.	129.5	134.	129.2	.....	128.	.....
119.1	123.	126.8	125.9	124.4	127.3	128.	128.7	130.4	.....	126.	6 Viola blanda	132.2	128.4	128.8	132.4	133.1	131.7	133.2	132.8	133.9	135.2	.....
125.5	127.5	.....	128.3	129.4	130.5	128.7	132.1	131.2	.....	129.2	7 Viola palmata, *cucullata*	136.1	133.2	132.9	.....	135.1	137.7	136.9	136.1	138.6	138.1	.....
118.	129.	123.	.....	.....	128.	130.	145.5	.....	....	128.9	8 Hepatica triloba, etc.	133.6	123.	136.	129.	130.	.....	132.	136.	149.	.....	.....
129.7	128.7	129.5	127.9	128.6	129.6	129.	132.	131.5	.....	129.6	9 Acer rubrum	133.8	133.8	133.2	132.7	131.5	138.1	135.2	134.4	136.5	136.	.....
125.6	127.2	129.	126.6	130.3	130.1	130.2	129.9	132.8	.....	129.1	10 Fragaria Virginiana	136.5	133.5	134.6	135.1	133.9	138.7	137.	138.	137.7	140.	.....
161.3	163.9	163.9	163.4	169.3	167.5	168.	169.5	173.7	.....	165.6	11 " " fruit ripe	175.9	173.2	173.6	172.3	174.5	180.1	174.	176.8	179.	179.7	.....
125.3	129.2	131.1	130.5	131.2	132.7	133.7	136.7	136.5	.....	131.9	12 Taraxacum officinale	138.7	134.9	134.7	137.3	138.4	137.8	138.8	140.	144.	143.	.....
152.	150.	.....	151.	130.	131.6	136.7	.....	166.	.....	145.3	13 Erythronium Americanum	152.	156.	160.	.....	153.	.....	135.7	137.5	.....	170.	.....

I.—FLOWERING AND OTHER PHENOCHRONS FOR THE PROVINCE OF NOVA SCOTIA—*Continued.*

1	2	3	4	5	6	7	8	9	10	Av.		Av.	1	2	3	4	5	6	7	8	9	10
129.1	131.6	130.9	133.5	131.3	132.5	134.6	137.8	139.5	.....	133.4	14 Coptis trifolia	139.5	135.7	136.5	136.3	141.8	138.5	137.2	141.	143.1	145.1	.....
117.	.....	.....	122.5	128.	129.	128.3	141.3	137.1	.....	129.	15 Claytonia Caroliniana	136.3	138.	.....	.....	129.5	133.	132.1	133.4	146.7	141.7	.....
146.3	136.7	135.5	139.6	140.2	140.2	134.	144.2	150.9	.....	140.8	16 Nepeta Glechoma	148.3	148.7	144.4	.....	147.7	149.	145.6	145.4	148.5	157.1	.....
138.6	137.	137.6	137.4	142.9	141.	143.5	150.4	150.4	.....	142.1	17 Amelanchier Canadensis	148.3	145.2	143.4	143.2	143.1	152.2	147.	149.4	156.	155.1	.....
.....	201.	.....	.....	207.5	.....	.....	213.	205.	.....	206.6	18 " " (fruit ripe)	212.8	.....	210.	.....	.....	215.5	.....	.....	.....	213.	.....
144.8	144.3	142.5	145.8	152.5	150.9	150.2	156.1	156.	.....	149.2	19 Prunus Pennsylvanica	154.2	150.8	150.2	147.8	152.6	155.5	155.	155.6	160.8	159.7	.....
194.	.....	222.	.....	215.	.....	206.	209.	229.	.....	212.5	20 " " (fruit ripe)	217.8	200.	.....	.....	.....	220.	222.	212.	.....	235.5	.....
137.4	138.	143.9	145.8	148.9	145.3	149.2	159.7	159.5	.....	147.5	21 Vaccinium Can. and Penn.	153.8	144.2	146.9	149.6	152.4	155.8	151.4	154.6	164.1	165.3	.....
.....	183.5	.....	.....	.....	200.	188.	230.	230.	.....	206.3	22 " " " (fruit ripe)	213.	200.	191.	.....	.....	214.	205.	200.	247.	234.	.....
153.6	151.7	154.4	158.6	158.7	157.3	157.8	163.9	163.4	.....	157.7	23 Ranunculus acris	163.8	159.4	158.9	160.2	164.3	165.7	163.4	164.4	169.6	168.6	.....
153.7	154.8	159.1	157.6	163.7	162.8	158.9	168.9	166.2	.....	160.6	24 R. repens	165.7	161.7	161.5	164.5	162.1	169.3	167.	160.1	173.2	172.2	.....
141.9	146.	139.8	141.7	149.3	144.3	147.6	154.5	158.2	.....	147.	25 Trill. erythrocarpum	152.1	147.2	152.1	145.	150.9	156.8	150.4	152.7	156.	157.5	.....
143.6	145.5	148.5	144.7	153.2	151.	154.3	160.3	162.5	.....	151.5	26 Rhododendron Rhodora	157.9	151.	151.2	153.9	155.	162.5	156.8	159.6	165.8	165.7	.....
146.5	149.8	151.2	152.1	153.5	154.4	154.3	157.9	157.7	.....	153.	27 Cornus Canadensis	159.1	154.7	157.4	157.5	157.6	161.9	156.7	160.7	162.9	162.6	.....
182.	198.	.....	.....	206.	197.	204.	225.	212.5	.....	203.5	28 " " (fruit ripe)	215.	193.	208.	.....	248.	212.	202.	209.	230.	218.	.....
150.1	150.5	150.	154.8	155.6	152.7	154.	158.7	161.2	.....	154.2	29 Trientalis Americana	159.9	155.7	156.4	155.5	160.2	162.1	160.2	160.	162.8	166.1	.....
150.4	154.5	151.2	159.	157.5	157.3	160.9	166.2	162.2	.....	157.7	30 Clintonia borealis	163.8	156.3	159.6	158.3	167.4	165.4	163.3	165.8	169.8	168.2	.....
155.	157.	154.	163.	160.	161.	166.1	166.5	164.	.....	160.1	31 Calla palustris	167.6	166	162.7	166.	165.	177.	165.	168.7	170.	167.6	.....
156.2	156.2	157.3	162.7	161.7	161.3	163.4	176.4	167.7	.....	162.5	32 Cypripedium acaule	167.3	161.6	162.4	162.7	168.3	168.	166.7	166.3	179.7	170.2	.....
158.2	159.	157.9	159.8	163.7	161.9	163.5	168.4	168.3	.....	162.3	33 Sisyrinchium angustifolium	167.5	164.8	165.	163.1	165.2	168.6	166.8	167.8	173.2	172.8	.....
164.	162.3	165.5	167.9	171.1	171.2	167.8	171.6	171.1	.....	168.	34 Linnæa borealis	173.1	170.	168.3	176.	174.2	176.9	176.5	172.6	169.9	173.5	.....
151.8	155.	151.7	152.1	150.	155.9	153.6	164.	169.	.....	155.9	35 Kalmia glauca	162.9	167.5	161.3	159.	157.1	156.5	161.	160.9	169.8	173.	.....
172.8	169.9	169.	171.8	168.6	175.3	174.5	176.4	176.7	.....	172.8	36 Kalmia augustifolia	178.8	175.2	176.9	.....	179.4	176.	179.3	178.7	182.5	182.	.....
165.8	163.5	160.1	161.	.....	164.1	167.4	169.	.....	.....	164.4	37 Cratægus oxyacantha	168.4	170.7	168.1	165.	167.	.....	166.6	170.	171.5	.....	.....

166.5	158.6	158.8	159.8	166.	161.6	161.7	170.3	165.	.....	163.1	38	Cratægus coccinea, etc	166.7	171.6	165.	164.5	163.2	171.2	166.	166.4	175.	168.7	.....
166.	164.5	165.3	166.4	172.7	166.7	168.7	174.2	173.1	.....	168.6	39	Iris versicolor	173.1	169.3	170.3	169.4	171.1	177.8	171.3	173.5	177.5	177.5	.....
163.	163.7	164.4	167.	169.4	166.6	166.5	173.7	174.6	.....	167.7	40	Chrysanthemum Leucanth	173.5	169.9	170.3	170.2	173.1	176.4	172.6	173.3	177.4	178.6	.....
167.5	167.1	157.	169.5	173.8	165.	168.7	175.2	172.1	.....	168.4	41	Nuphar advena	172.6	168.	170.1	160.	177.8	177.9	170.5	173.7	177.3	177.8	.....
165.9	164.8	161.4	163.6	168.1	166.	161.4	171.6	173.6	.....	166.3	42	Rubus strigosus	172.	172.1	170.8	168.9	169.1	175.6	171.3	169.7	173.3	177.4	.....
188.	201.	.....	.....	201.5	202.5	192.	211.5	211.7	.....	201.2	43	" " (fruit ripe)	209.5	199.	208.	.....	.....	207.5	210.	199.	223.5	219.5	.....
168.5	168.3	172.2	177.1	178.2	175.6	175.8	175.5	178.5	.....	174.6	44	Rhinanthus Crista-galli	178.4	174.	173.6	176.5	179.5	181.7	181.6	181.1	176.3	181.5	.....
168.7	168.8	166.7	170.8	173.7	173.7	172.3	171.	176.	.....	171.2	45	Rubus villosus	176.5	174.9	174.4	172.	174.3	180.8	177.1	177.	176.8	181.1	.....
214.	231.	.....	274.	231.7	240.	241.	.....	248.	.....	240.	46	" " (fruit ripe)	246.3	229.	244.	.....	263.	238.2	248.5	247.5	.....	254.	....
170.6	168.2	.....	174.	173.	173.6	168.5	175.7	172.	.....	171.9	47	Sarracenia purpurea	176.2	174.2	173.9	.....	.....	179.5	177.	174.	178.3	176.6	.....
176.3	174.1	173.	176.	181.5	175.1	176.	174.5	180.	.....	176.3	48	Brunella vulgaris	181.4	179.4	178.6	178.	179.5	187.5	178.1	177.9	185.	189.	.....
175.8	176.	174.4	177.3	176.6	173.2	177.	186.7	172.5	.....	176.6	49	Rosa lucida	183.	182.8	178.3	178.5	181.2	183.	179.5	180.	198.	185.8	.....
164.8	166.3	166.1	166.1	172.2	169.5	167.8	176.5	184.	....	170.4	50	Leontodon autumnale	176.6	170.	172.3	173.1	174.2	179.	175.2	175.9	182.1	187.4	....
170.	174.8	166.	170.	171.5	177.7	174.5	174.8	172.5	.....	172.4	51	Linaria vulgaris	178.6	.....	179.3	179.	180.	177.5	180.	178.9	179.	175.	.....
133.8	135.3	133.1	134.5	140.5	133.3	138.1	142.2	143.1	....	137.1	52	Trees appear green	148.3	.....	146.	143.5	146.3	151.4	143.	150.7	152.8	152.4	.....
142.	142.8	140.2	145.7	147.6	149.6	148.8	153.7	159.1	.....	147.7	53	Ribes rubrum (cultivated)	153.7	150.5	148.8	148.1	150.5	153.9	154.9	154.2	158.4	163.8	.....
188.	.....	194.	179.	.....	200.5	185.	.....	209.	.....	192.6	54	" " (fruit ripe)	203.	197.	.....	.....	.....	.....	209.	188.	.....	218.	.....
144.7	145.2	142.8	147.5	153.3	150.9	151.5	156.7	161.4	.....	150.4	55	R. nigrum (cultivated)	156.	153.1	153.6	150.1	151.4	158.6	154.7	157.2	158.7	166.2	.....
193.	.....	.....	.....	.....	205.	208.5	.....	211.5	.....	204.6	56	" (fruit ripe)	206.1	177.5	.....	.....	.....	.....	211.	215.	.....	221.	.....
141.6	145.6	143.3	148.7	152.	153.	153.1	158.3	157.9	.....	150.4	57	Prunus Cerasus	155.5	149.8	152.3	148.6	153.8	157.9	156.5	156.6	163.2	160.5	.....
.....	....	221.	.....	206.	.....	214.	.....	230.	.....	217.8	58	" " (fruit ripe)	222.	.....	.....	.....	.....	213.	.....	218.	.....	235.	.....
146.5	146.7	146.7	149.6	153.8	154.2	153.8	161.	160.8	.....	152.6	59	Prunus domestica	158.1	153.3	152.6	153.1	154.1	161.9	158.6	158.5	165.6	165.1	.....
149.5	150.	149.6	152.1	155.6	155.	154.9	162.2	161.4	.....	154.5	60	Pyrus Malus	160.9	158.4	157.6	156.5	157.7	163.7	160.2	160.3	167.5	166.	.....
160.8	160.4	158.9	159.8	168.2	161.1	162.9	168.6	169.5	.....	163.4	61	Syringa vulgaris	168.6	167.9	166.1	164.1	164.5	174.1	166.	167.	173.3	174.3	.....
162.3	162.2	161.2	161.	167.3	163.8	163.6	171.	168.5	.....	164.5	62	Trifolium repens	170.5	168.3	168.5	167.1	169.6	172.5	168.8	170.1	175.2	174.5	.....
150.3	158.2	161.1	162.2	167.9	166.5	164.9	172.	170.3	.....	163.7	63	Trifolium pratense	170.3	162.	165.8	167.2	169.6	174.6	171.	171.	175.9	176.	.....

I.—FLOWERING AND OTHER PHENOCHRONS FOR THE PROVINCE OF NOVA SCOTIA—*Continued.*

1	2	3	4	5	6	7	8	9	10	Av.		Av.	1	2	3	4	5	6	7	8	9	10
174.6	165.8	173.1	168.8	172.2	174.5	172.6	185.8	179.7	.....	174.1	64 Phleum pratense	179.	179.	170.8	175.	171.	178.5	180.8	180.7	189.	186.5	.....
180.	176.5	178.	.....	192.	.....	185.6	187.3	190.5	.....	184.3	65 Solanum tuberosum	193.2	.....	182.	.....	.....	197.	.....	197.5	191.5	198.	.....
102.1	110.7	115.9	125.	118.7	125.4	127.6	116.6	120.2	.....	118.	66 Ploughing (first of season)	129.2	118.	120.9	126.9	140.8	128.3	138.4	138.	124.3	127.3	.....
118.	121.	127.	134.9	130.5	133.3	136.4	133.2	133.7	.....	129.8	67 Sowing " "	137.8	128.4	128.5	135.2	139.1	138.7	142.7	146.4	141.	140.4	.....
111.3	117.6	133.3	135.9	126.1	136.	133.4	125.3	130.3	.....	127.7	68 Potato-planting "	137.9	123.8	125.3	144.1	148.1	134.3	147.2	146.6	134.3	137.3	.....
133.4	123.2	130.	143.	132.1	134.3	138.	133.8	124.	.....	132.4	69 Sheep-shearing "	142.4	143.2	133.6	135.2	152.2	140.6	144.1	151.3	145.9	135.9	.....
177.5	177.7	181.5	195.	196.	202.	196.5	213.7	206.3	.....	194.	70 Hay-cutting "	204.8	194.5	183.	.....	201.	208.2	210.	201.7	224.4	215.5	.....
250.3	239.	.....	250.7	244.	239.6	241.2	243.2	241.5	.....	243.7	71 Grain-cutting "	250.3	243.5	248.5	.....	258.8	249.6	246.8	251.3	253.3	250.6	.....
264.3	260.6	261.5	266.6	264.	265.1	273.3	269.1	271.1	.....	266.2	72 Potato-digging "	273.6	253.3	270.	281.	274.2	272.6	270.	282.	277.7	280.4	.....
82.3	66.5	82.7	79.7	79.7	88.5	77.7	86.7	82.2	.....	80.7	73aOpening of rivers	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
82.7	95.5	105.	95.5	105.2	104.	73.2	104.7	99.7	.....	96.2	73bOpening of lakes	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
114.6	112.4	117.1	121.7	116.6	117.1	118.4	117.4	120.8	.....	117.3	74aLast snow to whiten ground	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
120.9	121.	119.7	126.4	131.1	122.8	129.2	147.6	139.9	.....	128.7	74b " to fly in air	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
127.1	121.5	136.	119.5	147.1	139.4	132.9	124.4	127.1	.....	130.6	75aLast spring frost—hard	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
141.7	134.	151.2	152.5	155.8	158.3	148.4	155.8	144.3	.....	149.1	75b " " hoar	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
92.2	91.	82.	85.	93.5	106.	62.	107.7	97.	.....	90.4	76aWater in streams—high	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
271.	273.1	.....	226.5	263.6	212.	198.7	259.8	220.	.....	240.6	76b " " low	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
253.4	259.	248.	252.5	255.9	258.	256.	268.5	283.7	.....	259.4	77aFirst autumn frost, hoar	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
279.9	292.4	290.5	276.2	275.9	293.2	287.5	302.7	298.5	.....	288.5	77b " " hard	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
304.5	304.5	304.2	299.4	301.1	295.	301.8	300.	293.9	.....	300.5	78aFirst snow to fly in air	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
312.5	316.4	310.9	305.4	319.8	304.6	312.4	309.2	304.5	.....	310.6	78b " to whiten ground	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
357.5	350.5	333.5	.....	338.7	336.	351.	331.1	343.5	.....	342.7	79aClosing of lakes	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
40.	.....	342.	344.	346.	317.	349.3	347.7	342.	.....	349.1	79b " rivers	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
79.5	84.5	79.5	97.2	82.7	97.	84.1	94.8	85.3	.....	87.1	81aWild ducks migrating, N.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

.....	.....	279.	310.	287.7	.....	298.8	310.5	309.	.....	299.2	81b	"	"	S.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
85.8	52.	82.	81.2	76.8	94.8	82.8	86.9	88.1	.....	81.2	82a	Wild geese	"	N.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
306.5	322.7	325.	347.7	313.6	.....	318.5	305.2	300.3	.....	317.4	82b	"	"	S.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
82.9	89.6	88.4	84.9	92.7	93.9	90.4	92.7	94.7	.....	90.	83	Melospiza fasciata,		North	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
78.2	81.4	82.9	81.3	84.1	90.	84.7	90.7	92.2	.....	85.	84	Turdus migratorius		"	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
97.6	93.5	88.5	74.3	90.	90.	89.6	95.8	121.2	.....	93.4	85	Junco hiemalis		"	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
136.	124.7	.....	141.	136.	127.6	128.5	114.5	122.1	.....	128.8	86	Actitis macularia		"	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
131.	103.5	110.6	158.	130.	.....	134.5	.....	.....	.....	127.9	87	Sturnella magna		"	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
128.7	124.2	120.6	126.	126.7	127.	120.9	127.5	126.5	.....	125.3	88	Ceryle Alcyon		"	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
138.	120.3	130.9	124.5	132.7	130.	129.5	128.7	133.6	.....	129.8	89	Dendrœca coronata		"	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
137.3	138.5	137.8	137.3	133.1	131.7	138.5	146.1	148.6	.....	138.8	90	D. æstiva		"	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
130.	128.5	.....	127.8	123.	131.	119.1	122.5	122.6	.....	125.6	91	Zonotrichia alba		"	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	148.9	144.1	142.1	145.7	150.5	150.	147.	152.3	.....	147.6	92	Trochilus colubris		"	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
138.5	148.6	141.	146.3	142.5	141.5	138.3	147.	146.	.....	143.3	93	Tyrannus Carolinensis		"	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
136.8	.....	140.1	143.9	147.2	146.8	139.8	135.5	148.8	.....	142.4	94	Dolychonyx oryzivorus		"	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
135.5	138.3	150.6	150.5	140.5	.....	141.7	145.	149.8	.....	144.	95	Spinis tristis		"	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
163.	135.1	143.6	125.	136.	.....	142.6	113.	133.5	.....	136.5	96	Setophaga ruticilla		"	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
150.	139.	152.	.....	145.	163.	148.3	149.	135.	.....	147.7	97	Ampelis cedrorum		"	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
139.3	136.7	129.5	136.6	128.5	130.5	144.6	136.5	141.4	.....	135.9	98	Chordeiles Virginianus		"	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
97.6	103.	104.9	106.5	103.4	106.8	105.	110.2	111.4	.....	105.4	99	First piping of frogs.....			.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
104.6	103.8	119.	117.	111.6	114.	118.9	122.5	126.2	.....	115.3	100	First appearance, snakes.....			.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

THUNDERSTORMS—PHENOLOGICAL OBSERVATIONS, NOVA SCOTIA, 1908–09.

The indices indicate the number of stations from which the Thunderstorms were reported on the day of the year specified.

Observation Stations.

1. Yarmouth and Digby.	2. Shelburne, Queens and Lunenburg.	3. Annapolis and Kings.	4. Hants and South Colchester.	5. Halifax and Guysboro.	6. S. Cobequid Slope (S. Cum. & Col.)	7. North Cum., Col., Pictou and Antig.	8. Richmond and Cape Breton.	9 & 10. Victoria and Inverness.		Total reports of Thunderstorms for Year 1908.
YEAR 1908.										
182^{2}	182^{2}	.....	.....	.....	.....	.....	.....	.....	.....	182^{4}
183	.....	.....	.....	183	.....	.....	.....	183	.....	183^{3}
.....	.....	.....	.....	184	.....	.....	184	.....	.....	184^{2}
.....	.....	.....	.....	.....	.....	.....	185	185	.....	185^{2}
.....	.....	.....	.....	.....	.....	.....	.....	186	.....	186
.....	.....	.....	187	.....	.....	.....	.....	187	.....	187^{2}
.....	.....	.....	.....	.....	.....	.....	.....	188	.....	188
.....	.....	.....	.....	194	.....	.....	.....	.....	.....	194
.....	.....	.....	.....	.....	.....	.....	.....	195	.....	195
.....	196	.....	.....	196	.....	.....	.....	.....	.....	196^{2}
.....	.....	.....	.....	.....	.....	.....	.....	197	.....	197
.....	198	.....	.....	.....	.....	.....	.....	.....	.....	198
.....	.....	.....	.....	.....	.....	.....	200	.....	.....	200
.....	.....	.....	.....	.....	.....	.....	.....	202	.....	202
.....	.....	.....	.....	.....	.....	.....	.....	206	.....	206
.....	.....	.....	.....	.....	.....	.....	.....	214	.....	214
.....	.....	.....	.....	.....	.....	.....	223	.....	.....	223
.....	.....	.....	.....	.....	.....	.....	.....	227	.....	227
.....	.....	.....	.....	.....	.....	.....	.....	231	.....	231
.....	233	.....	.....	.....	.....	.....	.....	.....	.....	233
.....	.....	.....	.....	.....	.....	244	.....	.....	.....	244
245^{3}	245^{3}	245	.....	.....	.....	.....	.....	.....	.....	245^{7}
246	246	.....	.....	.....	.....	.....	.....	.....	.....	246^{2}
247	247	.....	.....	.....	.....	247	.....	247	.....	247^{4}
248	.....	.....	.....	.....	.....	248	.....	.....	.....	248^{2}
.....	.....	.....	.....	.....	.....	.....	.....	254	.....	254
.....	.....	.....	.....	.....	.....	.....	.....	255	.....	255
.....	.....	257^{3}	257^{2}	257^{3}	.....	.....	257^{6}	.....	.....	257^{14}
.....	.....	.....	.....	258	.....	.....	258	.....	.....	258^{2}
259	.....	.....	.....	.....	.....	.....	.....	.....	.....	259
.....	.....	.....	.....	260	.....	.....	.....	.....	.....	260
.....	.....	262	.....	.....	.....	.....	.....	.....	.....	262
264^{8}	264^{13}	264^{2}	264^{6}	264^{2}	264	.....	.....	.....	.....	264^{32}
265	265^{2}	.....	265	265	.....	.....	.....	.....	.....	265^{5}
272^{3}	.....	.....	.....	.....	.....	.....	.....	.....	.....	272^{3}
.....	.....	.....	.....	273	273	.....	.....	.....	.....	273^{2}
274^{7}	274^{9}	274^{5}	274^{5}	274^{3}	274^{2}	274^{2}	.....	.....	.....	274^{33}
275	.....	.....	275	275	.....	.....	.....	.....	.....	275^{3}
.....	.....	277	.....	.....	.....	.....	.....	.....	.....	277
284	.....	.....	.....	.....	.....	.....	.....	.....	.....	284
.....	.....	.....	.....	.....	.....	.....	293	.....	.....	293
.....	302	.....	.....	302	.....	.....	.....	.....	.....	302^{2}

THUNDERSTORMS—PHENOLOGICAL OBSERVATIONS, NOVA SCOTIA, 1908–09—*Continued.*

1	2	3	4	5	6	7	8	9	10	Total
.....	304	.....	.....	304^{2}	.....	.....	.....	.....	.....	304^{3}
305	.....	.....	.....	.....	.....	.....	.....	.....	.....	305
.....	308^{12}	308^{10}	308	308	308^{13}	308^{2}	308^{5}	308	.....	308^{45}
.....	.....	.....	.....	.....	.....	309^{3}	.....	309	.....	309^{4}
.....	.....	.....	.....	315^{2}	.....	.....	.....	.....	.....	315^{2}
				YEAR 1909.						
.....	6	.....	.....	.....	.....	.....	.....	.....	.....	6
.....	.....	.....	.....	17	.....	.....	.....	.....	.....	17
.....	.....	.....	.....	.....	.....	.....	37	.....	.....	37
.....	.....	.....	.....	.....	.....	.....	38	.....	.....	38
.....	55	.....	.....	.....	.....	.....	.....	.....	.....	55
56	.....	.....	.....	56	.....	.....	.....	.....	.....	56^{2}
62	62	.....	62	.....	.....	.....	.....	.....	.....	62^{3}
63^{4}	63^{43}	63^{18}	63^{10}	.....	63^{4}	.....	.....	.....	.....	63^{79}
.....	64^{2}	.....	.....	.....	64	.....	.....	.....	.....	64^{3}
.....	.....	.....	.....	.....	65	.....	.....	.....	.....	65^{2}
.....	.....	67	.....	.....	.....	.....	.....	.....	.....	67
.....	68	.....	.....	.....	.....	.....	.....	.....	.....	68
.....	.....	.....	.....	.....	.....	.....	69	.....	.....	69
.....	.....	.....	.....	.....	.....	.....	.....	71	.....	71
.....	74	.....	.....	.....	.....	.....	.....	.....	.....	74
.....	79	.....	.....	.....	.....	.....	.....	.....	.....	79
.....	85	.....	.....	.....	.....	.....	.....	.....	.....	85
.....	87	.....	.....	.....	.....	.....	.....	.....	.....	87
.....	.....	.....	.....	.....	89	.....	.....	.....	.....	89
.....	.....	.....	96	96	.....	.....	96	.....	.....	96^{3}
.....	.....	.....	.....	.....	97	97^{5}	.....	.....	.....	97^{6}
.....	.....	.....	.....	.....	.....	98	.....	.....	.....	98
99	.....	.....	.....	.....	.....	.....	.....	.....	.....	99
.....	.....	.....	.....	.....	.....	100^{3}	.....	.....	.....	100^{3}
.....	.....	.....	.....	.....	.....	101	.....	.....	.....	101
.....	.....	.....	.....	.....	.....	.....	.....	103	.....	103
.....	.....	.....	105	.....	.....	.....	.....	.....	.....	105
.....	.....	106^{2}	.....	.....	106	.....	106	106	.....	106^{5}
109^{5}	109^{7}	109^{8}	109^{8}	109^{16}	109^{11}	109^{8}	109^{18}	109^{14}	.....	109^{95}
110^{2}	.....	.....	.....	.....	.....	110^{8}	110	110	.....	110^{12}
.....	.....	.....	.....	.....	.....	111	111^{2}	111	.....	111^{4}
.....	112^{4}	.....	112	.....	.....	.....	112^{2}	.....	.....	112^{7}
113^{18}	113^{44}	113^{9}	113^{6}	113^{18}	.....	113	113^{2}	113^{3}	.....	113^{100}
.....	.....	.....	.....	.....	.....	114	114	.....	.....	114^{2}
115	115^{2}	.....	.....	.....	.....	.....	.....	.....	.....	115^{3}
.....	.....	116	.....	.....	.....	116	116	.....	.....	116^{3}
.....	.....	.....	.....	.....	.....	117	117^{2}	.....	.....	117^{3}
.....	118	.....	.....	.....	.....	.....	.....	.....	.....	118
.....	119^{4}	.....	.....	.....	.....	.....	.....	.....	.....	119^{4}
121^{16}	121^{34}	121^{16}	121^{4}	121^{7}	121^{2}	.....	.....	.....	.....	121^{79}
122^{2}	122^{9}	.....	122^{4}	122^{12}	.....	.....	122^{3}	122	.....	122^{31}
.....	.....	.....	.....	.....	.....	.....	123	.....	.....	123
.....	.....	.....	.....	126	126^{5}	126^{8}	.....	126	.....	126^{15}
.....	.....	.....	.....	.....	.....	.....	.....	128	.....	128
.....	.....	.....	.....	.....	.....	129	.....	.....	.....	129
131	.....	131	.....	.....	.....	.....	.....	.....	.....	131^{2}
.....	.....	.....	.....	.....	.....	.....	.....	132	.....	132
134	134	.....	.....	.....	.....	.....	.....	.....	.....	134^{2}
.....	.....	.....	.....	.....	135	.....	.....	.....	.....	135
.....	.....	.....	.....	.....	140	.....	.....	.....	.....	140
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

THUNDERSTORMS—PHENOLOGICAL OBSERVATIONS, NOVA SCOTIA, 1908–09—*Continued.*

1	2	3	4	5	6	7	8	9	10	Total
.....	.....	142	.....	.....	.....	.....	.....	.....	.....	142
.....	.....	.....	.....	.....	.....	143	.....	.....	.....	143
.....	.....	.....	.....	148	.....	.....	.....	.....	.....	148
.....	.....	.....	.....	.....	.....	.....	.....	149	.....	149
.....	.....	.....	.....	.....	.....	150	150^{13}	150^{2}	.....	150^{16}
.....	.....	151^{10}	151^{5}	151^{5}	151^{6}	.....	151^{2}	.....	.....	151^{28}
.....	.....	.....	.....	.....	152	.....	152	.....	.....	152^{2}
.....	.....	.....	.....	.....	.....	153	153	.....	.....	153^{2}
.....	.....	.....	.....	154^{6}	154	.....	.....	154^{2}	.....	154^{9}
.....	.....	.....	.....	.....	.....	.....	.....	157	.....	157
.....	.....	.....	.....	.....	.....	.....	159	.....	.....	159
.....	160^{3}	.....	.....	.....	.....	.....	.....	.....	.....	160^{3}
.....	.....	.....	.....	.....	.....	.....	.....	161^{2}	.....	161^{2}
.....	.....	162	162	162^{2}	.....	.....	162^{2}	.....	.....	162^{6}
.....	.....	163^{2}	163^{3}	.....	163^{3}	163^{2}	163^{2}	163^{8}	.....	163^{20}
.....	164	.....	.....	.....	.....	164^{5}	.....	164^{2}	.....	164^{8}
165	165	165	165	.....	.....	165	165^{2}	.....	.....	165^{7}
166	166	.....	.....	166^{3}	.....	.....	166^{10}	166^{2}	.....	166^{17}
167	167	.....	.....	.....	.....	167^{2}	167	.....	.....	167^{5}
.....	.....	168	.....	.....	.....	168	.....	.....	.....	168^{2}
169	.....	.....	169	169	.....	.....	.....	.....	.....	169^{3}
170	170	.....	170^{2}	.....	.....	170	.....	.....	.....	170^{5}
171^{4}	.....	171^{5}	171^{3}	.....	171	171^{2}	.....	171	.....	171^{16}
172^{9}	172^{9}	172^{13}	172^{2}	172^{14}	172	172^{4}	172	172^{3}	.....	172^{56}
.....	173^{4}	.....	.....	.....	.....	173^{5}	.....	173	.....	173^{10}
174	174^{15}	.....	.....	.....	.....	.....	.....	.....	.....	174^{16}
175^{2}	.....	.....	.....	175^{2}	175	.....	.....	.....	.....	175^{5}
176	176	.....	.....	176	.....	176^{3}	.....	176^{3}	.....	176^{9}
177^{10}	177^{13}	.....	.....	177^{2}	177^{10}	177^{6}	177	177^{5}	.....	177^{47}
.....	178	.....	.....	178	.....	178^{7}	.....	.....	.....	178^{9}
179^{4}	179^{3}	179	.....	.....	179^{2}	179^{9}	.....	.....	.....	179^{19}
180^{14}	180^{6}	180	.....	180	.....	.....	.....	.....	.....	180^{22}

II.—PHENOCHRONS ("When First Seen"), CANADA, 1909.

YEAR 1909.

Day of the year corresponding to the last day of each month.

Jan.	31	July	212
Feb.	59	Aug.	243
March	90	Sept.	273
April	120	Oct.	304
May	151	Nov.	334
June	181	Dec.	365

For Leap Year add one to each except January.

NOMENCLATURE—GRAY'S.	Observation Stations.										
	Average Dates Nova Scotia	St. Stephen, N.B. (J. Vroom).	Scotch Lake, N.B. (Wm. H. Moore).	Abitibi, Que. (Geo. Drever).	Guelph, Ont. (J. W. Eastham).	Average 11 Stat'ns (Ontario).	Average 6 Stations (Manitoba).	Mistawasis, Sask. (J. C. Bryden).	Average 8 Stations (Sask. & Alberta).	Princeton, B.C. (Mrs. H. Hunter).	Average 7 Stations (British Columbia)
	1	2	3	4	5	6	7	8	9	10	11
1 Alnus incana, Wild	105.4	....	....	....	....	....	....	....	....	....	....
2 Populus tremuloides	117.8	....	....	....	....	....	....	....	....	....	....
3 Epigea repens, L.	106.3	139	134	....	....	122	....	....	....	....	....
4 Equisetum arvense	129.1	....	....	....	108	....	....	....	....	....	....
5 Sanguinaria Canadensis	126.3	....	144	....	115	112	....	....	....	....	....
6 Viola Blanda	126.	....	135	....	....	137	145	....	149	135	111
7 Viola palmata, *cucullata*	129.2	....	144	147	135	138	145	146	142	121	123
8 Hepatica triloba, etc.	128.9	124	....	....	109	108	....	....	....	....	....
9 Acer rubrum	129.6	125	135	....	....	125	138	....	141	....	124
10 Fragaria Virginiana	129.1	140	141	154	135	138	149	161	149	121	129
11 " " (fruit ripe)	165.6	....	....	....	....	....	....	....	....	160	....
12 Taraxacum officinale	131.9	....	144	150	121	130	145	....	151	121	126
13 Erythronium Americanum	145.3	....	....	....	130	....	....	....	....	....	....
14 Coptis trifolia	133.4	....	....	....	137	....	....	....	....	....	....
15 Claytonia Caroliniana	129.	....	....	....	116	....	....	....	....	....	....
16 Nepeta Glechoma	140.8	....	....	....	136	....	....	....	....	....	....
17 Amelanchier Canadensis	142.1	....	....	....	138	....	148	....	147	....	148
18 " " (fruit ripe)	206.6	....	....	....	....	....	....	....	....	....	....
19 Prunus Pennsylvanica	149.2	....	....	....	....	....	....	....	....	155	....
20 " " (fruit ripe)	212.5	....	....	....	....	....	....	....	....	....	....
21 Vaccinium Can. and Penn.	147.5	....	152	....	....	161	144	....	166	....	....
22 " " (fruit ripe)	206.3	....	....	....	....	....	....	....	....	....	....
23 Ranunculus acris	157.7	....	152	154	144	149	124	....	138	....	100
24 R. repens	160.6	....	....	....	....	....	....	130	....	....	....
25 Trillium erythrocarpum	147.	....	138	....	135	130	157	....	....	....	126
26 Rhododendron Rhodora	151.5	....	....	....	....	....	....	....	....	....	....
27 Cornus Canadensis	153.	....	....	....	....	....	....	....	....	....	....
28 " " (fruit ripe)	203.5	....	....	....	....	....	....	....	....	....	....
29 Trientalis Americana	154.2	....	....	....	154	....	....	....	....	....	....
30 Clintonia borealis	157.7	....	....	....	155	....	....	....	....	....	....
31 Calla palustris	160.1	....	....	....	155	....	....	....	....	....	....
32 Cypripedium acaule	162.5	....	....	....	155	....	....	167	....	....	....
33 Sisyrinchium angustifolium	162.3	....	....	....	152	....	....	....	....	....	....

II.—PHENOCHRONS ("When First Seen"), CANADA, 1909—*Continued.*

	1	2	3	4	5	6	7	8	9	10	11
34 Linnæa borealis	168.	....	....	....	....	....	....	....	....	....	....
35 Kalmia glauca	155.9	....	....	....	....	....	....	....	....	....	....
36 Kalmia augustifolia	172.8	....	....	....	....	....	....	....	....	....	....
37 Cratægus oxyacantha	164.4	....	....	....	....	....	....	....	....	124	....
38 Cratægus coccinea, etc.	163.1	....	....	....	....	....	....	....	....	....	....
39 Iris versicolor	168.6	....	....	....	....	....	....	....	....	....	....
40 Chrysanthemum Leucanth.	167.7	....	....	....	....	....	....	....	....	....	....
41 Nuphar advena	168.4	....	192	....	....	175	172	....	....	....	184
42 Rubus strigosus	166.3	....	156	....	162	167	166	....	173	166	128
43 " " (fruit ripe)	201.2	....	....	....	....	....	....	....	....	....	....
44 Rhinanthus Crista-galli	174.6	....	....	....	....	....	....	....	....	....	....
45 Rubus villosus	171.2	....	....	....	....	....	....	....	....	....	....
46 " " (fruit ripe)	240.	....	....	....	....	....	....	....	....	....	....
47 Sarracenia purpurea	171.9	....	166	....	....	196	....	....	....	....	....
48 Brunella vulgaris	176.3	....	....	....	....	....	....	....	....	....	....
49 Rosa lucida	176.6	....	171	179	....	168	166	164	168	152	154
50 Leontodon autumnale	170.4	....	....	....	....	....	....	....	....	....	....
51 Linaria vulgaris	172.4	....	....	....	....	....	....	....	....	....	....
52 Trees appear green	137.1	....	....	....	....	....	....	....	....	123	....
53 Ribes rubrum (cultivated)	147.7	141	....	153	....	149	....	....	153	....	142
54 " " (fruit ripe)	192.6	....	....	....	....	....	150	....	....	....	....
55 R. nigrum (cultivated)	150.4	....	....	....	....	....	....	....	....	145	....
56 " (fruit ripe)	204.6	....	....	....	....	....	....	....	....	....	....
57 Prunus Cerasus	150.4	....	....	....	....	141	....	....	....	....	112
58 " " (fruit ripe)	217.8	....	....	....	....	....	....	....	....	....	....
59 Prunus domestica	152.6	....	149	....	....	139	144	....	....	....	119
60 Pyrus Malus	154.5	151	152	....	145	153	151	....	....	159	141
61 Syringa vulgaris	163.4	....	161	....	149	151	154	....	....	161	141
62 Trifolium repens	164.5	....	....	180	....	160	156	....	181	148	150
63 Trifolium pratense	163.7	....	166	178	....	159	176	....	....	169	150
64 Phleum pratense	174.1	....	....	....	....	....	....	....	....	....	....
65 Solanum tuberosum	184.3	....	....	....	....	....	....	....	....	....	....
66 Ploughing (first of season)	118.	....	125	144	....	102	109	....	125	99	107
67 Sowing " "	129.8	....	140	146	....	119	119	....	124	100	97
68 Potato-planting " "	127.7	....	140	....	....	197	134	....	137	109	125
69 Sheep-shearing " "	132.4	....	....	....	....	....	....	....	....	....	....
70 Hay-cutting " "	194.	....	201	205	....	187	198	....	203	....	185
71 Grain-cutting " "	243.7	....	237	....	....	....	218	....	227	....	237
72 Potato-digging " "	266.2	....	....	146	....	....	....	....	....	....	....
73a Opening of Rivers	80.7	....	104	137	....	95	101	....	131	82	92

II.—PHENOCHRONS ("When First Seen"), CANADA, 1909—*Continued.*

	1	2	3	4	5	6	7	8	9	10	11
73bOpening of lakes	96.2	....	129	144	....	103	....	....	132	....	120
74aLast snow to whiten ground	117.3	....	....	....	....	....	....	115	....	106	....
74b " " to fly in air	128.7	....	....	....	....	....	....	....	....	125	....
75aLast spring frost—hard	130.6	....	....	....	....	....	....	118	....	143	....
75b " " hoar	149.1	....	....	....	....	....	....	....	....	200	....
76aWater in streams—high	90.4	....	....	....	....	....	....	....	....	....	....
76b " " low	240.6	....	....	....	....	....	....	....	....	....	....
77aFirst autumn frost —hoar	259.4	....	....	....	....	....	....	284	....	....	....
77b " " " hard	288.5	....	....	....	....	....	....	288	....	....	....
78aFirst snow to fly in air	300.5	....	....	....	....	....	....	283	....	....	....
78b " " whiten ground	310.6	....	....	....	....	....	....	294	....	....	....
79aClosing of lakes	342.7	....	....	....	....	....	....	288	....	....	....
79b " rivers	349.1	....	....	....	....	....	....	....	....	....	....
81aWild ducks migrating, N	87.1	....	103	109	....	110	107	94	105	84	87
81b " " " S	299.2	..	....	....	....	....	....	....	....	....	....
82a " geese " N	81.2	141	89	108	....	110	91	95	103	81	93
82b " " " S	317.4	....	....	....	....	....	....	....	....	....	....
83 Melospiza fasciata, North	90.	97	96	....	....	87	110	....	127	85	85
84 Turdus migratorius "	85.	92	97	128	....	76	102	97	116	70	82
85 Junco hiemalis "	93.4	92	91	....	....	81	101	....	100	....	100
86 Actitis macularia "	128.8	....	....	....	....	....	....	....	....	....	....
87 Sturnella magna "	127.9	..	....	....	....	87	105	122	119	58	100
88 Ceryle Alcyon "	125.3	....	....	....	....	....	....	....	....	....	....
89 Dendrœca coronata "	129.8	....	....	....	....	....	....	....	....	130	....
90 D. æstiva "	138.8	....	....	....	....	....	....	....	....	139	....
91 Zonotrichia alba "	125.6	....	....	....	....	....	....	....	....	....	....
92 Trochilus colubris "	147.6	....	151	153	....	146	154	....	146	141	130
93 Tyrannus Carolinensis"	143.3	....	130	....	....	....	....	....	....	....	....
94 Dolychonyx oryzivorus	142.4	....	....	....	....	....	....	....	....	....	....
95 Spinis tristis "	144.	....	....	....	....	....	....	....	....	....	....
96 Setophaga ruticilla "	136.5	....	....	....	....	....	....	....	....	....	....
97 Ampelis cedrorum "	147.7	....	....	....	....	....	....	....	....	....	....
98 Chordeiles Virginianus"	135.9	....	....	....	....	....	....	....	....	160	....
99 First Piping of frogs	105.4	114	128	136	95	110	120	126	120	111	105
100First appearance, snakes	115.3	....	....	....	....	....	....	122	....	143	....

III.—PHENOLOGICAL PHENOMENA, CANADA, 1909.

Dates When First Seen (By the Meteorological Service).

Phenological List of the Meteorological Service, Canada.	Fort St. James, B.C.	Goldstream, B.C.	Princeton, B.C.	Quesnel, B.C.	Big Creek, B.C.	Ladner, B.C.	Bittern Lake, B.C.	Sion, Alta.	Emsbury, Alta.	Fort Vermilion, Alta.	Dorenlee, Alta.	Ranfurly, Alta.	Victoria, Alta.	Gatesgarth, Pense, Sask.	Fairfield, Sask.	Oakbank, Man.	Cartwright, Man.	Aweme, Man.	Morden, Man.	Gretna, Man.	Norquay, Man.	Lake Talon, Ont.	Bruce Mines, Ont.	Beatrice, Ont.	Birnam, Ont.	Cottam, Ont.	Woodstock, Ont.	Lucknow, Ont.	Port Dover, Ont.	Toronto, Ont.	Madoc, Ont.	Arden, Ont.	Abitibi, Que.	Scotch Lake, N.B.	St. Stephen, N.B
PLANTS, BIRDS, &c.																																			
1 Blood Root (Sanguinaria Canadensis) Flowering																									115		114		95	114	126			144	
2. Hepatica (Hepatica triloba) Flowering																											116	108	98	107	113				124
3. Trailing Arbutus (Epigæa repens) Flowering																						138						113		117				134	139
4. Dandelion (Taraxacum officinale) Flowering	158	126	121	100		110	146	155	127	161	159	156				157	146	142		134	148	146	145	149	126	125	124	124	114	114	131	133	150	144	
5. Violet, Blue (Viola cucullata) Flowering			135	121	125	91	145	140	145	152		136	141			148	146			143	143	151		149			124	134	129	132	140	145	147	144	
6. Violet, White (Viola blanda) Flowering			121	121		91		144		152		152					146			145		140		149	136		127		129	131	140	145		135	
7. Columbine (Aguilegia formosa) Flowering		144	162	121								164					164	158		158	157	176							132	152	148			161	
8. Blueberry (Vaccinium ——— ?) Flowering								166												144		154	148								153	191		152	
9. Red Clover (Trifolium pratense) Flowering		162	169	118		154										177				175					180	140		162	123	162	166	193	178	166	
10. White Clover (Trifolium repens) Flowering	177	162	148	120		146					181					173		148		171	153					182		163	130	161			180		
11. Wild Raspberry (Rubus ——— ?) Flowering			166	110		110		176			179	166					167	163		170	165	182						162	153	162	166			156	
12. Cultivated Currant (Ribes rubrum) Flowering			135	110	160	125		159			158	142					153	147		153	150	156							156		151	134	153		141
13. Wild Rose (Rosa lucida) Flowering	175		152	130		146	168	165	178	169	166	166	166			164	171	167	167	170	160	172		170	166				163	172	166		179	171	
14. Trillium (Trillium ——— ?) Flowering		126																153		166	152			149			132	131	105	129	137			138	
15. Anemone (Anemone patens) Flowering					144			165	120			122	129	115		127	115	123	109	175									109	136	165				

16. Maple (Acer ————) Flowering		140				109						141				136		137	137	143		148	138	146	110	97		138	111	115	128			135	125
17. Strawberry, Wild (Fragaria Virginiana) Flowering		129	121		131	119	145	141	152	156	152	145				163	153	140		144	145	143	143	147	147		132	139	105	140	140	152	154	141	140
18. Strawberry, Cultivated (Fragaria) Flowering			135			121														154				150	147		135		113	151	148	155		150	
19. Crocus, Cultivated (Iris ————) Flowering		83	149			60									109					131					112		102		82						
20. Lilac (Syringa vulgaris) Flowering			161	140		122										153		153		155	155	164			152		150	152	145	151	154	145		161	
21. Apple (Pyrus Malus) Flowering			159			123													151	152		153					147	149	143		149	180		152	151
22. Plum, Cultivated (Prunus domestica) Flowering						119														144		153			137	126		144		138	143	136		149	
23. Cherry, Wild (Prunus ————) Flowering			155			110				156	155	152				155	152	146		154	158	150			143				148	139	144			152	
24. Cherry, Cultivated (Prunus Cerasus) Flowering						112																			141		141	142	144	139					
25. Buttercup (Ranunculus acris) Flowering				100				155	130			131								124		150			158		121		148	154	164		154	152	
26. Yellow Pond Lily (Nuphar advena) Flowering				187	182												193			155	170	152							213	172	164			192	
27. Pitcher Plant (Sarracenia purpurea) Flowering																													227		165			166	
28. Saskatoon (Amelanchier Canadensis) Flowering	159		128		158			130		155		152	154			150	151	145				149													
29. Golden Rod (Solidago ————) Flowering						237		193	203			169					217	197		203		219			236			221	212	208	214			226	
30. Geese ..... Migrating	99		84	80	97		106	93	101	123	95	99	122		93		93	91	91	91	91	121							87		97	138	108	89	141
31. Ducks ..... "	82		81	82	88		105	97	99	122	96	113	125	91	100	114	99			109	108			120					95		103	124	109	103	
32. Robins ..... "	82	78	70	73	72		121	105	131	129	119	111	121		101	123	96	96	96	101	103	96		93		65	55	80	66	83	80	68	128	97	92
33. Meadow Larks ... "			58	152	72		120	117	111			145	130		95	136	99	91		95			77	110		65	71	86	68	89	93	124			
34. Blue Birds ..... "	90		104	85	78			106		124										134	138	140			122	73	86	82	69	85	71	96		99	
35. Flicker or Golden Woodpecker ..... Migrating		88		115	104					138	134	131				122	115	114		115					106	75		85	60	104	105	130	128	103	
36. Song Sparrow .... "			85					130		133		118						115		105		97					58		95	79	55	138		96	97
37. Swallows ..... "	130	109	150	121	86	119	143	130	139	136		132		136				135		135	126	128	136	151	130		120	120	130	120	107	141	126	127	
38. Juncoes ..... "	100										95	106					95	95		115	100						86			79	27	135		91	92
39. Orioles ..... "												190					139	140	140	118	143				129	134	130		152	131	135		153		
40 King Birds ..... "							143					140		131			145	135		118		140			135		139	139	130	136	126	138		130	
41. Humming Birds .. "	134	102	141	153		121						146					158	150				143	149		149	162	154		125	137	151		153	151	
42. Frogs Piping ..... "		84	111		129	81	121	122	115	138	119	122	125	115	105	115	123			100	145	126	145	116	92	87	92	95	148	107	105	104	136	128	114
43. Earth Worm Casts (Frost out of ground)		91		91					134	144	137	128							93		126		124	123	98		90		93	97	197	107	144	135	
44. Lakes Open	140	87			111		145	122	129	145	132	136												120					77		109	106	144	129	
45. Rivers Open	115		82	81	92			120		142			132				97	115	92				130				91		74	79	91	106	137	104	
46. Ploughing	126		99	100	105		106	121	120	130	132	126					112	106	94	127		127		123	96		99	95	26	114	110	130	144	125	
47. Sowing	127		100	100	105	86	68	130	112	131	146	122		107		133	107	109	100	139	130	132		125	114	114	107	114	105	128	124	132	146	140	
48. Hay Cutting			193	201	211	114	206	201	204		206	203				210	196		182	191	211	197		195	186	191		186	169	182	186	193	205	201	
49. Grain Cutting			221	258	242	233	231	232	225		228	228	224				226	221	213	205	229	229		230		196		207	198	110	212			237	
50. Potato Planting			109	130	149	105	132	125	151	138	140	132				142	130		128	136		140		181		110	132	147	128	117	124	137	146	140	

FAC-SIMILE REPRODUCTION

OF

ADDRESS TO HIS MAJESTY THE KING

AS ENGROSSED IN ENGLISH AND IN FRENCH

Très Excellente Majesté le Roi.

Qu'il plaise à Votre Majesté,

Nous le président et les membres de la Société Royale du Canada réunis en session annuelle, osons prier humblement Votre Majesté de bien vouloir accepter nos sincères condoléances à l'occasion de la mort de Son auguste Père, le Roi Edouard VII, et d'agréer nos respectueuses sympathies.

Chacun de nous, lors de cet événement, l'a considéré comme une affliction personnelle; mais c'est aujourd'hui seulement que nous pouvons, comme Société, témoigner nos sentiments.

Nous désirons aussi donner à Votre Majesté l'assurance que cette grande perte nous touche d'autant plus intimement, que Sa Majesté le Roi Edouard était l'auteur de l'entente anglo-française, qui naturellement a fait vibrer toutes les cordes sympathiques entre les Canadiens d'origine anglaise et d'origine française, qui vivent sous l'égide de la couronne britannique.

Que Votre Majesté veuille bien accepter l'expression de notre loyal dévouement à Son Trône et à Sa Personne. C'est avec fierté que nous portons le titre d'une Société Royale. Nous n'oublierons jamais l'intérêt que nous a manifesté Son Altesse Royale la Princesse Louise, lors de la fondation de la Société par Son Excellence le Marquis de Lorne, sous le patronage de Sa Majesté la Reine Victoria d'heureuse mémoire.

Nous désirons aussi exprimer très respectueusement la satisfaction que nous éprouvons de nous voir maintenant sous la haute protection d'un Souverain dont la carrière est si propre à confirmer notre dévouement.

La profonde connaissance que Votre Majesté possède de cet Empire dont nous sommes heureux de former partie et la récente visite qu'Elle a faite au Canada durant la célébration des fêtes destinées à commémorer la fondation de Québec et à honorer les héros des deux races, Lui ont conquis tous les cœurs canadiens et nous fortifie, nous aimons à le croire, les liens qui unissent notre Confédération à la Mère-Patrie.

Au nom de la Société Royale du Canada.

Ottawa, le [illegible] 1910.

Secrétaire honoraire. Président.

Georges Bryce D.D., LL.D.

To The King's Most Excellent Majesty:

May it please Your Majesty

We, the President Fellows of the **Royal Society of Canada** assembled in annual meeting, humbly approach Your Majesty to offer our sincere condolence for the loss you have suffered by the death of **your Royal Father, His Majesty King Edward Seventh** and to assure you of our most respectful sympathy. We have long felt as individuals a sense of keen personal loss which we are only now able to express for the first time as a corporate body.

We beg leave to assure Your Majesty that this great loss has touched us very nearly in another most intimate way. Since King Edward was the author of the Anglo-French entente, which naturally struck every sympathetic chord between the Anglo- and French Canadians under British Crown

It also please Your Majesty to accept the heartfelt assurance of our most devoted loyalty to Your Throne and Person. We take the greatest pride in the honour of being one of Your Majesty's "Royal" Societies. We shall never forget the interest that Her Royal Highness the Princess Louise took in our foundation by His Excellency the Marquess of Lorne, under the patronage of Her Majesty Queen Victoria of happy memory. And we most respectfully beg to express the special satisfaction we feel in being now under the exalted patronage of a Sovereign whose own career has done so much to confirm our devotion.

Your Majesty's wide and comprehensive knowledge of the Empire of which we so gladly form a part, and your recent visit to Canada, when your presence added so greatly to the significance of the Quebec Tercentenary, a celebration designed to commemorate the heroes of both our races, have endeared you to our people as a whole, and we rejoice to believe it have sensibly strengthened the ties which bind our Dominion to the Parent State.

Signed on behalf of the

Royal Society of Canada.

W. D. Lighthall, B.A., LL.D. — George Bryce, D.D., LL.D.

Hony Secretary — President

SOCIÉTÉ ROYALE DU CANADA

MÉMOIRES

SECTION I.

LITTÉRATURE FRANÇAISE, HISTOIRE, ARCHÉOLOGIE, ETC.

ANNÉE 1910

I.—*Les Ecossais du Cap-Breton.*

Par M. ERROL BOUCHETTE.

(Lu le 28 septembre 1910.)

Sommaire: Situation économique du pays.—L'état social.—Deux familles. —Le type anglo-américain.—Quelques mots des groupes français.

La présente étude ne comporte pas une description complète et approfondie de la population du Cap-Breton. Ce n'est qu'une esquisse destinée à fixer les reliefs d'un état social d'autant plus intéressant qu'il disparaît rapidement.

Cette population du Cap-Breton subira en effet l'évolution commune aux races parlant la langue anglaise sur notre continent. Sous l'influence des conditions anglo-américaines, celles-ci tendent à se fusionner en un type uniforme. Cette observation est certainement vraie pour les Etats américains du littoral de l'Atlantique, ainsi que pour les provinces maritimes et la province d'Ontario au Canada. Tout observateur attentif pourra se rendre compte que dans cette région la formation sociale est au fond essentiellement et constamment la même. On remarquera des divergences superficielles; et si l'on pousse ses études jusque dans l'Ouest américain et canadien, on trouvera, chez les pionniers, des traits caractéristiques temporaires, mais partout la tendance ultime est la même et aboutit au type anglo-américain.

Ce type domine donc dans presque toutes les provinces anglaises du Canada. Le pays subit du reste, sous une foule de rapports, une transformation radicale. Déjà enrichi et formé aux idées du progrès intense, son peuple éprouvera bientôt l'impérieux besoin des hautes cultures intellectuelles. Comme aux Etats-Unis, nous assisterons ici à une renaissance universitaire assez générale pour influer notablement sur notre avenir. La population tard venue et d'origine cosmopolite, dépassera bientôt l'ancienne en importance numérique. Celle-ci, il est vrai, détiendra longtemps encore la direction politique et la forte part des valeurs économiques, malgré l'appoint important du capital étranger.

Situation économique du Cap-Breton.

Il n'en sera pas ainsi dans toutes les parties du Canada, et nous trouvons au Cap-Breton une exception à cette règle. L'importance de sa situation militaire et pardessus tout ses richesses minérales y attirent déjà, avec d'immenses capitaux, une population nouvelle venant en partie des autres provinces canadiennes, mais principalement de la Grande-Bretagne et des Etats-Unis. Aussi faudra-t-il que son peuple se transforme ou qu'il cède la place.

La ville de Louisbourg ou plus probablement celle de Sydney deviendra la principale base de la défense navale du Canada; ainsi le veut la position stratégique de ces havres situés à l'entrée du golfe Saint-Laurent. Choix des ingénieurs français du 18e siècle, ce site s'impose encore davantage aujourd'hui. La houille et ses dérivés sont devenus le pouvoir moteur des flottes, et les charbonnages du Cap-Breton sont les seuls que l'on trouve sur le littoral de l'Atlantique. On se ferait difficilement une idée de l'importance que vont prendre les mines et les aciéries. Leur développement ne fait que commencer.[1] Un incident le fera comprendre. Un jour, cheminant à pied dans la forêt des environs de Mira, nous nous efforcions de retracer la marche sur Louisbourg du contingent français dont les vaisseaux s'étaient brisés aux récifs de Scutari. Quelle fut notre surprise, en trouvant tout à coup une ville en pleine forêt. Elle s'élevait sur un coteau près d'un beau lac, et plusieurs édifices considérables entouraient un hotel d'un style tout à fait élégant, et luxueux à l'intérieur. Les rues étaient correctement tracées, mais les maisons, sauf le groupe central, étaient rares. Dans la vallée s'élevaient de vastes usines et on apercevait les ouvertures de plusieurs puits de mines. Le tout était désert et silencieux. C'était la ville de Broughton, siège principal de la Cape Breton Mining Company, rivale de demain de la Dominion Coal Company. Un procès suspend actuellement l'entreprise, mais demain la ville de Broughton renaîtra. Ce n'est pas un exemple isolé.

Déjà les grands centres miniers et manufacturiers de l'ile ne peuvent plus compter pour s'approvisionner sur la pêche côtière ou sur l'agriculture, dans leur état actuel. La pêche pourra se transformer; la petite barque fera place au grand chalutier à vapeur, et le pêcheur côtier pourra, suivant ses talents, devenir patron ou matelot, sans cesser d'être pêcheur. Quant à l'agriculture, il n'est pas certain qu'une transformation avantageuse soit possible pour le moment.

Ce n'est pas l'espace qui manque. La superficie du Cap-Breton est d'environ le tiers de celle de l'Ecosse, elle est presque égale à celle de la Belgique dont la belle agriculture, sous la même latitude, nourrit sept millions d'hommes. Mais les conditions ne sont pas les mêmes. Ici le climat est moins favorable. Les vents et les courants de l'Atlantique

[1] En 1908, le Canada produisait en chiffres ronds 8,200,000 tonnes de houille. Cette même année, la seule Dominion Coal Company, du Cap-Breton, en produisait 3,600,000 tonnes. Les mines de cette compagnie couvrent 145 milles de terrain et on calcule que le gisement total doit dépasser un millaird et demi de tonnes. D'autres compagnies possèdent des mines presque aussi vastes et riches que celle-ci, très accessibles surtout et rapprochées d'excellents ports. On comprendra donc que dans quelques années le Cap-Breton sera littéralement absorbé par l'industrie de la houille et celle de l'acier, lesquelles en attireront d'autres. Ce sera un des grandes foyers manufacturiers du monde.

poussent vers les côtes des banquises qui y séjournent parfois presque jusqu'en mai, sans cependant bloquer les ports. Bien que fertile, le sol n'offre pas l'exubérante productivité de celle des plaines de l'Ouest; d'autre part, les algues, les varechs, les déchets de poisson se trouvant partout en abondance pour l'enrichir, il ne s'épuise pas facilement et peut donner de riches moissons. Au midi de la Suède, où la terre et le ciel offrent à peu près les mêmes ressources et les mêmes inconvénients, on a fait merveille; l'Irlande renaît sous l'impulsion de quelques savants agronomes et l'exode de ses habitants a à peu près cessé. Ces réformes demandent un effort que le Cap-Breton ne fera pas maintenant, car on trouve plus de profit à acheter les produits agricoles de l'Ouest canadien; on épuisera cette ressource avant que d'en chercher plus près de soi. L'agriculture, au Cap-Breton, semble donc devoir retomber au second plan, pour renaître à une époque ultérieure. Aussi constate-t-on que la population rurale et côtière, ainsi que les produits de leur industrie n'ont guère augmenté depuis vingt ans. Les vrais et appréciables progrès se bornent aux centres miniers et industriels, habités en grande parties par des étrangers à l'île dont nous sommes à étudier l'état social.

Etat Social.

Le Cap-Breton a eu plusieurs historiens, surtout M. Brown et notre regretté collègue à la Société Royale, Sir John Bourinot. Les richesses minérales si variées de la région ne sont un secret pour personne; elles étaient connues en partie des premiers explorateurs. Décrire ce pays serait donc superflu et il nous suffira de rappeler au fur et à mesure les points essentiels à la thèse.

On sait que le célèbre lac du Bras-d'Or divise géographiquement cette île en deux parties; il en est de même au point de vue social, exemple remarquable de l'influence du lieu sur les mœurs. En abordant à la rive nord de ce fjord on trouve tout d'abord un pays montueux aboutissant à un plateau très vaste et pratiquement inexploré qui s'élève parfois à plus de douze cents pieds au-dessus du niveau de la mer. Sur de grandes étendues ce plateau est dénudé et exposé aux vents du large; l'agriculture n'y donnerait que de médiocres résultats, mais c'est le paradis du gibier et notamment du caribou qui le parcourt en hordes nombreuses. On pourrait avantageusement établir là un parc national. Vu de l'Atlantique la côte apparaît aride et déserte, mais on trouve dans l'intérieur, nous disent les explorateurs, de profondes vallées où des forêts de chênes et d'érables ombragent un sol vierge, fertile et protégé contre les souffles du large.

C'est sur la rive septentrionale du Bras-d'Or et jusqu'à quelques milles dans les vallées intérieures que se groupe le gros de la population catholique d'origine écossaise. Elle semble avoir conservé encore

mieux que ses compatriotes de la vieille Ecosse, les mœurs et les traditions des ancêtres. Je n'ai fait que passer dans cette région sans pouvoir l'étudier, mais j'en ai vu assez pour me rendre compte que les habitants sont bien des montagnards écossais, parlant encore assez généralement la langue gaélique. Leurs occupations sont l'agriculture et la pêche, mais ils n'ont pas su leur donner de grands développements. C'est que leur émigration fut antérieure à la réforme agricole en Ecosse. Le duc d'Argyll, dans son remarquable ouvrage : *Scotland as it was and as it is*, établit que la misère publique qui a déterminé l'expatriation de tant de familles tenait presque entièrement à un mauvais système d'agriculture qu'on refusait d'abandonner pour un système meilleur. L'exode d'une population très intelligente dans de telles conditions témoigne de la puissance de la routine et des efforts qu'il faut déployer pour la combattre. Ce groupe est d'un physique avantageux, mais le milieu est assez pauvre; les jeunes gens sont beaucoup mieux instruits que leurs pères, grâce aux excellentes écoles communes du Nouveau-Brunswick. Bien qu'ils ne fussent que tenanciers dans leur pays d'origine, les colons ont su depuis cent ans conserver la propriété de leurs terres. C'est un progrès réel accompli, grâce à un concours de circonstances favorables.

Au midi du Bras-d'Or, le pays est moins accidenté, l'agriculture et la pêche plus faciles, la population plus dense, plus instruite et plus prospère. Il s'agit ici naturellement de la population rurale établie sur le sol. En dehors de cette population et ayant assez peu de rapports avec elle, se trouve la population ouvrière des mines et des fabriques. Ces populations urbaines, déjà très importantes, dépasseront bientôt en nombre la population originaire du Cap-Breton. Celle-ci, au sud comme au nord du Bras-d'Or, se compose en partie des descendants d'émigrants de la haute Ecosse, mais avec un fort mélange de "lowlanders" et des successeurs de soldats ayant obtenu des octrois de terres. Le culte presbytérien domine presque partout. Ici encore on observe les anciennes mœurs; la langue gaélique est pieusement cultivée, bien que la transformation qui se produit soit évidente, surtout chez les jeunes gens. Dans telle église, par exemple, le service se fait en langue gaélique d'abord, pour les anciens, puis en anglais pour la jeunesse qui ne comprend plus guère la langue de ses pères.

Nous avons donc devant nous comme une miniature de l'Ecosse, dont le Cap-Breton est en quelque sorte la réplique. Comme en Ecosse, les côtes sont découpées en baies profondes et entourées d'îles. Un important bras de mer forme la ligne de démarcation entre les terres hautes et basses. Ici comme dans l'ancienne patrie la population du nord est catholique, tandis qu'au sud du Bras-d'Or comme de la Forth, la race celtique se mêle à l'élément anglo-saxon dont elle partage la langue et

la religion. Pour que rien ne manque au tableau, on trouve ici comme en Ecosse, de nombreux souvenirs français, sans parler des établissements acadiens, des côtes occidentale et méridionale et de l'île Madame. Ceux-ci cependant forment un groupement social séparé rappelant les vieilles colonies scandinaves des Orcades.

Les Ecossais du Cap-Breton ont conservé pour leur pays d'origine un attachement très vivace. A ceux qui se sont établis ailleurs sur le continent, il ne reste le plus souvent qu'un souvenir affectueux; ils ont perdu la tradition et surtout les mœurs. Au Cap-Breton les mœurs se sont peu modifiées et la tradition est restée longtemps à peu près intacte, car ce pays isolé ne différait pas essentiellement de la haute Ecosse. Aussi peut-on dire que pendant près de cent ans les Ecossais du Cap-Breton ont fait tache au milieu de la population américaine originaire de la Grande-Bretagne. Ils sont restés distincts de la masse par les mœurs et en partie par la langue. C'est en vivant au milieu de ces hommes qu'on comprend qu'il pèse encore sur eux quelque chose de la tristesse de leurs pères arrachés à leur patrie. Cette tristesse Robert Louis Stevenson l'a fortement décrite: A l'entrée du loch Aline un grand navire est à l'ancre. Sur son pont et sur la plage voisine se presse une foule compacte; elle s'agite, passe et repasse continuellement par d'innombrables barques entre la rive et le vaisseau. Une lamentation funèbre s'élève des flots et ceux qui sont restés sur la rive y répondent en accents tristes et déchirants. C'est un départ d'émigrants en destination d'Amérique. Notre barque approche; les exilés penchés sur les bastingages tendent vers nous leurs mains suppliantes. Mais voici le signal du départ, les voiles se déploient, le navire s'éloigne lentement et bientôt nous n'entendons plus que le triste refrain: Adieu, adieu Lochaber, s'éteignant comme un lointain sanglot.

Pour ce qui est du Cap-Breton, cette émigration eu lieu surtout de 1802 à 1812, ou 1827, dit M. Edward Gilpin.[1] Pendant cette période, plus de 25,000 personnes venues pour la plupart du versant occidental de la haute Ecosse, se sont établies dans le pays. Ce n'est pas volontairement que ces braves gens s'éloignaient de leur patrie si aimée. La cause première de l'exode était sans doute la faillite de l'agriculture traditionnelle devenue insuffisante pour nourrir la population. Mais il est certain aussi que plusieurs grands propriétaires terriens encourageaient systématiquement leur départ, trouvant leur profit à convertir de pauvres métairies en pâturages. Les montagnards, l'esprit de clan aidant, se soumettaient docilement, mais le cœur serré, à l'exil qu'on leur imposait. Cet esprit de clan se manifestait aussi chez les seigneurs. Ils savaient que malgré les déchirements du départ, le sort de leurs censitaires se

[1] Le régime des octrois des terres de la Couronne a pris fin en 1810; depuis lors jusqu'en 1818 on y a substitué le régime des permis (Crown Licences, Warrants, etc.)

trouverait en définitive amélioré. La plupart du temps ils les faisaient accompagner d'hommes de confiance, chargés de les diriger et de veiller à leur premier établissement dans leur nouvelle patrie. L'autorité de ces hommes était une délégation de celle du seigneur ou du chef de clan. N'étant sanctionné par aucune loi, les colons s'en affranchissaient en général dès leur arrivée en Amérique et les chefs qui, comme le célèbre Laird McNab, dans Ontario, ont voulu imposer une autorité féodale, n'ont pas tardé à le regretter.

Au Cap-Breton il en fut autrement par suite de l'isolement des émigrés. On y conserva longtemps, on n'a pas encore complètement perdu cette caractéristique de la race celtique: fidélité aux personnes plutôt qu'aux idées et aux principes. Parmi les chefs qui conservèrent longtemps dans l'île une autorité considérable, on en cite un qui portait le sobriquet de Long-Doigt, parce que deux des doigts de sa main droite étaient démesurément longs et rigides; cette difformité singulière est sans doute pour quelque chose dans sa célébrité. Il semble cependant avoir possédé quelques-unes des qualités d'un meneur d'hommes et il exerçait une influence assez notable. On le prenait volontiers pour arbitre des différends et s'il arrivait aux autorités de Sydney d'émettre un avis contraire au sien il enfourchait sa monture et se rendait à la ville où juges et avocats craignaient sa véhémence sinon ses arguments.

Les chefs de la première génération disparurent dans le cours ordinaire de la nature, mais l'esprit communautaire de clan persistant toujours, ils eurent des successeurs. Pendant de longues années, un excellent prêtre, le révérend messire McLeod, fut le maître incontesté de la région du nord, tandis que son cousin, le révérend pasteur McLeod, presbytérien, exerçait une influence analogue au sud. Ce dernier avait obtenu l'autorisation de percevoir la dîme. Ce droit, aux termes de son titre de concession, était transmissible à ses descendants qu'ils fussent ou non ministres du culte. C'est un exemple des fréquentes concessions irrégulières faites dans ce pays.[1] Comme tous les événements de l'origine, celui-ci décèle la formation communautaire qui donna lieu à tant d'abus du système féodal en Ecosse, en Irlande et dans certaines parties de la France. On sait que la féodalité restée en somme favorable à l'expansion sociale dans les pays anglo-saxons et francs, se compliqua bientôt chez les groupes celtiques d'exactions sans nombre. Cela donna lieu à la longue à des soulèvements populaires, mais pendant des siècles, surtout

[1] La confusion des titres au Cap-Breton a toujours été très grande. C'est à tel point qu'en 1839 le gouvernement du Cap-Breton les annulait en gros dans le but d'accorder des titres nouveaux. La loi de 1843, d'autre part abroge celle de 1839, et remets tout en question. Aujourd'hui les titres de propriétés sont assez bien établis; mais il n'en est pas de même pour les droits miniers. Une foule de prétentions contradictoires retardent l'extraction du minerai de fer sur l'île.

en Ecosse, les peuples souffrirent en silence; ils s'effacèrent. La merveilleuse chronique de saint Colomban d'Iona, redit la carrière du saint dans ses moindres détails quant à sa vie spirituelle et a ses rapports avec les grands; mais quant au peuple qu'il a aimé et protégé, qui vénérait la trace de ses pas, on chercherait en vain dans ce document des indices sur sa manière d'être et de penser; on dirait qu'il n'existe pas. On sait d'autre part que les chefs de clans, qui n'étaient revêtus d'aucune autorité légale, exerçaient alors et longtemps après, un pouvoir absolu d'autant plus difficile à entamer que le peuple semblait chérir ses liens.

Les traces de ce régime existent encore au Cap-Breton. Elles deviennent de plus en plus faibles et rares et elles s'effaceront bientôt entièrement, car le pays tout entier est en pleine transformation. Cette évolution est généralement plus rapide au sud qu'au nord, mais on trouve encore, même au sud du Bras-d'Or, des exemplaires de la tendance ancienne et moderne.

Deux Familles.

Deux familles que j'ai pu observer représentent assez bien l'une l'ancien type écossais du Cap-Breton, l'autre celui qui évolue très rapidement vers un état social plus moderne. Il serait intéressant et utile de les passer toutes deux au crible de la méthode de M. Léon Gérin, et je crois posséder pour cela les données nécessaires. Mais outre que la transcription de ces observations comporterait une étude beaucoup plus longue que la présente, je m'en trouve détourné pour des raisons personnelles. J'espère que les quelques indications données ici seront jugées suffisantes. Chacune de ces familles occupe une terre agricole à l'embouchure de la rivière Mira, qui en cet endroit coule étroite et profonde entre des rives hautes et escarpées. Une crevasse qu'on appelle "Mira Gut" (détroit de Mira) livre passage à la rivière jusqu'à la mer; son cours s'élargit en remontant vers les jolis lacs qui forment sa source. La terre que possède chacune de ces familles est d'une égale fertilité, mais celle qui occupe le promontoire de gauche est assez pierreuse. Sur les bords de la mer, au pied de ces deux propriétés circule les trains de la voie ferrée Sydney et Louisbourg, qui passent par les centres importants de Glace Bay et de Morienne. Des bateaux à vapeur d'un tonnage suffisant remontent la Mira sur une cinquantaine de milles, touchant à plusieurs villages et à des points d'une importance industrielle. La baie de Mira est d'autre part un lieu de villégiature idéal; grève magnifique, paysage très intéressant, souvenirs historiques de tous les côtés.

Sur la rive droite demeure le fils de l'ancien chef de clan, Long-Doigt. C'est un homme de soixante-quinze ans, à barbe blanche, mais grand, droit et vert, n'ayant presque rien perdu de son activité et de sa vigueur. Il porte le béret écossais et se drape volontiers dans un plaid qui ne manque pas d'une certaine élégance. Il est fier de son nom, de

son origine, de sa personne et il nous fait voir une charrue apportée d'Ecosse par son père et construite en 1708. Cette charrue est presque le seul souvenir matériel qui lui reste, si ce n'est quelques procès qui durent encore. Ses frères et ses sœurs sont dispersés au loin, lui-même ne s'est marié que bien tard et il est le père de plusieurs enfants dont l'aîné n'a que seize ans.

Dans cette famille le père commande en maître absolu et on comprend bien vite en lui parlant que la paix ne règnerait pas longtemps au foyer si la mère ou les enfants risquaient la moindre contradiction. Et cependant dans ses rapports avec ses voisins, une timidité étrange se mêle à un ton naturellement tranchant. C'est que les choses ont bien changé. Ce personnage autoritaire dans sa famille et cela par la conception traditionnelle de son rôle de chef, aurait exercé dans la région une influence analogue à celle de son père, s'il eut possédé ses talents, et surtout si le milieu social ne s'était pas profondément modifié. Aujourd'hui, il se trouve presque seul de son espèce, du moins au sud dû Bras-d'Or; ses voisins, tout en ayant soin de ne pas entrer en conflit avec lui, n'acceptent plus ses idées. Puis on sait qu'au fond du cœur il a des prétentions qu'il ferait valoir s'il en avait le pouvoir.

La terre du fils de Long-Doigt a une étendue de cent acres environ; c'est un plateau ondulé se terminant au promontoire de Mira, au sommet duquel se trouve sa maison, assez vaste, mais de pauvre apparence et pas très bien tenue. Cette maison est en bois, elle est exposée à tous les vents et facile à incendier. Tout près un coteau s'incline doucement vers la Mira; on y trouve les restes d'un beau verger, d'un potager et d'une fontaine dont les eaux arrosaient des plate-bandes. Cela entoure les ruines d'une solide maison de pierre abritée contre les vents. Pourquoi avoir abandonné cet excellent site pour un endroit beaucoup moins favorable? Pourquoi quitter des maisons solides et substantielles pour de pauvres baraques de bois? Personne n'a su me donner une explication satisfaisante de cette singulière manière d'agir qui est générale pourtant dans cette partie du Cap-Breton. Ces anciennes maisons françaises, offraient pour la plupart des logements plus désirables sous tous les rapports que les maisons actuelles; leur entretien ne présentait aucune difficulté. Cependant on voit leurs murs ruinés ou leurs solides cheminées se dressant soudain dans les champs comme des spectres du passé.

La principale ressource de cette famille est une agriculture assez rudimentaire et laissant peu de surplus pour la vente, si ce n'est un peu de foin. La pêche côtière faite très en petit, mais régulièrement, forme aussi un appoint important. Du reste toute la famille est suffisamment et décemment vêtue, sa nourriture est saine et suffisante, se composant surtout d'avoine bouillie, le mets national écossais, de poisson, de lait, de

pommes de terre et aussi souvent de bœuf ou de lard, et la santé de tous ne laisse rien à désirer. Sa vie isolée, les traditions qui l'entourent, les préjugés auxquels son chef est attaché, son isolement social et même jusqu'à un certain point religieux, tout concourt à former ici, au point de vue économique et social, un type bien inférieur à ceux de la province de Québec que décrit M. Gérin. Si le père élevait les enfants à sa guise ceux-ci hériteraient de beaucoup de ses préjugés et de ce qu'on pourrait appeler ses incompétences sociales, sans acquérir les vertus un peu barbares de son ancêtre Long-Doigt.

Seulement, et c'est là un point capital dans l'étude qui nous occupe, les enfants de cet homme de formation surannée pour ne pas dire inférieure, sont obligés de par la loi de fréquenter les excellentes écoles établies par le gouvernement de la Nouvelle-Ecosse; les autorités municipales veillent de près à sa rigoureuse observance. Il est donc probable que les enfants ayant acquis l'instruction et des idées plus modernes, cesseront de vivre dans un isolement relatif; leur formation sera supérieure non seulement à celle de leurs parents, mais aussi à celle de certains types supérieurs à leur type ancestral, mais qui n'ont que la tradition familiale comme guide. Celle-ci (la tradition, la mentalité) a sans doute, sa très grande importance, mais si elle n'est pas fortifiée par l'instruction elle va nécessairement en s'affaiblissant.

Supérieure au type précédent, supérieure aussi, je crois, à celui de l'habitant de Saint-Justin, la famille M..... offre un exemple du groupe écossais du Cap-Breton ayant à peu près complété l'évolution qui en fait l'égal des types anglo-saxons les plus avancés du continent américain. La comparaison entre cette famille et la précédente est d'autant plus intéressante que toutes deux, je l'ai dit, occupent des terres voisines de même valeur et étendue à peu de chose près, qui leur sont parvenues par héritage. Nous verrons qu'ils ont tiré un parti bien différent d'avantages à peu près analogues.

Cette famille M..... se compose de neuf personnes, le père, la mère, deux fils, quatre filles tous adultes, moins une seule fille, et une tante célibataire. On n'emploie pas de domestiques, bien que la présence dans la maison, pendant la saison d'été, de plusieurs pensionnaires, semblerait le justifier. Le père, âgé de 65 ans environ, est le descendant d'un ancien soldat dont le régiment a été licencié au Cap-Breton. Le vétéran obtint un octroi de terre que ses descendants cultivèrent de père en fils. En général, au Cap-Breton, le fils aîné d'un cultivateur cherche fortune à l'extérieur ou à l'étranger, pour ne pas obérer le budget familial et aussi s'il se peut, pour augmenter ses ressources jusqu'à son mariage. Il en a été ainsi habituellement dans la famille M..... Son chef actuel avait un frère aîné qui est devenu marin et qui a péri dans un naufrage. Le fils aîné de la génération présente, victime d'un accident qui le rend

impropre au travail manuel, est télégraphiste sur le chemin de fer Sydney et Louisbourg, et en bonne voie de prospérité. Le cadet, âgé aujourd'hui de vingt-un ans, aide à son père et lui succédera. Au physique comme au moral ce père et ce fils sont des types supérieurs; ils sont instruits, lisent des livres et des journaux, discutent leurs propres affaires et les affaires publiques avec intelligence et modération. On ne remarque pas chez eux cette rudesse dans les manières qu'on déplore souvent chez les gens de la campagne. Les M.....et ceux qui les entourent sont des gentlemen dans leurs manières. Je n'ai pas du reste rencontré de gens impolis au Cap-Breton.

Ils tirent du sol le meilleur parti qu'ils peuvent sans changer absolument les méthodes anciennes. Trop exposée aux vents du large, leur terre produit difficilement et tardivement les céréales. Il faudrait pour la mettre en rapport augmenter le troupeau qui ne se compose actuellement que de quatre ou cinq têtes, et se livrer davantage à l'industrie laitière. L'agriculture est cependant la principale ressource de la famille.

Dans la famille M.....on ne fait plus la pêche. Le travail est très exactement réparti entre les divers membres. La mère s'occupe exclusivement de la maison, des enfants, et l'été de ses pensionnaires. Sa belle-sœur et ses filles lui aident à tour de rôle, mais chacune a en outre ses occupations particulières. La tante tient le bureau de poste de Mira; la fille aînée seule est simple fermière, toutes les autres, bien que ne dédaignant pas ces travaux, fréquentent l'école normale et ont obtenu ou obtiendront des diplômes d'institutrices; l'une possède un vrai talent pour la musique, mais toutes sont sans prétention, modestes dans la mise et le maintien.

Cela constitue un intérieur agréable où règne la paix absolue. L'habitation modeste est saine et bien tenue, la nourriture variée et convenablement apprêtée est semblable à celle des cultivateurs aisés de la Nouvelle-Angleterre et d'Ontario, peut-être un peu plus recherchée, le vêtement est sans recherche, on soigne surtout la personne, les cheveux, les dents. Un harmonium, plusieurs liasses de bonne musique, livres, revues, journaux, sont la ressource des soirées d'hiver. Le rouet, qui ne sert plus, reste néanmoins dans un coin du "living room."

Toute cette vie familiale laborieuse, animée et heureuse est en grande partie l'œuvre de l'excellent système des écoles publiques de la Nouvelle-Ecosse. Ici sans doute l'évolution était déjà commencée dans la génération précédente, les parents se trouvent eux-mêmes en état de diriger leurs enfants. Mais grâce à une instruction plus complète et à une formation énergique, les enfants feront encore mieux. C'est ainsi que le fils cadet, successeur de son père, se prépare de longue main à faire valoir la propriété. La modeste pension, pouvant recevoir une

dizaine de personnes, sera entourée de chalets qui rendront la plage populaire. Puis il exploitera les carrières qui se trouvent sur sa terre et construira des fours à chaux. Cette pierre, utilisable dans l'industrie, entrave l'agriculture mais il nous a fait remarquer qu'elle ne nuit en aucune façon à l'élevage des vaches laitières et des animaux de boucherie.

Naturellement, une telle famille exerce une influence saine sur son entourage. Appartenant au culte Baptiste, dont les adhérents sont peu nombreux, elle s'occupe de l'entretien de la chapelle et héberge le pasteur plus souvent qu'à son tour. Ses rapports de voisinage sont fréquents et les associations dont elle forme partie tiennent surtout de l'école et de l'église. On s'occupe peu des affaires municipales, si ce n'est au point de vue de ces groupements; quant à la politique, on en suit les développements, mais sans passion. Enfin chacun des membres de la famille affirme dans tous ses actes, la doctrine si salutaire de la confiance en soi: "self-reliance et self-help."

Le type anglo-américain.

Ces deux familles sont des exemplaires assez typiques de la population écossaise rurale du Cap-Breton à l'heure actuelle. Sa destinée ultime ne me paraît pas douteuse. Elle perd rapidement sa caractéristique traditionnelle pour se fondre dans la masse anglo-saxonne américaine. Celle-ci est partout presque identique, car partout on trouve des influences identiques à l'œuvre: les pouvoirs publics et l'école s'inspirant d'un même principe et agissant dans des milieux où les moyens d'existence ne sont pas essentiellement différents. La facilité et la rapidité des transports mettent les mêmes objets et les mêmes ressources à la portée de tous. Ce phénomène semble du reste général dans l'Amérique septentrionale. C'est la langue qui détermine les groupements. Les gens de langue française au Canada, si différents en France, en Belgique et en Suisse, perdent rapidement ici leurs traits distinctifs. Quant aux Anglais modernes, ils ne reconnaissent plus leurs cousins d'Amérique tant ceux-ci ont évolué.

Ce type américain ne s'est pas, on le conçoit, formé en un jour. On en trouve l'origine aux Etats-Unis. Dès le milieu du XVIIIe siècle l'influence d'une élite nouvelle intellectuelle et sociale se manifestait parmi les descendants des *pilgrim fathers* qui s'étaient expatriés pour satisfaire à une conviction profonde. Ce fut là le foyer de la révolution américaine à laquelle le peuple des Etats hors de la Nouvelle-Angleterre, ne se rallia d'abord qu'en hésitant. La révolution politique triomphante fit la révolution sociale dont l'école publique fut l'instrument. Dès citoyens grandirent imbus des traditions plus ou moins véritables de cette révolution. On ne craignit pas de nourrir les enfants de gloires

quelquefois un peu problématiques afin de stimuler leur ambition patriotique. L'effort fut calculé, unanime, énergique. Ses initiateurs, s'affranchissant de toutes entraves traditionnelles, s'appliquèrent à former les jeunes intelligences d'après un programme de philosophie pratique nouveau dans l'histoire de l'humanité.

Naturellement cette innovation donna lieu à de vives critiques, les mêmes du reste qu'on fait entendre aujourd'hui dans d'autres pays ou l'on tente des expériences sociales analogues. Il est vrai que le premier produit de l'éducation nouvelle fut franchement désagréable. Les nouveaux citoyens manifestaient leur liberté par la grossièreté et la violence. Charles Dickens en a fait un portrait inoubliable. Mais il avait écrit sans assez refléchir, car les descendants des hommes qu'il critiquait, sortis du même moule scolaire, ont à certains points de vue, réalisé l'idéal de l'écrivain.

Le système scolaire d'Ontario, des provinces maritimes et de l'Ouest canadien fut calqué sur celui des Etats-Unis. L'institution est trop connue pour qu'il soit nécessaire d'en faire la description. On y exalte systématiquement l'effort, mais l'effort concentré impassible et sans démonstration extérieure, ce qui décuple les forces d'un homme en face d'un ennemi non averti. C'est une armure. C'est ce qu'un écrivain a appelé: "to learn the lesson of the race." Les jeunes gens ainsi formés sont capables presque de tout, car on leur a persuadé que rien ne leur est impossible et qu'en toutes choses ils doivent compter sur leurs propres forces, leur propre jugement. Que nous sommes loin du citoyen idéal décrit par le vicomte M. de Vogüé: "prêt à tous les dévouements et à tous les sacrifices sur un signe du chef qui sait capter sa confiance, n'exigeant en retour de ce chef qu'une garantie de protection après la lutte quand les combattants licenciés retombent dans leur apathie." Chez les populations de formation anglo-américaine, on peut dire que l'apathie n'existe pas, on ne demande la protection de personne, on ne reconnaît point de chef et c'est tout au plus si on consent à déléguer certains de ses pouvoirs. Ces populations sont complètement particularistes.

Plusieurs romanciers anglo-américains et canadiens, notamment messieurs Robert Barr, Knowles et Montgomery se sont fait les peintres de cet état social. Certaines parties des Etats-Unis, surtout la Nouvelle-Angleterre sont, on le conçoit, en avance sur le Canada ou le milieu est moins riche et le terrain moins préparé. Aussi trouve-t-on dans la république américaine une magnifique floraison d'écoles supérieures, dont on peut juger de l'esprit en étudiant cette personnalité remarquable, le Dr. Goldwin Smith, qui en fut une des âmes dirigeantes.

Impossible de nier en tout ceci l'influence du régime scolaire. Mais l'école ne donne ces résultats que parce que le milieu est favorable.

Le réformateur reste impuissant en face de certaines conditions antisociales. Dans les très grandes villes et dans certains centres industriels, où sont parquées les masses prolétaires, on trouve une population bien difficile à classifier. L'organisation des unions ouvrières leur a donné une formation, inférieure il est vrai à celle que nous venons de décrire, mais bien supérieure à son état antérieur. Il ne faut pas l'oublier, en effet, une masse prolétaire non organisée et amorphe, est réfractaire au progrès social. On constate donc qu'en Amérique comme ailleurs, la classe ouvrière reste distincte du reste de la population et que la divergence entre les deux est profonde. Il en est déjà ainsi au Cap-Breton. Un assez grand nombre de jeunes gens, il est vrai, abandonne l'agriculture pour le travail des mines, mais on remarque que ceux qui ont suffisamment évolué vers le type supérieur anglo-américain évitent de se laisser entraîner de ce côté.

Les groupes français.

C'est cette force sociale dont nous venons de parler qui développe l'Amérique septentrionale. Son esprit est un peu exclusif, mais sa puissance est formidable. Ceux qu'elle n'assimile pas elle les isole, elle les emmurent d'indifférence et de silence, comme les abeilles ensevelissent dans la cire les intrus qui pénètrent dans la ruche. Cela n'est pas l'effet d'un calcul c'est la résultante d'une impulsion d'où l'instinct n'est pas absent. Les immigrants qui s'attendent à des conditions nouvelles se conforment autant qu'ils le peuvent aux conditions de l'Amérique, mais les Anglais qui croient retrouver des Anglais en restent fort surpris; aussi les malentendus sont-ils fréquents. Il en est de même pour les Français; il ne comprennent plus d'abord les Canadiens-français.

Seul un groupe puissant, homogène et économiquement indépendant, peut résister à cette assimilation civilisatrice, mais un peu trop uniforme et despotique, et cela à la condition de lui opposer un élément civilisateur également avantageux. Il est bien évident que si ce qu'on voulait opposer à la civilisation anglo-américaine lui était inférieure, il ne serait pas sage d'insister pour qu'elle survive. Les Canadiens-français sont assez nombreux et organisés pour résister à l'assimilation; ils l'ont fait avantageusement, alors qu'opposés à une population anglo-saxonne, moins avancée que celle d'aujourd'hui, ils ont conquis la liberté. Ont-ils su conserver leurs avantages? Ont-ils compris la nécessité d'un effort soutenu? Ont-ils conquis surtout l'indépendance économique corollaire obligé des libertés politiques? Ne sont-ils pas plutôt, comme le citoyen idéal de M. de Vogüé, retombés dans l'apathie? Ont-ils jamais réfléchi que s'il leur arrive de se laisser devancer dans la lutte, le contre-coup pénible de leur infériorité même temporaire se fait sentir jusque dans le plus infimes groupement français de l'Amérique, et à plus

forte raison du Canada? Si les colonies françaises de la Nouvelle-Angleterre, du Nouveau-Brunswick, du Cap-Breton sont prospères et respectées, c'est que la province de Québec aura fait son devoir; sont-elles malheureuses et léthargiques, c'est que dans la province de Québec on est oublieux du devoir social. Les circonstances ne m'ont pas permis de visiter les groupes français de l'île du Cap-Breton, je ne les connaît que par ouï-dire; je ne saurais donc dire jusqu'à quel point ils souffrent de nos fautes. Ce que je sais bien c'est que ces fautes ne sont pas irréparables, que le Canada français peut encore se racheter et reprendre son véritable rôle, au prix d'un effort unanime et sérieux. Et s'il fait cet effort, les Acadiens vivant en villages isolés sur l'ancienne île Royale verront s'ouvrir devant eux un brillant avenir sans qu'ils aient à sacrifier pour cela la langue qui leur est chère. Il fut un temps ou le peuple grec, jadis si glorieux, n'était plus représenté que par une poignée de paysans ruinés et rendus à demi-sauvages par des siècles d'oppression. Et cependant nous voyons aujourd'hui la nation grecque refleurir non seulement en Grèce, mais aussi dans toute la Turquie d'Europe où elle domine par sa culture et par sa puissance économique, en attendant sa complète émancipation. De tels exemples prouvent que les rejetons d'un peuple illustre peuvent tout espérer s'ils veulent faire de sérieux efforts pour reconquérir leur place au soleil, sur une terre où l'oppression est inconnue et où l'intelligence et l'effort sont sûrs de trouver une prompte récompense.

II.—*La Baie d'Hudson.*

Par M. le juge L.-A. PRUD'HOMME.

(Lu le 28 septembre 1910.)

La compagnie de la Baie d'Hudson, comme nous avons déjà pu le constater, avait tenté l'impossible de 1672 à 1720, pour établir des postes dans l'intérieur du pays et je me suis efforcé de faire toucher du doigt, dans des études précédentes, les raisons de son peu de succès dans cette direction.

Il semblerait que ses serviteurs se croyaient enchaînés à la baie, et elle ne put les déterminer à entreprendre des voyages réguliers, dans l'intérieur et encore moins à s'y fixer. Force lui fut donc de se résigner à son sort.

Pendant que ces rudes gaillards de coureurs des bois, venaient lui enlever les plus belles fourrures, jusqu'aux portes de ses forts, elle tournait ses regards vers le nord, qu'elle commença à explorer. Elle se mit en quête de mines d'or et de cuivre et fit la chasse aux baleines et aux phoques.

Cependant elle ne négligea aucun moyen d'encourager les sauvages de la rivière Churchill à visiter ses postes. En 1738, on constate que 300 canots descendirent à la mer par cette rivière. Il ne paraît pas toutefois que les sauvages de la rivière Mackenzie fréquentèrent la baie à cette époque. Si quelques-uns s'y rendirent ce ne fut qu'à de rares intervalles. La factorerie d'York attirait un plus grand nombre de sauvages que les autres forts. C'était là que venaient traiter les tribus, habitant les lacs La Pluie, des Bois, Winnipeg, Manitoba et Winnipegosis. Cette traite n'était pas cependant aussi abondante qu'on serait porté à le croire. Cette partie du pays n'était par très giboyeuse et la longueur du trajet décourageait les sauvages. Bon nombre d'entr'eux avant l'arrivée de La Vérendrye préféraient laisser traîner dans leurs loges des fourrures de prix plutôt que de passer tout l'été en voyage.

La compagnie ne se décida à gagner le sud et à sortir de sa torpeur qu'en 1772, lorsque Joseph Frobisher intercepta la flotte des sauvages au fort de "Traite," sur la rivière Churchill et la laissa sans un poil. Voyant que les sauvages désertaient ses comptoirs, elle secoua son manteau de glace et pénétra enfin dans le pays dont elle gardait la côte nord depuis cent ans.

Il lui fallut un demi-siècle de lutte contre sa jeune rivale, la compagnie du Nord-Ouest, pour remporter la victoire et demeurer maîtresse souveraine de tout le Nord-Ouest jusqu'aux rivages de l'océan Pacifique.

Le gouverneur Burnet—Sa politique—Défense d'exportation—Conséquences sur la traite.

De 1727 à 1730, on constate que le zèle des coureurs des bois se ralentit un instant et que la traite subit momentanément une baisse dans la Nouvelle-France. La cause de ce changement doit être attribuée à un acte politique adopté à la suggestion de Burnet, gouverneur de l'Etat de New-York.

Les traiteurs canadiens importaient presque toutes leurs marchandises de la Nouvelle-Angleterre. Ce marché qui était à leur porte leur permettait de s'approvisionner plus promptement qu'à Québec, où le plus souvent il leur fallait attendre l'arrivée des navires pour charger leurs canots. De plus, les prix des marchandises anglaises étaient moins élevés que ceux du Canada. Burnet, qui était un rusé diplomate, résolut de leur couper les vivres et d'encourager les marchands de New-York à faire le commerce directement avec les tribus sauvages.

De cette façon, il espérait gagner les sympathies des indigènes et les attacher plus sûrement à l'Angleterre. A cet effet, il fit sanctionner une législation prohibant l'exportation des marchandises anglaises au Canada. Les marchands de New-York ne voyaient pas les choses du même œil que leur gouverneur.

Les traiteurs étaient d'excellents acheteurs qui payaient bien—Atteints dans leur clientèle, les marchands s'opposèrent à cette loi.

Ils en appelèrent en Angleterre. Le Conseil Privé, après avoir longtemps hésité, finit par confirmer la loi Burnet. Ce fut comme une conséquence de cette politique et pour favoriser l'expansion de la traite par les commerçants anglais que le fort Oswégo fut construit, près du lac Ontario.

La colonie du Canada, négligée par la mère-patrie, ne pouvait obtenir de France, à des prix et à des conditions aussi avantageuses qu'à New-York, les marchandises indispensables à la traite.

New-York ayant été fermé aux trappeurs, le commerce français de l'ouest ne tarda pas à languir.

L'intérêt détacha de la France des nations qui avaient toujours recherché son alliance. Cependant les trappeurs mieux aguerris aux privations et aux fatigues des voyages à longs cours, ne tardèrent pas à se relever de cet échec. Des maisons françaises leur ouvrirent des crédits et les consolèrent de leurs anciennes relations avec la Nouvelle-Angleterre. Au lieu d'enrichir les commerçants de New-York, ils firent bénéficier de leur industrie ceux de Québec. Burnet ne connaissait pas assurément toutes les ressources de ces hommes remuants et pleins de courage. Il semble qu'il aurait eu tout à gagner à leur tendre les bras et à les attirer à lui. Il s'imaginait follement que cette mesure détruirait leur crédit et qu'il aurait le temps, avant qu'ils ne s'équipent de

nouveau, de les remplacer par des traiteurs anglais dans les territoires sauvages.

Il ne réussit qu'à les embarrasser pendant quelque temps et à diminuer les profits qu'ils faisaient. La compagnie de la Baie d'Hudson qui avait tant à souffrir de la concurrence des traiteurs français, ne tira avantage de cette loi que pendant environ trois ans. Le but que se proposait le gouverneur ne fut pas atteint.

Arthur Dobbs—Expéditions de 1742–1746—*Ses attaques contre la compagnie.*

Cet homme fut l'un des adversaires les plus acharnés et les plus redoutables de la compagnie de la Baie d'Hudson. Il organisa deux expéditions pour trouver le fameux passage conduisant à la mer de l'ouest. La première qui eut lieu en 1742, fut confiée au capitaine Middleton, et la seconde en 1746, aux officiers Moore et Smith. Naturellement ces tentatives, comme les précédentes, n'eurent aucun succès.

Dans un ouvrage publié en 1744, Dobbs discute longuement les raisons qui empêchaient la compagnie d'étendre son commerce dans le pays et de contracter des alliances avec les tribus de l'intérieur.

D'après cet auteur, c'était la crainte d'exciter la convoitise des commerçants anglais et d'attirer l'attention publique sur les profits énormes qu'elle réalisait qui la décida à ne pas envoyer ses employés dans le pays.

On comprend que la compagnie n'était pas sans entretenir des doutes sérieux sur la légalité du monopole commercial que lui conférait sa charte et qu'elle n'aurait pas aimé à s'adresser aux tribunaux pour les faire discuter. Néanmoins ces raisons me paraissent assez futiles. Il était relativement facile de se renseigner en Angleterre sur ce que rapportait le commerce de la compagnie. D'ailleurs des établissements à l'intérieur n'auraient pas donné plus de retentissement à ses affaires que sur le littoral de la mer. Ses opérations eussent été même plus ignorées. Il ne faut pas perdre de vue également que Dobbs avait des motifs intéressés pour lancer ces accusations contre la compagnie. En 1746, il présente aú parlement impérial une requête demandant pour lui et ses associés une charte l'autorisant à fonder une colonie et faire la traite avec les sauvages dans tout le Nord-Ouest canadien. Les plaintes qu'il porte contre la compagnie proviennent donc de source suspecte et ont besoin d'être contrôlées. Dobbs est un témoin mal disposé dont il convient de se défier. Il est bon d'être averti avant de le lire.

Entrées à LaRochelle—Statistiques—Produit des fourrures—Importations et exportations—Capital de la Cie—Valeur des actions.

Les trappeurs français, nous l'avons déjà vu, s'emparaient du plus grand nombre des peaux de renard, loup-cervier, martre, vison, loutre,

putois, chat sauvage, caribou, antilope et chevreuil. Ces fourrures étaient transportées en canot avec beaucoup de soin jusqu'à Montréal et Québec d'où elles étaient expédiées à LaRochelle.

Le commerce des traiteurs français était de beaucoup plus considérable que celui de la compagnie.

Il suffit pour constater ce fait de mettre en regard le chiffre des fourrures exportées du Canada à LaRochelle. Je me contenterai de donner celui de 1743—

Capots de castor	15,000
Peaux brutes de castor	112,080
" d'ours noirs	10,623
" " bruns	5,889
" de martre	30,325
" " loutre	110,000
" " lynx	1,700
" " chat sauvage	1,220
" " loup	1,267
" " renard	10,280
" " biche	92
" d'élan	12,428
" de renards rouges	451

formant un total de 311,355 fourrures diverses.

Joseph LaFrance, nous fournit des chiffres curieux sur les prix imposés par la compagnie de la Baie d'Hudson pour ses marchandises en 1742—

Une livre de poudre valait		4	peaux	de castor.
Une couverte en laine	"	12	"	"
Une hache	"	4	"	"
Un chapeau	"	7	"	"
Une chemise	"	7	"	"
Un fusil	"	25	"	"
Un pistolet	"	10	"	"

Les profits s'élevaient jusqu'à 2,000 pour cent. En 1742 la compagnie acheta au fort York 50,000 peaux de castor. La France prétend que les employés majoraient le prix des marchandises afin de faire du zèle en faveur de la compagnie et obtenir pour eux-mêmes un salaire plus élevé.

La compagnie envoyait toutes ses peaux à Londres, mais elle en vendait quelquefois à vente privée, quand l'acheteur offrait une avance sur le prix réservé à l'enchère.

Il lui restait des fourrures en mains pendant trois ou quatre ans parce qu'elle ne pouvait les vendre. Elle payait en 1740 de 8 à 10 pour cent. de dividendes à ses actionnaires.

Grâce aux profits qu'elle avait accumulés, son capital en 1749 s'était élevé à £103,950, réparti entre 105 actionnaires.

Le tableau qui suit fera mieux voir l'importance de la traite à la baie et les hausses et les baisses qu'elle subit à diverses époques.

	£	s.	d.		£	s.	d.
1699	693	15	7	1721	1,788	4	4
1701	1,658	9	8	1722	2,449	15	11
1702	972	16	3	1723	2,305	2	7
1705	2,021	10	0	1724	1,497	18	7
1706	958	6	2	1725	2,410	17	1
1708	2,025	3	6	1726	1,599	15	11
1710	1,160	4	3	1727	1,756	2	0
1711	760	2	0	1728	2,571	13	4
1712	745	14	1	1729	1,941	19	7
1713	893	14	3	1730	2,315	3	9
1714	2,349	7	9	1731	2,876	1	2
1715	1,402	18	8	1732	3,350	12	3
1716	1,259	17	3	1733	3,110	9	9
1717	3,191	2	9	1734	3,930	19	9
1718	1,847	18	7	1735	2,232	17	11
1719	1,731	11	9	1736	1,549	16	10
1720	1,897	9	9	1737	4,124	18	2
				1738	3,879	17	11

	£.	s.	d.
1739 à 1740	30,279	16	6
1740 à 1741	28,877	17	1
1741 à 1742	22,957	1	8
1742 à 1743	26,804	19	7
1743 à 1744	29,785	19	3
1744 à 1745	30,148	6	0
1745 à 1746	26,350	15	9
1746 à 1747	26,849	7	2
1747 à 1748	30,160	5	11

Le commerce nécessitait un bon nombre de bateaux spécialement destinés au service de la baie.

Il y avait en sus des paquebots qui visitaient les principaux ports et distribuaient les marchandises.

Le tableau suivant donnera une idée du chiffre et du tonnage de ces vaisseaux:—

1739	3	bateaux		170	130	120	tonnes.
1740	3	"		170	130	120	"
1741–2–3	2	"			170	120	"
De 1744 à 1748	4	"	190	170	130	120	"

Pour se faire une idée plus exacte de ces opérations, je donnerai la valeur des importations et des exportations pendant une décade.

	Importations.			Exportations.		
	£	s.	d.	£	s.	d.
1736	1,519	16	10	9,924	8	7
1737	4,124	18	2	10,813	5	9
1738	3,879	17	7	10,821	11	7
1739	3,984	4	4	13,659	10	5
1740	3,837	2	8	11,869	3	7
1741	4,203	17	1	9,656	3	6
1742	3,028	17	0	12,647	9	10
1743	3,044	2	9	12,466	3	11
1744	4,871	10	1	11,036	3	9
1745	3,795	4	9	11,380	16	4
1746	3,320	9	10	8,560	9	0
Total	£40,240	1	1	£122,835	6	3

Les dépenses pour maintenir une organisation convenable, payer les salaires, solder les frais de construction et l'entretien des forts, s'élevaient à des sommes rondes tous les ans. Qu'on en juge par ce qui suit:

	£	s.	d.
1739	12,245	14	9
1740	13,346	9	3
1741	11,756	16	6
1742	12,084	3	0
1743	12,772	13	0
1744	20,201	13	11
1745	12,702	0	5
1746	19,360	11	4
1747	16,609	13	4
1748	17,352	4	10
Total	£157,433	14	4

Le capital de la compagnie était originairement de £10,500. En 1690, par une résolution de la cour générale, les actions furent portées à trois fois leur valeur; c'est-à-dire que le capital fut fixé à £31,300. Au mois d'août 1720, la même opération porta le capital à £94,500. Les actionnaires furent appelés, en outre, à souscrire dix pour cent. sur le capital versé en 1690, soit £3,150, qui, triplé en vertu d'une résolution donna £9,450. Les motivés des résolutions passées en 1690 sont fort curieux à consulter. Les voici brièvement exposés.

Première raison: Cette entreprise étant d'un caractère national, il importe que les actionnaires soient nombreux et que le public encourage l'entreprise. 2e. La compagnie possède dans ses entrepôts en Angleterre des fourrures qui garantissent la valeur du capital originaire. 3e. On évalue à £20,000 les peaux de castor emmagasinées aux fort Nelson et New Severn. La valeur des marchandises mises à bord des bateaux envoyés pour faire le service des côtes est égale à la mise du capital. 4e. Le capital est représenté par la valeur des forts, édifices, canons, bateaux, etc., et par l'indemnité que la compagnie peut raisonnablement prétendre et espérer recevoir des français, lorsque la paix sera rétablie, pour la perte de plusieurs de ses forts et d'une grande quantité de ses marchandises. Ces pertes sont évaluées à £100,000. Tels étaient les arguments que se faisaient les directeurs, pour justifier la prime donnée à ses actions. Le dernier motif semblait à leurs yeux trop problématique pour y accorder un grand crédit et les justifier d'escompter l'avenir, car la résolution n'en parle que comme des espérances raisonnables, d'une compensation légitime et d'une perception probable après la guerre. Sur une simple résolution, les parts qui d'après la charte, étaient de £100 chacune, furent majorées jusqu'à £300.

Règlements militaires—Sentinelles—Préparatifs de guerre—Instructions sur les moyens de défense.

Des auteurs mal renseignés ont laissé entendre qu'il y avait peu de gloire pour la France de s'emparer des postes de traite à peine défendus et qu'à l'exception des combats navals il n'y eut guère de rencontre sérieuse.

Heureusement que plusieurs historiens nous ont donné le récit détaillé des principaux engagements et ont ainsi réfuté d'avance ces remarques peu judicieuses.

Les instructions sévères données aux gouverneurs des forts, les précautions prises pour recevoir l'ennemi et le nombre des canons et fusils qui les défendaient prouvent au-delà de tout doute que plusieurs de ces forts pouvaient soutenir un siège en règle. Voici d'ailleurs un autre témoignage non équivoque que nous fournissent les registres de la compagnie.

"Ordres de la compagnie de la Baie d'Hudson à leur facteur principal, dans la baie, se rapportant à la défense de ses forts. Ces ordres sont adressés à Joseph Isbister, au fort Albany, et datés de Londres le 10 mai 1744:—

"Les Anglais et les Français s'étant déclarés la guerre et les hostilités avec l'Espagne se continuant, nous vous ordonnons d'être toujours sur vos gardes, de tenir constamment des sentinelles en faction et vos hommes aussi près des forts que possible. Vous ferez couper tous les arbres et autres plantes qui pourraient gêner la vue, ou abriter un ennemi, de manière à mettre à découvert tout le terrain avoisinant jusqu'à une portée de canon.

Réparez les palissades et les bastions sans délai. Pointez vos canons aux endroits les plus exposés à l'assaut des ennemis. Faites l'essai de vos canons afin de vous assurer de leur portée et exercez vos hommes à la manœuvre.

Les canons et les fusils doivent être chargés en tout temps. Vous devez tirer sur tout bateau qui fait voile près de vos forts sans donner les signaux convenus.

La compagnie récompensera libéralement tous ceux qui auront fait preuve de courage et de dévouement dans la défense de ses forts et une pension sera payée aux blessés ou aux veuves des morts. Copie du présent ordre sera affichée dans tous nos forts. Les bateaux devront être mis à l'abri des forts, pour les empêcher de tomber entre les mains des ennemis. Au cas où le fort sur la rivière Orignal serait attaqué par les Français, le commandant doit se tenir en communication continuelle avec ce fort. Nous reposons pleine confiance dans le courage et l'habileté de votre chef Isbister. Nous croyons que si vous êtes attaqués, ce sera durant l'hiver par des Français du Canada, qui arriveront par terre. Dans ce cas l'ennemi ne pourra pas avoir de canons avec lui et nous espérons que vous pourrez facilement repousser ses assauts. Tâchez d'obtenir tous les renseignements possibles des sauvages, sur les préparatifs des Français, sur leurs mouvements, sur les provisions et les munitions de guerre qu'ils ont amenées dans le pays. Gardez constamment deux sauvages au fort et envoyez-les tous les matins en éclaireurs, à une certaine distance du fort, de manière à ce qu'ils puissent être de retour le soir. Si ces sauvages ne reviennent pas le soir, ce devra être pour vous un avis d'être prêts. Mais ne donnez pas connaissance à ces sauvages de vos préparatifs."

Pendant la durée de la guerre contre la France, ces ordres étaient répétés tous les ans. Les employés étaient exercés au maniement des armes une fois par semaine. De plus la compagnie pour se fortifier, chercha à enrégimenter des sauvages, mais sans succès. Elle ne se dispensa du service de ses deux patrouilles indiennes qu'après le traité de

Paris. En 1747, les instructions font mention d'une batterie au Cap Merry et des moyens de communication et de support entre les forts York, Prince de Galles, Albany et East Main.

C'en est assez, je suppose, pour établir que ces forts étaient à l'abri d'un coup de main et qu'il fallait du courage et de l'habileté pour s'en emparer.

Organisation des forts et quelques notes sur les forts Prince de Galles—York —Severn—Albany—East Main et Orignal en 1771.

Fort Prince de Galles.

Ce fort avait été construit sur une péninsule, à l'entrée ouest de la rivière Churchill. C'était le poste le plus au nord de la compagnie. En 1771, il était défendu par 42 canons. Sur la rive opposée se trouvaient la poudrière et le cap Merry protégé par six canons. La rivière avait à cet endroit 1,006 verges de largeur. Les navires pouvaient la remonter jusqu'à 6 milles au-dessus du fort. La garnison était obligée de se rendre jusqu'à douze milles pour se procurer de l'eau fraîche. Ce fort était commandé par un facteur en chef qui avait sous ses ordres, cinq officiers et 60 serviteurs et commis. Le conseil se composait du facteur en chef, d'un second facteur, du chirurgien, du contre-maître des barges et du capitaine des bateaux. En sus de ces officiers, il y avait dans ce fort, un comptable, un traiteur, un armurier, un charpentier, un tonnelier, un forgeron, un maçon et un tailleur. Tous les matins, la cloche appelait les employés au travail qui durait depuis six heures du matin jusqu'à six heures du soir durant l'été et de huit heures à quatre heures pendant l'hiver. Deux sentinelles montaient la garde pendant l'hiver et trois durant l'été. La besogne favorite des serviteurs était la chasse aux perdrix. Ces hommes étaient engagés pour 3 ou 5 ans. Mais la compagnie se réservait le droit de les congédier en aucun temps, lorsqu'elle le jugeait à propos. Tous les ans, au mois d'août, ou au commencement de septembre, un navire apportait des provisions à ce poste. Après avoir chargé à bord les fourrures amassées pendant l'hiver le navire quittait le fort, au bout de dix jours pour l'ordinaire. La traite annuelle variait de 4 à 10,000 peaux de castor et comprenait en plus une grande quantité de plume d'oie et d'huile de baleine.

Ce fort était en pierre et commandait l'entrée de la rivière. Les travaux commencés en 1733 ne se terminèrent que plusieurs années après. Joseph Robson, arpenteur de la compagnie surveilla la construction des murs et des bastions.

L'enceinte couvrait une étendue de 300 pieds carrés, avec des tourelles à chaque coin. Les murailles avaient une épaisseur de 25 pieds sur trois côtés et de 42 pieds sur la partie faisant face à la mer. Les bas-

tions tenaient lieu de magasins et de poudrière. Un ancien fort avait été érigé en 1688, à cinq milles plus haut, sur la rivière Churchill. Ce premier fort était en bois. La compagnie le fit démolir et utilisa le bois pour construire un parapet dans le nouveau fort. Dans l'intérieur se trouvaient deux maisons, un bureau et la résidence du gouverneur. L'une de ces bâtisses avait 100 pieds de longueur, 33 de largeur et 17 de hauteur et était couverte en plomb. Ce fort abandonné ne présente plus que des ruines imposantes qui semblent garder le triste souvenir des exploits glorieux de la Pérouse qui le détruisit.

Sur ces murs massifs à demi-écroulés, les sauvages viennent parfois planter leur tente en passant, comme pour affirmer leur prise de possession de ce coin de terre que les blancs se sont disputés pendant de nombreuses années. Sur ce rocher où la voix des canons et des hommes de guerre de deux grandes nations s'élevait jadis comme une clameur, règne aujourd'hui un silence lugubre qui n'est interrompu que par les cris stridents de la mouette qui cache son nid dans les crevasses des murs et par les accents plaintifs de la bise glaciale qui passe en gémissant sur ces restes désolés.

Fort York.

Ce fort occupe la côte nord de la rivière Hayes, à trois milles de son embouchure. A trois milles au nord, coulent les eaux de la rivière Nelson; en sorte que la terre entre ces deux rivières forme, pour ainsi dire une presqu'île. Ce fort avait été construit en boulins et était flanqué de quatre bastions. La double palissade qui l'entourait était protégée par un remblai en terre. Il était défendu par douze canons. En amont du fort, près du rivage, la compagnie avait élevé une batterie de 12 canons avec des fortifications en terre en forme de demi-lune.

A deux milles au-dessous du fort se trouvait une autre batterie de dix canons avec une caserne et une poudrière. La nature avait contribué puissamment à protéger ce fort. L'entrée de la rivière Hayes est couverte de battures qui empêchent l'accès des navires de guerre. Les bateaux sont obligés de jeter l'ancre à cinq milles au-dessous du fort pour ne pas s'échouer.

En 1771, il y avait 42 hommes à ce poste. La traite était loin de donner le même rendement tous les ans. Quelquefois la compagnie en retirait jusqu'à 33,000 peaux de castor, tandis que d'autres années ce chiffre s'abaissait à 7,000 peaux. Les Esquimaux y apportaient aussi de l'huile de baleine blanche fort estimée.

Fort Severn.

Le fort Severn occupait la rive nord de la rivière du même nom. Il était en bois et possédait quatre bastions. La compagnie en 1771, n'en-

tretenait que dix-huit hommes à ce poste secondaire, sous le commandement d'un facteur et d'un capitaine de paquebot. Il n'avait que huit canons d'un petit calibre. Les bancs de sable qui ferment l'entrée de la rivière ne permettent pas aux gros navires de se rendre jusqu'au fort. Ce n'est qu'au printemps, à la crue des eaux, que les paquebots peuvent quitter le fort pour transporter au fort York les ballots de fourrures et en rapporter les marchandises nécessaires à la traite. Ce poste donnait annuellement de 5,000 à 6,000 peaux de castor.

Fort Albany.

Ce fort est situé sur une île du côté sud de la rivière Albany à quatre milles de son embouchure. Il était en bois, avec des bastions aux quatre angles du carré et quelques canons. La compagnie y entretenait 30 serviteurs ayant à leur tête un facteur et quelques officiers. Les difficultés de la navigation forçaient les navires à relâcher à 15 milles du fort. Des bateaux de moindre tonnage transportaient de cet endroit les marchandises au fort. Le poste de East Main lui était tributaire. La compagnie en rapportait de 10 à 12,000 peaux par année.

Albany fut le premier endroit de la baie que les Européens visitèrent et la tradition veut que ce soit à Albany où l'infortuné Hudson hiverna.

D'après le traité de Ryswick, chacune des nations belligérantes devait garder les postes qu'elle possédait au commencement de la guerre; or l'Angleterre ne possédait à cette dernière date que le fort Albany. Il s'en suivit que jusqu'au traité d'Utrecht, c'est-à-dire pendant 17 ans (1696 à 1713), Albany fut le seul pied à terre de l'Angleterre à la Baie d'Hudson.

Le poste d'East Main et le fort Orignal—Notes générales.

Le poste d'East Main n'avait qu'une importance secondaire. Situé à l'entrée de la rivière Slude, il ne consistait qu'en quelques bâtisses où demeuraient une douzaine d'hommes. La traite donnait de mille à deux mille peaux. Le fort Orignal, construit en bois, occupait la rive sud de la rivière du même nom. Un facteur en avait charge ayant 25 employés sous ses soins. Il possédait un port profond qui permettait aux navires de s'y rendre. La compagnie en recevait par année de 3 à 4,000 peaux. Le même bateau qui approvisionnait Albany faisait le service au fort Orignal.

Tous les forts de la baie étaient soumis à une même discipline. Chaque facteur recevait une commission de la compagnie et traitait directement avec le bureau des directeurs à Londres, dont il relevait. Les établissements de moindre importance étaient parfois placés sous le contrôle du facteur le plus rapproché. Cette indépendance des facteurs,

les uns des autres, n'empêchait pas qu'en cas de nécessité ils devaient se secourir et se rendre mutuellement de bons offices, dans l'intérêt général de la compagnie.

D'après l'historien Gunn, la compagnie en 1746 n'avait que quatre forts et deux comptoirs dans toute la baie et le nombre de tous ses employés n'excédait pas 150. A cette époque elle ne possédait également que quatre bateaux. Durant ce quart de siècle (1746 à 1771)—elle n'augmenta que peu le nombre de ses forts, mais par contre, son commerce se développa merveilleusement. Débarrassée des luttes et des rivalités de la France et de ses traiteurs, surtout depuis 1755, les fourrures affluèrent à la baie. L'ouest lui payait le tribut de ses plus riches pelleteries.

Principaux gouverneurs—Pouvoirs du Conseil—Instructions édifiantes de la cour générale.

Les principaux gouverneurs qui commandèrent à la Baie d'Hudson, furent: Le capitaine Henry Kelsey, John Fullertine, Robert Norton, James Napper, Joseph Isbister, Robert Pilgrim, George Spence, John Newton, Chs. Bagby, John Pott, John Bridgar, James Isham, Henry Sargeant, George Geyer, Anthony Beal, Richard Stanton, Samuel Hearne et Myatt. Ces officiers possédaient les qualités par excellence qu'exigeait la compagnie; la prudence et l'esprit des affaires. Les principaux officiers de chaque fort constituaient le conseil qui avait le droit de passer des règlements pour la gouverne des employés et pour déterminer leurs devoirs et leurs rapports avec les sauvages.

Les instructions de la cour générale de Londres aux commandants des forts sont parfois bien édifiantes et font preuve de sollicitude pour le salut de l'âme de ses employés. Les directeurs ordonnaient de célébrer le jour du Seigneur par quelque cérémonie religieuse et de suspendre tout travail qui n'était pas absolument indispensable. Ils conseillaient à tous la sobriété et la modération et finissaient par les confier à la protection divine et par implorer pour eux les bénédictions célestes. La note religieuse apparaît dans la correspondence de la compagnie surtout aux époques troublées et aux heures d'angoisse, tels que pendant la guerre entre la France et l'Angleterre. Lorsque les nuages se dissipent et que le ciel se rassérène, les exhortations morales et les pieuses invocations se font plus rares. Le monde n'a pas changé depuis et c'est encore aux jours d'épreuve que les fidèles sentent davantage le besoin de se rapprocher de leur Créateur.

La compagnie ne parait pas avoir envoyé de ministres dans ses forts. La France pourtant lui avait donné le bon exemple, pendant le peu d'années qu'elle commandait dans la baie. Les P.P. Albanel, Sylvie, Dalmas et Marest y avaient exercé leur zèle et évangélisé les sauvages.

La compagnie, trop occupée d'amasser du "pelu," se souciait surtout d'augmenter ses dividendes. Elle voulut, au moins dans la Baie d'Hudson, demeurer fidèle à sa devise "Pro pelle cutem."

Les œuvres des Missionnaires—Témoignage de Carver.

J'ai déjà eu occasion de constater que ce fut à la demande pressante des missionnaires que les gouverneurs du Canada prohibèrent la vente des liqueurs aux sauvages et obligèrent les traiteurs à prendre une licence. Ce ne sont pas là les seuls services qu'ils rendirent au pays. Ils firent également cesser chez les diverses tribus la coutume barbare de torturer les prisonniers de guerre et de les faire périr sur le bûcher, en leur inculquant les divins enseignements de l'évangile et en leur montrant les avantages qu'ils pourraient retirer de leurs prisonniers en les adoptant dans la tribu. Plus tard, mûs par le désir du gain, les sauvages les réduisirent en esclavage et les vendirent. Ce furent encore les missionnaires qui obtinrent, en 1693, une ordonnance punissant sévèrement ces ventes indignes d'hommes libres. En plus d'une circonstance, ils apaisèrent le courroux des sauvages soulevés par l'inconduite et la malhonnêteté de quelques trappeurs. Enfin ils firent aimer les Français dans tout l'ouest par leur dévouement admirable et leur charité envers les indigènes.

L'historien Carver ne peut s'empêcher de reconnaître les bienfaits qu'ils ont rendus à la cause de la civilisation et de l'humanité dans les termes suivants. "Les sauvages commencent maintenant à ne plus torturer leurs prisonniers, mais les font esclaves en les adoptant. Cette conduite de leur part ne provient pas de leur instinct naturel, mais de l'influence des missionnaires français, qui ont eu des rapports avec eux. Ces bons Pères ont pris grand soin de faire pénétrer dans leur esprit des principes généreux d'humanité qui ont modifié leurs usages. Les blancs qui ont des rapports avec les tribus de l'ouest bénéficient beaucoup de ces changements heureux pour lesquels ces missionnaires ont droit à la reconnaissance publique."—

Joseph LaFrance—Sa vie—Ses voyages.

Le voyage extraordinaire de ce traiteur métis, à travers le continent jusqu'à la baie d'Hudson, et les notes précieuses qu'il donne sur le pays et les aborigènes qu'il visita, offrent un intérêt particulier et jettent un jour nouveau sur ces sujets intéressants. Son journal dénote un esprit d'observation remarquable et est émaillé d'aventures qui feraient le thème de jolies légendes. Cette monographie, sous plus d'un rapport, se rattache à l'histoire de l'ouest; c'est pourquoi je n'ai pu résister à la tentation de lui donner une place à la fin de cette étude déjà trop longue.

Joseph La France, naquit en 1707 à Michillimakinac. Son père était Français et sa mère de la tribu des Sauteux du Sault Ste.-Marie. Son père se maria dans des circonstances assez extraordinaires. Il traitait sur le lac Huron et avait réussi à se faire une certaine fortune lorsqu'un jour en 1705 remontant les chutes du Sault Ste.-Marie ses cannots se brisèrent. Dans les efforts qu'il fit pour sauver ses marchandises du naufrage il faillit périr lui-même. Découragé et manquant de tout, il tomba malade et ne dut son rétablissement qu'aux soins assidus d'une jeune Sauteuse, fille d'un chef qui l'avait reçu dans sa loge. Touché du dévouement de cette femme, il l'épousa dans un voyage subséquent et l'amena avec lui à Michillimakinac. C'est à ce dernier endroit que naquit celui dont j'esquisse en ce moment la vie.

Il fut baptisé à St.-Ignace de Michillimakinac, dans la chapelle où le Père Claude D'Ablon et le Père Marquette baptisèrent plusieurs centaines de sauvages. Sa mère mourut en 1712. L'année suivante, il descendit à Québec avec son père. Il y passa six mois à apprendre le français. Il suivit ensuite son père dans ses excursions jusqu'à la mort de ce dernier, en 1721. Deux ans après, il se rendit à Montréal pour y vendre les fourrures provenant de l'héritage paternel. Jusqu'à l'âge de 27 ans, il continua la carrière de son père, chassant et traitant avec les tribus avoisinant Michillimakinac. En 1734, il visita le Mississipi et l'ouest de cette rivière. Son voyage dura un an et fut très fructueux. Il n'y avait, cette année là, dit-il, que deux soldats qui gardaient le fort Michillimakinac, 15 à St.-Joseph et une garnison de 30 hommes à Niagara.

Il mentionne, en passant, un fort bâti par les Français au fond du lac Michigan. Si la carte qu'il a préparée est exacte, il se trouvait sinon à l'endroit même ou s'élève aujourd'hui la ville de Chicago, au moins dans le voisinage immédiat. Il parcourut, en 1735, le Wisconsin et le Missouri. LaFrance était un de ces traiteurs qui n'avaient pas de permis et qui étaient considérés comme des contrebandiers. Au retour de son voyage dans le Wisconsin, il descendit avec huit Iroquois et deux canots chargés de fourrures, les lacs Huron et Erié, et passa pendant la nuit, en face du fort St. Joseph, afin d'éviter la confiscation de ses effets. Il donna, pour faire le portage de la chute Niagara, cent peaux de castor et arriva à Oswégo, à la fin de l'été. C'était à cette époque un poste de traite considérable. Craignant là, comme ailleurs, la main-mise sur ses fourrures, il laissa à ses Iroquois le soin de les vendre pour lui et évita ainsi tout soupçon.

D'après les renseignements qu'il donne, les postes français étaient gardés par de faibles garnisons. En cas de danger, les traiteurs du voisinage volaient à leur secours. Ces traiteurs étaient des sentinelles vigilantes qui donnaient l'alarme dès que les tribus tramaient quelque

complot. En 1734, LaFrance désirant régulariser sa position et las de se voir constamment exposé à être molesté dans son commerce, se rendit à Montréal avec deux sauvages et une cargaison de fourrure. Le gouverneur se trouvait en ce moment à cet endroit. LaFrance lui fit présent de mille couronnes et de plusieurs centaines de peaux de castor, afin d'obtenir un permis de faire la traite pendant un an. Le printemps suivant, le gouverneur ayant été informé qu'il avait vendu de l'eau-de-vie aux sauvages, le lui refusa. Il lui défendit même de partir pour voyage et confisqua l'argent qu'il lui avait donné. LaFrance, déçu dans ses desseins, résolut de s'enfuir avec ses sauvages. De retour à Michillimakinac, il se livra de nouveau à la traite—Le commerce des pays d'en haut avait beaucoup perdu de son importance à cette époque. Les Anglais avaient établi des postes dans le voisinage du lac Erié et par conséquent la navigation était devenue moins longue pour les sauvages de l'Ouest. De plus le prix des marchandises avait baissé par suite de la compétition. En 1740, il n'y eut guère plus que douze canots qui se rendirent à Montréal, d'après le témoignage de LaFrance. Le commerce était presqu'exclusivement entre les mains d'officiers en retraite, à qui le gouverneur avait accordé des licences ou "congés de traite" pour les récompenser de leurs services et leur permettre d'élever convenablement leurs familles. Au printemps de 1738, malgré l'accueil peu encourageant qu'il avait reçu du gouverneur, LaFrance décida de tenter un second effort pour l'apaiser et se le concilier. Il suivit la route du nord et passa par le lac Nipissing. Avant d'atteindre la rivière Ottawa, il recontra le beau-frère du gouverneur qui se dirigeait vers l'Ouest suivi de neuf canots montés par 30 voyageurs. LaFrance fut arrêté avec ses compagnons et sa cargaison fut saisie. Durant la nuit, trompant la vigilance de ses gardes, il se sauva à travers la forêt, n'emportant pour toute ressource que son fusil et cinq livres de poudre et de plomb. Il n'était pas homme à se livrer au découragement. Pendant six semaines, il suivit la rive nord du lac Huron, à travers les marais, les forêts et les montagnes qui longent ce lac. Il vécut surtout de castors qui abondaient dans ces parages. Il arriva enfin au Sault Ste. Marie, presque mourant de faim et épuisé de fatigue.

Après avoir tout perdu, voyant que le gouverneur était implacable et que la traite ne lui était plus possible, il prit le parti d'abandonner le Canada et de se rendre aux établissements anglais de la baie d'Hudson. Cette entreprise aurait eu de quoi effrayer une nature moins hardie que la sienne. Il partit au commencement de l'hiver 1739 et suivit le lac Supérieur, vivant avec les Sauteux, auxquels il était allié par sa mère. Il visita ensuite la nation des Epinettes et passa une partie de l'hiver à la rivière Michipicoton. A trois cents milles plus à l'ouest, se trouve, dit-il, une rivière appelée du "Pic" et qui tombe dans le lac Supérieur.

Ce nom lui fut donné à cause d'un rocher (pic de montagne) qui la borde à trois lieues de son embouchure. Il atteignit cette rivière au mois de mars 1740. Le 18 avril il se trouvait à la rivière du Pic. Il passa deux jours au milieu des Monsonis qui avaient deux villages de chaque côté de la chute de la rivière La Pluie (Fort Francis). Au mois de mai il se rendit au lac des Bois et fit alliance avec les Kristineaux qui habitaient la rive nord de la rivière Winnipeg. Le 15 septembre, après avoir descendu cette rivière, il voguait sur les eaux du lac Winnipeg. Il se livra tout l'automne à la chasse au castor. LaFrance dit qu'à l'ouest du lac Winnipeg habitaient les Assiniboëls des prairies, tandis qu'au nord se trouvaient les Assiniboëls des bois et au sud les Beaux-Hommes et les Sioux.

Tous ces sauvages se tatouaient la peau et se bigarraient la face de peintures représentant des têtes d'animaux ou des desseins de monstre. Leurs membres et leur corps étaient oints d'huile d'ours et de castor afin de les protéger contre les piqûres des maringouins et autres insectes qui les torturaient tout l'été. Les Beaux-Hommes excellaient surtout dans l'art de se tatouer la peau; c'est de là, prétend LaFrance, que provient le nom donné à cette tribu.

Au printemps suivant, il se rendit en canot, au lac "Du Sien," traversa le lac "Caribou" et arriva au lac Pachegoïa en mars 1742. Il visita la tribu des "Vieux-Hommes" ainsi appelés à cause du grand nombre de vieillards que la nation s'honorait de posséder. On a accusé souvent les sauvages de se débarrasser des plus âgés de leurs tribus comme des êtres nuisibles et fatigants qui étaient un fardeau pour le camp—Il faut bien avouer que cette accusation n'est pas sans fondement. Les barbares et les païens ne connaissaient pas le devoir filial ou l'amour fraternel de son prochain. Ils étaient sans pitié ni entrailles pour les faibles, les indigents et les abandonnés. Il ne faut pas trop généraliser toutefois cette affirmation. La loi naturelle avait encore ses prises chez quelques tribus sauvages de l'Ouest où la coutume cruelle d'abandonner les personnes âgées n'a jamais existé.

Sur les bords du lac Pachegoïa, poussait une grande quantité de folle-avoine. Les sauvages en emportaient constamment avec eux et en mangeaient à chaque instant. C'est sur les bords de ce lac que se réunissaient les sauvages pour couper l'écorce de bouleau et confectionner leurs légers canots. C'était aussi le point de ralliement et de départ, tous les printemps, pour les postes de la Baie d'Hudson.

Sans vouloir préciser avec une rigueur mathématique le tracé du voyage de LaFrance, il est facile de le suivre jusqu'au lac du Pic, qui, d'après la carte qu'il nous a laissée, correspond au lac Nipigon. Cette carte toutefois n'est pas un guide sûr et on voit qu'il n'a point une idée exacte des distances relatives entre les divers lacs ou rivières qu'il visite.

Si ce n'était point faire une trop grande violence à cette carte, on pourrait croire que la rivière du Pic indique l'entrée de la rivière Pigeon, qui fut connue autrefois sous le nom de "Le Pic." Il faut bien admettre cependant que cet écart de la carte de LaFrance est trop considérable pour soutenir cette hypothèse. Le lac du Pic désigne donc le lac Nipigon. De là, il se rendit à la rivière Pigeon qu'il remonta jusqu'au lac La Pluie et suivit ensuite la route par où sont passés tous les canotiers de l'ouest, savoir: la rivière La Pluie, le lac des Bois, la rivière et le lac Winnipeg et enfin la rivière Hayes. Il est assez probable que le lac "Du Sien" désigne le lac "Du Pin," le lac Caribou indique le lac Oxford, et enfin le grand lac Pachegoïa, le lac de Dieu.

Le 4 avril, tous les canots étaient prêts et l'approvisionnement pour le voyage complété. Il fut choisi comme guide et partit avec cent canots. Le voyage se fit lentement, chaque canot portait en moyenne deux personnes et 100 peaux de castor. Ils descendirent la rivière Epinette, ne faisant que deux à trois lieues par jour. C'est surtout au cours de ces voyages que se dessine bien le caractère indolent du sauvage. Si la chaleur l'incommode un peu, il s'arrête pour sommeiller. Il n'est jamais pressé de partir le matin. Il aime à flâner. Après tout qu'a-t-il à gagner à se hâter? Il s'arrête souvent près des eaux rapides des rivières pendant de longues heures, et regarde fixement, immobile, drapé dans sa couverte, avec la dignité d'un sénateur romain, revêtu de sa toge. On dirait en le contemplant, qu'inquiété par le bruissement de la feuillée, la chute d'un arbre, le murmure des eaux ou le gazouillement des oiseaux, il en cherche la cause dans tout ce qui l'entoure. Qui sait ce qui se passe dans le cerveau de cet enfant de la nature, durant ces heures de recueillement et de rêverie? Le 29 juin, la flotte arrivait au fort York. Comme les canots ne pouvaient contenir qu'un certain nombre de peaux, les sauvages ne transportaient que les fourrures qui leur étaient absolument nécessaires pour obtenir de la poudre, du plomb, du thé et du tabac. La longueur de ce voyage, les nombreux rapides à franchir sur la rivière Hayes, les naufrages souvent accompagnés de perte de vie, durant ces courses lointaines, inspiraient peu d'attrait aux sauvages de l'intérieur pour les forts de la Baie. Ils ne s'y rendaient que par nécessité et comme pis aller.

LaFrance nous donne sur les castors des renseignements assez curieux. Un chasseur, dit-il, peut d'ordinaire tuer 600 castors par saison, au lac Pachégoïa et n'en amène à la baie que cent dans son canot.

Les cinq cents autres peaux lui servent de lit, de couverture et d'ornement. D'autres les pendent aux branches des arbres, près des restes de leurs enfants décédés, comme une offrande à leurs mânes. Il en était ainsi, un peu partout dans le Nord-Ouest canadien avant l'arrivée de LaVérendrye. Quelquefois aussi, ils font griller l'animal avec sa

fourrure comme nous faisons d'une laie. Le castor ainsi apprêté, est servi dans les grandes circonstances. Il y a trois espèces de castor: le rouge foncé, le noir et le blanc. Le premier est le moins recherché. La compagnie de la Baie d'Hudson préfère le second et le blanc est celui qui se vend le plus cher en Canada. Les sauvages regardent comme un mets exquis la langue et la queue du castor. Ils en font une grande consommation en hiver. Pendant l'été, les castors sont d'une maigreur extrême, à cause des travaux fatigants auxquels ils se livrent. Ils sont constamment à l'œuvre, travaillant avec la plus grande activité à couper des branches et abattre des arbres. Ils amassent du tremble pour se nourrir pendant l'hiver, réparent leurs chaussées et emmagasinent des provisions. En étudiant les mœurs intelligentes et les habitudes de travail de cet animal, on comprend que le Canadien-Français ne pouvait placer sur son drapeau, un emblême plus significatif des qualités excellentes que possède notre race.

LaFrance rapporte que chez quelques-unes des tribus qu'il visita les mères avaient l'habitude de faire avaler de la graisse et de l'huile à leur enfant, lorsqu'il venait au monde et avant qu'il ne prit aucune autre nourriture. Cette pratique avait pour effet, d'après eux, de l'endurcir contre le froid et les privations et d'assouplir son corps. Les Cimbres avaient une habitude à peu près analogue, qui consistait à exposer leurs nouveaux nés dans la neige, pendant quelques instants. Une autre coutume curieuse que raconte LaFrance, c'est qu'après la mort du chef de famille, lorsqu'un enfant portait son nom, on le remplaçait par un autre, afin d'éviter la tristesse que le souvenir du défunt pouvait faire naître, en rappelant son nom. On pourrait faire ici, un rapprochement. On dit qu'Alexandre le Grand, ne voulait pas que personne portât son nom, et Pline dit qu'un jour, un soldat appelé Alexandre, ayant été accusé devant lui de mener une vie débauchée, il lui commanda de changer de vie ou de nom.

Les sauvages dans le voisinage de la Baie d'Hudson, en outre du castor, chassaient aussi l'ours, l'orignal et le caribou. Ils laissaient aux femmes le soin de prendre aux pièges, le menu gibier, tel que la martre, le vison et le chat sauvage. Ils confectionnaient une espèce de sucre noir avec l'écorce de bouleau bouillie et s'en servaient comme de remède, dans le cas de bronchite et de pulmonie. Ils témoignaient une horreur invincible pour le fromage, parce qu'ils s'imaginaient follement que cet aliment était fabriqué avec de la graisse de mort. Les objets nouveaux et rares excitaient toujours leur convoitise et étaient estimés à un grand prix. Au lac Pachégoïa, LaFrance obtint trois peaux de martre pour une petite clochette. Ils donnaient ces objets à leurs femmes comme un ornement destiné à les embellir: preuve que la vanité féminine ne fait point sentir son doux empire seulement chez les nations les plus policées,

et qui se trouvent au contact des raffinements de mode de la civilisation moderne.

A l'ouest de la rivière Ouinipigouchich (Winnipegosis) LaFrance vit un sauvage qui l'assura à plusieurs reprises avoir rencontré des hommes portant une moustache, vivant dans des maisons en pierre et dans des forts, au sud de ce lac. Ces hommes qui ne pouvaient être autres, d'après cette description, que des blancs, possédaient des ustensiles de cuisine en ferblanc. Il dit avoir vu une coupe de ce métal entre les mains de ce sauvage, qui prétendait l'avoir reçue d'un blanc. Ceci se passait au printemps de 1742, pendant qu'il se dirigeait vers la Baie d'Hudson. Il n'y a aucun doute que ce sauvage avait du visiter le fort La Reine où se trouvait LaVérendrye et que c'est du découvreur de l'Ouest ou de quelques-uns de ses serviteurs qu'il avait reçu cet objet.

En 1742, la nation des Beaux-Hommes fit une excursion à l'ouest du lac Pachégoïa. Les guerriers furent trois mois absents et fumèrent le calumet de paix avec une tribu vivant dans les Montagnes Rocheuses. A l'ouest de ces montagnes habitait une tribu qui ne connaissait pas l'usage des armes à feu. Cette infériorité contribua à son asservissement et les sauvages qui la composaient furent tous vaincus, faits prisonniers et vendus comme esclaves. En signe de servitude, les vainqueurs leur coupèrent la jointure du petit doigt. Quelques-uns furent amenés au petit lac des Esclaves, qui fut ainsi nommé à cause de leur présence. Pendant son séjour au fort York, LaFrance rencontra un vieux chef, qui vivait à quelque distance à l'ouest de la rivière Nelson. Ce vieillard faisait partie d'une bande de trente guerriers, qui en 1727 poursuivirent les Attimospiquois ou Têtes-Plates, jusque sur les côtes du Pacifique. Il fut le seul à revenir vivant de cette campagne militaire et demeura l'unique témoin de cette course lointaine, pour annoncer à sa nation le sort de ses frères d'armes, morts de faim, de fatigue ou sous les coups des ennemis.

Le récit de ce vieillard rappelle les campagnes des Parthes ou des Scythes. Voici un court abrégé de cette fameuse expédition. Résolus de se venger des cruautés commises par les féroces Attimospiquois, ou de périr à la tâche, trente guerriers, après avoir dit adieu à leurs parents, partirent avec leur femme et leurs enfants. Ils voyagèrent pendant deux hivers et un été, et au mois d'avril 1727, ils atteignirent les rives de l'Océan Pacifique. Ils se construisirent alors des embarcations et laissèrent leurs familles dans une île qui n'était séparée de la terre ferme qu'à la marée haute. Leurs familles devaient attendre leur retour à cet endroit. Les guerriers ainsi allégis, se mirent à la recherche des Têtes-Plates. Ils naviguèrent pendant trois mois, se nourrissant de poisson et faisant des haltes de temps à autres, pour se livrer à la chasse ou se reposer de leurs fatigues.

Ils finirent enfin par apercevoir les vestiges d'un camp et un peu plus loin des feux à demi-éteints. Ils quittèrent à l'instant leurs canots pour suivre ces traces. Quelques heures après, ils trouvèrent enfin leurs ennemis campés sur les bords d'une petite rivière inconscients du danger qui les menaçait. Ils fondirent sur eux en poussant leur cri de guerre. Les Têtes-Plates surpris et effrayés s'enfuirent à toute jambe, laissant beaucoup de morts. Ces fuyards, cependant, ayant constaté le petit nombre de leurs assaillants reprirent courage et les attaquèrent à leur tour. Les agresseurs accablés sous le nombre furent obligés de regagner leurs canots, après avoir perdu quinze des leurs. Tous périrent de misère, à l'exception de trois qui purent retourner à l'île où devaient se trouver leurs femmes et leurs enfants. A leur grande douleur, ces trois survivants ne rencontrèrent que deux femmes expirantes, qui leur racontèrent qu'une bande de Têtes-Plates les avaient attaquées pendant la nuit, qu'ils avaient enlevé ou tué toutes les femmes et les enfants et qu'elles-mêmes n'avaient été abandonnées que parce qu'ils les croyaient mortes. Ils passèrent trois jours dans l'île et au moment du départ les deux femmes et l'un des trois survivants avaient expiré. Un mois plus tard, le dernier compagnon de voyage de ce vieillard ayant succombé, il partit seul, voyagea pendant un an, et traversa de nouveau les Montagnes Rocheuses, parcourant maintes régions inconnues. Lorsqu'il arriva au milieu des siens, il se mourait de faim. Il avait perdu son fusil, sa hache, et même son couteau et n'avait pour soutenir sa chétive existence que la mousse des bois, des rochers et les racines des prairies.

LaFrance apprit de ce vieillard qu'il avait visité un endroit dans les Montagnes Rocheuses où le feu sortait de terre et où des pierres enflammées étaient lancées du pied des montagnes à de longues distances. Si ce rapport n'est pas le fait de l'imagination ardente de ce sauvage et peut être considéré comme véridique, il indiquerait la présence de volcans qui autrefois étaient en activité et se sont éteints depuis. En traversant les Montagnes Rocheuses, ce vieillard dit qu'il rencontra peu de sauvages. Ils vivaient par groupe de dix à douze familles, sur les bords des rivières où ils s'étaient construits des maisons en bois très spacieuses. Ils se nourrissaient surtout de poissons qu'ils apprêtaient avec des fruits dont les vallées étaient couvertes. La dernière partie de ce récit porte l'empreinte de la vérité, car Sir Alexandre Mackenzie, dans son voyage, aux côtes du Pacifique en 1793, confirme ces renseignements. Il parle même de villages bien bâtis, au milieu desquels étaient érigés des temples païens ayant cinquante pieds carrés. De chaque côté de ces temples, étaient sculptées des figures grossières, représentant deux êtres humains, les mains appuyées sur les genoux et supportant sur leur dos le poids de toute la construction. De l'autre côté du temple étaient des figures hyéroglyphiques représentant des têtes d'ours et de castor. Quant aux

proues des pirogues que le capitaine Cook dit être ornées de dents humaines, il paraîtrait, d'après ce vieillard que c'était les dents d'un certain poisson, fort semblables surtout à distance, à celles d'un homme. Les sauvages des côtes du Pacifique vivaient à cette époque dans des villages construits avec soin, et étaient soumis à un chef qui exerçait une autorité souveraine. Ils étaient dans l'abondance et avaient la tête ornée de plumes d'aigle très communs dans ces parages. Ils avaient l'habitude de brûler leurs morts et d'entretenir des fleurs à l'endroit où leurs cendres avaient été déposées.

Ils prenaient le saumon à l'aide d'un appareil de forme conique ayant 15 pieds de longueur et quatre pieds et demi de diamètre. Le poisson pénétrait dans ce réservoir par une ouverture de sept pouces de diamètre. Une fois entré dans l'appareil, il n'en pouvait sortir. Encore ici ces données sont corroborées par Mackenzie.

On sait peu de choses des dernières années de LaFrance, si ce n'est qu'après un court séjour au fort York, il passa en Angleterre où il se lia d'amitié avec un armateur anglais du nom d'Arthur Dobbs qui écrivit sa vie. Il mourut au service de la compagnie de la Baie d'Hudson en 1763. LaFrance, de même que les anciens voyageurs, n'avaient ni compas, ni boussole pour se diriger. Il jugeait des distances parcourues par le nombre de jours de marche. La plus grande erreur de sa carte est d'avoir placé le Nord-Ouest canadien à au moins trois degrés trop au nord. Il indique aussi souvent le cours d'une rivière dans une direction qu'elle n'a pas. Il est à présumer qu'il ne visita ces rivières qu'à leur embouchure, dans les lacs où elles venaient se décharger et s'en rapporta quant à leur cours, dans l'intérieur, aux renseignements vagues ou erronés des sauvages. Quoiqu'il en soit de ces inexactitudes, le journal et la carte de LaFrance jettent plus d'un jour curieux sur la vie et les mœurs des aborigènes du Nord-Ouest à l'arrivée des premiers blancs au milieu d'eux.

Nicolas Jérémie.

Cet officier distingué naquit et fut baptisé à Sillery, le 16 février 1669. Son père se nommait Noël et sa mère Jeanne Pelletier. A l'automne 1693 il épousa une Montagnaise. Le Conseil Supérieur à la demande de son père annula ce mariage, vu que les ordonnances au sujet des unions entre blancs et sauvages n'avaient pas été observées et que Nicolas n'avait pas 25 ans, âge requis alors pour se marier sans le consentement paternel. Il demeura au fort Bourbon de 1695 à 1708, sauf une absence de quelques mois, en Angleterre, comme prisonnier de guerre. Il devint ensuite gouverneur du fort Bourbon qu'il ne quitta qu'en 1714, à l'exception d'un voyage qu'il fit en 1707 à Québec pour se marier. Il avait le grade de lieutenant dans les troupes du Canada et laissa un

travail fort intéressant sur la Baie d'Hudson. Ce livre est extrêmement rare et il est presqu'impossible de se le procurer. Quelque société historique devrait se charger d'en faire publier une nouvelle édition. J'imagine que celui qui ferait une telle entreprise, serait assuré de rentrer dans ses déboursés et de faire quelques profits. On pourra se faire une idée de l'histoire de Jérémie par le résumé de quelques pages que je vais donner. A quinze lieues de la rivière Churchill, dit-il, se trouve la rivière du Loup-Marin. Entre ces deux rivières, les chasseurs poursuivent de nombreux troupeaux de bœufs musqués. L'odeur prononcé de musc qui s'exhale de la chair de ces animaux, à certaines époques de l'année, la rend détestable. Leur poil est très long, traînant à terre et bien fourni. Leurs cornes retournées pèsent jusqu'à 60 livres. Les "Plas-Côtés-de-Chien" qui visitent cette rivière sont une nation douce. Ils portent à leur cou des morceaux de cuivre qu'ils trouvent sur les bords de la rivière de ce nom et qu'ils façonnent en les frappant avec des cailloux. Les cariboux durant l'été souffrent beaucoup des maringouins et autres insectes qui les tourmentent sans cesse. Afin d'échapper à leurs piqûres, ils quittent les bois et se dirigent vers la rivière Bourbon par troupeaux de huit à dix milles. Les sauvages n'ont qu'à les attendre au passage, à l'époque de cette migration, pour se procurer sans effort toute la nourriture dont ils ont besoin. Jérémie dit qu'on pourra peut-être l'accuser d'exagérer ridiculement ce qu'il a vu, mais qu'il est dans les limites de la vérité quand il affirme que les oies et les canards sont en tel nombre, sur les bords de cette rivière, que lorsqu'ils se lèvent, effrayés par la décharge d'une arme à feu, ils obscurcissent le ciel et que le bruit produit par le battement de leurs ailes, empêche les chasseurs de s'entendre. Les loups et les veaux marins étaient aussi en très grande quantité. Jérémie estime que dans une rivière qu'il appelle "Gargousse" et sur une autre nommée "Egarée," il eut été facile, dans une seule saison de recueillir 600 tonneaux d'huile. Dans le cours d'une année, les 80 hommes qui gardaient le fort Bourbon tuèrent 90,000 perdrix et 25,000 lièvres. Au mois d'avril, les cariboux et les orignaux se dirigent vers le nord, pour retourner au sud à l'automne. Les naturels les attendent en canot, près des rivières que le troupeau doit traverser et les tuent à coups de flèche, ou bien encore ils leur tendent des pièges avec des branches enlacées et de cette manière en prennent beaucoup vivants. Jérémie dit qu'il se consolait dans cet exil en dégustant des vins mousseux de Paris. Dans le jardin du fort, il récoltait des salades et autres légumes, avec lesquels il apprêtait la venaison.

Bacqueville de la Potherie.

LaPotherie arriva en Canada en 1700. Il est l'auteur d'une histoire de l'Amérique Septentrionale. D'après cet écrivain, à l'époque

où les Francais faisaient la traite à la baie d'Hudson, les sauvages s'y rendaient en grand nombre et le commerce était plus actif qu'au temps de Joseph LaFrance (1742). Ils se réunissaient, dit-il, douze à quinze mille ensemble, se choisissaient des chefs et partaient de l'intérieur du pays, jusque du lac des Bois, pour faire des échanges au fort Bourbon.

LaPotherie dit avoir vu jusqu'à mille canots auprès du fort Bourbon. On peut se faire une idée des profits énormes que faisaient les Français, auxquels les sauvages venaient apporter leurs plus riches fourrures dans un rayon de quinze cents à deux mille milles tout autour du fort Bourbon. On pourra en juger par ce simple fait: les peaux de renards argentés étaient communes. Presque chaque canot en apportait une ou deux; or les Français ne la payaient que $1.50 la peau. *Ab uno disce omnes.*

Témoignage de Frost—Derniers combats des coureurs de bois auprès de Pontiac.

Frost se trouvait au fort Orignal en 1730. Il demeura aussi quelque temps au fort Churchill. Il rapporte qu'à environ cent milles du for Orignal, les Français avaient un poste de traite où ils offraient des prix beaucoup plus élevés pour les fourrures que dans les comptoirs de la baie d'Hudson. Pourtant les commerçants du Canada se trouvaient dans des conditions désavantageuses puisqu'ils étaient obligés de transporter leurs marchandises en canot, à travers le continent, tandis que la compagnie les recevait directement des navires qui visitaient la baie, tous les ans. En 1742, les sauvages apportèrent 20,000 peaux de castor au fort Churchill.

Frost estime qu'à cette date, environ cent sauvages de l'intérieur visitaient ce fort et deux cents venaient de la région située au nord de Churchill. Je ne saurais apporter de preuve plus convaincante de la supériorité des trappeurs que ces faits qui se passent de commentaires. La même situation se présentait sur les grands lacs de l'est. La Nouvelle-Angleterre fut obligée d'y maintenir des garnisons nombreuses à grands frais. Les dépenses pour transport, salaire des guides et canotiers, absorbaient une partie notable de la traite. C'est pour cette raison que les marchands de New-York qui trouvaient ces comptoirs trop dispendieux à entretenir, se plaignirent si longtemps de la loi Burnet qui leur enlevaient leurs meilleurs acheteurs. Il ne faut pas s'étonner, en face de ces faits, si les postes français de l'ouest firent preuve d'une résistance si opiniâtre et ne cédèrent qu'après que Lévis eut levé le siège de Québec. C'est alors qu'on vit Pontiac, cet ami si touchant et si fidèle de la France, dans ses jours de malheur, ruiner et détruire plusieurs forts anglais et assiéger Détroit, après le traité de Paris. C'était vraiment un beau spectacle que celui de cet illustre guerrier sauvage,

ralliant une dernière fois autour de lui les tribus demeurées attachées à la France, ainsi que quelques coureurs de bois qui avaient fait aimer le nom Français dans tout l'intérieur, renversant tout ce qui se présentait devant sa bande meurtrière, pour tenter dans un suprême effort de sauver la colonie. Combien d'or et de sang l'Angleterre a du répandre pour se rendre maîtresse du commerce de l'ouest et soumettre ces braves dont l'audace et le dévouement à leur ancienne mère-patrie avaient de quoi émouvoir jusqu'aux larmes. Ce dernier reflet de gloire des armes françaises rappelle les plus belles épopées des temps anciens.

Dernier exploit de l'amiral LaPérouse.

Je touche à la fin des luttes de la France pour la suprématie de la baie d'Hudson. Voici le dernier acte de ce drame sanglant. Au mois d'août 1782, LaFrance, qui se rappelait des brillantes victoires du célèbre D'Iberville, envoya l'amiral LaPérouse faire une expédition dans la baie. Il se présenta devant le fort Prince de Galles qui était en état de soutenir un long siège. Sa flotte se composait du *Sceptre* qui portait 74 canons, de l'*Astarte* et de l'*Engageante*, qui avaient chacun 36 canons. Dès la première sommation, le gouverneur Samuel Hearne se rendit sans coup férir. Umfreville qui se trouvait dans ce fort critique sévèrement la conduite de son chef dans cette circonstance. Il dit que les Français, après un long voyage, étaient épuisés de fatigue, mal vêtus, que la moitié d'entr'eux n'avaient pas de chaussure et qu'il eut été par conséquent facile de leur résister. Le 21 août suivant, le fort York se rendait également à LaPérouse. Ces victoires qui avaient peu coûté, n'eurent aucun résultat. La compagnie subit des pertes considérables, mais ces postes lui furent bientôt rendus.

Après cet exploit, le drapeau français quitta les rivages de la baie d'Hudson pour n'y plus reparaître. La France absorbée par ses guerres continentales, ne s'occupa plus de ses anciennes possessions d'Amérique.

III.—*Un Poète Illettré.*

Par M. ADJUTOR RIVARD.

(Lu le 28 septembre 1910.)

Le poète n'est-il pas en quelque sorte un déséquilibré?

Il y a chez lui quelque chose d'anormal. Ses facultés ne sont pas dans un juste rapport, ou mieux, dans un rapport qui paraisse juste aux gens de sens rassis. Quelqu'une prédomine, développée aux dépens des autres, et l'équilibre intellectuel et moral en est rompu. Aussi, le poète passe-t-il dans la vie comme en un songe. Il est parmi les autres hommes ainsi qu'un étranger; les autres regardent, il contemple; les autres pensent, il rêve; les autres parlent, il chante. C'est une sorte de malade, et qui souffre délicieusement; un exilé, un voyageur en cherche d'idéal; un être à part, dont le cœur se hausse et plane

Où la raison boîteuse n'atteint pas.

Il est

.....celui qui vient on ne sait d'où,
Et qui n'a pas de but, le poète, le fou.....

On naît poète, avec une sensibilité extrême, avec une imagination brûlante, avec au cœur une blessure qui saigne et ne veut pas se fermer. C'est le poète brut. Mais, pour qu'une âme de poète transparaisse, et resplendisse, et jette ses éclairs, il la faut former comme un diamant qu'on taille et qu'on polit. Plus encore, le poète doit faire l'apprentissage du verbe; pour dire son rêve, pour faire passer son idéal dans un chant, il lui faut l'harmonie, la cadence et le rythme, l'heureuse combinaison des sonorités, la judicieuse distribution des mots, et le jeu fécond des coupes intérieures; il lui faut de la mesure, de la couleur et de la musique, des nuances et des demi-teintes, de l'éclat et de la douceur, de la souplesse et de la solidité, des mouvements qui se prolongent et des dessins qui se développent, tout l'organisme à la fois résistant et flexible du vers.

La nature ne fait qu'ébaucher le poète; l'art doit achever de le former.

Or, il y a des gens qui, nés poètes, ne reçoivent pas cette culture nécessaire, et ne voient jamais lever la semence de poésie qu'ils ont dans l'âme. Ces illettrés se traînent sur la grande route, perdus dans la foule, isolés, souffrants, raillés, tourmentés par une soif qu'ils ne savent apaiser.

Je connais l'un de ces malheureux.

Pierre-Paul est né poète.—Je ne dis pas qu'il est poète; je dis qu'il est *né* poète.—Enfant, il apprit, à la petite école, comment on s'y prend pour former les lettres et pour les reconnaître ensuite; bref! il sait lire et écrire. Là s'arrête son savoir. De l'orthographe et de la grammaire, il n'a rien retenu, et toute sa prosodie consiste dans un compte approximatif des syllabes; il a le sens de la mesure pourtant, et, dans l'oreille, comme le souvenir obsédant de la cadence alexandrine. Car Pierre-Paul n'est pas de ces farceurs qui riment des chansons sur airs connus; c'est un épris de poésie grande et noble; il ne connaît guère que les grands vers.....Il lui arrive même d'en faire qui sont trop grands, qui dépassent toute mesure.

Nascuntur poetæ.....Preuve, la fureur de rimer qui possède Pierre-Paul.

Brave paysan du Royaume de Saguenay, il laboure, sème, récolte; il pourrait être heureux. Mais le chant des vers le hante, une rage de parler en mesure le dévore; c'est un besoin, une obsession, un harcellement....Il faut qu'il rime! On lui conseille de dompter cette passion, on lui assure qu'il n'est pas poète, on le gronde comme un enfant; rien n'y fait. "C'est plus fort que moi," dit-il.

Il rime donc, tant bien que mal, et tant bien que mal cultive sa terre, vend les produits de sa ferme. Je l'ai vu arrêter devant ma porte sa charrette pleine de denrées, laisser là les chalands, entrer en hâte chez moi, saisir un crayon, et, sur un chiffon de papier ou dans son livre de comptes, griffonner quelque chose; c'était des vers. "Quand les rimes me poursuivent et me bourdonnent aux oreilles comme des mouches, me disait-il, je ne peux plus mesurer ma saucisse, ni compter mes navets; il faut que je me débarrasse d'une couple de vers. C'est fait. Maintenant, je suis tranquille. Bonjour, Monsieur, et merci. Je m'en vais, car il y a là quelqu'un qui veut acheter une tresse d'oignons." Et, soulagé, Pierre-Paul retournait à son négoce.

.....Pierre-Paul, Pierre-Paul! j'ai mangé vos légumes, et j'ai lu vos vers. Hélas! vos vers ne valent pas vos légumes. Et vos *gretons*, ô Pierre-Paul, vos *gretons* sont vos meilleurs poèmes!.....

Les vers de Pierre-Paul sont donc mauvais. S'ils valent le papier sur lequel ils sont écrits, c'est qu'ils sont écrits sur du papier d'emballage. Et pourtant, quand on connaît l'auteur, on reste déconcerté devant ces productions étranges, incohérentes et décousues, parfois grotesques, mais où le poète se révèle tout de même. Un fatras de lieux communs, c'est vrai, et beaucoup de fautes de français, mais aussi des idées qu'il pêche on ne sait où, des expressions de choix qui lui viennent on ne sait comment, ici et là un vers bien frappé qui le surprend lui-même et qu'il ne reconnaît plus sitôt qu'il l'a fait, de la mesure, de la rime, de la césure

même, voilà la poésie de Pierre-Paul. Une fois l'orthographe rétablie, le croirait-on? eh bien! ça ne fait pas toujours mauvaise figure.

Lisez ces vers sur le Saguenay:

Par un étrange effort trôuant les Laurentides,
Le sombre Saguenay roule ses flots limpides
Dans un cadre imposant de rochers escarpés,
De caps majestueux en tableaux[1] découpés.
Sur la cime des monts, des sapins rachitiques
Semblent de noirs lutins aux gestes fantastiques,
Et les grands vents d'hiver, à travers les rameaux,
Font entendre, la nuit, de lugubres sanglots.
Ce fleuve est d'un aspect majestueux et sombre.
. . . . . .

Lisez encore le salut du poète à Charlesbourg, "berceau de son enfance":

Salut, vieux Charlesbourg! Des hauteurs où tu donnes,
Couronné par ton temple où règne la Madone,
Tu peux voir à tes pieds, du haut de ta grandeur,
Québec, Lévis, Beauport, la rade et sa splendeur.
De ton site éminent, tu vois la plaine altière
Où Wolfe et de Lévis enchaînaient la victoire....

Eh quoi! vous trouvez que *victoire* ne rime pas avec *altière*?.... Vous ne savez pas que Pierre-Paul est du grand siècle; bon Canadien, il prononce *victouère*, et c'est aussi pourquoi il fait ailleurs rimer *exploits* avec *guérêts*.

Il est vrai, cependant, Pierre-Paul se contente parfois de l'assonance; *larme*, chez lui, rime avec *âme*, *sombre* avec *fondre*, *femmes* avec *infâmes*, *gêne* avec *extrême*, etc. Mais qu'est-ce que cela? Peccadilles! Pierre-Paul, en revanche, ne rime jamais pour l'œil, et ce n'est pas lui qui accouplerait *hallebarde* et *miséricorde*! Et la pauvreté des rimes, les hiatus, les barbarismes même n'empêchent pas Pierre-Paul de trouver parfois de beaux vers—comme celui que j'ai souligné dans la pièce sur le Saguenay, ou comme celui-ci, où la césure ne saurait être mieux placée:

Il dit, et le soldat électrisé s'élance.

D'ailleurs, Pierre-Paul est modeste.

Ma muse, je l'admets, est loin d'être élégante,

dit-il dans un morceau qui est à la fois une satire dirigée contre les critiques malveillants, et une manière de plaidoyer *pro domo* ..... Quelques vers de cette pièce:

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[1] *Tableau*: pan de rocher, falaise à pic et unie.

Lecteurs, en vous servant ce poème indigeste,
Je ne m'attarde pas, en un long manifeste,
A quêter à genoux un indulgent pardon:
Je n'écris pas pour ceux à qui le sort est bon,
Mais pour les malheureux à qui la terre est dure
Et qui ne savent rien de la littérature.

. . . . . .

. . . . . .Critiques entêtés,
Ennemis indiscrets des médiocrités,
Ne m'infligez donc point de cruelles défaites.
Ah! si vous compreniez tout le mal que vous faites,
En brisant un auteur qui fait ses premiers sauts
Pour enfourcher Pégase avec ses oripeaux!

. . . . . .

Je le sais, je ne suis qu'un rustique poète.
Ma muse est paysanne, et son habit de fête,
D'étoffe du pays, teint de sombres couleurs,
Attire la critique et non pas les flatteurs....[1]

Pierre-Paul, donc, sait que la plupart de ses vers sont mauvais; il n'en fera jamais de meilleurs, il le sait aussi.....Mais le démon de la poésie le tient: Pierre-Paul rime, avec passion, avec acharnement. Les gens se moquent de lui, se le montrent du doigt; lui, timide, se dérobe aux regards, et, seul, honteux, comme on commet une mauvaise action, il rime; il chante à sa façon la montagne et la plaine, les grands bois sourds et les gerbes d'or, la chaude lumière du jour et la froide lueur de nos nuits d'hiver. Malgré les conseils, en dépit des sarcasmes, il rime; il rimera jusqu'à sa mort.....

N'est-il pas à plaindre, ce poète illettré, impuissant à dire son rêve, et pour qui la poésie est comme un mal dont on a honte?

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[1] Toutes ces citations sont tirées de trois plaquettes, publiées par notre poète: *Essais poétiques*, par Pierre-Paul Paradis (Chicoutimi, 1893, 7 pages); *la Fin du Monde*, par le même (Chicoutimi, 1895, 22 pages); et *les Funérailles de l'Amour*, par le même (Chicoutimi, 1897, 27 pages). Dans le *Prologue* de ce dernier recueil, P.-P. Paradis écrivait:

Le procureur est rude, il lui faut de la graisse:
Je fais faire à crédit le travail de la presse.

Hélas! Pierre-Paul avait maille à partir avec les procureurs! Il faut croire que le profit fut mince, car P.-P. n'a rien imprimé depuis cette date. Mais que de vers il a faits, qu'il n'a pas publiés, qu'il n'a pas même écrits!

IV.—*Les Bretons en Canada.*

PAR M. BENJAMIN SULTE.

(Lu le 28 septembre 1910.)

Sans prétendre résoudre la question posée à plus d'une reprise, dans les livres et les journaux, pour savoir combien de colons la Bretagne nous a fourni "du temps des Français," je me contente d'un à peu près et, dans ce but, j'ai recours au dictionnaire généalogique de Mgr. Tanguay, lui demandant tout ce qu'il peut nous donner en pareil cas. Ce commencement de preuve sera utile par la suite. Puisque nous ne savons rien sur ce sujet, voici toujours quelque chose en attendant.

Depuis la fondation de Québec jusqu'à la fin du régime français, nous n'avons eu aucun rapport de commerce avec la Bretagne. Nos colons sont venus des provinces d'où partaient les navires en destination du Canada—ce fait répond pour le plus grand nombre. Néanmoins, il en est venu d'ailleurs, comme à l'aventure, et les Bourguignons, les Champenois, les Berrichons, les Bretons entrent dans cette catégorie. Quant aux Parisiens, étant tout près du siège de l'administration générale, on comprend ce qui les concerne.

Mais les Bretons étaient-ils de la classe d'hommes la plus nécessaire en Canada? Il est permis d'en douter. A part le diocèse de Tréguier, la Bretagne était, au XVIIe siècle, sans agriculture. Les chefs de famille et les garçons vivaient sur la mer, soit à la pêche ou occupés aux grands voyages. Cette population n'était dressée ni aux travaux du défrichement ni à la culture des champs et ne s'avisait point de coloniser un pays aussi difficile que le Canada sous ce double rapport. Les Bourguignons, les Champenois, les Berrichons avaient la même pratique que nos "habitants" et ne se trouvaient pas dépaysés parmi eux.

Les Bretons survinrent, évidemment par rencontre, à la suite de quelques autres personnes, ou comme matelots, soldats, engagés de tous genres.

Les 56 notés pour la période de 1639–1680 ne forment qu'un chiffre insignifiant à côté de près de 10,000 âmes du recensement de 1681. C'est dire que la Bretagne ne compte pas dans la fondation de la colonie. Plus tard, le nombre des nouveaux Bretons augmente, mais pas assez pour faire sentir son influence sur 20,000, 40,000, 60,000 âmes.

C'est entre 1725 et 1760 qu'on en trouve le plus, soit 200 pour ces 35 années, ou 5⅔ personnes par année—une goutte d'eau dans l'océan.

Vingt-cinq hommes arrivés du Perche, de la Normandie, du Poitou, avant 1640 seulement, égalaient par leur descendance, en 1760, les 392

Bretons venus longtemps après eux—et qui tous (peu d'exceptions) épousèrent des Canadiennes.

J'emploie les mots "arrivé telle année," mais il n'existe rien pour nous guider à cette égard. Je m'en tiens à la date connue de 347 mariages et 21 sépultures qui ont eu lieu en Canada. Pour les fins de cette étude cela suffit. Le dictionnaire de Mgr. Tanguay ne constate pas l'arrivée des colons, parce que les documents sont absolument muets sur ce point, et je pense que le vide ne sera jamais comblé.

Parfois, les colons se trompent en désignant le diocèse d'où ils viennent. Ainsi, j'ai un homme de Dinan qui se réclame de St. Brieuc, tandis que 10 autres, du même Dinan, se disent de St. Malo.

Les registres des églises, seule source du dictionnaire, omettent deux fois sur cinq d'indiquer le lieu d'origine des colons. Il faut donc avertir le lecteur que mes 392 individus seraient probablement portés à 550 si les registres disaient tout, mais on ne devrait pas accorder plus de 400 ménages pour la période qui va de 1640 à 1760. Enfin, il est convenu de dire que la population fondatrice du Canada ne dépassait pas 4,000 ménages, ce qui donne 10 par cent, aux Bretons.

Ce travail était presqu'achevé lorsque le docteur T. Brisson, de Laprairie, m'a fait connaître deux colons, venus de la Bretagne, qui lui sont révélés par des actes de notaire. Il y a, sans doute, dans cette classe d'archives de bonnes notes à prendre sur le sujet qui nous occupe. Les papiers de la justice doivent aussi renfermer plus d'une mention à cet égard, mais tout cela est dispersé et je ne sais si le chercheur qui en fera l'examen naîtra bientôt. Eclaircir les points obscurs de notre histoire, c'est du patriotisme en action.

Diocèse de Dol. (Ille et Vilaine.)

Mariés en Canada:—

1662.—Pierre Maillet, St. Coulon.
1681.—Noël Faveron, menuisier.
1727.—Jacques Boudeau, St. Pierre de Plouenguen.
1729.—François-Nicholas Launay, Roc-sur-Brieu.
1730.—Julien Berthelot, Pariet.
1732.—Pierre Renaud, soldat, Ploevane.
1732.—Guillaume Hameury, Laneur.
1732.—Michel Grenier, Mendoe.
1735.—Jean Renaud, Evrard.
1735.—Pierre Favron, St. Carné.
1741.—Jean Carré, Rolandieur-Reaux-sur-la-Bruyère.
1741.—Thomas Ginga, St. Guinan.
1742.—Pierre Adam, Plaidien.
1745.—Jacques Senechal, Hangueneau.
1747.—François Belé, St. Germain.
1748.—Joseph Durocher, Dol. Arrivé en 1745.

1749.—François Blais, St. Germain.
1749.—François Bigon, St. Fidèle.
1752.—Julien Beaupied, St. Jacques.
1754.—Thomas Briant, Pledehan. Arrivé en 1746.
1755.—Julien Flaux, Cuyen.
1757.—Julien Pomeret, Plétien.
1761.—François Lavallée, St. Laurent.
1765.—Ives de Gauches, Pleude.
1779.—René Etienne, Rimoux.
En 1757, sépulture de Noël Pomier, de Chervais.

DIOCÈSE DE ST. MALO. (ILLE ET VILAINE.)

Mariés en Canada:—

1621.—Guillaume Couillard, charpentier, arrivé en 1613.
1665.—François Blanchard, St. Servant.
1674.—François Fortin, St. Hermel.
1675.—Olivier Quesnel, ville St. Malo.
1693.—François Loquet.
1693.—Jean Rinfret, St. François.
1698.—Geoffroy Vincelot, Plumelec.
1699.—Julien Aubert, soldat, Tinteniac.
1701.—Christophe Dufros, Madrac. Arrivé vers 1690.
1705.—François-Jérome Beaume, sergent, St. Medrias.
1706.—Jean Prud'homme, Meniac.
1708.—Pierre Lecompte, ville St. Malo.
1709.—Jean Mainguy, caporal, Guilbrac.
1715.—Eustache Gourdel, Cancale.
1715.—Nicolas Cargueret, ville St. Malo.
1716.—Charles Lechenu, ville St. Malo.
1716.—Clément de la Morinet, ville St. Malo.
1717.—Joseph Denanthois, ville St. Malo.
1720.—Pierre Leblanc, St. Sauveur.
1721.—Julien Hellot, St. Jean.
1721.—J. B. Journeau, marchand, ville St. Malo.
1723.—René Robert, Estadin.
1724.—Guillaume Corvaisier, Dinan.
1724.—Marc Bouchet, St. Charles St. Malo.
1725.—Julien Becquemont, St. Martin ville Josselin.
1726.—François Vilalun, Bruzily.
1727.—Jean-Robert de Mitre, ville St. Malo.
1727.—Mathurin Rondel, St. Brieu près St. Malo.
1730.—Joseph Tessier, Loya.
1730.—François Drouet, St. Pair. Arrivé en 1725.
1731.—Joseph-Jean Chauveau, St. Guino.
1731.—Olivier Guiguin, Pleinée-Jugon.
1732.—Servant Hairet, St. Servant.
1732.—Pierre Lafond, ville St. Malo.
1733.—Michel Privé.
1733.—Servant Bernard, St. Brie.
1734.—Pierre François Heurtin, ville St. Malo.
1735.—Guy Gouasin, ville St. Malo.

1735.—Claude-Louis Mainguy, ville St. Malo.
1735.—Bertrand Pithouas, Vildaiquingara.
1736.—Pierre Laurent, St. Servant.
1736.—François Laviolette, St. Sauveur.
1736.—Guillaume Lecorgne, Combour.
1736.—J. B. Macarty, St. Sauveur.
1737.—Julien Huet, St. Martin.
1737.—François Legallais.
1737.—J. B. Poitevin.
1737.—George Tanqueray.
1737.—Laurent Briant, Paramé.
1737.—Nicolas-François Aubry, Dinan.
1738.—Nicolas Chauvin, ville St. Malo.
1738.—Jacques-Vincent Dupré, St. Servant.
1739.—Michel Lebrette, St. Sauveur.
1739.—Pierre Breillé dit St. Pierre, soldat, St. Servant
1739.—Claude Leheu.
1739.—Jean Morvent, Calorien.
1740.—Augustin Laisné, St. Briard.
1742.—Pierre Adam, Plaidien.
1742.—Marc-François Carré, Gitte.
1743.—Philippe Degré, sergent, Pavanne.
1743.—Ives Lapierre, St. Sauveur.
1743.—Guillaume Moneret.
1743.—Julien Rehel.
1743.—François Roussel, Dinan.
1744.—Julien Gresseau, Evron.
1744.—Maurice-Michel Jean, Dinan.
1744.—Joseph Lamondé, Bonard.
1745.—Joseph Rojoux.
1745.— Louis Trébert.
1746.—Julien Guignard, Tader.
1746.—Jean Henri, Etremme.
1747.—Alain Boivin, Trélimont.
1747.—Jean Dubois, officier de frégate, St. Servant.
1747.—Julien Leclerc, Taden.
1747.—René-Jean Legallais, navigateur, St. Servant.
1748.—Mathurin Chenaut, St. Briard.
1748.—Julien Fourré, Corseul.
1748.—Nicolas-Gilles-Laurent Massot, ville St. Malo.
1749.—Thomas Carré, ville St. Malo.
1750.—Pierre Sore, charpentier, St. Malois.
1750.—Jacques Roussel, Ervaux.
1751.—Jean Lemaître, Lequonest.
1752.—Julien Blanchard, ville St. Malo.
1752.—Pierre Henri, ville Guingalan.
1754.—J. B. de Quilien, St. Roch, ville St. Malo.
1755.—Charles Corvaisier, Dinan. Etait ici en 1749.
1756.—Joseph Potrel, Trigarou.
1756.—Jean-Marie Boullet, Ploërmel.
1757.—J. B. Morin, Dinan.
1758.—Charles Restif, écrivain.

1762.—Jean Turmel, Pleurtin. Etait ici en 1751.
1762.—Noël Lebreton, Ste. Croix.
1763.—Jean Tanchot, Vignac. Etait ici en 1753.
1763.—Julien Angrillon, Mardrignac.
1764.—Pierre Lombard, grenadier, St. Sauveur de Dinan. Etait ici en 1760.
1764.—Louis Jogu, Postier.
1765.—Louis Gagné, Postier.
1766.—Michel Viel, Do, Dinan.
1768.—Félix Tetu, Vignac. Etait ici en 1754.
1768.—Jean Boulier, Avignac.
1775.—Charles-François Lecerclé, St. Servant.

Femmes arrivées seules:—

Anne Galais, ville St. Malo. Mariée, 1670, à Sylvain Veau.
Gillette Mignolet, N.-D. de St. Malo. Mariée, 1671, à Nicolas Minson.

Hommes arrivés avec leurs femmes:—

1740.—Guillaume Joquin.
1740.—François Lemaître.

Célibataires. Dates de leur arrivée:—

1740.—Gilles Lemarchand, Dinan.
1740.—Pierre Coutard, ville St. Malo.
1756.—Jacques Chaton, tonnelier, Calorien.
1757.—Jean Leroux, Coignac, St. Malo.

Connus seulement par leur sépulture:—

1743.—Pierre Lebat, Laurelas.
1748.—Julien Dumas, matelot, Plertuy.
1749.—Gilles Lacroix, Caucasse.
1751.—Louis Taillet, Dinan.
1777.—Jean Briant, St. Jouan-des-Guérets.

Diocèse de St. Brieuc. (Côtes du Nord.)

Mariés en Canada:—

1656.—Bertrand Chesney, ville St. Brieuc.
1671.—François Dubois, St. Potent.
1671.—Bertrand Courtois, Ploulagan.
1690.—Dominique Regault, St. Alban de Brieuc.
1690.—Mathurin Marais, Plérin.
1691.—Mathurin Robert, soldat, St. Pierre de Plumerais.
1694.—Pierre Morin.
1695.—Jean Auger, St. Thurion, ville Quintin.
1699.—Jean Cojean, ville St, Brieuc.
1701.—Antoine-Olivier Quiniart, St. Michel.
1701.—Jacques Triolet, soldat, Dinan.
1708.—Pierre Lecoq, soldat, ville St. Brieuc.
1727.—George Mabile, Lancier.

1731.—Guillaume Lemaître, Trève.
1732.—Guy-Joseph Després, Médria.
1736.—Gilles Bondé, Pleurtier.
1736.—Nicolas-Jean de Kerverzo, arpenteur, N.-D. de St. Brieuc.
1739.—Jean Hamond, Plérin.
1742.—Pierre Lecerf, soldat, Tinville.
1744.—Jean-François Ruelland, Plesla.
1746.—Guillaume Coutard, Plouzen.
1747.—Jacques Hayvert, Brehaut de Loudiac.
1748.—François-Mathurin Chapelet, Plérin.
1749.—Jean Harnois, St. Vincent.
1752.—François Moresq, St. Quentin.
1756.—Louis Héry, Hénon.
1756.—J. B. Lecollen, Plancha.
1757.—Vincent Bricaut, soldat, Gounet.
1758.—Jacques Marmignon, Pleto.
1758.—Félix Deslauriers, Tremezon.
1760.—J. B. Thebault, Plevelia.
1760.—Jean-Marie Ruelland, St. Mathurin de Montcontour.
1760.—Jean Labbé, Plédran.

Femme arrivée seule:—

1725.—Marie-Clotilde Poussart, épouse Jean Pognot.

Connus seulement par leur sépulture:—

1711.—J. B. Lavallée, Quintin.
1757.—Mathurin Lerétif, Pleuveron.
1758.—Dominique Videmont, canonnier, matelot, Seintier.
1794.—Jean-Olivier Briant, Plérin.

DIOCÈSE DE TREGUIER. (CÔTES DU NORD.)

Mariés en Canada:—

1672.—Nicolas Joffret, Guingamp.
1678.—Jean Rioux, Plougas.
1687.—Jean Guillaume Lebreton, N.-D. de Bonsecours.
1724.—Yves Phlem, St. Jean de Morlaix.
1725.—Julien Lebœuf, Guingamp.
1726.—Jean Laurent, Plegydé.
1734.—Pierre Courtin, N.-D. des Fontaines.
1748.—François Lunegant, St. Jean.
1748.—Guillaume Tanguay, Plouha.
1754.—François Malleterre, Loquipogras.
1755.—Joseph Joly, Ste. Marguerite.
1757.—Mathurin Bideau, Louanec.

DIOCÈSE DE ST. POL-DE-LEON. (FINISTÈRE.)

Mariés en Canada:—

1687.—Guillaume Lebellet, Plouyens.
1690.—Olivier Perrier dit Olivier, ville de Brest.

1693.—Pierre Cahouet, Landerneau.
1698.—Louis Prigeat, caporal, Triou.
1723.—Nicolas Gaudin, N.-D. de Recouvrance.
1727.—François Gréguin, Pleden.
1728.—Jves Penne, caporal, St. Pol.
1731.—Hamon Plehan, soldat, St. Louis de Léon.
1736.—Thomas Brochard, Sept-Saints, ville de Brest.
1743.—Noël Souzanet, St. Pol.
1750.—Gilles Cahouet, St. Louis de Brest.
1754.—Adrien Potin, tailleur, Enderdin.
1756.—Mathurin Filion, St. Louis de Brest.
1757.—Jves Mezou, Guipavas.
1757.—Joseph Guignard, la Longeon de Brest.
1759.—Charles Marq, Brest.

Connu par sa sépulture:—

1770.—Berthou, soldat, St. Martin de Morlaix.

Diocèse de Quimper. (Finistère.)

Mariés en Canada:—

1670.—Pierre Cœur, serrurier, St. Mathurin, ville Quimper.
1705.—Michel Fily de Kerrigore, sergent, Speguet.
1710.—Charles Guillimin, marchand, Concarneau.
1718.—Louis Divelec, Locmaria.
1726.—Joseph Cornet, Châteaulin.
1728.—Rolland Maillet, Châteauneuf.
1733.—Pierre-Corentin Denis, Quimper.
1738.—Henri Jac, Plougastel.
1742.—Jean-François de Vasson, lieutenant, Mallevale.
1751.—Christophe-Jean Corollaire, Kerquisinoire.
1757.—Philippe-Jean-Jacques Laboissière, chirurgien, Quimper.
1764.—Pierre Javray, St. Pierre de Melvin.
Noyé, 1760:—Henri Lebellet, bourg Cleder.

Diocèse de Cornouailles. (Finistère.)

Mariés en Canada:—

1639.—Jean Gorry, Pontaven.
1671.—Jean Policain, maçon, Locmaria.
1677.—Joseph de Montenon, Quimper.
1691.—Nicolas Sustier.
1698.—Noël Legaut, Ervillac.
1700.—Olivier Laisné, soldat, Doulan.
1701.—Noël Gromelin, soldat, Roldregal.
1713.—Josué Dubois, officier militaire, Bothoa.
1720.—Jves-François Arguin, Cameret.
1731.—Pierre Lafleur, Roscanvel.
1732.—Etienne Campion, La Ballance.
1732.—Maurice-Louis-Alexis La Brice de Kérock, Bériel.

Femmes mariées en Canada:—

1663.—Françoise Brunet, Quimper, épouse Théodore Sureau.
1669.—Etiennette Desmarais, Quimper, épouse Pierre Bodin.
1669.—Françoise Durand, Quimper, épouse Gabriel Samson.
1720.—Françoise-Rose (sœur d'Yes-François) Arguin, épouse François Chaumereau.
Sépulture, 1732:—Jean Mazeau, sergent.

Diocèse de Vannes. (Morbihan.)

Mariés en Canada:—

1662.—Michel Enard, La Ferrières près Vannes.
1683.—Guillaume Loret, Aulet.
1685.—Gilles Marin, Sédirac, à Belle-Isle.
1695.—Jean Quintin, St. Aubin.
1698.—François Quesdra, soldat, Quesdron.
1716.—Olivier Hugron, N.-D. de Redon.
1731.—Jean-Louis Roger, Languirie.
1739.—Guillaume Bonpart, St. Gilles.
1741.—J. B. Kerdorès, N.-D.-d'Hennebon.
1749.—Pierre Roger, Vannes.
1750.—Julien Guillaume, St. Martin.
1760.—Louis Blanchard, capitaine des troupes, Hennebon.
1760.—Joseph-Antoine Roupe, Colmart.
1761.—François Huchet, Lorient.

Femmes mariées en Canada:—

1750.—Jeanne Jalodin, veuve, de Carantois, épouse François Audoin.
1753.—Anne-Louise Malherne, de Quarantouard, épouse Marcel Guérin.
En 1653 arrive Olivier Martin du voisinage d'Auray. Tué au Long Saut en 1660.

Diocèse de Nantes. (Loire Inférieure.)

Mariés en Canada:—

1659.—Mathurin Gerbert, St. Pierre.
1661.—Jean Naud, Trinité de Mascou.
1663.—Jacques Descailhaut, St. Herbelain près Nantes.
1664.—Guillaume Gendron, Nantes.
1664.—Julien Jamein, St. Julien de Courcelle.
1664.—Jean Poitras, Cugan, ville Clisson.
1664.—Jean Deniau, Nantes.
1665.—Jean Moreau.
1667.—René Renaud, St. Pierre de Cujan.
1667.—Sidrac Dugué, officier des troupes, Persevil. Arrivé en 1665.
1668.—Julien Brosseau, Ste. Croix, ville Nantes.
1669.—Sébastien Thoison.
1669.—Julien Talua, St. Pierre.
1670.—Denis Brosseau, ville de Nantes.
1670.—Jacques Viau, Trinité de Clisson.
1670.—Pierre Boisseau, Tret.
1670.—Jean Joly, St. Denis.

1670.—Olivier Morel, officier des troupes, N.-D. de Gaure. Arrivé en 1665.
1672.—Guillaume Gourot, St. Nicolas de Nantes.
1673.—Jean Prou, Mantilly.
1673.—Jean de l'Epinay, Nantes.
1674.—Jacques Bricaut dit Lamarche, Vray.
1675.—Julien Bouin, St. Pierre Anceny.
1678.—Guillaume Chartier, Ste. Marie de Lost.
1679.—René Senat, St. Sébastien.
1680.—Jacques Ménard, Sabin, bourg des Marches.
1685.—Louis Bureau, St. Sébastien.
1685.—Guillaume Cartier, Dren.
1686.—André Bouteiller, St. André de Trois-Voix, ville Nantes.
1687.—Louis de Cadaran, seigneur de Bonneville, de Blin.
1687.—Louis Truchon, Daborel.
1688.—Ives Roy, soldat, St. Nicolas.
1688.—Gabriel Duchesne, St. Nicolas.
1689.—Nicolas Rotureau, Lauzon.
1690.—Luc Proto, Nantes.
1691.—Jean Leclerc, St. Nicolas, ville Nantes.
1692.—Jean Devin, St. Nicolas.
1692.—Joseph Gallais, Trinité de Nantes.
1692.—Pierre Billeron, St. Sabin.
1696.—René Bouchard, Lavault.
1698.—Nicolas Vinet, soldat, Nantes.
1699.—Jean Préaux, Pertuis.
1699.—Pierre Roulier, soldat, Bassemer.
1705.—Jacques-Henri Picoron, St. Nicolas de Nantes.
1704.—René Bouchaut, St. Lumine.
1715.—Louis Duret, Lamarne.
1716.—Pierre Bonneau, bourg St. Denis.
1717.—Daniel Beauregard, St. Saturnin de Nantes.
1720.—Pierre Voisin, sergent, St. Nicolas de Nantes.
1720.—Jean Laboissière, soldat, Nantes.
1723.—Etienne Girard, St. Jacques.
1723.—Honoré Hosteau, Ste. Croix Mascou. Arrivé en 1720.
1724.—Jean-Gilles Monier, navigateur, St. Per-de-Ré.
1725.—Jean Prevost, St. Pierre de Pimbeuf.
1727.—Claude-George Hosteau, caporal, Mascou.
1727.—Jean Normand, St. Laurent.
1728.—J. B. St. Romain, St. Nicolas de Nantes.
1729.—René Fourré, Herbignac.
1732.—Alexis Brunet, ville Ancenis.
1733.—Guillaume Favreau, N.D-. de l'île Bougue.
1735.—Julien Joly, St. Pierre d'Ancenis.
1737.—Christophe Dubois, sergent, St. Aubin, ville Guérande.
1738.—Louis Fleury, St. Nicolas.
1747.—François Richard, Chante.
1748.—Pierre Lebrun, maître d'équipage, St. Emilien.
1748.—Jean Collet, navigateur, St. Nicolas de Nantes.
1751.—Pierre Leparon, soldat, Revol.
1752.—Claude Moreau, Vieilleville.
1752.—Guillaume Bricaut, Beligny.

1756.—Nicolas Nardereau, Ste. Croix.
1757.—Guillaume Cariot, St. Similien.
1758.—J. B. Prud'homme, St. Nicolas de Nantes.
1759.—René Gareau, soldat, Devay.
1759.—Julien Freton, St. Jean de Moidon.
1759.—Alexandre Evin, St. Danlas.
1760.—Pierre Corbeau, Nantes.
1760.—Vincent Bourgaud, St. Vital.
1761.—Jean Arial, Nantes.
1761.—Pierre Petit, Pellerins.
1774.—Jean-Joseph Saupin, St. Nicolas de Nantes.
Marié en France. Claude-Sébastien de Villieu, Vieillevigne. Arrivé en 1665.
Arrivé 1653.—Jacques Brassier, St. Nazaire. Tué au Long Saut en 1660.

Femmes mariées en Canada:—

1671.—Jeanne Olivier, St. Saturnin, épouse André Leroux.
1672.—Madeleine Pepin, St. Jean, épouse Jacques Cachelièvre.

Connus par leur sépulture:—

1676.—Pierre Julienau, bourg Pernie, Pederez.
1689.—Charlemagne Duval, St. Pierre-le-Froisé.
1745.—Un nommé Bruneau, St. Donatien.
1770.—François Dufresne, Anet (mort au Détroit.)

Diocèse De Rennes. (Ille et Vilaine.)

Mariés en Canada:—

1639.—Gilles Bigot, Torcé près Rennes.
1660.—Guillaume Constantin, Sesons.
1663.—Jacques Meneux, Château-Giron.
1674.—Gilles Couturier, Toussaint.
1675.—Julien Garnier, Rennes.
1691.—Nicolas Georget, Toussaint.
1691.—René Des Coudrays, St. Etienne de Rennes.
1695.—Julien-Charles Sévigny, St. Germain.
1700.—J. B. Gervais, St. Germain.
1712.—Nicolas Estiambre, soldat, St. Pierre, ville Fougère.
1712.—Louis Jourdain, Toussaint, ville Rennes.
1712.—Joachim Marec, soldat, Toussaint, ville Rennes.
1713.—Jean-Joseph Feray, sergent, St. François, Rennes.
1716.—François Estiambre, St. Pierre, ville Fougère.
1718.—Pierre Sorieul, ville Rennes.
1719.—Ives-François Durocher, Toussaint, ville Rennes.
1723.—Julien Gardet, Royal.
1723.—Joseph-Gilles Perrin, soldat, Seçon.
1724.—Toussaint Rebour, Toussaint, ville Rennes.
1725.—Pierre Simon, Toussaint, ville Rennes.
1727.—Julien Perdriel, Lauroux-de-Fougère.
1730.—Jacques Griau, Toussaint.
1730.—Sébastien Martineau, St. Germain.
1738.—Mathieu Balté, St. Martin de Vitré.

1741.—Pierre Henri Lebreton, St. Aubin de Rennes.
1742.—Antoine Soyer, soldat, St. Sauveur.
1743.—Laurent Lorrain, soldat, St. Sulpice.
1752.—Simon Régent, St. Etienne de Rennes.
1752.—J. B. Brillant, médecin, Toussaint.
1756.—Gilles Salles, N.-D. de Vitré.
1757.—Jean Mallette, soldat, Toussaint.
1759.—Jacques-Benjamin Guérin, Rané.
1760.—Alexis Sevin, St. Germain.
1760.—Joseph Massé, Toussaint.
1760.—Pierre Coitty, Toussaint.
1761.—Toussaint Piot, St. Germain.
1761.—Pierre Colin, St. Sauveur de Rennes.
1761.—Pierre Boisverd, Gems.
1771.—Julien Rossignol, Sonjal. Arrivé en 1765.
1775.—André Mainguy, Sougeol. Arrivé en 1765.

Femmes mariées en Canada:—

1669.—Périnne Hutré, St. Germain, épouse Théodore Sureau.
1673.—Marguerite Latouche, Rennes, épouse Jacques Manseau.

Connus par leur sépulture:—

1749.—Un nommé Besnard, de Tran.
1758.—Etienne Manseau, soldat, Vitré.

Diocèse Non Indiqués.

Mariés en Canada:—

1647.—Julien Petau ou Perrault, Tours de Belan.
1692.—François Duval, Ponsot.
1694.—François Morvent, Mesle.
1731.—Félix Lemédèque, teinturier, Feoït.
1735.—Jean Chapelet, Chapelle-Janson.
1762.—J. B. Lachapelle, Romillai.

Connus par leur sépulture:—

1687.—Toussaint Gloumelon, soldat, Turon.
1737.—Julien Guérineau, Nevers.

Résumé.

1639–1680	56
1681–1699	45
1700–1724	54
1725–1734	50
1735–1742	50
1743–1750	50
1751–1759	50
1760–1779	37
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Diocèses.	Hommes mariés en Canada	Femmes mariées en Canada	Ménages venus de France	Hommes célibataires	Hommes connus par leur sépulture	Total
Dol	25	.....	.....	.....	1	26
St. Malo	100	2	2	4	5	113
St. Brieuc	33	1	.....	.....	4	38
Tréguier	12	.....	.....	.....	.....	12
St. Pol	16	.....	.....	.....	1	17
Quimper	12	.....	.....	.....	1	13
Cornouailles	12	4	.....	.....	1	17
Vannes	14	2	.....	1	.....	17
Nantes	79	2	2	.....	4	87
Rennes	40	2	.....	.....	2	44
(Divers)	6	.....	.....	.....	2	8
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PRÊTRES.

1666.—François Dollier de Casson, sulpicien, Basse-Bretagne.
1670.—Antoine Dalmas, jésuite, Quimper.
1691.—Maurice Quéré de Freguron, séculier, Quimper.
1694.—Ives Priat, sulpicien, Quimper.
1701.—Goulvin Calvarin, séculier, Vannes.
1714.—Amond Quen, sulpicien.
1717.—François Séré, sulpicien, Rennes.
1718.—Jean-Gabriel Le Pape de l'Escöat, sulpicien, St. Pol-de-Léon.
1722.—Jean-Pierre de Miniac, séculier, Rennes.
1722.—Louis Normant de Féradon, sulpicien, Nantes.
1737.—Joseph Dargent, sulpicien, Nantes.
1741.—Henri-Marie Du Breuil de Pontbriand, 6e évêque du Canada, Vannes.
1741.—Jean-Olivier Briand, St. Brieuc. Fut le 7e évêque du Canada.
1741.—René-Jean Allenon de la Villangevin, séculier, de Plérin, diocèse de St. Brieuc.
1741.—Olivier-Marie Semelle, séculier, Rennes.
1750.—François Le Guerne, séculier, Quimper.
1754.—Jean-Marie-Mathias Durumen, sulpicien, Morlaix, diocèse de Tréguier.
1754.—Vincent-Henri Guichard de Kersident, sulpicien, Quimper.
1754.—François-Auguste Magon, sulpicien, St. Malo.
1754.—Pierre Huet de la Valinière, sulpicien, Nantes.
1754.—J. B. Curateau de la Blaiserie, sulpicien, Nantes.
1796.—Charles-Bonaventure Jaouën, sulpicien, Morlaix, diocèse de Tréguier.

En 1648 est venue de Vannes, Jeanne Thomas sœur-hospitalière.

V.—*Les Archives du Canada à venir à* 1872.

Par J.-EDMOND ROY, docteur ès-lettres.

(Lu le 28 septembre 1910.)

Quel a été le sort, depuis la découverte du Canada jusqu'à nos jours, de tous les intéressants et précieux manuscrits fournis par les premiers explorateurs, les fondateurs, les fonctionnaires de toutes sortes? Que sont devenus ces documents si recherchés, si goûtés, si consultés aujourd'hui, comme source et matériaux historiques d'une incomparable valeur?

Il a été très divers et plein de vicissitudes? On peut dire que, bien souvent, c'est la dispersion et l'abandon qui ont le plus caractérisé leur destinée.

Si l'on regarde de près à la condition des temps et au mode dont les affaires étaient traités, on s'étonne moins cependant du peu de précautions que l'on prenait pour la sûreté et la garde de ces documents. A l'origine de la colonie, il aurait fallu que le gouvernement fut autrement régularisé et administré, pour que l'ordre qui présida plus tard à la préservation des papiers publics fut déjà établi. Les voyages et les déplacements continuels des premiers qui présidèrent aux destinées de ce pays du Canada, n'étaient pas faits pour des règlements d'administration intérieure du genre de ceux qui distinguaient les mœurs gouvernementales si policées des états européens. Puis, il aurait fallu aussi que le gouvernement n'eut pas été sans cesse dans l'inquiétude du lendemain, à la merci de la petite guerre des sauvages et des luttes acharnées qui, pendant cent ans, ont mis la colonie en danger. Ayons sous les yeux un tableau du temps. Regardons ces mouvements précipités, les traverses de toutes sortes; reconnaissons les inquiétudes et les anxiétés, les perpétuelles agitations; nous comprendrons qu'il eut été bien malaisé, même à un esprit organisateur, comme le fut celui de Talon, aussi fécond en desseins que le fut celui de Frontenac, aussi essentiellement administratif que le fut celui de Raudot, de rendre pratiques et exécutrices, les meilleures de leurs inventions policées.

Un autre obstacle au bon ordre et à la conservation précise des papiers tenait à la manière même dont les affaires étaient régies et administrées. Voyageurs, explorateurs, militaires, correspondaient avec des protecteurs, gens bien en cour, ou écrivaient des mémoires particuliers qu'ils transmettaient à leurs amis pour se faire valoir. La bibliothèque Nationale et les bibliothèques publiques de France, possèdent une quantité considérable de ces documents et pièces. Ils s'en trouvent repartis dans les divers fonds, surtout dans ceux qui

ont été formés par les Clairambault. Ceux-ci étaient des collectionneurs, et ils ramassaient tous les petits papiers. Mais combien d'autres les laissaient s'égarer ou détruire. Les documents émanés de l'administration, les lettres reçues par les premiers gouverneurs et intendants, demeuraient leur propriété. C'était chose d'hoirie, un bien meuble, une possession privée. Avec la fin de la charge d'un chacun, soit par retrait d'emploi, soit par mort d'homme, c'était chose naturelle et ordinaire que les papiers d'Etat, que les fonctionnaires avaient reçus et rassemblés, comme ceux qu'ils avaient envoyés, et dont ils avaient gardé les minutes—tout l'âme en un mot et tout le secret—passassent à leurs héritiers, à l'égal de leurs autres biens. Sauf peut-être quelques registres d'expéditions courantes et usuelles, qui se transmettaient de mains en mains, de secrétaire en secrétaire, comme preuve et modèle de choses à écrire, sorte de formules nécessaires, tout suivait la retraite ou le départ des fonctionnaires. C'est ce qui explique pourquoi l'on a si peu des lettres de Champlain, de Montmagny, d'Avaugour, de Mésy, de d'Ailleboust, de Lauzon, de Tracy et de Courcelles, dans les collections régulières des archives de France, et comment on en a aucune au Canada. Les lettres de d'Argenson furent toutes retrouvées plus tard, comme nous le verrons, dans ses papiers de famille. Ce n'est qu'à partir de Frontenac que l'on constate que l'on commence à recueillir à Québec la correspondance officielle venant de la métropole. Jusque vers 1672, on a nulle preuve de sauvegarde officielle des instructions et lettres envoyées aux gouverneurs et aux intendants, de tous ces documents qui parvenaient ici de tant de côtés différents et qui marquaient et représentaient les faits. Nulle rencontre d'un règlement quelconque pour leur préservation pendant des années, dont la chaîne forme plus d'un demi-siècle. C'est merveille encore que le nombre et la variété des épaves qui nous sont restées pour le bonheur et la lumière de l'histoire. Il est aisé de croire, d'après cet ordre de choses, quels abus naissaient et quelles facilités se produisaient dans le maniement des affaires publiques. Ce n'est que beaucoup plus tard que l'on commença à y mettre quelque soin, après que des incendies désastreux eurent détruit des archives judiciaires importantes, comme on le verra.

"Pour la première partie de nos annales, écrit l'abbé Ferland, dans son *Cours d'Histoire du Canada*[1], c'est-à-dire, jusqu'au temps de la création du Conseil supérieur, les documents originaux sont peu nombreux. Des matériaux précieux ont été, depuis un siècle, perdus par la négligence de ceux à qui ils étaient confiés. Ainsi, le collège de la compagnie de Jésus à Québec, possédait une importante collection de manuscrits, relatifs aux découvertes et aux événements civils et religieux de cette première période; fort peu de papiers ont échappé à la destruction.

[1] Québec, 1861, introduction, p. VIII.

Dans le journal du supérieur des Jésuites étaient consignés, jour par jour, les faits les plus remarquables, des réflexions sur les affaires de la colonie, des appréciations de la conduite de ses hommes publics. Continué pendant plus de cent ans, et tenu avec beaucoup de régularité, ce journal était d'une grande valeur pour suivre les événements. Eh bien! sur trois cahiers qui paraissaient avoir été complets à la suppression des Jésuites, il en restait encore deux à la fin du siècle dernier: un seul a échappé aux mains des Vandales, et encore est-ce par hasard, puisqu'il fut découvert dans un fourneau de la cuisine au Château Saint-Louis. D'autres causes comme l'incendie, l'humidité des archives, la mauvaise qualité du papier, ont aussi contribué à la destruction de nos archives historiques."

Le 15 juin 1640, un incendie détruisit la chapelle de Notre-Dame de la Recouvrance à Québec, les registres de l'état civil furent brûlés en même temps, et l'on eut recours à la mémoire des particuliers pour les reconstituer. Dans cet incendie furent aussi détruits tous les papiers du greffe et une grande partie des contrats entre les particuliers. François Doré, dit Monsieur Gand, commis général de la Compagnie des Cent Associés, occupait, avant l'incendie, une salle voisine de la Chapelle de Notre-Dame de la Recouvrance. C'est lui qui avait en sa possession les papiers du greffe.[1] Tout cela explique pourquoi nous avons dans la colonie si peu de documents antérieurs à 1640, à la réserve de quelques actes de notaires.

Au mois d'octobre 1682, un autre incendie dévasta presque toute la basse-ville de Québec. Plus de cinquante maisons furent brûlées, parmi lesquelles tous les grands magasins qui servaient d'entrepôts aux marchandises venant de France.[2] Beaucoup de particuliers y perdirent leurs titres de propriété, entre autres la famille Bissot.[3] Il n'appert pas cependant qu'aucuns papiers publics furent perdus en cette circonstance.

Tournons maintenant les yeux vers l'Acadie. Lors de la capitulation de Port-Royal, le 16 août 1654, il fut permis aux habitants de demeurer dans la colonie s'ils le voulaient, suivant leurs titres de concession et aux mêmes charges. Les missionnaires Capucins, qui voulurent s'en aller, eurent la liberté d'emporter avec eux leurs meubles, leurs vêtements et leurs livres.[4] Un inventaire des choses que les Français emportèrent avec eux fut alors dressé, mais il ne nous a pas été conservé, de sorte que l'on ignore quel fut le sort des archives.

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[1] *Notes sur les registres de Notre-Dame de Québec*, par l'abbé Ferland, 1863, p. 42.

[2] Archives des Colonies, série C^{11}, lettre de l'intendant de Meules, 6 octobre 1682, vol. 6.

[3] Ibid, vol. 59, 1733.

[4] Archives du Canada, série F., vol. 112, p. 214.

Lorsque Phips s'empara de nouveau de Port-Royal, au printemps de 1690, l'église fut saccagée, toutes les maisons furent pillées, et l'on emporta le butin qui fut repris ensuite en mer par trois pirates français. Il appert, cependant, qu'en cette occasion l'on put sauver les archives. En effet, le mois suivant, Villebon ayant reçu l'ordre d'aller reprendre possession de Port-Royal, il lui fut donné instruction de retirer les titres et papiers du greffe, de les transporter dans le lieu où il irait s'établir, et d'en disposer sur les ordres de l'intendant du Canada, Champigny.[1]

Le 12 novembre 1691, l'intendant Champigny écrivait de Québec au ministre "Le sieur Villebon m'a mandé qu'il avait retiré du greffe une partie des papiers, le reste ayant été brûlé et déchiré par les Anglais.[2]"

Nous avons la preuve qu'en 1651, il y avait à Port-Royal un notaire du nom de Domanchin et que Guillaume Le Bel était grand prévôt de la justice souveraine du pays d'Acadie.[3] Un acte de 1679, mentionne aussi le notaire Jacques Conraud. Nous ignorons ce que sont devenus leurs papiers. Il est sûr, cependant, que tous les documents de cette époque ne furent pas détruits, et quelques particuliers purent en sauver du désastre quelques-uns, parmi les plus précieux, puisque l'on trouve, en 1701, un mémoire imprimé pour Charles de Saint-Etienne, sieur de la Tour, légataire universel de Marie de Menou d'Aunay de Charnisay, où toute la filière des titres de sa famille est donnée, de 1634 à 1700.[4]

Dans les articles de la capitulation de Port-Royal en 1710, entre de Subercase et Nicholson[5] il n'est pas question de ce que deviendront les archives de l'Acadie. Nous savons qu'il y avait à Port-Royal, un tribunal régulier, un greffe. Un notaire du nom de Loppinot y exerça longtemps. Tous ces papiers n'ont pu être retrouvés. Une lettre du gouverneur Philips, datée du 2 septembre 1730, nous fait croire que la plupart furent apportés en Angleterre par Nicholson.[6] Quant aux actes de l'état civil de Port-Royal, de l'époque française, on sait qu'une partie se trouve à Halifax, soit entre les mains de l'archevêque catholique, soit au dépôt des archives de cette province. Une copie en a été faite pour le bureau des archives du Canada, il y a une trentaine d'années.[7]

Dans la nuit du 5 au 6 janvier 1713, le palais de l'intendant à Québec fut incendié.

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[1] Ibid, série F. vol. 115, p. 419.
[2] Archives des Colonies, série C.[11], vol. 11, p. 534.
[3] Archives du Canada, série F. 112, p. 206.
[4] Ibid., p. 60–122.
[5] Cf. *Nova Scotia Historical Society*, 1878, vol. I, p. 82.
[6] Archives du Canada, Nova Scotia Series, vol. M., 395–17.
[7] Série M., vols. 69–71.

Voici comment le gouverneur de Vaudreuil annonçait cette triste nouvelle au ministre, le II février:

"Je suis très mortifié, Monseigneur, d'estre obligé par cette occasion, de vous faire scavoir l'incendie du palais qui ariva la nuit du 5 au 6 Janvier entre minuit et une heure, Monsieur et Madame l'intendante m'avoient fait l'honneur ce jour là de dîner chez moy et n'eurent personne à souper. Madame L'intendante s'estant trouvé Incommodée par précaution mesme Monsieur L'intendant avoit fait faire avant de se coucher une visite générale par toutes les cheminées du palais sur ce qu'on luy avoit dit qu'on avoit veu sortir beaucoup de fumée de la cheminée de la chambre de Madame L'intendante ce qui ne s'estant trouvé rien, on vint deux heures après les éveiller en criant au feu. Il faisoit cette nuit là un vent si terrible et un si grand froid qu'on n'en a guère veu un pareil en Canada. On ne put jamais avoir le temps d'avertir à la haute et basse ville que tout estoit embrassé quelque diligence qu'on pût faire. Le Roy pert par cet Incendie, Monseigneur, une maison qui ne valait pas grande chose et quy estoit un vray brulot n'estant remplie que de vieux lambris et de cloisons partout. Il y a mesme longtems que nous prevoyons ce malheur le feu y ayant pensé prendre plusieurs fois. Pour Monsieur L'intendant il pert tout ce qu'on peut perdre ses meubles qui estoient très considérables et ses provisions pour plus de deux ans dont assurément Il se faisoit honneur, et qui luy coustent le double à racheter présentement. Ce n'est pas cependant ce qui le touche le plus et dans sa perte il ne songe qu'à la maison du Roy et à quatre de ses domestiques qui ont péry dans ce feu, pour moy je le trouve bien heureux et Madame Begon de s'estre sauvez comme ils ont fait avec leurs seules robes de chambre car un moment plus tard ils auroient pery aussy bien que tous leurs gens. Je laisse à Monsieur Begon, Monseigneur, à vous rendre compte de toutes choses; tout ce que je puis vous assurer c'est qu'on ne peut être plus sensible que je le suis à la perte qu'il fait qui certainement est très grande, il m'a fait voir ses lettres et les demandes qu'il vous fait de 20 miliers de poudre à prendre Icy en quatre ans dans les magasins du Roy, Je puis bien vous dire Monseigneur que cela ne portera aucun préjudice au public, et que c'est bien la moindre grâce que sa Majesté puisse accorder à Monsieur Begon en ayant acordé à bien d'autres en ce pays pour de moindres sujets." [1]

Quelques jours après le 17 février, l'administrateur d'Aigremont, écrivait de son côté:[2]

"Le feu prit au Palais la nuit de la veille des Roys a environ minuit avec tant de violence qu'au premier avertissement qu'en eurent Mr. et Madame Begon ils n'eurent que le temps de se sauver en robes de chambre et en mules sans bas dans la maison du nommé la Joie a cent pas de la. Il faisoit un si horrible froit qu'ils auroient esté infalliblement gelez avant que d'y arriver si par bonneur ils n'avoient eu le vent arrière. Trois de leurs Domestiques ont esté estouffez, et consommez dans les flames, le Sr. Seurat secrétaire de M. Begon ayant voulu passer par le

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[1] Archives des Colonies, série C^{11}, vol. 34, p. 37.

[2] Ibid, vol. 34, p. 32.

Jardin par une porte de dégagement qui y donne eut la moitié du corps gelé avant qu'il fut arrivé à la première maison, dont il est mort, Mr. et Madame Begon ont bien moins ressenty la perte de tous leurs meubles et de leurs provisions qui est très considérable, que celle de leurs Domestiques. Enfin, Monseigneur, ils ont soutenu cette disgrâce l'un et l'autre, en personnes très soumises à la volonté de Dieu; on ne peut scavoir certainement comme le feu à pris à ce Bastiment ny en attribuer la faute à personne, on Conjecture seulement qu'il aura pris par le Cabinet de Mr. Begon parcequ'on s'est aperçu de ce feu par la fumée qui en sortoit, si cela est, il faut ou qu'il se soit communiqué par quelques ouvertures de la cheminée dans le plancher d'en haut, ou il se sera conservé quelque temps sans qu'on s'en soit aperceu, ou qu'il soit entré quelques estincelles entre la superficie extérieure de la cheminée de ce cabinet et les ornemens de menuiserie qui estoient dessus ou il pouvoit y avoir de la suie que le feu y ait couvé quelque temps et qu'en suitte il ait pris tout d'un Coup a cette menuiserie qui estoit extrêmemen Seiche et qu'il y ait gagné dans un instant aux apartements d'en haut dont les chambres n'estoient séparées que par des cloisons de planches de pin qui est un bois très combustible estant remply de raisine. Le Roy a perdu peut de chose dans cette Incendie, Les effets les plus considérables de sa Majesté estant dans un bastiment nommé la Potasse qui n'a pas esté endommagé par le feu.

"Mr. Begon a pris la résolution de faire restablir le palais dans le même endroit parcequ'il en Coustera la moitié moins que si on le bâtissoit à la haute ville par les raisons cy après Scavoir, que le terrain est au Roy, que le sable et l'eau sont sur le lieu, qu'on peut tirer des murailles et cheminées qui sont restées de l'incendie plusieurs matériaux et qu'on y peut faire venir très facilement le Surplus de ceux qui y sont nécessaires par eau, Deplus n'y ayant pas d'autre endroit ou placer les magasins, il ne parroist pas qu'il convienne au service de sa majesté que l'Intendance en soit esloignée. Je finis avec une parfaite reconnoissance et un très profond respect."

Dans une lettre adressée de Versailles à Bégon, et datée du 3 juillet 1713—il est accusé réception de ses lettres du 14 octobre, 8, 9 et 12 novembre 1712, 11 et 12 février 1713, avec les papiers qui y étaient joints.

C'est dans les lettres du 11 et 12 février 1713, que Bégon a dû raconter l'incendie du palais arrivé le 5 janvier de cette année; mais elles ne nous ont pas été conservées.

Dans cette lettre du 3 juillet le ministre parle de la perte du palais:

. . . . . .

"Sa Majesté a été bien faché de l'incendie du palais de Quebec, dit-il, il est bien facheux qu'on n'ait point peu y remedier je suis très Touché en mon particulier de la grande perte que vous y aves faite et j'aurois souhaitté de tout mon Cœur de pouvoir vous procurer une gratiffication proportionnée pour vous dedomager mais la Scituation des affaires ne permet pas de faire tout ce que l'on voudroit en pareil occasion tout ce que j'ay pût obtenir de Sa Majesté a été une Some de 3000 livres pour le transport de Vos hardes et provisions, lorsque je pourray

vous procurer quelque chose de plus Vous devés estre persuadé que je le feray avec beaucoup de plaisir.

"Sa Majesté aprouve par toutes les raisons que vous m'avés marqué que le palais soit retably sur le même terrain où il etoit et sur les mêmes alignements afin que cela cause moins de depense j'en escrit amplement au Sr. de Beaucour vous devés observer aussi bien que luy que ce batiment soit plus solide et plus commode que l'ancien et qu'il soit construit contre le feu afin que pareil malheur n'arrive plus et pour retirer plus d'utilité de ce batiment il faut absolument que tout ce qui ne sera point pour votre logement celuy du garde Magasin et du concierge soit employé et Serve à Mettre les munitions du Roy afin d'Epargner les loyer s'il est possible il faut pour cela que Vous naccordiés aucun logement a qui que ce soit a la reserve du garde Magasin et du concierge qui seuls doivent y etre logés je vous recommande aussi que les prisons soient seures afin qu'ils ne s'échapent plus de prisonniers a l'avenir, jay ecrit a M. de Beauharnois qui a un plan du palais a Rochefort d'en faire distribuer les dedans sur le papier, il me marque qu'il le fera et quil vous le remettra Vous Verrés avec le Sr de Beaucour s'il conviendra de le suivre.

"Sa majesté a bien voulu accorder pour cette depense la somme de 30 M. livres que vous avez demandé il en a esté employé 15000 sur letat des charges de cette année et 15000 sur l'Etat de la Marine je suis persuadé quil y aura du revenant bon sur cette somme parce que les 15m livres du domaine etant payes en lettres de change sur le fermier il est certain que l'adjudication des ouvrages se fera a meilleur marché que si on payoit le tout en monnoye de carte, c'est ce qui doit attirer toute votre attention pour le faire au meilleur prix et avec plus deconomie qui sera possible Vous aurés soin de m'envoyer le plan et l'Etat de la depense."[1]

Le 25 juin précédent le roi avait écrit à MM. de Vaudreuil et Begon ce qui suit:

. . . . . .

"Sa Majesté a esté tres fachée daprendre L'Incendie du Palais de Quebec, Elle desire que ce Batiment soit refait dans le mesme Emplacement ou il estoit. Elle a accordé cette année pour le rebatir 15000 livres sur l'Etat des charges et pareille sur celuy de la marine, Elle recommande au Sr Begon de donner tous ses soins que ce Batiment soit fait solidement et avec le plus d'Economie quil sera possible, Sa Majesté est bien fachée de la perte que cet accident a causée au Sr Begon. Elle luy a accordé 3000l. sur l'Etat des depenses pour le Transport de ses hardes et provisions, Elle Entrera avec plaisir dans un dedomagement plus considerable si l'Etat de ses affaires pouvoient le luy permettre. On Verra dans la suitte ce qui se poura faire pour luy et Sa Majesté sen souviendra dans loccasion."[2]

Il fut alloué pendant quelques années 3,000 livres à Bégon pour l'indemniser des pertes qu'il subit dans cet incendie.[3]

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[1] Archives des Colonies, série B, vol. 35.

[2] Ibid, série B, vol. 35.

[3] Ibid, série B, vol. 38.

Les listes des effets perdus lors de la destruction du palais de l'intendant n'ayant pas été conservées, il est bien difficile maintenant de reconstituer les documents qui périrent alors. Tout ce que nous savons officiellement, c'est que le code chiffré dont se servait Bégon fut brûlé, puisque le ministre lui en envoya un autre exemplaire pour le remplacer, au mois de mars 1715.[1]

Comme l'on sait, c'est au palais de l'Intendant que le Conseil Supérieur de la colonie tenait ses séances depuis 1685.[2] C'est là, par conséquent, que se trouvait déposée la plus grande partie des archives de la colonie. On y avait, entre autres, les papiers et les registres du Conseil qui avait été institué en 1647 et qui dura jusqu'en 1663. Ces registres et papiers déposés dans un coffre chez l'ancien greffier Audouart avaient été, en 1663, l'objet d'un procès fameux avec un avocat du nom de Peronne du Mesnil, qui représentait ici les intérêts de l'ancienne compagnie.[3] Finalement, ils étaient demeurés en la garde du nouveau Conseil Supérieur. Ils existaient encore à la fin du XVIIe siècle, puisqu'on en trouve souvent des extraits cités par les auteurs et certifiés par les greffiers du Conseil Souverain, et qu'on y eut recours pour faire la preuve de la priorité des droits des Français, sur le territoire de la baie d'Hudson. Ces registres furent brûlés, ainsi que nous l'assure l'ancien procureur-général d'Auteuil, dans un mémoire de 1720[4], et ce fut une perte irréparable pour l'histoire. Ainsi périrent encore les registres et papiers de l'ancien tribunal de la sénéchaussée qui remontaient à 1651.[5]

C'est sans doute la destruction de tant d'archives précieuses qui décida le gouvernement de la métropole à demander des copies des pièces importantes que l'on possédait dans la colonie, Ainsi, en 1715, il demande un relevé de tous les titres des communautés religieuses.[6] Le procureur-général Collet, qui est en France depuis 1716, donne aussi un extrait des registres du Conseil;[7] mais le gouvernement n'est pas satisfait de cela, il veut un inventaire complet, et en 1718, l'intendant Bégon envoie en France tout un volume.[8] Il y décrit d'abord les

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[1] Série B, vol. 37, 9 mars 1715.

[2] Arrêt du Conseil d'Etat du Roi pour transférer le Conseil Supérieur de Québec dans le palais à ce destiné, avec les lettres patentes du Roi, 10 mars 1685.

[3] Cf. *Jugements du Conseil Souverain*, I, 32.

[4] Archives des affaires étrangères (France), Amérique, mémoires et documents, ancien volume 6, pièce No. 738.

[5] Dans ces registres se trouvait la plus grande partie des titres de concessions de la région de Québec.

[6] Cf. Archives des Colonies, série C^{11} 1718. "L'intendant du Canada, écrit le procureur-général Collet, a envoyé en 1715, les titres de toutes les communautés séculières et régulières, qui ont été établies au Canada depuis le commencement."

[7] Archives du Canada, série F. vol. 187, p. 87–103.

[8] Archives des Colonies, C^{11}, vol. 7, 2ième série.

documents conservés au greffe du Conseil Supérieur, puis vient un état des registres, liasses et autres papiers du bureau de contrôle de la marine à Québec, (registres des recettes et des consommations des magasins à Québec, 1701-1718, registres des recettes et des consommations à Montréal, 1698–1718). On voit passer sous nos yeux, les cahiers servant à enregistrer les commissions, les provisions et brevets des officiers depuis 1696, les cahiers servant à l'enregistrement des devis et ouvrages de maçonnerie pour les fortifications, ceux servant à constater la recette et la dépense du trésorier depuis 1701, les procès-verbaux de fabrication de cartes et de celles brûlées (1702–1717), les rôles d'équipages et matelots sortis du Canada, de 1703 à 1718, des mémoires au sujet des prisonniers anglais renvoyés à Boston du port de Québec au mois de juin 1706, les états des fonds de la marine envoyés au Canada depuis 1692, une ordonnance du Roi, accordant une année de solde aux soldats qui veulent se marier et établir au Canada et portant commandement de leur donner congé à la première demande qu'ils en feront.

Dans le bureau de l'Intendance, on trouve un double de tous les édits du Roi, et des arrêts du Conseil d'Etat concernant la colonie, puis quinze registres contenant les ordonnances des intendants, depuis 1686, et les concessions accordées. C'est par ce relevé que l'on constate que quatre des volumes des ordonnances des intendants (1686–1705) sont disparus depuis l'incendie de 1713. Ils existaient encore à la date du 8 novembre 1718.

Dans une note datée du 5 février 1793, le greffier George Pownall dit que ces registres d'ordonnances d'intendant antérieurs à 1705, furent brûlés en 1702, mais on voit que c'est là une erreur. L'intendant gardait dans ses bureaux un double de tous les registres concernant les comptes du trésorier, et des magasins du Roi à Québec et à Montréal. Le relevé que nous analysons donne le détail de tous ces registres, année par année. Mais ce qu'il y a de plus important pour l'histoire, se trouve dans l'inventaire des titres d'établissement de propriété, règlements, arrêts du Conseil d'Etat, lettres du Roi et de ses ministres qui étaient déposés au bureau du Gouverneur.

C'est là qu'on a la preuve qu'à partir de Frontenac, en 1672, on a songé à composer un recueil de documents formant une suite non-interrompue, et à le préserver d'aucune atteinte. Dans cet inventaire de 1718, on trouve indiquées au-delà de 150 lettres originales, (1672–1716), écrites de la main du Roi ou du ministre Pontchartrain, adressées soit à Frontenac, soit à Callières, soit à Vaudreuil, On en donne une analyse si complète, que lorsque les brouillons n'existent pas dans les ordres et dépêches conservés dans la Série B des Colonies à Paris, celle-ci peut les remplacer. Que sont devenues toutes ces lettres qui seraient si précieuses aujourd'hui? Qui nous rendra jamais l'original de la sommation

faite à Monsieur le Comte de Frontenac par Guillaume Phips, général de la flotte anglaise faisant le siège de Québec le 16 octobre 1690, que cet inventaire signale? Ce résumé des ordres et dépêches du Roi et de son ministre, de 1672 à 1716, nous donne presque toute l'administration de trois gouverneurs, et nous n'avons pas besoin d'insister sur son importance.

On voit que l'incendie du palais de l'intendant eut pour effet de mettre le gouvernement sur ses gardes puisqu'à part les relevés dont nous venons de parler, il réglementa en 1717, le dépôt des actes des notaires de la colonie et fit renouveler ses ordres à ce sujet, en 1724 et 1726. Bien plus, en 1727, il fit commencer par André de Leigne, l'inventaire de tous les actes déposés au greffe de Québec, que devait continuer et poursuivre en 1730 le procureur-général Verrier, (1730-1733).[1]

C'est alors que l'intendant Hocquart écrivit au ministre, le 5 octobre 1731, la lettre qu'on va lire:

"Il m'a été souvent représenté depuis que je suis en Canada, que les minutes des actes des notaires, les registres du Conseil Supérieur et de la prévôté ne peuvent être en sûreté dans les maisons particulières des greffiers où ces minutes et ces registres sont déposés, par les accidents du feu qui peuvent survenir et qui consumeraient les titres de tous les particuliers de la colonie. Ces représentations m'ont paru, monseigneur, si importantes que j'ai cru devoir vous en faire part, et vous proposer pour la sûreté publique de faire construire un bâtiment à l'abri du feu pour contenir tous ces papiers. Je n'ai point trouvé de lieu plus convenable pour faire ce bâtiment que la cour du Palais. . . ."

Ainsi donc c'est l'intendant Hocquart qui, le premier, eut l'idée au Canada de construire un hôtel pour y recueillir les archives.

L'on a eu la délicatesse de rappeler ce fait historique lorsque a été élevé, en 1904, un édifice pour les archives du Canada à Ottawa. Une tablette de bronze, à gauche de la porte d'entrée, porte en effet l'inscription qui suit: *The erection of an Archives building for Canada was first proposed by Gilles Hocquart, Intendant of the Colony of New France, in the year* 1731.

Le 19 juin 1721, le jour de la Fête-Dieu, en plein midi, le feu prit à l'Hôtel-Dieu de Montréal, et consuma la moitié de la ville où étaient les plus belles maisons.[2] Le corps de garde et les magasins du Roi furent compris dans l'incendie, mais les bâtiments renfermant les papiers publics ne furent pas touchés.[3] C'est alors que l'ingénieur de Léry

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[1] Cf. Archives des Colonies, C[11], vols. 52 et 54. Ce dépouillement de Verrier, se trouve aux archives des Colonies. (Rapport Marmette (1885, p. XXIV). Il y en a aussi une copie au greffe de Québec.

[2] Série C.[11], vol. 43, 25 septembre 1721, lettre de Chaussegros de Léry. Ibid. vol. 43, délibération du conseil de Marine, 9 décembre 1721.

[3] Série C.[11], lettre de M. de Léry, 25 septembre 1721, vol. 43.

recommanda instamment que tous les édifices publics tant à Montréal qu'à Québec, et à Trois-Rivières, fussent couverts en ardoises afin de les protéger contre le feu.

Le 10 avril 1734, sur les sept heures du soir, le feu prit à la couverture de la maison de la veuve Francheville, située sur le bord du fleuve, dans la ville de Montréal. Il gagna si promptement les maisons voisines malgré les secours que l'on put y apporter qu'en moins de trois heures, il y en eut 46 de consumées. L'Hôtel-Dieu était du nombre. La plupart de ces maisons appartenaient aux meilleurs négociants; ils perdirent presque tous leurs meubles, effets et marchandises. Le sieur Lestage qui était le plus riche négociant de la colonie perdit 200,000 livres, les autres négociants ou propriétaires de maisons à proportion, tels furent la veuve Francheville, les sieurs Berey, Radisson, des Chaillons, Joncaire, Périgny, Gamelin, Guillory et autres.

Cet accident arriva par la méchanceté d'une esclave négresse appartenant à la veuve Francheville qui, par quelque mécontentement de sa maîtresse, mit le feu de propos délibéré dans les greniers de la maison, qui s'enflamma si rapidement par un vent d'ouest, qui soufflait alors, que le feu s'étendit dans tout le quartier et fit appréhender un incendie général. Tous les habitants furent tellement occupés de cette frayeur, que chacun loin d'aller promptement au secours des maisons qui brûlaient ne pensa qu'à sauver sa propre maison et ses effets, même dans les quartiers les plus éloignés. Cependant par les bons ordres qui furent donnés à propos et avec le secours des troupes on préserva le reste de la ville.

La négresse fut arrêtée et son procès instruit. Elle fut condamnée à faire amende honorable, à être pendue, et son corps mort à être jeté au feu, ce qui fut exécuté à Montréal le 21 juin 1734.[1]

Il n'appert pas qu'aucun des documents d'archives de Montréal ait été perdu lors de cet incendie. Seulement il fut brûlé pour près de 5,000 livres d'ordonnances ou monnaies de carte dans la maison de M. de Berey, trésorier payeur à Montréal, de même qu'une partie des papiers constatant la recette et la dépense que l'on eut grande peine à reconstituer.[2]

En 1733, il fut dressé un inventaire des registres, titres et papiers étant à Québec et servant à la régie du bureau du Domaine, alors que le Roi en prit possession, depuis 1719 jusqu'en 1732, par le notaire Pinguet de Vaucour. Une copie de cet inventaire fut envoyée en

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[1] Série C.[11], 9 octobre 1734, vol. 61, lettre de Beauharnois et Hocquart. Une lettre du 6 mai 1734, dans laquelle Hocquart rendait compte de l'incendie, et qui fut envoyée par l'Ile Royale, n'est pas aux archives.

[2] Série C.[11], 14 octobre 1734, vol. 62, et 4 octobre 1737, vol. 67.

France, ainsi qu'on le voit dans une lettre de l'intendant Hocquart du 30 septembre 1733, mais elle n'est point aux archives.

On chargea aussi dans le même temps le procureur-général Verrier de faire le relevé du papier-terrier de la colonie. Ce travail qui dura de 1733 à 1740, et qui comprend sept volumes, est conservé aux archives des colonies en France.

En 1754 un autre incendie considérable éclata à Montréal. Il prit dans la maison des Jésuites, consuma un très grand nombre de maisons, entre autres celles de l'intendant, du trésorier, du commissaire ordonnateur, et une partie des magasins du Roi. On fut assez heureux pour sauver des flammes tous les papiers du trésor et l'argent. Mais les registres du magasin furent brûlés.[1]

Le trésorier d'Auterive, pendant cet incendie, abandonna le soin de sa propre maison pour sauver les papiers d'état de la trésorerie. Le Roi lui accorda pour cette raison 600 livres de pension, et quand il mourut en France au mois de décembre 1783, à la demande du maréchal de Lévis, cette pension fut continuée à sa veuve.[2]

En 1759, voyant que les ennemis s'approchaient de la ville de Québec, pour en faire le siège, Bigot pensa qu'il fallait mettre en sûreté les papiers et registres des magasins et du contrôle, les comptes des trésoriers et les actes du greffe. Il envoya au marquis de Vaudreuil une note, par laquelle il le priait de vouloir bien indiquer le lieu qu'il jugerait le plus sûr dans la colonie pour y déposer ces papiers. Le marquis de Vaudreuil répondit au pied de ce billet, le 25 mai, qu'il convenait de les déposer dans la ville des Trois-Rivières. Bigot les y fit transporter.[3]

Ceci explique pourquoi nos archives ont pu sortir saines et sauves des horreurs du siège de 1759.

La capitulation de Montréal, du 8 septembre 1760, partagea les archives de la colonie entre la France et le Canada.

Voici les principaux articles de cette capitulation qui les concerne:[4]

Art. 7.—Les magasins, l'artillerie, fusils, sabres, munitions de guerre et généralement tout ce qui appartient à S. M. Très Chrétienne, tant dans les villes de Montréal et Trois-Rivières, que dans les ports et postes mentionnés en l'article 3, seront livrés par des inventaires exacts aux commissaires qui sont ou seront préposés pour les recevoir au nom de S. M. Britannique. Il sera remis au marquis de Vaudreuil des expéditions en bonne forme des dits inventaires.

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[1] Mémoire justificatif de Bigot, p. 144. Dans une lettre du 12 novembre 1754, Pichon écrit du fort Beauséjour, à Surlaville, qui est alors à Louisbourg: "Il est arrivé un incendie considérable à Montréal, tous les papiers de la colonie y ont péri." (p. 132).

[2] *Archives des colonies*, série B, 1783.

[3] Mémoire justificatif de Bigot, t. I, p. 215.

[4] Archives du ministère de la guerre, vol. 3574, pièce 113.

Art. 12.—Il sera destiné pour le passage en droiture au premier port de mer de France, du marquis de Vaudreuil, le vaisseau le plus commode qui se trouvera.....et il emportera avec lui ses papiers, sans qu'ils puissent être visités....

—Accordé, excepté les archives qui pourront être nécessaires pour le gouvernement du pays.

Art. 14.—Il sera destiné deux vaisseaux pour le passage en France de M. le chevalier de Lévis, des officiers principaux et état-major des troupes de terre, ingénieurs et officiers d'artillerie, et gens qui sont à leur suite.... Ces officiers pourront emporter tous leurs papiers qui ne seront point visités....

—Accordé, excepté que M. de Vaudreuil et tous les officiers, de quelque rang qu'ils puissent être, nous remettront de bonne foi toutes les cartes et plans du pays.[1]

Art. 15.—Il en sera de même destiné un pour le passage de M. Bigot, intendant, et de sa suite.....; il y embarquera également ses papiers qui ne seront point visités....

—Accordé, avec la même réserve que l'article précédent.

Art. 21.—Le général anglais fera également fournir des vaisseaux pour le passage en France des officiers du conseil supérieur de justice, police, de l'amirauté et les autre officiers....

—Accordé; mais, s'ils ont des papiers qui concernent le gouvernement du pays, ils doivent nous les remettre.

Art. 23.—Il sera permis au munitionnaire des vivres du Roi de demeurer en Canada jusqu'à l'année prochaine, pour être en état de faire face aux dettes qu'il a contractées dans la colonie, relativement à ses fournitures; si néanmoins il préfère de passer en France cette année, il sera obligé de laisser jusqu'à l'année prochaine une personne pour faire ses affaires. Ce particulier conservera et pourra emporter tous ses papiers, sans être visités....

—Accordé.

Art. 25.—....L'agent principal de la Compagnie des Indes conservera tous les papiers de la dite Compagnie, et ils ne pourront être visités.

—Accordé.

Art. 43.—Les papiers du gouvernement resteront sans exception au pouvoir du marquis de Vaudreuil et passeront en France avec lui; ces papiers ne pourront être visités sous quelque prétexte que ce soit.

—Accordé, avec la réserve déjà faite.

Art. 44.—Les papiers de l'intendance, des bureaux du contrôle de la Marine, des trésoriers anciens et nouveaux, des magasins du Roi, du bureau du domaine et des forges de Saint-Maurice, resteront au pouvoir

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[1] Cet article ne fut pas rempli apparemment. En effet, en 1762 (Rapport du 5 juin), le gouverneur Murray se plaint qu'il ne peut dire exactement quelle partie de l'Amérique du Nord les Français appelaient "Canada," aucune carte ou plan n'étant tombé entre les mains des Anglais, et aucun document n'ayant été publié pour démontrer l'étendue des frontières.

de M. Bigot, intendant, et ils seront embarqués pour France dans le vaisseau où il passera; ces papiers ne seront point visités.

—Il en est de même de cet article.

Art. 45.—Les registres et autres papiers du Conseil Supérieur, de la prévôté et amirauté de la même ville, ceux des juridictions royales des Trois-Rivières et de la ville de Montréal, ceux des juridictions seigneuriales de la colonie, les minutes des actes des notaires des villes et des campagnes, et généralement les actes et autres papiers qui peuvent servir à justifier l'état et la fortune des citoyens, resteront dans la colonie, dans les greffes dont ces papiers dépendent.

—Accordé.

L'existence aux Archives du ministère des Colonies d'une douzaine de volumes intitulés *Notariats du Canada*, donne à penser que l'article 45 de la capitulation de Montréal n'a pas été complètement observé, mais il s'agit ici d'actes faits en double, dont un exemplaire est resté au Canada et l'autre a été envoyé en France.

D'une façon générale, le Canada a gardé les registres et autres papiers qui sont énumérés dans l'article 45. Ils forment le fonds le plus ancien des Archives de la province de Québec, à Québec.

Dans les deux capitulations de Louisbourg, en 1745 et en 1758, il ne fut pas question des archives de cette ville; mais nous verrons plus loin ce qu'elles sont devenues.

Nous allons maintenant essayer de suivre les papiers rapportés en France par les différents fonctionnaires. Et, à cette fin, notons l'arrivée en ce pays de chacun des navires qui ramènent, après la capitulation, Vaudreuil, Lévis, Bigot et les autres officiers.[1]

Le 23 novembre 1760, on signale l'arrivée à Morlaix d'un vaisseau anglais venant de Plymouth avec six compagnies de Montréal.

Le 27 novembre, Lévis écrit au ministre, de La Rochelle, pour annoncer son arrivée. Il a traversé la mer sur un vaisseau de 200 tonneaux (vol. 105).

Le 28 novembre, Vaudreuil écrit de Brest au ministre, qu'il lui envoie Villemont avec les dépêches (vol. 105).

Le 6 décembre, il est encore à Brest et s'excuse auprès du ministre de ce que le rhumatisme l'empêche de se rendre immédiatement à la cour. De son côté, l'intendant de Brest annonce à la cour, le 3 décembre, l'arrivée du vaisseau anglais l'*Aréthuse*, avec M. de Vaudreuil, 142 passagers, et les papiers relatifs à la capitulation de Québec et de Montréal.

Le trois octobre, arrivée à La Rochelle du *Ultham*.

Le 12 décembre, arrivée à Morlaix du *Britannia*.

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[1] Nous tirons tous ces renseignements des Archives des Colonies, série B.

Le 19, arrivée à Royan du *Rebecca*. Bigot est arrivé lui aussi, mais il n'en écrit rien à la cour.

Le 19 décembre 1760, le secrétaire de la Marine écrit à M. d'Abaddie à La Rochelle, qu'il a reçu sa lettre dans laquelle il l'informe qu'il a loué de concert avec Bigot trois chambres pour y déposer les papiers venant du Canada. Il approuve le prix du loyer convenu; mais il n'est pas nécessaire d'engager un gardien (vol. 112, p. 151).

Le 30 janvier 1761, le ministre fait mander à M. Mellis, écrivain venant du Canada qui est dans le moment à Bordeaux, d'aller travailler aux comptes de la colonie qui seront mis en ordre à La Rochelle (vol. 113).

Le même jour, il écrit à M. de Rouis que M. de Querdisieu Tremain, commissaire de la Marine, se rendra à La Rochelle pour mettre en ordre et classer les comptes du Canada, de concert avec M. Martel qui avait été commissaire à Montréal (vol. 113).

Le même jour, lettre semblable à M. de Querdisieu Tremain, qui fera rapport tous les quinze jours (vol. 113, p. 12).

Le 16 mai, lettre à M. de Sartines relativement aux papiers que la Commission du Canada requiert (vol. 114, p. 117).

Même jour, circulaire aux intendants et aux commissaires des ports sur le même sujet (vol. 114, p. 119).

Le 8 mai 1761, le ministre écrit à M. Poncet de la Grave que les registres et minutes des amirautés de Louisbourg et de Québec ont été déposés aux archives de La Rochelle, pour être retournés dans les colonies, si l'occasion s'en présente, quand la paix sera rétablie. C'est ce qui a été fait de ces registres en 1745. Ceux qui désireront des copies pourront les avoir à La Rochelle (vol. 113, p. 107).

Le 2 juillet, lettre à M. Imbert, ancien trésorier du Canada, à Nemours, relativement aux comptes de son fils qui était chargé de percevoir l'impôt levé sur les habitants de Montréal au sujet des fortifications de cette ville (vol. 113, p. 140).

Le 22 juillet 1762, le ministre écrit à Hocquart qu'il a reçu le paquet contenant la correspondance entre l'amiral Rodney et le général Monckton qui a été trouvé dans un coffre sur un vaisseau saisi en mer par M. Beugnon (vol. 114, p. 183).

Le 27 février 1763, le ministre écrit au duc de Nivernois, en Angleterre, et lui demande de se procurer les papiers et comptes des dépenses et recettes du Domaine du Roi au Canada pour les années 1755–1757, que M. Imbert, greffier et trésorier général du Canada, avait mis à bord du navire le *Sauvage*, le 29 octobre 1757. Ce vaisseau fut capturé par les Anglais et amené à Cork, en Irlande. Il est informé, dit-il, que ces papiers ont été déposés à l'amirauté de Dublin (vol. 117, p. 64).

Le duc de Nivernois fit comme on lui demandait. Les lords de la justice anglaise reçurent instruction de faire faire des recherches à la Cour d'Amirauté où l'on supposait que ces papiers étaient déposés. Il résulta de l'enquête tenue en Irlande que le capitaine et les officiers du vaisseau capturé avaient jeté à la mer les papiers du gouvernement du Canada avant de se rendre prisonniers. Telle fut la réponse qu'écrivit au comte d'Egremont, le comte de Northumberland, lord lieutenant d'Irlande, le 5 mai 1763.[1]

Le 19 mars 1763, le ministre écrit à M. de Fontanieu qu'il a reçu l'état des déclarations relatives au papier du Canada, du 8 février au 1er mars, se montant à 9,803,893 livres (vol. 115, p. 92).

Le 21 juillet 1764, le ministre écrit qu'il a reçu deux volumes contenant les dépositions des Anglais concernant la monnaie de carte (vol. 120, p. 249).

Le 26 décembre, il écrit à M. de Villehélie que le vaisseau *Le Chevalier de Lévis* est arrivé à La Rochelle, amenant de Québec 65 officiers et habitants. Il enverra à Rochefort les caisses contenant les papiers relatifs au service du Canada que le sieur Landrième a emportés sur ce vaisseau (vol. 120, p. 113).

Le 9 mars 1765, le Roi fait choix du Sr Haran, écrivain de la Marine au port de Rochefort, pour y remplir les fonctions de garde d'archives des différents titres, papiers et renseignements provenant des colonies du Canada, des Iles Royale, de St-Jean et du Mississipi, le tout détaillé dans le titre qui le constitue en cette qualité (série B, vol. 122, p. 27).

Il est resté en dépôt, à La Rochelle, différents papiers provenant du Canada qui doivent faire partie du dépôt des archives que le Roi a jugé à propos de faire rassembler à Rochefort. Ordre est donné à Haran de se transporter à La Rochelle pour retirer tous les papiers rapportés du Canada et les faire conduire à Rochefort pour y être, comme les autres, consignés et gardés dans les Archives des Colonies.

(Lettre du ministre datée de Compiègne, le 23 juillet 1765, p. 72, vol. 122, série B, et vol. 192, série F.)

Le 7 août 1765, le ministre écrit à M. Le Pelletier de Morfontaine qu'il a reçu sa lettre concernant une caisse qui se trouve dans les archives de son intendance et qui d'après son étiquette, contient des certificats de revue et des actes de sépulture de soldats. Il lui donne instruction de constater si cette caisse contient d'autres papiers concernant particulièrement le Canada, de les en retirer et de les envoyer pour être déposés à Rochefort (vol. 122, p. 122).

Le sieur de Meyracq, ci-devant juge de la juridiction et de l'amirauté de Louisbourg, avait rapporté à son retour de cette colonie à La Ro-

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[1] Cf. *Calendar of Home Office Papers*, 882, Ireland, v. 428, No. [1]a to c.

chelle, les papiers de ces tribunaux. Comme ces papiers étaient confondus avec d'autres objets, lors d'un déplacement qui eut lieu dans un temps qui ne permettait pas d'y pouvoir mettre de l'ordre, le duc de Praslin donne ordre à de Meyracq de se rendre de Paris à La Rochelle et à Rochefort pour procéder conjointement avec Haran, dépositaire des papiers provenant des colonies septentrionales, à l'examen et inventaire de ceux de la juridiction de Louisbourg. Haran se chargera de ces papiers au bas de l'inventaire qui sera dressé et dont une copie sera expédiée au ministre. Le Sr de Meyracq devait partir incessamment de Paris pour aller remplir sa mission. Ce voyage à La Rochelle et à Rochefort ainsi que le séjour que de Meyracq était obligé d'y faire, devant lui occasionner des frais qu'il ne doit pas supporter, le ministre lui procure du Roi une gratification extraordinaire de mille livres pour le mettre en état d'y subvenir, et elle lui fut payée à Paris avant son départ.

(Lettre du ministre, datée à Versailles, 24 juin 1766, folio 50, vol. 124).

L'ordre du Roi daté à Versailles, le 24 juin 1766, est joint à cette lettre (folio 50).

Il est ordonné au sieur de Ruis Embito, intendant de la Marine à Rochefort, de faire procéder en sa présence par le Sr Haran, nommé par ordre du Roi dépositaire des papiers rapportés des colonies septentrionales conjointement avec le Sr de Meyracq, ci-devant juge de la juridiction et amirauté de Louisbourg, à l'examen des papiers de la juridiction du dit lieu de Louisbourg que le dit Sr de Meyracq en a rapportés à son retour à La Rochelle et à l'inventaire des dits papiers pour ensuite iceux être remis au dit Sr Haran qui s'en chargera au bas de l'inventaire qui en sera dressé pour rester en sa possession en conformité de l'ordre de Sa Majesté qui l'établit dépositaire. Fait à Versailles, le 24 juin 1766.

Le même jour, le ministre écrit à M. Meyracq, à Paris, qu'il est informé qu'il a apporté de Louisbourg à La Rochelle une caisse pleine de papiers appartenant à la juridiction de l'amirauté de l'île Royale. Ces papiers devront être remis à M. Haran qui a été nommé garde de tous les papiers concernant l'Amérique du Nord. Il ira à Rochefort aider à M. Haran à classer ces papiers (p. 221, vol. 125).

Le 20 janvier 1767, le Roi étant à Versailles nomma M. Prévost, assistant du sieur Haran au dépôt des archives de la Marine à Rochefort (vol. 128, p. 6).

Le 15 janvier 1773, le ministre de la Marine écrit à M. d'Aubenton, intendant, qu'il a reçu une copie de l'inventaire des papiers du Canada qui étaient déposés à La Rochelle et qui ont été ensuite transportés à Rochefort. (Série B, vol. 144, p. 12).

Au mois de juin 1776, un édit royal ordonna l'établissement à Versailles d'un dépôt où seraient versés tous les actes et papiers provenant des colonies, et il fut décidé d'y réunir tout ce que le dépôt de Rochefort contenait déjà. Des ordres furent donnés en conséquence à M. Daubenton, alors intendant à Rochefort.[1] Ce dernier répondit que la masse des papiers accumulés dans ses bureaux était si considérable que leur transport à Paris coûterait très cher. Il ajoutait que la plus grande partie de ces papiers provenait du Canada, de l'Ile Royale et de la Louisiane, et que le gouvernement n'avait aucune raison d'en changer l'endroit de dépôt, d'autant plus que les habitants de ces colonies réfugiés en France, étaient presque tous établis aux environs de Rochefort et qu'ils pouvaient avoir besoin de ces documents à chaque instant. Le ministre se rendit aux arguments de M. Daubenton et les papiers restèrent à Rochefort.[2]

Au mois de décembre 1786, nous savons qu'un incendie éclata à Rochefort, et il est à présumer que beaucoup de papiers coloniaux furent alors détruits, car l'intendant de cette place, M. Charlot, à qui le gouvernement avait demandé des renseignements "concernant l'origine et les motifs" des pensions que l'on payait alors aux Acadiens répondait que l'incendie de 1786 le mettait dans l'impossibilité d'en fournir aucun.[3] C'est en 1790 que cette demande de renseignements était faite. En 1791, un "Dépôt des colonies et des chartes des colonies" était définitivement établi à Versailles. Il est plausible de présumer que c'est en cette même année que les archives du Canada et de l'Ile Royale, déposées jusque-là à Rochefort, furent versées à Versailles. Il s'en faut cependant que tous les papiers concernant ces deux colonies aient pris alors la route de Versailles. Il en reste encore beaucoup parmi les archives de Rochefort. Qu'il suffise de dire pour le moment que les registres de l'état civil de Louisbourg, de même que les papiers judiciaires de cette ville maintenant disparue, que l'on trouve aujourd'hui aux archives des Colonies, proviennent de l'ancien dépôt de Rochefort et qu'ils passèrent par Versailles, en ou vers 1791 jusqu'au jour où ils furent ramenés à Paris en 1837 dans les fourgons qui contenaient les archives de la Marine.

On peut voir dans notre *Rapport sur les Archives de France* publié en 1910, ce que sont devenus les papiers du Canada, que la capitulation de Montréal avait permis de rapporter en France.

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[1] Série B, vol. 158, 10 juillet 1776, p. 287.

[2] Série B, vol. 158, 18 août 1776, p. 340.

[3] Série G., volume 458 (1/122), archives des colonies, 18 septembre 1790. Série F., volume 243, archives du Canada.

II.

Après le départ des autorités françaises de la colonie, les archives notariales furent confiées à un garde-notes, M. Boisseau, et le soin des archives judiciaires et des papiers relatifs aux terres fut partagé entre le greffier du conseil exécutif et le secrétaire de la province. L'on conserve au bureau des archives à Ottawa les inventaires qu'on en dressa de temps à autre.

Le 3 août 1767, le gouverneur Carleton lançait une proclamation dans laquelle il était ordonné à tous ceux qui detenaient des papiers concernant les affaires publiques du temps du gouvernement français, de les délivrer au greffier du conseil.[1]

Chaque fois que l'un des fonctionnaires que nous venons de nommer abandonnait sa charge, c'était de règle que son successeur consignât dans un mémoire la liste des documents qu'il recevait. C'est ainsi que nous avons la liste des papiers laissés en 1765, par Henry Kneller, greffier du conseil, à son successeur James Potts. Nous en possédons une autre de 1778, qui nous énumère les papiers et les registres déposés au bureau du secrétaire de la province.[2] Le gouverneur Haldimand, qui était un grand collectionneur, voulut que tous les fonctionnaires lui rendissent compte des documents dont ils avaient la garde, et nous avons des listes préparés en 1783, par ses ordres, des papiers du bureau du receveur général William Grant, de ceux déposés au greffe de papier-terrier qui existait depuis le mois de juillet 1777, de même que des archives déposées au collège des Jésuites sous la garde de Boisseau. L'on conserve de même les inventaires dressés en 1783, par le greffier du conseil et le secrétaire de la province. Ces relevés sont encore très utiles, car ils aident à retracer une foule de documents aujourd'hui disparus. Dans l'inventaire dressé par le secrétaire en 1783 on trouve qu'il possédait une caisse remplie de vieilles archives trouvées dans les caves du palais de l'Intendant en 1775.

Le 11 avril 1778, M. de Léry proposait au Conseil législatif que tous les registres et papiers du secrétaire de la province fussent mis dans une voûte à l'épreuve du feu, et que les mêmes précautions fussent prises pour les actes que M. Boisseau avait sous sa garde, de même que pour tous les autres documents de la province. C'est lui encore qui proposa que l'évêque donna instruction à tous les curés de déposer chaque année, un double des registres de l'état civil de chaque paroisse, dans la voûte du greffier de Québec (23 avril 1778).

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[1] *State Papers*, Q. 5-1.

[2] D'après un inventaire des papiers déposés chez le secrétaire de la province, dressé le 27 septembre 1788, on voit que le 22 janvier 1768, il fut fait une liste générale des papiers publics appartenant aux différents fonctionnaires sous le gouvernement français.

Le 27 décembre 1787, le gouvernement nomma deux commissions, l'une à Québec et l'autre à Montréal, pour s'enquérir de l'état des anciennes archives françaises, et voir à leur conservation. L'enquête devait être la plus minutieuse.[1] Tous les greffiers des bureaux reçurent instructions de préparer des listes descriptives des documents et registres, qu'ils avaient en leur possession, afin d'aider le travail des commissaires-enquêteurs.[2] Le secrétaire de la province, le greffier du conseil exécutif, le greffier de la cour des plaidoyers communs, celui de la cour des prérogatives et de vice-amirauté, celui du papier-terrier dressèrent chacun un inventaire des documents dont ils avaient la garde,[3] et la commission de Québec se mit à l'ouvrage, examinant avec soin, à l'aide de ces listes, volume par volume, registre par registre, pièce par pièce, toutes les archives déposées dans la capitale, soit dans les voûtes de l'ancien évêché, soit dans celles du collège des Jésuites. Elle siégea pendant vingt-sept séances, du 20 juillet 1789 au 16 mars 1790. Au mois de décembre 1789, le gouverneur Dorchester, voulant hâter le travail, adjoignit le juge Panet et les greffiers des tribunaux aux commissaires, qui soumirent enfin leur rapport le 17 mars 1790. C'est à l'aide de ce rapport que l'on peut relever la liste exacte des documents français qui étaient restés dans le pays. Le secrétaire Pownall avait en sa possession, dans l'ancien évêché de Québec; 10 volumes des registres des insinuations du Conseil Supérieur (1679–1758); 6 volumes de registres contenant les édits, arrêts, déclarations et provisions du Roi (1663–1743); 5 volumes des registres de l'Intendance; 2 volumes de cahiers de l'Intendance; 1 volume de foi et hommage (1723–1754); 3 volumes de papiers-terriers (aveux et dénombrements); 2 volumes de cahier des emplacements et concessions en roture; un registre des titres des emplacements de Québec; un cahier contenant les impositions pour les casernes; 44 volumes des ordonnances des Intendants (1705–1759); un volume contenant le règlement du district des paroisses en 1722; les papiers de la cour d'Amirauté, très endommagés, avec un inventaire fait par Guillimin, de 1731 à 1759.

Dans la voûte du collège des Jésuites, sous la garde du greffier Panet, les commissaires trouvèrent les jugements du Conseil Supérieur, les papiers de la Prévôté, arrêts et insinuations, ceux de la juridiction de Trois-Rivières (1667–1759), les registres, tous les répertoires et minutes des notaires.

Dès le 23 juillet 1788, le greffier de la cour des plaidoyers communs

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[1] Instructions du 19 juin 1788.

[2] Ordre du 23 juillet 1788 et *Gazette Officielle* du 31 juillet, 7 et 14 août 1788.

[3] Ces listes sont conservées aux archives du Canada, et elles ont été publiées dans le rapport de 1904, sous le titre: "Les archives en 1787," pp. 81 à 189, Appendice D. Elles sont utiles à consulter. Elles portent la date du 27 septembre 1788.

à Montréal, LePailleur, avait fait rapport des archives déposées dans son bureau. A part les actes des notaires, il y avait là deux registres des édits et ordonnances, les documents relatifs aux cours criminelles et civiles, quelques permis accordés aux voyageurs d'en haut, des dossiers provenant des cours tenues par les capitaines de milice, sous les administrations de Gage et de Burton, et une masse de papiers confus, qu'il était impossible de classer. Tout cela reposait dans une voûte crevassée, sans protection contre le feu, et si petite qu'on était obligé de garder beaucoup de pièces dans le bureau du greffier.

La commission d'enquête, nommée pour Montréal en 1787, ne commença à siéger, cependant, qu'au mois de novembre 1790, sous la présidence de Picoté de Bellestre. L'on avait fait avertir dans les journaux, à plusieurs reprises, tous les greffiers d'avoir à déposer leurs registres à Montréal, mais personne n'avait bougé. C'est alors (17 avril 1790), que le gouvernement fit passer une ordonnance (30 George III, chapitre VIII), que l'on trouve imprimée dans la collection des *Ordonnances faites et passées par le gouverneur et le Conseil Législatif de la province de Québec, actuellement en force dans la province du Bas-Canada*, qui parut à Québec en 1795, chez l'imprimeur Guillaume Vondenvelden. Nous donnons ici le texte français, d'après la traduction officielle de Cugnet:

"Y ayant plusieurs cents [volumes de papiers, manuscrits et régistres de la plus grande conséquence à tels des habitants de cette province qui tiennent des propriétés en vertu de titres obtenus avant la conquête; lesquels doivent être déposés de manière à en rendre l'accès facile et peu dispendieux; et étant expédient de les mettre dans un état de sûreté et de conservation, et de prendre les moyens de les faire connaître et de les rendre utiles; et les anciennes archives du district de Montréal exigeant une attention prompte pour les garantir des dangers de la ruine; et l'institution du nouveau district de Trois Rivières séparé du district de Québec et de Montréal, rendant nécessaire de rendre au dit district des Trois Rivières, tels des archives publiques qui peuvent être trouvées autre part, et qui concernent et intéressent plus immédiatement les habitants du district de Trois Rivières; qu'il soit à ces causes statué par son Excellence le Gouverneur et le Conseil Législatif; et il est par ces présentes statué par la dite autorité, qu'il sera légal pour le Gouverneur ou Commandant en chef pour lors, de l'avis du Conseil, de faires des ordres concernant l'arrangement, le transport, la rédaction, l'impression, la publication, la distribution, la conservation et la disposition des dits papiers, manuscrits et régistres, ou d'aucune partie d'iceux; et toute personne ayant en sa possession aucun des dits papiers, manuscrits et régistres anciennement appartenant à aucun office ou dépôt public avant la conquête, qui rendra tels papiers, manuscrits et régistres, comme il pourra être requis par tel ordre, sera aussi bien déchargé en lois comme s'il les eut livrés en vertu d'aucun acte ou ordonnance fait et fourni spécialement à tel effet; et il ne sera permis à qui que ce soit, qui aura entre ses mains tels ou aucuns papiers publics, manuscrits ou régistres, de les garder ou retenir en contravention à tel ordre, comme si les dits papiers ussent été retenus en contra-

vention d'aucun Acte ou ordonnance de la législation, qui ordonnerait expressément la reddition des dits papiers à l'office convenable, dont ils peuvent dépendre."

A la suite de cette ordonnance, le Conseil se réunit (30 avril 1790), et décida, vu que la commission de Montréal n'avançait à rien, et qu'il fallait protéger les archives de ce district de la destruction dont elles étaient menacées, de les faire transporter à Québec où l'on pourrait procéder à leur classement. Devant cet ultimatum, la commission de Montréal se décida à agir, et, le 10 novembre 1790, elle adressait enfin au gouverneur un rapport complet sur les archives de ce district lui assurant en même temps que ces dernières, mises en ordre, étaient désormais à l'abri du feu. Ce rapport qui nous a été conservé, nous donne un état complet et détaillé des anciennes archives de Montréal depuis 1666.[1]

Depuis la conquête du pays, la plupart des anciennes archives du gouvernement de Trois-Rivières étaient demeurées déposées à Québec au collège des Jésuites. Dans l'été de 1790 (10 juillet) presqu'aussitôt après la formation du nouveau district judiciaire de Trois-Rivières, le conseil ordonna le transport en cette ville, des archives dont elle avait été dépossédées. Tous les registres de la prévôté de Trois-Rivières, qui remontent à 1658, les papiers judiciaires de toute nature, nominations de tuteurs, assemblées de parents, ventes par licitations, furent donc remis au nouveau greffier Charles Thomas, le 7 mars 1791. En vain, le secrétaire et registraire de la province, George Pownall, représenta au Conseil, qu'en vertu des prérogatives de sa charge, il avait la garde de toutes les archives, et que le greffier de Trois-Rivières ne pouvait tout au plus être que son délégué.[2]

Déjà, depuis 1782, par ordre du gouverneur Haldimand, les études des notaires Ameau, Petit, LeProust, Dielle, Rouillard, Trottain, Chevalier, Augé, Rigaud, Pressé, Duclos, Caron, Poulin, Veron de Grandmenil, Pottier, Lafosse, Pollet et Normandin, déposées à Québec, avaient été remises au notaire Badeau, de Trois-Rivières. Celui-ci en fit rapport au gouverneur le 12 janvier 1788. On voit par un autre rapport du 21 août 1788, qu'il avait aussi en dépôt dans sa maison les registres des insinuations, des clôtures d'inventaire, et de l'état civil des paroisses. C'est pour cette raison que le 27 janvier 1790, le Conseil avait ordonné aux commissaires-enquêteurs de se transporter à Trois-Rivières, afin d'y poursuivre leurs recherches.

Le 3 février 1791, le conseil ordonna, vu le mauvais état de la voûte du collège des Jésuites, que toutes les anciennes archives françaises,

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[1] Cf. Rapport sur les archives de 1904.

[2] Délibérations du Conseil, 17 juillet 1790.

qui s'y trouvaient seraient transportées dans les voûtes de l'évêché, ce qui fut exécuté immédiatement. Le secrétaire de la province en reçut la garde temporaire, en attendant que l'on put aviser autrement.

D'après l'inventaire qui fut fait en 1783, par le greffier Boisseau, il appert que les archives n'eurent pas trop à souffrir du siège de Québec. C'est tout au plus s'il signale comme ayant brûlées quelques minutes des études d'Audouart et de Dulaurent, et quelques registres de la prévôté. Les minutes du notaire Pichet, notaire sur l'île d'Orléans, furent cependant complètement perdues.

La commission d'enquête nommée en 1787 fit un choix des documents qu'elle avait examinés, et il en fut publié une plaquette en 1791, chez l'imprimeur Samuel Neilson sous le titre: *Anciennes archives françaises ou extraits des minutes du Conseil, qui concernent les registres du Canada, lorsqu'il était sous le gouvernement de la France,* avec texte anglais en regard. En 1783, on avait de même publié les *Capitulations et extraits des traités concernant le Canada.* Cette dernière plaquette fut réimprimée en 1800. On possède aussi une liste des documents sous la garde du secrétaire de la province, datée du 10 août 1791, et une autre du 1er mai 1792, donnant la liste des papiers d'Etat reçus en 1790, 1791, et 1792.

Une liste des officiers civils et des divers bureaux du gouvernement de la province du Bas-Canada, préparée le 7 janvier 1792, d'après l'ordre du lieutenant-gouverneur Alured Clarke,[1] nous indique avec exactitude comment les anciennes archives allaient se diviser sous le nouveau système d'administration et comment il allait s'en créer de nouvelles. Dès 1789, le comité exécutif avait formé dans son sein une sous-commission, chargée spécialement de l'administration et de la vente des terres publiques, et celle-ci recommanda aussitôt que le greffier plaça en sûreté ses archives. Il y a là un rapport très élaboré du conseil, daté le 4 décembre 1789, où il est dit, comment il faut assurer la conservation de tous les titres de propriété. En 1790, le gouverneur Dorchester s'occupe de recueillir tous les plans et cartes qui peuvent intéresser la province, et la liste qui en fut dressée alors par l'arpenteur général Samuel Holland, (12 novembre 1790), est encore très intéressante à consulter. On s'occupe de même à rassembler chez le greffier des terriers tous les registres concernant les propriétés seigneuriales (28 janvier 1791).[2] En 1794, c'est le nouveau grand-voyer Gabriel-Elzéar Taschereau, qui demande à rassembler dans son bureau tous les anciens procès-verbaux de la voirie afin qu'il soit en mesure de mieux accomplir ses devoirs, et il nous révèle en même temps le fait que beaucoup de ces procès-verbaux

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[1] Cf. Livre A des délibérations du Conseil exécutif, pp. 76 à 84.

[2] Voir aussi lettre de Philippe de Rocheblave, nouveau greffier du papier-terrier, qui demande un endroit où mettre ses archives en sûreté (6 juin 1794).

anciens sont encore en la possession des familles Cugnet, de Léry, Magnan et Renaud, dont les chefs ont occupé cette charge depuis la conquête.

Le 9 décembre 1795, la Chambre d'Assemblée étudie l'état des chambres d'audience, des prisons et bureaux publics, afin de voir à la conservation des archives dans les districts de la province. L'année suivante, les citoyens de Montréal demandent la construction d'un édifice pour mettre les archives en sûreté (10 mars 1796). Ce n'est cependant qu'en 1799, que fut passée une loi pour ériger des chambres d'audience à Montréal et à Québec.

La requête présentée à la Chambre d'Assemblée, par les citoyens de Montréal en 1796, vaut la peine d'être publiée, car elle démontre l'intérêt que l'on prenait alors à la conservation des archives.[1]

"Ils prennent la liberté de soumettre à la Chambre leurs représentations sur un objet important à eux mêmes et à tous les habitants du District de Montréal. Que l'etat insuffisant de l'endroit, approprié pour tenir les Cours de Justice dans cette ville, en même temps qu'il est au dessous de la décence et de la dignité convenable à l'administration des Loix, met en danger la santé des personnes dont le devoir ou les affaires requièrent indispensablement la présence en ce lieu, qui n'est d'ailleurs tenû que sous un titre absolument précaire et incertain. Que si ces considérations seules n'étoient pas assez fondées pour faire la matière d'une application à la Chambre, il en est une de la consequence la plus sérieuse, et qui mérite l'attention immédiate de la Législature. Que toutes les minutes des Notaires décédés dans ce District, les Procès Verbaux d'Arpenteurs et les Regîtres de Baptêmes, Mariages et Sépultures des Paroisses, sont et doivent être déposés suivant la loi dans la Cour du Banc du Roi. Que si on réfléchit que des papiers si essentiels à la fortune et à l'état des particuliers, sont actuellement entassés dans un endroit infiniment trop petit pour les contenir, dont la voûte est prête d'écrouler, et incapable, de les garantir du feu ou autres accidents, qu'ils sont même actuellement dans un état de perdition par l'humidité du lieu; on sentira la nécessité urgente d'y pourvoir au plutôt, pour éviter la ruine des sujets de Sa Majesté. Qu'il y a d'autres papiers, tels que les Records et Régîtres des Cours qui doivent être mis et tenûs en lieu de sûreté, et devroient être placés à la proximité du lieu où se rend la justice, ce qui n'est pas le cas actuellement; les offices qui contiennent ces papiers étant séparés et éloignés de la salle où se tiennent les Cours, et dans un endroit où ils sont tout-à-fait en danger. Qu'il est en conséquence nécessaire d'ériger dans cette ville, un bâtiment convenable, qui repondra aux objets désirés. Que les soussignés ne prendront pas sur eux de suggérer les moyens qui sont en nombre, de prélever la somme nécessaire pour la construction d'un tel bâtiment; mais qu'ils ne craignent pas d'assurer à la Chambre, que le District et particulièrement la Ville de Montréal, contribueront avec satisfaction, à fournir la somme qui sera jugée suffisante, de la manière qui sera

[1] Nous la reproduisons du *Journal de la Chambre d'Assemblée du Bas-Canada*, pour 1796, p. 204.

prescrite par la Législature. Que les soussignés supplient, en conséquence, l'interférence et l'aide de la Chambre, et qu'elle voudra bien prendre leur exposé en sa considération immédiate, et s'occuper des moyens de redresser les griefs qu'il contient."

Le 14 décembre 1795, Joseph-François Perrault, l'un des greffiers de la Cour du Banc du Roi, pour le district de Québec, représenta au conseil exécutif, que dès l'année 1787, les archives furent tirées "de la poussière où elles étaient ensevelies et distribuées avec autant d'ordre, que le chaos dont on les tirait put alors le permettre, mais qu'il y avait quelque chose à faire pour mettre la dernière main à la conservation de ces précieux dépôts, sur lesquels reposait le sort de maintes familles," et il suggérait ce qui suit:

"1e. Jusqu'à ce que les archives soient remises dans un même lieu "que les Greffiers de la Cour du Banc du Roi de ce District ayent des "doubles clefs pour aller et venir à l'appartement à l'Eveché où une "partie des archives sont déposées afin qu'ils puissent, sans delay, "procurer aux individus les papiers dont ils ont besoin.

"2e. De faire faire et poser à l'appartement qui renferme les Archives "aux Jesuites des chassis neufs afin de prevenir l'humidité que la pluie "et la neige, dont ils ne peuvent garantir, occasionnent dans cet endroit, "et faire mettre à ces ouvertures des barres et des contrevents de fer "pour preserver de la spoliation et du feu ce qu'il contient.

"3e. De faire mettre aux chassis des appartements où sont depo-"sées les archives tant aux Jesuites qu'à l'Eveché des éventoirs pour "changer l'air humide et épais qu'ils contiennent et qui endommage "beaucoup les papiers.

"4e. De faire faire des bœtes de bois de differentes grandeurs pour "y renfermer hermétiquement et séparément les études de chaque "notaire deposées tant aux Jesuites qu'à l'Eveché, afin de les garantir "des souris et des insectes qui les rongent.

"5e. D'autoriser le Suppliant à prendre quelque personne de con-"fiance (à laquelle il seroit accordé un salaire journalier) pour diviser "plusieurs anciennes études confondues ensemble, les arranger con-"formement à leurs dates et à leurs auteurs, ainsi que celles qui sont un "peu plus distinctes, distinguer chaque année de chaque notarial pour "les mettre ainsi soit dans un carton soit dans une petite bœte de bois "mince avant de les renfermer dans les grandes bœtes, sur lesquelles "devroient être inscrits le nom et le domicile du notaire dont elles "contiennent l'étude commençant en telle année et finissant dans telle "autre, avec un repertoire alphabetique pour chaque étude.

"Telles sont les choses que le Suppliant croit indispensablement "necessaire à la conservation et à la plus grande utilité des archives de "ce District et pense qu'il est de son devoir de representer et soumettre "humblement à la consideration de votre Excellence pour en être or-"donné ce que dans sa sagesse elle jugera le plus convenable et le Sup-"pliant ne cessera de prier."[1]

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[1] State Book B, p. 228.

A la réquisition du Conseil, les juges Thomas Dunn et P. A. de Bonne, accompagnés du colonel Mann, ingénieur commandant, se transportèrent au collège des Jésuites où ils trouvèrent que les archives y étaient déposées dans un endroit humide, mal protégées contre le feu, et dans un très mauvais état. Ils recommandèrent donc que ces archives fussent de nouveau transportées dans les voûtes de l'évêché, où il y avait suffisamment d'espace et d'air et qu'on les protégeât contre les ravages des rats. Le 26 janvier suivant, un comité spécial du Conseil faisait un nouveau rapport au gouverneur comme suit:

"En obéissance à l'ordre de reference de votre Seigneurie du 2e "de ce mois, le Comité après avoir pris en consideration la ditte petition, "ainsi que le rapport annexé, a eu recours aux procedés des differents "Comités du 27 Decembre 1787 et 23 Juillet 1791 concernant les an-"ciennes archives françoise, le Comité s'est transporté ensuite au College "des Jesuites et à l'Eveché pour examiner les archives, ainsi que les "appartemens où elles sont logés et ayant trouvé les choses telles qu'il "a été representé, est d'opinion que pour prevenir de plus grands incon-"veniens, il seroit suffisant d'adopter pour le present les moyens pro-"posé par le rapport de Messieurs les juges à cette occasion; en con-"sequence le Comité prend la liberté de les recommander et demande "humblement la permission d'y referer votre Excellence.

"A l'egard de l'ordre et arrangement qu'exige une partie de ces "Archives pour faciliter les recherches que le gouvernement et le public "peuvent avoir occasion d'y faire de tems en tems, le Comité est d'avis, "que comme il y a beaucoup de melange et de confusion dans un grand "nombre de ces papiers, particulièrement dans un amas considerable "qui est deposé dans la voute de l'Eveché, dans laquelle il parait y "avoir quelques minutes de notaires, il seroit necessaire d'employer à "cet ouvrage une personne de capacité en presence, et avec l'aide d'un "des greffiers des Cours du Banc du Roy: le Comité suggere qu'un "notaire seroit la personne la plus propre pour cet objet et croit que "cinq schelings seroit une compensation suffisante pour 5 heures de "travail par jour, et que le mois de Mai prochain seroit le tems conve-"nable pour commencer. Le tout néanmoins humblement soumis à la "profonde sagesse de votre Excellence.

"Par ordre du Comité.

"F. Baby, Président."

Le 2 avril, le Conseil donnait l'ordre de transporter les vieilles archives françaises, du collège des Jésuites où elles étaient, dans les voûtes de l'évêché, sous la garde de Perrault, et le procureur-général Sewell reçut instruction d'employer des personnes compétentes pour les mettre en ordre, et en faire un inventaire complet, afin que le public put être mis à même de les consulter facilement.[1] Le transport eut lieu immédiatement, mais comme au bout d'un an écoulé personne ne s'était en-

[1] State Book B, p. 271.

core occupé de leur classement, Perrault prit sur lui de le faire, et le 16 décembre 1799, il présentait rapport de son travail au Conseil et filait une réclamation en indemnité de 561 louis. Il avait mis en ordre, année par année, 2,010 liasses de minutes de notaires et de procès-verbaux d'arpenteurs, classifié et restauré les registres et papiers du Conseil militaire (1760–1765); ceux des justices seigneuriales de Notre-Dame des Anges, et de la rivière du Sud; ceux du Conseil Supérieur (1666–1760), et ceux de la Prévôté, les dossiers d'assemblées de parents (1687–1760); les registres des baptêmes, mariages et sépultures; les concessions de fiefs; les clôtures d'inventaires et les insinuations des donations, (1677–1698); les papiers de Guillimin et une caisse contenant ceux de Taché, et une masse d'autres documents antérieurs à 1759. Ce travail fait avec beaucoup de soin était accompagné d'un inventaire général, que nous possédons encore au bureau des archives. Perrault fit, en outre, rentrer au greffe les minutes des notaires Jean-Claude Panet, Imbert, Lanouillier, que les familles de ces derniers avaient gardé en leur possession, et proposa de verser à Trois-Rivières les minutes de ce district qui se trouvaient encore à Québec. Il recommanda aussi que les registres de l'intendance, alors sous la garde du greffier Pownall, fussent versés à l'évêché, de même que tous les papiers des justices seigneuriales qui étaient encore entre les mains des particuliers.[1]

Le Conseil hésita longtemps, avant de payer la réclamation de Perrault qu'il trouvait trop élevée, finalement après avoir entendu ce dernier, et le procureur-général Sewell, qui déclara n'avoir été aucunement consulté dans cette affaire, il fut décidé qu'une somme de 150 livres serait suffisante pour indemniser Perrault.[2] Ce n'était pas trop payer un travail de si grande importance et dont on sent encore, même aujourd'hui, toute l'utilité.

C'est sans doute, lors de ce travail de restauration, que Perrault recueillit les notes qui lui permirent de publier en 1824, les extraits des précédents tirés des registres de la prévôté, puis les extraits des précédents tirés des registres du Conseil Supérieur, deux opuscules fort recherchés aujourd'hui.

En 1802, lors de la démission de George Pownall comme greffier du Conseil, il fut dressé un nouvel inventaire de toutes les archives, tant françaises qu'anglaises, qu'il avait sous sa garde, et cet inventaire est maintenant au bureau des archives du Canada.

La même année, le Conseil exécutif s'occupa de réformer la tenue de ses archives, au sujet de l'administration et de la vente des terres, et

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[1] Rapport du 21 janvier 1800, State Book C, p. 43.
[2] Délibérations du Conseil, 10 septembre 1800.

il faut lire le très curieux mémoire qu'écrivit à ce propos le greffier Ryland.[1]

Le 5 mars 1801, la Chambre d'Assemblée demanda que les édits, arrêts et déclarations des rois de France, les ordonnances des intendants, les règlements des intendants et les commissions des principaux fonctionnaires du régime français,[2] qui pouvaient avoir quelque utilité publique, fussent imprimés. Ordre fut donné en conséquence de faire un extrait des pièces les plus importantes, pour les donner à l'imprimerie,[3] et en 1803–1806 parurent chez Desbarats, les deux volumes intitulés: *Edits, ordonnances royaux, déclarations et arrêts du Conseil de l'Etat du Roy* (1548–1758) *concernant le Canada. Ordonnances des intendants et arrêts du Conseil Supérieur de Québec* (1667–1756).[4]

En 1803, parut encore des *Extraits des titres des anciennes concessions de terre en fiefs, et seigneuries faites avant, et depuis la conquête*, compilés par Wm. Vondelvenden et Louis Charland.

C'est ainsi que le gouvernement, et même de simples particuliers, s'occupaient dès le commencement du siècle dernier de la publication de nos anciennes archives.

M. Pierre-Edouard Desbarats qui imprima les *Edits et Ordonnances*, de 1803–1806, était en même temps employé au bureau du registraire. C'est lui qui avait choisi et compilé, sous la direction de l'orateur Panet et du procureur-général, les matériaux nécessaires à cet ouvrage. Il voulut donc être payé à la fois de son travail de compilation et de celui de l'impression, et en 1803, il réclama 1,080 louis de rémunération pour le premier volume qui venait de paraître, mais le Conseil décida de ne lui accorder que cent livres pour ses travaux supplémentaires, à part ses frais d'impression qui lui furent payés en entier.[5]

De son côté, le greffier Pownall, indépendamment de ses recherches, avait dû faire préparer pour ce travail imprimé 911 pages de copies de documents, soit 140,000 mots. La publication de ces manuscrits dont il avait le privilège de donner des extraits pour lesquels il se faisait payer des émoluments, lui enlevait en outre un revenu assez considérable. Il demanda en conséquence rémunération au gouvernement.[6] Mais nous ne savons ce qu'il résulta de cette demande.

En 1823, M. Bremer prépara une table analytique des délibérations du Conseil, depuis l'établissement du gouvernement civil en 1764, et il continua plus tard ce travail, à deux reprises différentes, jusqu'en 1838.[7]

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[1] 24 avril 1802.

[2] *Journal de la Chambre d'Assemblée pour* 1801, p. 229.

[3] 16 et 18 février 1802, lettres de H. W. Ryland à Sir G. Pownall.

[4] Il y en a eu une deuxième édition augmentée et corrigée en 1854.

[5] State Book D, p. 291, et p. 371, 14 janvier 1804, 30 mai et 24 octobre 1804.

[6] Lettre du 21 avril 1802.

[7] State Book, J, p. 427 (2 mai 1823); State Book K, pp. 9, 98 et 112; State Book M, p. 431 (1838) et State Book N, p. 72.

En 1830, le juge Vallières de Saint-Réal demanda que les actes passés par le notaire Séverin Ameau, et tous les autres documents, concernant le district de Trois-Rivières qui se trouvaient encore à Québec, fussent versés à Trois-Rivières, ce qui fut accordé par le Conseil.[1]

III.

Jusque vers 1824, l'on ne s'était occupé des archives qu'au point de vue de l'utilité qu'elles pouvaient offrir dans la pratique courante des affaires, soit pour en tirer des précédents au point de vue légal devant les tribunaux, soit pour assurer les titres de propriété. La culture des lettres et de l'histoire n'était encore le partage que d'un petit nombre de privilégiés et d'amateurs. C'est à peine si, de temps à autre, il se publiait quelques livres, et encore le plus souvent on cherchait plutôt à amuser qu'à instruire. A part quelques ouvrages de droit et des livres de classe, la bibliothèque canadienne comptait peu de productions sur ses rayons. On ne peut pas appeler de la littérature ou de l'histoire, des opuscules comme le *Journal du naufrage de M. de Saint-Luc de la Corne, dans le navire l'Auguste en* 1761, *avec le détail des circonstances de son voyage,* qui parut en 1778, ni le *Voyage du récollet Crespel en Canada, et son naufrage sur l'île d'Anticosti* en 1736, qui fut réédité à Québec en 1808, ni la *Vie de la Sœur Bourgeois,* du P. Ransonnet, que l'on reproduisit en 1818.

En 1815, M. William Smith, qui était greffier du Conseil législatif, fit imprimer une *Histoire du Canada, depuis sa découverte jusqu'à l'année* 1791, mais des circonstances inévitables en empêchèrent la publication jusqu'en 1826.[2] L'apparition de cet ouvrage fit renaître le goût des études historiques dans notre pays. Aussitôt qu'il fut publié, on chercha à le critiquer. En 1827, l'abbé Maguire faisait imprimer ses *Observations sur l'histoire du Canada* de Smith.

En 1824, Lord Dalhousie fonda la *Société littéraire et historique de Québec.* Le but de cette société était de poursuivre des recherches sur l'histoire primitive du Canada, de recueillir et publier les anciens manuscrits.[3] Aidée par le noble lord qui lui donna pendant son séjour au Canada, (1824–1828), une subvention annuelle de cent livres sur sa bourse privée, patronnisée par lord Kempt et lord Aylmer,

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[1] State Book T, p. 75 (2 octobre 1830).

[2] Voir *Gazette de Québec,* du 20 juillet 1826. Nous ignorons les causes qui empêchèrent que ce livre fut distribué plus tôt au public.

[3] Rapport du juge en chef Sewell, président en 1831, p. 6. Le Dr. W.-J. Anderson, président de la Société, a publié dans les mémoires de cette Société, session de 1871–72, une étude sur les Archives du Canada, pp. 118–132, qui nous fait connaître tout ce que cette Société a fait pour les archives canadiennes, de 1824 à 1872. Voir aussi les rapports du président de 1831, 1833, 1837, 1839, 1843, 1844, 1845.

qui la fit dépositaire d'un grand nombre de documents dans l'intérêt public, cette société a rendu de grands services à la science dans notre pays.[1]

A la requête de la *Société littéraire et historique* de Québec, le 25 février 1832, la législature de Québec adoptait un acte pour approprier une certaine somme d'argent, afin d'obtenir des documents historiques concernant les premiers temps du Canada (2 Guillaume IV, ch. 48). "Vu qu'il est expédient, disait cet acte, de se procurer autant de documents historiques qu'il est possible de le faire actuellement, relativement aux premiers temps du Canada, le gouverneur est autorisé à avancer trois cents louis à la *Société littéraire et historique de Québec*, pour la mettre en état d'obtenir et de publier des documents historiques concernant les premiers temps du pays."

Celle-ci constitua aussitôt un comité spécial et un "Historical document Fund," auquel vint s'ajouter une nouvelle subvention en 1833. Mais l'on ne put rien faire pendant l'année 1832, où éclata le choléra, qui paralysa tous les mouvements.[2]

En 1836, l'abbé John Holmes, du séminaire de Québec, ayant été envoyé en Europe par le gouvernement pour y étudier l'organisation des écoles normales, profita de son voyage pour poursuivre des recherches à Londres et à Paris dans l'intérêt de la Société. Cette dernière avait déjà employé un agent à Paris en 1835, à qui les autorités ne voulurent rien communiquer,[3] malgré qu'il fut recommandé par l'ambassadeur d'Angleterre. Les démarches de l'abbé Holmes, pour pénétrer aux archives de la marine, furent de même sans résultat. On lui fit réponse que ce qu'il cherchait avait brûlé pendant la Révolution.[4] Il put cependant avoir accès à la section des manuscrits de la bibliothèque Nationale, et en 1837, il envoyait une collection de mémoires relatifs à l'histoire du Canada.[5] La Société fit aussitôt imprimer en 1838, les *Mémoires sur le Canada*, depuis 1749 à 1760, en trois parties, avec cartes et plans.[6] Deux ans auparavant, en 1836, avait paru à Montréal, un mémoire sur le siège de Québec, copié d'un manuscrit que M. D.-B. Viger avait rapporté de Londres en 1834. De 1833 à 1838, parurent les cinq parties de l'abrégé de l'Histoire du Canada, de J.-F. Perrault. En 1837, Bibaud avait publié son *Histoire du Canada, sous la domination*

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[1] En 1809, avait été fondée la *Société Littéraire de Québec* qui portait la belle devise, *Floreamus in nemoribus*, puis vint en 1843 la *Société Canadienne d'Etudes Littéraires et Scientifiques*, fondée par Fournier, Taché, Aubin et Plamondon, avec la devise "A l'avenir de la patrie."

[2] Rapport du président, 1832, p. 2; rapport de 1837, p. 4.

[3] Harrisse, *Notes sur la bibliographie de la Nouvelle-France*, introduction, p. XVI.

[4] Rapport du président Wilkin, 11 janvier 1837.

[5] Rapport du président, 1838 et 1839.

[6] Il y a eu une réédition de ces mémoires en 1876.

française, et Faribault, son *Catalogue d'ouvrages sur l'histoire de l'Amérique.*

En 1840, la *Société littéraire et historique* publie cinq des manuscrits transmis par l'abbé Holmes en 1838.

1.—*Histoire du Canada*, par l'abbé de Belmont, d'après un manuscrit à la bibliothèque du Roi à Paris, 36 pages.

2.—*Relation de ce qui s'est passé au Siège de Québec, et de la prise du Canada, par une religieuse de l'Hopital Général de Québec, adressée à une communauté de son ordre en France*, 21 pages. D'après un passage du manuscrit, il est évident qu'il dut être écrit en 1765. L'original de ce manuscrit, d'après lequel la relation fut imprimée, appartient maintenant au séminaire de Québec. On le dit d'après un manuscrit récemment obtenu de France, mais on n'indique pas autrement la provenance.

3.—*Jugement impartial sur les opérations militaires de la campagne en Canada, en* 1759, d'après un manuscrit récemment obtenu de France, 7 pages. L'original de ce manuscrit appartient maintenant au séminaire de Québec. On ignore la provenance et le nom de l'auteur.

4.—*Réflections sommaires sur le commerce qui s'est fait en Canada*, d'après un manuscrit à la bibliothèque du Roi à Paris, sans date ni nom d'auteur, mais écrit après la conquête, 7 pages.

5.—*Histoire de l'eau de vie en Canada*, d'après un manuscrit récemment obtenu de France, 24 pages. Sans date ni nom d'auteur. Date présumée 1705. Original de ce manuscrit, maintenant en la possession du séminaire de Québec.

En 1838, Lord Durham, sur le point de laisser l'Europe pour le Canada, s'était procuré au bureau des archives de la marine à Paris, quelques manuscrits relatifs au pays qu'il allait gouverner. A son arrivée à Québec, il les présenta à la Société littéraire, qui les fit publier en 1840, en même temps que les documents Holmes. C'étaient:

1.—Un mémoire sur l'état présent du Canada en 1667, attribué à Talon.

2.—Un mémoire, sans nom d'auteur ni date, mais attribué à l'intendant Beauharnois, vers 1736.

3.—Considération sur l'état présent du Canada, sans nom d'auteur, mais daté de 1758.

Il y avait encore en 1843, une balance de 300 louis au fonds historique de la Société littéraire sur les octrois que le gouvernement lui avait votés. Il fut décidé de consacrer une partie de ce montant à publier les Voyages de Cartier, dont les rares éditions de 1545 et 1595, étaient depuis longtemps épuisées. On ne connaissait à la vérité au Canada, que ce que Lescarbot dit des voyages de ce célèbre navigateur. L'abbé Holmes avait trouvé à la bibliothèque Nationale de Paris, trois exemplaires manuscrits du deuxième voyage de Cartier. Il fit prendre

une copie par le Dr. McLaughlin de l'exemplaire que l'on croyait alors être l'original, et c'est cette copie que la Société fit imprimer en 1843.

Cette réimpression du deuxième voyage de Cartier contient la célèbre épître dédicatoire qu'il adressa à François 1er, et que l'on croit avoir été composée par Belleforest, historiographe du temps, de même que le premier et le troisième voyage, ce dernier traduit de la collection Hakluyt. On y a ajouté le *Routier de Jean Alphonse, de Xaintonge,* premier pilote de Roberval, le voyage de ce dernier en 1542, une lettre de Jacques Noël, petit neveu de Cartier, à Jean Groote, étudiant à Paris, le tout tiré de Hakluyt. Enfin, l'ouvrage se termine par une description de la première habitation de Québec, extraite des œuvres de Champlain, une carte de Québec et de ses environs en 1608, des extraits de Champlain, de Jean de Laêt, de la Potherie et de Charlevoix.

Sans doute qu'on peut trouver à redire à cette réédition, après tant de travaux érudits qui ont été publiés depuis, mais quand on considère la date où elle a eu lieu, on ne peut s'empêcher de dire que c'était vraiment une époque de renaissance que celle où l'on tentait de semblables efforts.

En 1842, la Société littéraire reçut de M. Margry, de Paris, dont le nom allait bientôt être connu par ses publications sur les explorations de l'Ouest, l'offre de lui procurer des documents relatifs à l'histoire du Canada, sur des faits que l'on ne trouve pas dans Charlevoix. Il y avait, assurait-il, des milliers de pages manuscrites sur notre histoire, aux archives de la marine et de la guerre. En 1843, il renouvela ses propositions, et en 1844, pour démontrer sa bonne foi sans doute, il adressait à la Société un plan de Montréal en 1729, par de Léry, qu'il disait avoir trouvé aux archives. La Société n'ignorait pas, depuis le voyage de Holmes, les trésors que recélaient les archives de France; mais elle avait été si peu bien accueillie dans ses premières tentatives, qu'elle ne voulait pas s'engager dans cette voie sans être sûre de la valeur de ce qu'on lui offrait. Elle entama donc une correspondance avec M. Margry. D'un autre côté, la réédition des voyages de Cartier avait épuisé les fonds dont la Société pouvait disposer, et avant d'aller plus loin, elle voulut s'assurer de l'appui du gouvernement. Une première demande faite en 1843 arriva au moment où la Chambre allait s'ajourner.[1]

Le 18 décembre 1844, il était lu devant la Chambre d'Assemblée, une pétition de G.-B. Faribault, président de la Société littéraire et historique de Québec, demandant une aide pour permettre à cette Société de se procurer en Europe certains documents relatifs à l'histoire du Canada. Il était sûr, disait-il, que des documents importants exis-

[1] Cf. *Journaux de la Chambre d'Assemblée,* pour les pétitions de la Société, 1841, p. 304; 1843, pp. 138 et 203.

taient à Paris, et il en donnait pour preuve le succès qui avait couronné la mission récemment envoyée par la Société Historique de New York, dont l'agent avait remporté de France une masse de copies.[1]

Le 24 janvier 1845, le secrétaire de la province faisait savoir à Faribault, que le Conseil avait pris en considération la requête qu'il avait présentée, dans laquelle il demandait un octroi de 1,000 louis, et que le gouvernement était prêt à voter un subside supplémentaire de 200 louis.[2]

Cependant, à même ces deux cents louis, la Société devait employer soixante et quatorze louis, à payer les frais des copies de pièces faites à Paris, par le Dr. McLaughlin, et pour la garde du musée d'histoire naturelle de Chasseur. Il fut jugé que la balance restant en mains, savoir 126 louis, n'était pas suffisante pour ordonner une recherche fructueuse dans les archives de France, et l'on décida de l'employer à faire copier des documents déposés à Albany, et qui provenaient des archives de Paris et de Londres. Par l'entremise du consul anglais à New-York, M. Barclay, la permission fut facilement obtenue des autorités américaines, et l'honorable M. Cochrane, l'un des membres de la Société, se rendit à Albany, pour y marquer les documents que l'on devait d'abord copier.[3]

A peu près dans le même temps où la Société historique s'était adressé à la législature, celle-ci nommait un comité de sept de ses membres pour s'enquérir et faire rapport sur l'état des archives de la Nouvelle-France et celles de la province de Québec, qui étaient déposées dans les voûtes de l'Evêché, l'Hôtel du Parlement à Québec ou ailleurs, dans le but d'adopter des mesures pour leur classement et leur conservation et aussi pour recueillir tous les documents accessibles relatifs à l'histoire primitive du Canada.[4]

Ce comité, composé de MM. Christie, Aylwin, Hale, Dunlop, Chabot, Taché et Williams, fit rapport le 26 mars comme suit:

"Les voûtes dans l'Evêché ou Hôtel du Parlement à Québec, sont impropres à la conservation des documents en question. Ces documents devraient être recopiés par des personnes entendues dans la langue française et connaissant les anciennes lois du Bas-Canada.

"Ces archives consistent en une variété de registres et de livres manuscrits contenant les anciennes lois et ordonnances, les arrêts et autres actes publics du gouvernement et des autorités judiciaires du

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[1] Cette pétition, datée du 16 novembre 1844, se trouve dans le journal de l'Assemblée pour 1844-45, p. 61.

[2] Lettre du 24 janvier 1845, (*Archives du Canada*).

[3] Rapport du président de la Société Littéraire et Historique de Québec, au secrétaire de la province, 30 mars 1846.

[4] *Journal de la Chambre d'Assemblée*, 1844–45, p. 134, 15 janvier 1845.

Canada avant 1759, aussi bien que les ordonnances passées subséquemment pour la province de Québec, et une quantité d'autres papiers. Elles comprennent aussi des pièces en parchemin, des commissions et des documents détachés, relatifs à l'administration française, les plus anciennes lois écrites de la colonie, diverses décisions légales, beaucoup de papiers de jurisprudence, tous les octrois originaux des seigneuries et fiefs de la Couronne. De fait, les lois et les institutions existantes, et presque toute la propriété immobilière du Bas-Canada reposent sur ces documents. Il est désirable que ces pièces soient recopiées, et que les originaux soient déposés à Québec et les copies à Montréal.

"Les lettres patentes concernant les terres, émanées par l'ancien gouvernement du Bas-Canada, ont été récemment classées, et prêtes à être consulter. Ce système devrait être continué."

Le comité enfin suggérait de confier telles de ces archives qui n'étaient pas indispensables au siège du gouvernement, et particulièrement celles qui étaient purement de nature historique à la Société littéraire et historique de Québec. Le comité recommandait encore qu'une somme fut votée pour les fins ci-dessus et une aide accordée à la dite Société.[1]

Le 26 mars 1845, ce rapport fut pris en considération, et la Chambre d'Assemblée vota une adresse au gouverneur, lui recommandant de prendre les mesures nécessaires pour la conservation des documents en question, et pour se procurer les autres papiers et documents de sources accessibles en Angleterre et en France, tendant à jeter plus de lumière sur l'histoire du pays, assurant qu'elle ferait bon de toutes dépenses ordonnées à cette fin.[2]

Le 28 avril le Conseil exécutif, sur la recommandation de l'honorable D.-B. Papineau, mit une somme de deux cents louis, à la disposition de l'honorable Louis-Joseph Papineau, qui se trouvait alors à Paris, pour l'aider à obtenir plus de renseignements sur l'histoire primitive de ce pays. On ne pouvait avoir de meilleure occasion de remplir les vœux de l'Assemblée, disait-on.[3]

Avant de dire ce qu'il advint de la mission confiée à M. Papineau, nous allons voir d'abord ce qu'étaient les documents que la Société littéraire de Québec voulait faire copier à Albany.

IV.

La "New York Historical Society," fondée en 1804, s'était occupée depuis lors de recueillir et de conserver toutes les pièces pouvant inté-

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[1] *Appendice H.H. des journaux de la Chambre d'Assemblée pour* 1844–45. Cf. p. 315 des journaux pour réception de ce rapport.

[2] Journ. de la Ch. d'Assemblée, 1844–45, p. 44.

[3] State Book D, p. 291.

resser l'histoire des Etats-Unis. En 1814, elle fit, par l'entremise de son vice-président Clinton, un pressant appel à la législature de l'Etat pour l'engager à faire copier, dans les dépôts d'archives d'Europe, les documents relatifs à l'Amérique. Avant d'entreprendre ce travail, le gouvernement voulut d'abord s'assurer de ce qu'il possédait lui-même, et il fit adopter une loi ordonnant l'inventaire et le classement des documents déposés à Albany, capitale de l'Etat, et dont la plus grande partie provenait du fonds qui existait à New-York, avant la déclaration d'indépendance. L'ancienne colonie de New-York avait d'abord appartenu à la Hollande (1609–1664), et les plus anciens registres, les actes d'administration des gouverneurs Keift, Stuyvesant, Minuit et Van Twiller, étaient en langue hollandaise. On les fit traduire en anglais. Cette collection connue sous le nom de "Albany Records" forme vingt-six volumes. L'on s'occupa aussi de recueillir et de classer les pièces relatives à l'administration anglaise, et quoique la correspondance politique manquât presque totalement—car les gouverneurs coloniaux avaient tous l'habitude de garder en leur possession les lettres reçues du ministère—on parvint à rassembler une très belle collection. Un mémoire préparé par le secrétaire d'Etat en 1820, nous fait savoir que l'on possédait alors à Albany 661 registres, 900 liasses et 324 cartes, tous relatifs à la colonie de New-York, et distribués en trois catégories bien distinctes: I.—*Dutch Colonial Records*; II.—*English Colonial Records*; III.—*State Records*.

Quelqu'importante que fut cette collection, l'enquête faite par les autorités avait donné la preuve qu'un grand nombre des dossiers relevés étaient incomplets, que beaucoup de documents étaient déjà disparus, et que l'on manquait surtout de la correspondance échangée entre la métropole et les autorités de la colonie. On regrettait encore la disparition des minutes des délibérations des commissaires des sauvages, de 1675 à 1751, en quatre volumes, que l'on supposait avoir été emportés par Sir John Johnson ou ses agents, lors de la Révolution.

La "New York Historical Society" revint donc à la charge en 1838, et demanda à la législature un subside annuel afin de pouvoir faire copier en Europe les documents, qui pourraient compléter l'histoire manuscrite de la colonie. "Ces documents, disait-elle, dans son mémoire, sont du plus haut intérêt pour nous. Ils nous feront connaître les relations de la colonie avec la métropole, les sentiments que l'on éprouvait pour le peuple américain, les aspirations et les ressources de nos ancêtres. Ni les associations, ni les individus, ne peuvent avoir accès dans les dépôts d'archives d'Europe. C'est au gouvernement à entreprendre cette tâche patriotique. Déjà, l'état de Georgie a en Angleterre un agent qui poursuit des recherches historiques du même genre. Il est digne de l'Etat de New York, qu'il ait en sa possession, et qu'il puisse

contrôler tous les matériaux qui peuvent être utilisés pour nous faire connaître notre histoire."

La législature, se rendant aux vœux si éloquemment exprimés par la Société historique de New-York, adopta en 1839 une loi pourvoyant à la nomination d'un agent, qui fut chargé d'aller en Angleterre, en Hollande et en France, recueillir des documents affectant l'histoire coloniale de New-York, et une somme de quatre mille dollars fut spécialement attribuée à cette fin.

Ce ne fut cependant que le 15 janvier 1841, que le colonel John Romeyn Brodhead fut chargé de la mission en question. Après avoir reçu ses instructions du gouverneur, il examina d'abord soigneusement les archives déjà déposées à Albany, afin de ne point s'exposer à faire faire de la copie inutile, puis s'embarqua pour l'Europe au mois de mai.

L'envoyé de l'Etat de New-York commença ses recherches en Hollande, où il avait déjà séjourné. Il y constata à son grand regret que tous les documents relatifs aux compagnies des Indes orientales et occidentales, antérieurs à 1700, avaient été vendus aux enchères en 1821, par ordre du gouvernement des Pays-Bas. Il put cependant en avoir communication du particulier qui les avait achetés, mais il lui fallut payer une bonne rénumération pour satisfaire sa curiosité. Tout de même, Brodhead, grâce à l'obligeance des fonctionnaires hollandais, put faire bonne récolte en ce pays, puisqu'il y fit copier seize volumes de documents, (1614–1678).

En Angleterre, où l'accès aux dépôts d'archives n'était pas alors aussi facile qu'aujourd'hui, Brodhead put aussi examiner les papiers du *State Paper Office*, du *Privy Council* et du *British Museum*, de même que les collections *Harleian*, *Lansdowne* et *Cottonian*, et il en rapporta quarante-sept volumes de copies.

La politique de la France touchant l'établissement de ses postes militaires sur la frontière américaine, ses négociations avec les tribus sauvages, sa longue lutte afin de maintenir son influence dans la partie nord du continent, voilà autant de questions qui intéressent le peuple de l'Etat de New-York. Aussi Brodhead ne manqua pas d'aller consulter les archives de France, afin d'en tirer des matériaux pour l'histoire de la colonie qu'il représentait.

L'administration du Canada français fut pendant longtemps confiée au ministère de la Marine, qui comprenait celui des colonies. Aussi, c'est par ce ministère que Brodhead commença ses recherches, dont l'entrée lui fut facilitée par le général Cass, ambassadeur des Etats-Unis en France. Les archives de la marine et des colonies sont très riches en documents relatifs au Canada, Mais lorsque Brodhead les compulsa en 1843, elles étaient dans un état de confusion déplorable, et il prit un temps considérable à trier les matériaux dont il avait besoin

dans cette masse de papiers, rangés au hasard sur les rayons. Voici comment ces archives étaient alors classées. Une première série consistait en volumes reliés commençant en 1663 et se terminant en 1737. Cette série comprenait 70 volumes et contenait les dépêches du Roi et de ses ministres aux gouverneurs et aux autres fonctionnaires de la colonie. La suite manquait, et Brodhead exprime ses plus vifs regrets de ne l'avoir pu voir. L'autre série, le dépôt le plus abondant, comprenait, une collection de *cartons* ou *portefeuilles* dans lesquels étaient placés pêle-mêle, sans aucun classement, une masse de pièces détachées, se rapportant toutes au Canada, depuis 1630, jusqu'au traité de Paris, le 10 février 1763. Il y avait plus de cent cartons, chacun desquels pouvant contenir assez de matières pour faire deux volumes reliés de format ordinaire. Poussiéreux, rongés par la vétusté, souvent sans date, une dépêche de 1670 à côté d'un document relatif à la défaite de Dreskau, une relation du siège de Québec incluse dans une lettre du gouverneur Dongan, l'expédition de 1690 mélangée avec les attaques sur les forts George, Frontenac et Duquesne, les Hurons et les Ottawas faisant ménage avec les Indiens de Manhattan—tel est le tableau noir que trace Brodhead de ces documents. Il est évident que cet état de choses devait être embarrassant au possible, une tâche ingrate; non-seulement cela augmentait le travail, mais souvent une pièce importante faisait défaut! Et cependant, dit Brodhead, les contenus de ces cartons forment en vérité les matériaux d'une brillante mosaïque historique, dont les richesses peuvent compenser la peine du patient chercheur. Il est étonnant qu'il ait pu tirer autant de ce fouillis, et si l'on trouve des manquements dans sa collection, certes, il ne faut pas lui en tenir compte, étant données les difficultés qu'il a surmontées. Grâce à l'aide de M. d'Avezac, alors directeur de ces archives, Brodhead put faire un bon travail.

Brodhead eut aussi sa libre entrée aux archives du ministère de la guerre, qui présentaient un grand contraste avec celles des colonies. Là tout était en volumes reliés, et par ordre chronologique, et l'examen de ces registres fut aussi agréable que la tâche avait été ardue aux colonies. Ce ne fut pas avant 1755, quand la guerre de sept ans éclata entre la France et l'Angleterre, que le ministère de la guerre commença à s'occuper des opérations militaires au Canada, sauf quelques dépêches en 1748, lors du premier siège de Louisbourg. Brodhead limita ses recherches dans ce dépôt, de 1755 à 1763, aux correspondances du ministère avec les officiers militaires.

Brodhead visita ensuite la bibliothèque Royale, mais aux archives étrangères le ministre Guizot fit réponse qu'il n'y avait rien se rapportant aux colonies.

Brodhead rapporta de France 17 volumes de copies—(6,000 pages), 1631-1763, comprenant dépêches des rois, lettres des gouverneurs, etc.

Brodhead fut de retour à New-York, en juillet 1844. Il avait poursuivi ses travaux pendant trois ans consécutifs. Il mit ses papiers en ordre et fit rapport le 21 février 1845, au gouverneur. La mission avait coûté en tout 18,000 dollars, y compris le traitement de Brodhead, à 2,000 dollars par an. Le 5 mai 1845, le rapport fut déposé devant le Sénat à Albany.

En 1849, (30 mars), la législature de l'Etat de New-York adopta une loi pour pourvoir à la publication des documents colligés en Europe par Brodhead. C'est ce qui nous a valu les *Documents relative to the colonial history of the State of New York, procured in Holland, England and France*, plus connus sous le nom de "Collection Brodhead."

Les volumes III, IV, V, VI, VII et IX furent publiés sous la direction du gouvernement à partir de 1853. Les documents français et hollandais furent traduits par le Dr. E.-B. O'Callaghan, qui surveilla l'impression des premiers volumes.[1] En 1856, une autre loi fut adoptée pour donner le soin de la publication des derniers volumes à l'Université. Brodhead fut chargé d'écrire une introduction que l'on trouve en tête du premier volume et dans laquelle il donne l'historique de sa mission. Elle est très intéressante à lire.

La collection Brodhead comprend 10 volumes en tout, qui furent publiés dans l'ordre suivant:

1er vol.	Holland Documents	1603–1656–1856
2ième vol.	"	1657–1678–1858
3ième vol.	London Documents	1614–1692–1853
4ième vol.	"	1693–1706–1855
5ième vol.	"	1707–1733–1855
6ième vol.	"	1734–1755–1855
7ième vol.	"	1756–1767–1856
8ième vol.	"	1768–1782–1857
9ième vol.	Paris Documents	1631–1744–1855
10ième vol.	"	1745–1774–1858

Un index général de ces dix volumes fut publié en 1861.

Les documents contenus dans les vols. IX et X de la collection Brodhead sont des copies des originaux conservés aux archives de la marine et des colonies et au ministère de la guerre. Il n'y en a qu'un ou deux de la bibliothèque Nationale. Brodhead, malheureusement, n'a pas indiqué de quels volumes il avait extrait ces pièces—c'est tout au plus s'il indique par une simple mention, quels sont les documents tirés du ministère de la guerre. Les autres sont tous censés pris du

[1] Il avait déjà compilé les archives de l'Etat de New-York, qu'on fit imprimer sous sa direction en 1848, en 4 volumes.

ministère de la marine, section des colonies. Un des manquements de cette collection se trouve encore peut-être dans le fait que les documents provenant des archives de la guerre sont mélangés avec ceux des colonies. Il existe aussi plusieurs doubles dans cette collection imprimée. Mais l'existence de doubles, venant de différentes sources, dans les collections publiques, est universelle, et souvent désirable, attendu que ces doubles servent à vérifier et à contrôler.

Lorsque la Société historique de Québec se décida à faire copier un double de ces documents en 1845, il n'y en avait encore aucun d'imprimés.

L'exécution de ce travail exigeait une connaissance parfaite de la langue française et un homme entendu sur les choses de l'histoire, et la Société fit marché avec M. Glackmeyer, pour la copie de tous les documents rapportés de Paris par Brodhead, pour la somme de deux cents louis. Glackmeyer se rendit à Albany à la fin de novembre 1845, et le 30 mars 1846, il avait déjà transmis à Québec cinq volumes, comprenant environ 2,800 pages de manuscrits, contenant la correspondance des rois et ministres de France avec les officiers coloniaux, de 1631 à 1692. C'était à peu près un tiers de l'ouvrage, et l'on calculait alors qu'il faudrait encore douze mois pour le terminer. La somme promise à Glackemeyer dépassait de £74, la somme attribuée par le gouvernement, mais la société espérait que ce dernier n'hésiterait pas à voter un nouveau subside pour compléter l'ouvrage, et aussi pour se procurer les copies des documents provenant des archives de Londres, et se rapportant à l'histoire de la colonie avant et après la conquête de 1759.[1] Dans une lettre du 4 avril 1846, M. Faribault, écrivant au secrétaire de la province, M. Daly, ajoutait à ces renseignements que pour compléter la copie des 17 volumes des documents de Paris, et copier les 10 volumes des documents de Londres, faire une table analytique, relier le volumes, et imprimer ceux de ces documents jugés les plus importants, il faudrait au moins cinq cents louis.

La Chambre d'Assemblée en 1846, n'hésita pas à voter 300 louis, afin de permettre de compléter ce travail important.[2] Pendant l'été de 1846, M. Glackemeyer alla donc continuer sa copie, et le 8 janvier 1847, le président de la Société historique pouvait annoncer dans son rapport qu'elle possédait sur les rayons de sa bibliothèque 17 volumes reliés, extraits des documents de Paris, provenant de la collection Brodhead. Quelques temps après, il fut reçu six volumes des documents de Londres. Il restait une balance sur la somme votée par la législature, et l'on se proposait de procéder de suite à la publication des quelques-uns de ces précieux documents.

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[1] Mémoire du président John Charlton Fisher à Daly, 30 mars 1846; mémoirê semblable adressée au gouverneur, 31 mars.

[2] Journal de la Ch. Ass. 1846, pp. 61,62, 66, 295.

Les 17 volumes in-folio, contenant particulièrement la correspondance officielle du gouvernement français relativement au Canada et autres colonies de la Nouvelle-France, tirée des archives du ministère de la marine, ainsi que celle du ministère de la guerre à Paris, se trouvent encore aujourd'hui déposés à la bibliothèque de la Société Littéraire et Historique de Québec. Le catalogue publié en 1858, par le Parlement du Canada, en donne une table et analyse sous le titre de "Première Série," de page 1451 à page 1498. Il existe une deuxième copie de ces 17 volumes (1ère Série) au bureau du secrétaire de la province de Québec. Il en a été donné une analyse dans l'annexe 10 du rapport de cet officier publié à Québec en 1888, pp. 68–129. Enfin, une troisième copie faite en 1884 par M. A.-N. Montpetit, sur la copie déposée au secrétariat de Québec, se trouve à la section des manuscrits au bureau des archives à Ottawa.

Les volumes I à VIII de cette première série correspondent au volume IX, du texte anglais de l'édition de New-York. Les volumes IX à XVII, correspondent au volume X.[1]

Les documents de Londres, copiés à Albany de la collection Brodhead, et qui forment six volumes déposés à la Société de Québec, sont analysés aux pages 1622–1644, du catalogue du Parlement, publié en 1858.

Vol. 1	1613–1688
Vol. 2	1688–1697
Vol. 3	1698–1726
Vol. 4	1727–1754
Vol. 5	1754–1760
Vol. 6	1760–1779

Il y a aussi une table analytique de ces six volumes dans le rapport du secrétaire de la province de Québec pour 1886-87 (imprimé en 1888), pp. 235–263.

V.

Le jour même où le Conseil exécutif avait voté deux cents louis, pour permettre à l'honorable M. Papineau de faire des recherches dans les archives de France, il prenait en considération l'adresse de l'Assemblée législative, qui recommandait d'instituer une enquête afin de s'assurer de l'état des vieilles archives de la province de Québec, dépo-

[1] Une note accolée au catalogue du Parlement de 1858, qui se trouve à la bibliothèque des Archives, indique les différences entre la copie Montpetit et celle de Québec.

sées dans l'évêché qui avait servi jusqu'lors d'Hôtel du Parlement.[1] (28 avril 1845, State Book D., p. 293). Le secrétaire de la province, Daly, reçut instruction d'aller à Québec, pour donner effet à cette résolution, avec pouvoir d'employer l'aide nécessaire. S'il se trouve que quelques-unes de ces archives sont d'un caractère purement historique, il en dressera une liste détaillée afin que le Conseil puisse prendre des mesures ultérieures à ce sujet, ajoutait le décret ministériel.

M. Daly vint à Québec au mois de mai, et chargea M. Faribault, assistant greffier de la Chambre, de faire enquête. Il ne pouvait trouver un homme plus compétent.

Ainsi donc, pendant que Papineau poursuivait ses recherches en France, que Glackemeyer faisait sa copie à Albany, Faribault enquêtait à Québec. Les trois opérations marchaient de front.

Faribault fit rapport le 20 mai 1847.[2]

"Au commencement de mai 1845, dit-il, je procédai à l'examen des anciennes archives françaises, consistant en livres reliés et registres, aussi bien qu'en papiers détachés, déposés dans les deux voûtes du Palais de l'Evêché à Québec, occupé comme bureau, depuis un grand nombre d'années, par les différents secrétaires de la province du Bas-Canada, jusqu'à ce que le siège du gouvernement fut transporté de Québec à Montréal.

"Avant cependant d'entrer dans des détails au sujet de l'état de ces archives ou sur les moyens à adopter pour leur conservation, il est peut-être opportun de faire observer que la condition de toutes les archives du Canada en général, telles qu'elles existaient quelques temps après la conquête, a occupé l'attention du gouvernement exécutif aussi à bonne heure qu'en 1787, tel qu'il appert par un rapport et un journal des procédures du Conseil exécutif du 6 juillet 1791, que l'on peut trouver dans un petit volume imprimé in-quarto intitulé "Ancient French Archives" ou extraits des minutes du Conseil relatives aux Archives du Canada sous le gouvernement de France."

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[1] Le 23 décembre 1844, le Conseil exécutif avait décidé d'entretenir les édifices parlementaires laissés inoccupés depuis l'Union, et d'en venir à une entente à ce sujet avec les maires de Québec et de Toronto. Diverses associations étaient logées dans ces bâtiments. Il fut décidé que dans ceux de Québec, on laisserait un local convenable pour les archives jusqu'à ce qu'il fut jugé à propos de les transporter ailleurs (*State Book* D. p. 63). Le 3 janvier 1845, afin d'effectuer une économie de £200 par an et s'exempter les dépenses de chauffage, il fut décidé d'abolir la charge de garde des archives à Québec. Le nouveau traducteur le remplacera dit le décret en conseil. Il fut ordonné encore qu'aussitôt la navigation ouverte, les archives conservées jusqu'alors à Québec seraient transportées à Montréal, où on n'avait pas pu les loger auparavant, faute de place convenable, et qu'elles seraient là sous la garde du régistraire de la province. (State Book D., p. 80).

[2] L'original en anglais est dans les annexes de la correspondance du secrétaire d'Etat, dossier No. 1340, série S.

"Par ce document imprimé il appert que le comité du Conseil exécutif a été occupé en différents temps de 1787 à 1791, à s'enquérir de la nature et de l'étendue de ces archives, qui alors, à ce qu'il semble, étaient dispersées en différents dépôts, sans distinction soit de bureaux ou de départements ou des juridictions respectives d'où elles relevaient. Ceci peut, cependant, naturellement s'expliquer quand on songe à la confusion et aux dangers auxquels ces archives ont dû être exposés pendant les remarquables événements qui survinrent alors, savoir: le siège de Québec en 1759 et le siège de cette même ville en 1775–76.

"En parcourant ce rapport du Conseil exécutif, il est évident que le comité a pris grande peine à s'assurer de la nature exacte et de la description de ces archives, une mesure qui devenait de toute nécessité avant d'en faire la distribution convenable, à cause des exigences de la nouvelle organisation de la province de Québec qui allait avoir lieu incessamment.

"En conséquence des instructions de ce comité il appert que la partie des archives contenant des matières d'Etat, ou des délibérations sur les affaires coloniales; celles contenant les commissions des gouverneurs et autres officiers supérieurs, les ordonnances des intendants de même que les importants registres dans lesquels sont enregistrés les nombreuses concessions ou octrois de seigneuries dans toutes les parties du Canada furent déposés chez le secrétaire de la province du Bas-Canada, sous la garde duquel elles ont continué de demeurer jusqu'à ce jour, et de qui des copies certifiées de ces documents peuvent être obtenues quand il est nécessaire. Les autres archives, c'est-à-dire celles relatives aux matières judiciaires, de même que les nombreuses études des notaires furent distribuées aux greffiers ou protonotaires des différents districts; celles relatives aux chemins aux différents grands voyers; et les importants documents et papiers concernant le domaine royale furent donnés en garde à l'Inspecteur du domaine du Roi et clerc des terriers.

"Il doit être observé ici que quoique le rapport en question dise que plusieurs de ces registres étaient alors dans un état de décadence ou autrement en mauvais ordre, cependant aucune mesure ne semble avoir été prise ni aucune recommandation adoptée par le comité pour remédier à cet état de choses, et l'on peut se former une idée de la condition de dilapidation dans laquelle plusieurs de ces documents ont dû être trouvés après avoir été laissés dans le même état pendant plus d'un demi-siècle."

Faribault procède ensuite à décrire l'état où il trouva ces archives et les soins qu'il prit pour les faire restaurer. Peu de ces registres avaient des tables, et quand il en existait elles se trouvaient sur des feuilles détachées. Il fut procédé à indexer tous les registres, par ordre

alphabétique ou chronologique. Voici les volumes qui furent alors mis en ordre:—

Registres des insinuations du Conseil Supérieur.....	10 vol.
Table.....	1 "
Registres d'intendance.....	4 "
Cahiers d'intendance.....	2 "
Table générale.....	1 "
Registre des Edits et Arrêts.....	6 "
Registre des Arrêts du Conseil d'Etat (originaux sur parchemin).....	1 "
Registres d'ordonnances des intendants.....	44 "
	69

Les registres d'ordonnances des intendants furent transférés à Montréal dans l'automne de 1845.

M. Faribault fait remarquer que dans les registres des commissions, il y a souvent des lacunes qui s'étendent sur une période de plusieurs années. Il explique cela par l'incendie du Palais de l'Intendant en 1713 où plusieurs de ces titres furent détruits. Plusieurs propriétaires ne peuvent à cause de ces lacunes remonter à l'origine de leur propriété. Il n'y a pas de doute, ajoute-t-il, que beaucoup de ces documents qui nous manquent sont en France car les intendants étaient obligés d'y verser une copie de tous les titres de propriété qu'ils octroyaient.

M. Faribault, afin de se conformer à ses instructions, fit transcrire plusieurs registres dont les pages tombaient de vétusté. Il en donne la liste. Quatre copistes furent continuellement employés à ce travail pendant l'été de 1845.

Parmi les anciennes archives, M. Faribault trouva en outre les registres qui suivent:—

1. Imposition pour l'entretien des casernes de Québec, depuis 1749 à 1756.....	1 vol.
2. Imposition pour les casernes de Québec, pour les années 1758 et 1759.....	1 vol.
3. Ordonnances, ordres, règlements, durant le gouvernement militaire en Canada, de septembre 1760 à juillet 1764 et de sep. 1764 à juin 1775.....	2 vol.
4. Recensements du gouvernement de Québec des paroisses du Canada pour 1762, 1765 et 1784.....	5 vol.

M. Faribault dépouilla enfin une masse de vieux documents qui étaient déposés dans une voûte abandonnée et que l'on avait étiquetée "Papiers inutiles" dans l'inventaire de 1791. Il y avait dans ces

papiers beaucoup de dossiers provenant du Conseil Supérieur et de la prévôté; mais quelques-uns se rapportaient aussi à des événements historiques. Il en fit un choix qu'il mit en volumes reliés et dont voici la liste:—

1. Documents pour servir à l'histoire du Canada, depuis 1626 jusqu'à 1763.	1 vol.
2. Le siège de Beauséjour et l'enquête militaire au sujet de la reddition de ce fort en 1757.	1 vol.
3. Documents judiciaires en matières civiles.	1 vol.
4. Documents judiciaires en matières criminelles. . . .	6 vol.
5. Documents divers.	1 vol.

M. Faribault recommandait que cette collection fut remise à la Société Historique de Québec.

Ce qui restait des documents fut mis en 147 liasses et déposé chez le protonotaire de la Cour Supérieure à Québec. Les registres d'insinuation du Conseil Supérieur, les registres d'intendance, les cahiers d'intendance, les édits, arrêts et déclarations, les arrêts du Conseil d'Etat du Roi, la table générale des titres de concession et celle des registres du Conseil Supérieur, soit en tout 25 volumes, prirent la route de Montréal, le 18 mai 1847, pour aller rejoindre les 44 volumes d'ordonnances d'intendance déjà rendus dans cette ville depuis l'automne de 1845.[1]

VI.

Au mois d'avril 1846, la Chambre d'Assemblée chargea un comité spécial de s'enquérir et faire rapport: 1. Sur l'état et la condition des rôles, archives, journaux et autres manuscrits et papiers imprimés, appartenant aux ci-devant parlements du Haut et du Bas-Canada respectivement et au parlement du Canada, et sur les précautions prises pour les mettre en sûreté; 2. Sur l'état et la condition des registres judiciaires, archives, records et papiers appartenant aux diverses cours de justice, dans le Bas-Canada sous la charge des greffiers, protonotaires, greffiers de la Couronne, greffiers de la paix, shérifs et autres officiers ou fonctionnaires, afin de voir si ces officiers tiennent ces papiers en ordre, s'ils ont les soins nécessaires pour les conserver, et quelles mesures il faudrait prendre pour les mieux protéger.[2]

Au mois de mai, ce comité spécial fit comparaître devant lui un grand nombre de fonctionnaires. Le rapport a été publié en appendice

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[1] Le Rapport de M. Faribault fut soumis au Conseil exécutif le 17 septembre 1847, (State Book D, p. 419), et le 8 avril 1848, on lui votait une indemnité de 200 louis pour son travail, (State Book H, p. 366).

[2] Journaux de la Ch. d'Assemblée, 1846, p. 56

au journal de l'Assemblée pour 1846, et nous y référons.[1] Il appert de cette enquête que tous les documents de l'ancienne Chambre d'Assemblée et du Conseil Législatif du Canada, depuis 1792, se trouvaient alors dans les voûtes de l'ancien Palais de l'Evêché à Québec. Quant aux papiers et archives de l'ancienne Chambre d'Assemblée du Haut-Canada, ils furent détruits par le feu, lors de la prise de York (Toronto) pendant la guerre de 1812 avec les Etats-Unis. Un autre incendie, survenu en 1824, détruisit toutes les archives de 1812 à 1824. On se procura du Colonial Office en Angleterre, des copies manuscrites des journaux détruits, lors du premier incendie, et ces copies se trouvaient en 1846, dans l'Hôtel du Parlement à Montréal.[2]

Les archives judiciaires de la province, tant de l'ancien que du nouveau régime, se trouvaient concentrées dans les palais de justice de Québec, de Montréal et de Trois-Rivières. Les officiers de chacune de ces cours vinrent tour à tour témoigner. Comme conclusion de cette grande enquête, on peut dire que les voûtes où ces documents précieux étaient déposés souffraient de l'humidité, et qu'à part les minutes des notaires, tous les autres registres manquaient d'index suffisants pour en permettre la consultation facilement. Au mois de septembre 1846, le Conseil exécutif attribua une somme de 200 louis aux réparations des voûtes du palais de justice de Québec.[3]

C'est à la session de mai 1846, que la Société Historique de Québec fit déposer devant l'Assemblée les copies de manuscrits qui avaient été transcrites à Albany, et qu'un nouvel appel eut lieu dans le but de continuer ce travail.[4]

Comme nous l'avons dit, l'honorable M. Papineau avait été chargé en 1845 par le Conseil exécutif de faire copier à Paris certains documents historiques concernant le Canada. Qu'était-il advenu de sa mission? M. Papineau était de retour au pays vers le 15 septembre 1845. "On attend M. Louis-Joseph Papineau, l'ex-orateur, à Montréal, cette semaine, ou au plus tard, le 15 de ce mois, disait la *Minerve*, du 2 septembre 1845. L'exécutif pendant qu'il était à Paris, lui a envoyé £200 pour qu'il y fit copier autant de documents que possible, relatifs

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[1] Appendice K.K. Les témoignages accompagnent le rapport. Journaux de l'Assemblée, 1846, pp. 345, 349.

[2] Le 18 février 1845, un comité spécial fut nommé par la Chambre d'Assemblée, pour étudier les meilleurs moyens de compléter les séries existantes des archives législatives de l'ancienne province du Haut-Canada. Ce comité ne fit pas de rapport.

[3] Lower Canada State Book S., pp. 704–705.

[4] 30 mai 1846, Journ. de la ch. p. 296. En 1847, la Société s'adressa de nouveau à la Chambre, p. 43. Sa pétition fut imprimée pour l'usage des membres, p. 45.

à l'histoire du Canada. Il est probable que son long séjour en France l'aura mis en état d'y faire des recherches utiles."[1]

Le 29 juin 1848, l'honorable A.-W. Cochrane, président de la Société littéraire et historique de Québec, demandait au gouvernement que cette société fut mise en possession de manuscrits copiés par M. Papineau, au prix de £200, suivant l'ordre en conseil du 8 avril 1845. Le conseil chargea le secrétaire de la province d'écrire à M. Papineau afin de savoir quels documents il avait pu se procurer, et s'il aurait objection de remettre ces manuscrits à la Société littéraire et historique.[2]

L'honorable A. B. Sullivan, alors secrétaire de la province, écrivit en conséquence à M. Papineau.[3]

Le 27 juillet, M. Papineau, qui était alors dans sa seigneurie de la Petite Nation, répondit au secrétaire de la province, qu'il avait écrit le jour même à son fils L.-J. Amédée Papineau, de transmettre au gouvernement afin qu'il en put disposer comme il l'entendrait, les copies des manuscrits historiques qu'il avait fait faire à Paris en 1845. Les nombreuses occupations qui m'ont retenu, et quelques voyages indispensables m' ont empêché de répondre plus tôt, écrivait-il, et après s'en être excusé, il continuait:

"J'avais laissé la France et je voyageais en Italie lorsque j'y reçus une lettre de l'honorable D. B. Papineau m'apprenant que l'assemblée législative avait voté deux cents louis afin de se procurer la copie de manuscrits relatifs à l'histoire des premiers temps de l'établissement du Canada. Je regrettai que cette nouvelle m'arrivait à un moment où, après avoir décidé de m'en retourner au Canada, je faisais une rapide visite dans plusieurs parties de l'Europe, sans avoir l'intention de rentrer de nouveau en France. Je me croyais dans l'impossibilité de faire faire un travail de ce genre d'une façon complète, de manière à ce qu'il fut utile à mon pays et à me faire honneur à moi-même, comme je l'aurais pu faire pendant mon séjour dans la capitale française. Je ne désirais pas toutefois manquer complètement l'occasion qui se présentait de recueillir de nouveaux renseignements concernant l'histoire des premiers temps de la colonie, je changeai donc et je raccourcis mes projets de voyage, et je retournai passer un mois à Paris.

"Avec la libéralité charactéristique qui distingue si honorablement le gouvernement français, j'avais déjà avant cela obtenu aussitôt que je leur demandai libre accès aux bureaux du ministre de la marine, où il y a une immense collection de correspondance officielle et autres entre les colonies et la mère patrie, et j'y avais fait de nombreux extraits pour mon usage particulier.

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[1] Dans le *Mercury* du 4 octobre 1844, on voit que le journal de la Bibliothèque de Québec annonçait que M. Papineau avait laissé la France pour le Canada et était attendu de jour en jour au pays. Mais M. Papineau avait dû retarder son retour, précisément à cause des recherches qu'il avait eu mission de faire.

[2] State Book I, p. 4, 12 juillet 1848.

[3] Cf. Appendice Y, des journaux de la Chambre d'Assemblée pour 1850.

"Parmi les différents employés qui travaillaient là sous M. d'Avezac, alors le directeur savant et aimable de ces archives, je m'adressai à l'un d'eux, M. Margry, comme étant l'un de ceux qui pouvait faire faire l'ouvrage requis de la manière la plus exacte et la plus judicieuse.

"Il venait justement d'être nommé pour classer par ordre chronologique une grande partie des anciennes archives qui ne l'étaient pas déjà, ou qui avaient été déplacées lorsqu'on les transporta de Versailles à Paris, et qui formaient une masse immense de livres non reliés et de feuilles détachées. Il avait été employé avec beaucoup d'avantage par le général Cass, alors ambassadeur des Etats-Unis d'Amérique, par M. Brodhead, de l'état de New-York, et par les agents qui avaient fait faire des recherches dans ce premier dépôt pour les états de Massachusetts et de la Louisiane; il avait fait des recherches pour lui-même dans le but de publier des notes biographiques sur La Salle et sa découverte du Mississipi.

"Je lui dis que j'étais retourné à Paris que pour le temps justement nécessaire pour faire faire des copies et les apporter avec moi pour l'assemblée législative, des manuscrits relatifs à l'histoire de la colonie sous le gouvernement français. Je lui demandai de faire copier le plus tôt possible tels manuscrits des archives qu'il saurait les plus intéressants et qui n'avaient pas déjà été copiés pour le général Cass, ou pour les autres agents des différents états américains et d'en colliger les textes avec soin.

"Il fit ce travail avec beaucoup de diligence, de flair, et d'exactitude. Considérant le peu de temps employé, personne n'aurait pu faire mieux. Afin d'obtenir ce résultat, il fallait un accès aussi libre aux archives que lui et moi pouvions l'avoir, sans compter la connaissance que nous possédions des copies déjà faites. Autant que le local exigu à sa disposition le pouvait permettre il employa des copistes qu'il surveilla et dirigea assidûment, et nous examinions nous mêmes ces copies avec les originaux. S'il était jugé opportun en aucun temps de continuer ce travail, je recommanderais M. Margry à la considération la plus favorable du gouvernement, comme étant à tous les points de vue l'une des personnes le mieux qualifiée pour bien faire ce travail.

"J'ai seulement déboursé cinquante dollars pour les manuscrits que je vous remets. Si le gouvernement jugeait à propos de réclamer la balance, je la remettrai sur demande. Je crois cependant que le gouvernement me doit beaucoup plus que cette balance.

"Il y a deux ans, j'ai demandé à la législature, par l'entremise du gouverneur, ce qui m'était dû pour les arrérages de mon traitement comme orateur de la Chambre d'assemblée du Bas-Canada. L'exécutif, avec droiture et libéralité, m'a informé que ma demande serait soumise à l'assemblée et qu'il l'appuierait, et avec une justice et une libéralité égale l'assemblée a voté unanimement une somme de £4,500 que j'ai recue.

"Dans le cours d'une conversation avec l'un des membres du gouvernement je lui avais dit qu'un ordre pour ce montant avait été signé par lord Gosford en 1837, alors gouverneur en chef, pour arrérages dus au premier octobre; qu'il m'en avait donné avis en plusieurs occasions et plus spécialement moins d'une journée avant que je crus de mon droit de laisser le pays; mais que je ne voulus pas toucher cette somme,

persistant comme je le faisais alors dans l'espoir que le Conseil législatif finirait par voter les lois de subsides sans les amender ou les rejeter.

"Il est probable en conséquence de cette conversation que l'Exécutif a seulement demandé pour moi ce qui m'était dû suivant l'ordre signé par lord Gosford. Pour rencontrer le montant qui, suivant les votes de l'assemblée, m'était dû, il faudrait une plus forte somme, et je vous demande de soumettre à la considération favorable de Son Excellence que je la demande.

"Quel est le montant exact qui m'est dû? Est-ce que les malheureux événements de 1837 ont rendu la solution de cette affaire si difficile que l'on ne puisse la déterminer? Je n'ai pas les documents officiels de l'époque chez moi, et j'écris ce qui suit de mémoire.

"Dans la dernière session du parlement du Bas-Canada les subsides furent votés pour six mois; et je crois que si le parlement a duré six mois après ce vote, je devrais recevoir le traitement de l'orateur pour cette partie de temps qui ne peut pas avoir été couverte par ce que j'ai reçu. Si le parlement avait été régulièrement dissous avant la fin de cette période, la proportion accrue entre le 1er octobre 1837 et le jour de la dissolution me serait alors due.

"Le gouvernement décidera comme il le jugera bon, si le vote de l'assemblée du Bas-Canada n'est pas suffisant en lui-même pour avoir créé une dette que l'Exécutif est en aucun temps autorisé à honorer, ou si d'après les circonstances l'Exécutif actuel n'étant que celui de la province unie du Canada devra demander un vote de l'assemblée législative pour me payer ce qui m'est dû, déduction étant faite de la balance que j'ai en mains.

"Vous êtes assez bon de me demander si j'aurais aucune objection à ce que les manuscrits que je vous remets fussent confiés à la société littéraire et historique de Québec? Je n'en ai aucune. Ces manuscrits appartiennent à la province, et le gouvernement décidera comme il le jugera bon sur l'endroit où ils devront être déposés. La société en question est digne de tous éloges pour le zèle qu'elle a montré en recueillant et publiant des documents intéressants regardant l'histoire du pays, et nous sommes déjà assurés par l'esprit qui jusqu'à ce moment l'a animé à cet égard, qu'elle facilitera en tout temps l'accès public aux dépôts qui lui sont confiés. Je soumets, cependant, humblement, sans insister en aucune manière, que peut-être les archives publiques dans le bureau du secrétaire de la province ou la bibliothèque de la législature sont des établissements importants qui pourraient être proprement enrichis de ces manuscrits."

Le 25 août 1848, le secrétaire de la province fit savoir à M. Papineau que sa réclamation avait été mise à l'étude, que le Conseil avait décidé de s'en tenir au vote de l'Assemblée, et qu'il devait remettre le reliquat de 150 louis qu'il avait en mains. Il le remerciait en même temps du soin qu'il avait pris à rassembler tant de manuscrits précieux, sans en exiger rémunération, service que seul il pouvait rendre à cause des facilités d'accès qu'il possédait aux archives de Paris.[1] Le Conseil

[1] Appendice Y, Jour. de la Ch. d'Ass. 1850. Réponse à une adresse de la Chambre.

décida à la même occasion que les manuscrits rapportés par M. Papineau seraient déposés à la Société Historique de Québec.[1]

Que sont devenues les copies de manuscrits que Papineau rapporta de Paris en 1845, et que contenaient ces copies?

Nous savons qu'il en existait dix volumes, et que deux parts en furent faites dès 1848. L'une, de quatre volumes, échut à la Société littéraire et historique de Québec, l'autre, de dix volumes, alla à la bibliothèque de l'Assemblée législative, qui siégeait alors à Montréal.

Les quatre volumes déposés à la bibliothèque de la Société littéraire et historique de Québec existent encore. Le catalogue de la Bibliothèque du Parlement publié en 1858 nous en donne la liste qui suit, à la page 1448.

Vol. I.—1682–1712. Relation de ce qui s'est passé en Canada, au sujet de la guerre, tant des Anglais que des Iroquois, depuis l'année 1682.

Vol. II.—1695–1696. Relation de ce qui s'est passé de plus remarquable en Canada, depuis le départ des vaisseaux en 1695, jusqu'au commencement de l'année 1696.

Vol. III.—1698–1699. Journal d'un voyage fait au Mississipi en 1698 et 1699, par MM. d'Iberville et de Surgères.

Vol. IV.—1640–1672. Histoire du Montréal, de 1640 à 1672, par M. Dollier de Casson.

Depuis 1866, la Société Historique a fait imprimer trois de ces volumes: 1. Histoire du Montréal; 2. Voyage d'Iberville; 3. Recueil de ce qui s'est passé en Canada au sujet de la guerre, tant des Anglais que des Iroquois, depuis l'année 1682 jusqu'en 1712.[2]

Le dernier fut publié en 1871, sous la direction de M. LeMoine, à la suggestion de l'historien Parkman, qui avait voulu en avoir une copie manuscrite.[3]

Les six autres volumes déposés à la Bibliothèque du Parlement à Montréal périrent dans l'incendie du 25 avril 1849.[4] En 1870, M. Parkman voulut savoir ce qu'ils étaient devenus. Le président de la Société Historique de Québec, M. Anderson, écrivit à Papineau lui-même, et il en reçut cette réponse:

Montréal, 21 février 1871.

....Je regrette beaucoup qu'il ne soit guère en mon pouvoir de vous aider à recouvrer les manuscrits qui ont été détruits par le feu en 1849.

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[1] State Book I, p. 85.

[2] Rapport du président Le Moine, 10 janvier 1872, p. 4 en note

[3] Lettre au président Anderson, janvier 1870. *Mémoires de la Soc. Hist.*, 1871-1872, p. 127.

[4] Lettre de Parkman à Barthe en 1871, (loc. cit. p. 130). Le catalogue du Parlement de 1858 (p. 1448), dit expressément que ces six volumes furent détruits dans l'incendie de 1849

"Les bibliothécaires du parlement à Ottawa seraient plus en mesure que moi de vous en donner les dates et les titres. Je demeure à Montréal pendant les mois d'hiver, et ma bibliothèque est à ma résidence de Montebello où je ne retourne habituellement qu'à l'ouverture de la navigation vers la fin d'avril. Très vraisemblablement les titres et les dates de ces documents doivent être imprimés dans le catalogue général de la bibliothèque du parlement et les noms de ceux qui les ont copiés. Ces volumes sont sur les rayons de ma bibliothèque, comme ils sont sur les vôtres, mais ma pauvre vieille mémoire ne peut plus s'en rappeler. Si, lorsque je serai de retour à ma résidence, je pouvais tirer de mes notes quelques indications qui pourraient vous aider à faire recopier dans les archives françaises ces manuscrits perdus, soyez assuré que je ne manquerai pas de me faire un plaisir et un devoir de vous les donner."

Mais les renseignements promis par M. Papineau ne vinrent jamais. La mort le prit quelques temps après.

Il est vraisemblable qu'il ne garda jamais la liste des documents qu'il avait donnés au gouvernement. Quant aux bibliothécaires du parlement qui les reçurent en 1848, l'incendie du mois d'avril 1849 les empêcha sans doute d'en parler.[1]

Ce ne fut pas la seule perte que le pays eut à déplorer. "La collection complète de nos livres, à l'exception de 200 volumes, est détruite disait le comité de la bibliothèque, dans son rapport du 16 mai 1849. Nos minutes même sont disparues." La collection unique des livres sur l'Amérique, que Faribault avait recueillie avec tant de persévérance, transportée à Montréal en 1846, placée sur des rayons construits spécialement pour la recevoir, et que le comité se félicitait en 1848, de voir maintenant à l'abri, avait péri elle aussi au milieu de la catastrophe. On calculait que les flammes avaient consumé 25,000 volumes.[2]

M. Faribault rend compte de la disparition des archives dans les termes suivants.[3]

"Quant aux archives, nous pensons qu'il n'y a eu de sauvé de l'incendie que les seuls bills grossoyés qui se trouvaient alors dans la salle des séances du Conseil Législatif et qui avaient reçu la sanction royale peu d'heures auparavant. Ainsi, tout ce qui existait en fait d'archives et de documents manuscrits de la ci-devant Législature du Haut-Canada, de même que tous ceux appartenant aux deux chambres de la Législature du Canada depuis l'Union, en 1841, consistant en rapports de comités généraux, dont quelques-uns seulement sont insérés dans les journaux, des milliers de pétitions présentées aux deux cham-

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[1] Le rapport de la bibliothèque pour 1848, ne fait pas allusion aux manuscrits Papineau.

[2] Rapport de 1850.

[3] Notice sur la destruction des archives et des bibliothèques des deux chambres législatives du Canada, lors de l'émeute qui a eu lieu à Montréal, le 25 avril 1849, par G. B. Faribault, imprimerie du *Canadien*. Bibliothèque des Archives du Canada, p. 236.

bres, de nombreux et importants documents sur la statistique du pays, tous les projets de bills soumis à la chambre depuis quinze à vingt années et reliés en volumes, avec une masse de journaux, de rapports et de documents séparément imprimés;—tout est devenu la proie des flammes; et il ne reste de vestiges des archives de notre Législation que celles de la Législature du Bas-Canada depuis 1791 jusqu'à 1837, qui heureusement sont toujours demeurées jusqu'à ce moment dans le Palais Législatif à Québec, faute d'un local convenable, pour les déposer dans l'édifice qui vient d'être incendié à Montréal."

Le comité de la Bibliothèque avait recommandé que 150 louis fussent attribués pour se procurer des copies de documents de valeur relatifs au Canada, en possession de l'Etat du Massachussetts, et alors déposés à l'Université Harvard, près de Boston. Les autorités de cet Etat avaient fait savoir qu'elles donneraient toute facilité pour les copier à la personne que le gouvernement du Canada enverrait. Ces documents, alors que toutes nos archives venaient d'être détruites, auraient été de la plus grande utilité, mais le comité, obligé comme il était de reconstituer la bibliothèque incendiée, remit à plus tard cette dépense, espérant que l'Etat du Massachussets finirait par publier lui-même ces manuscrits.[1]

L'incendie du mois d'avril 1849 eut pour effet d'éveiller de nouveau l'attention de la Chambre sur la nécessité de conserver les archives.

Le 3 mai, sur proposition de M. Christie, appuyé par M. Laterrière, elle représenta au gouverneur qu'il y avait une grande quantité de documents publics, registres et papiers, relatifs au gouvernement civil et militaire du Canada, tant avant qu'après la division de la province de Québec en Haut et Bas-Canada, aussi bien que des archives et papiers intéressant au point de vue de la colonisation et du gouvernement du pays, appartenant à l'Ordre des Jésuites, et datant du premier établissement de cet ordre au pays jusqu'à sa suppression, tous d'une grande valeur pour l'histoire du pays et sa littérature, qui étaient dispersés dans les différents bureaux publics (y compris ceux du secrétaire de la province et du commissaire des terres), et qui étaient dans un état négligé et prêts à être détruits à toujours. Ces papiers, disait la proposition, devraient être, sans perte de temps, sauvés de la ruine et de l'anéantissement qui semble les attendre. Une personne compétente devrait les examiner, les recueillir, en déterminer la valeur, les mettre en ordre et assurer leur conservation. La Chambre paierait les dépenses nécessaires avec plaisir.[2]

Cette recommandation fut présentée au gouverneur, et M. Baldwin, procureur-général, donna l'assurance que des mesures seraient prises pour complaire aux désirs de la Chambre.[3]

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[1] Journ. Ch. d'Ass. 1849, p. 307.
[2] Jour. de la Ch. d'Ass. 1849, p. 265.
[3] Loc. cit. 8 mai 1849, p. 273.

VII.

Aussitôt après l'incendie de l'Hôtel du Parlement, l'orateur de la Chambre écrivait en Angleterre et aux Etats-Unis, pour demander aux grandes corporations d'aider à reconstituer la bibliothèque incendiée.[1] De son côté la Chambre d'Assemblée, le 28 juillet 1851, donnait instruction au comité de la bibliothèque d'étudier l'opportunité d'envoyer en Europe une personne compétente dans le but d'acheter les ouvrages nécessaires.[2]

Le 18 août, le comité recommandait que M. Faribault, assistant greffier de l'Assemblée, fut choisi pour cette mission de confiance. M. Chauveau, qui était rapporteur en cette occasion, rappelait le zèle infatigable de M. Faribault qui depuis longtemps avait amassé tant de livres, pour enrichir la section américaine de la bibliothèque. Il mérite, disait-il, les remerciements de tous. Son choix sera celui des deux Chambres et du public.[3]

M. Faribault accepta la mission qu'on lui offrait et il partit aussitôt après que la session de la législature eut été prorogée en octobre 1851.

L'occasion de son voyage était favorable pour obtenir des archives publiques d'Angleterre, de France et d'autres pays, des documents manuscrits relatifs à l'histoire coloniale du Canada, pour compléter la série des pièces que l'on possédait déjà. Sur proposition de M. Christie, appuyée par M. Price, la Chambre demanda donc au gouverneur général, que l'agent qui était envoyé en Europe, pour acheter des livres pour reconstituer la bibliothèque, fut en même temps chargé de faire la recherche des manuscrits, et qu'il serait fait bon de ses dépenses.[4]

Le 6 septembre, le Conseil exécutif, prenant en considération les vœux de l'Assemblée et deux lettres que M. Faribault lui avait adressées à ce propos, donnait instruction au receveur général d'ouvrir à ce dernier, chez les agents de la province à Londres, un crédit de 4,400 louis.[5]

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[1] Journ. Ch. Ass. 1850, appendice B.

[2] Journaux de l'Assemblée législative de 1851, p. 199. Le Conseil donna son assentiment à cette recommandation (p. 212). Le comité de la bibliothèque demanda en outre que la Chambre fit imprimer les mémoires du Père Jésuite Bressani, et acheter l'Histoire du Canada de Christie, dont le supplément contient tant de documents inédits.

[3] Rapport adopté le 25 août 1851, p. 320, loc. cit. Les rapports du comité de la bibliothèque de l'époque sont très intéressants à lire, non seulement pour l'histoire de nos collections incendiées, mais encore parce que c'est lui qui a la direction de l'achat des livres. C'est à ce comité que les auteurs s'adressent pour vendre leurs livres et c'est lui qui en recommande l'achat. Il y a donc dans ces rapports comme une revue annuelle du mouvement littéraire.

[4] Journaux de l'Assemblée du 27 août 1851, p. 330.

[5] State Book L, p. 447, 6 septembre 1851.

Le 8 novembre 1852, l'honorable M. Bradgley, du comité de la bibliothèque, présentait à l'Assemblée le rapport qui suit:[1]

"Nous avons reçu de M. G.-B. Faribault, l'agent député pour les deux chambres, à la derniere session, pour aller en Europe acheter des livres pour la bibliothèque un rapport détaillé de sa mission. Le comité désire manifester sa satisfaction sur la manière dont M. Faribault s'est acquitté de cette mission de confiance, nonobstant la malheur domestique qui l'a frappé et la mauvaise santé qu'il a eue et qui ont retardé ses travaux.

"Le zèle et l'assiduité déployés par M. Faribault, aussi bien que par M. Wicksteed, le greffier en loi de l'Assemblée, qui l'a aidé pendant qu'il était à Londres, en obtenant des départements publics, tant en France qu'en Angleterre, des dons de livres publiés sous la direction de ces gouvernements d'une grande valeur méritent une mention honorable. Des détails complets en rapport avec ces dons et aux travaux en général de MM. Faribault et Wicksteed se trouvent dans le rapport et le mémoire ci-joints. Au sujet de ces dons, le comité saisit la première occasion qui lui est donnée pour dire combien il apprécie la libéralité des gouvernements de France et d'Angleterre qui ont voulu enrichir la bibliothèque du Canada d'une série de publications de si haute valeur. Le comité désire remercier tous ces Messieurs de Paris et de Londres, qui avec une égale bonté, ont accepté et aidé par tous les moyens possibles les demandes de ces agents auprès de leurs gouvernements respectifs et de l'intérêt bienveillant qu'ils ont manifesté à notre bibliothèque. Assuré que ces sentiments seraient ceux de la Chambre, le comité a préparé des résolutions à ce sujet qui, lorsqu'elles seront adoptées pourront être adressées à ces messieurs par l'orateur.

"Le comité a aussi reçu de M. Faribault des états complets de ses dépenses accompagnés de pièces justificatives, tant pour l'achat des livres que pour les manuscrits et ses déboursés particuliers. Ces comptes sont déposés depuis trop peu de temps devant le comité pour qu'il ait pu les examiner à fond, mais autant qu'il a pu en juger par un premier examen, il peut dire qu'il approuve la manière économique et judicieuse avec laquelle les fonds mis entre ses mains ont été dépensés et le choix qu'il a fait d'un agent en Europe pour acheter des livres à l'avenir.

"Outre les dons dont il a été parlé plus haut, les bibliothécaires en ont aussi reçu plusieurs de personnages officiels ou de particuliers. Une liste en a été préparée qui accompagne ce rapport."

Nous extrayons du rapport de M. Faribault ce qui concerne les manuscrits :

"J'étais sur le point de commencer mon ouvrage, écrit M. Faribault, lorsqu'éclatèrent les événements du 2 décembre. Je dus tout interrompre et attendre les réponses des différents ministères à qui nous nous étions adressés. D'autres événements survinrent qui me plongèrent dans le plus grand trouble et m'infligèrent la plus pénible affliction qui pouvait m'arriver. Ma famille m'avait accompagné en Europe, et ma femme tomba malade. Ayant d'un côté le souci des soins à donner

[1] Journaux de l'Assemblée, 16 Victoria, 1852, vol. XI, part I, p. 430.

à ma femme, et l'obligation où j'étais de surveiller les intérêts que l'on m'avait confiés, je fus à la fin obliger de recourir à une personne de confiance que M. de Puibusque me présenta. Pendant plusieurs mois ma femme fut retenue au lit, et enfin, elle mourut au milieu du mois de mars. Accablé par ce malheur, et souffrant comme je l'étais d'une maladie de plusieurs semaines, je fus pendant longtemps incapable de m'occuper de rien. C'est alors que je reçus une lettre du président du Conseil législatif, qui ayant appris mon malheur, m'informait que M. Wicksteed, qui se trouvait en ce moment à Londres, viendrait à mon aide à Paris.....

"Aussitôt que ma santé me permit de laisser la maison, je me présentai au ministère de la guerre, au ministère de l'instruction publique,chez le ministre de la marine, au ministère des colonies et chez les secrétaires de différentes académies. Je reçus partout la plus bienveillant accueil et tous firent de leur mieux pour faciliter l'exécution de ma mission."

La Chambre vota 250 louis d'indemnité à M. Faribault. Le bibliothécaire Winder fait de son côté les plus grands éloges de la façon dont il avait accompli sa mission.[1]

La copie des manuscrits obtenue des archives de Paris par M. Faribault en 1851–52, fut reçue en Canada au cours des années 1853 et 1854.

Le président de la Société Historique en rend compte dans son rapport de 1854. "Les manuscrits des documents choisis par M. Faribault sont arrivés, dit-il. C'est la correspondance officielle des gouverneurs et intendants de la colonie avec les autorités françaises. Ils continuent la série de même nature déjà copiée à Albany, et formeront, lorsqu'ils seront reliés, onze volumes."

La Société Historique aurait bien voulu pouvoir placer cette nouvelle collection à côté de celle qu'elle possédait déjà, mais le gouvernement la réserva pour la bibliothèque du Parlement. Et ce fut bien heureux, car la bibliothèque de la Société Historique fut incendiée une première fois en 1854, avec l'Hôtel du Parlement, et une deuxième fois en 1862, alors qu'elle occupait des salles sur la rue St.-Jean. C'est depuis lors qu'elle est logée au Morrin College, où elle se trouve encore aujourd'hui. On sait quels services cette société a continué de rendre en publiant les manuscrits des journaux de Malcolm Fraser, Jean-Claude Panet, Simon Sanguinet, Jean-Baptiste Badeaux, Hugh Finlay, Antoine Foucher, et autres relations des sièges de 1759 et 1775, de même que les documents recueillis par M. Desmazières de Séchelles, sur Jacques Cartier.

La bibliothèque du Parlement à Ottawa possède encore la collec-

[1] Journ. Ch. d'Ass. p. 11, 1852.—A ceux qui seraient désireux de connaître la carrière de M. Faribault, nous référons à l'opuscule publiée en 1867, par l'abbé H.-R. Casgrain.

tion des manuscrits qui furent copiés à Paris de 1851 à 1854, d'après les instructions de M. Faribault.

Ce sont ceux connus comme la "deuxième série" et la "troisième série."

Le catalogue de 1858 en a donné une table analytique.

Deuxième série, (p. 1499–1538).

Vol. I. . . . . 1614–1661.
Vol. II. . . . . 1672–1679.
Vol. III. . . . . 1666–1686. (comprenant les recensements de 1666, 1667, 1681).
Vol. IV . . . . . 1680–1685.
Vol. V . . . . . 1686–1690.
Vol. VI . . . . . 1691–1693.
Vol. VII. . . . . 1694–1696.
Vol. VIII. . . . . 1696–1699.
Vol. IX. . . . . 1699–1703.
Vol. X. . . . . 1703–1707.
Vol. XI. . . . . 1708–1727.

La "troisième série," (p. 1538 à 1611), comprend:

Vol. 1. . . . . (1654–1699), Acadie.
Vol. 2. . . . . (1672–1679), "
Vol. 3. . . . . (1659–1709), (Terreneuve).
Vol. 4. . . . . (1703–1708), " . .
Vol. 5. . . . . (1706–1714), T. N. et Ile Royale.
Vol. 6. . . . . (1713–1717), Canada.
Vol. 7. . . . . (1718–1721), "
Vol. 8. . . . . (1722–1725), "
Vol. 9. . . . . (1725–1726), "
Vol. 10. . . . . (1727 "
Vol. 11. . . . . (1728–1729), "
Vol. 12. . . . . (1730–1731), "

Le secrétariat de la province de Québec possède aussi une copie de la deuxième série, à la réserve du onzième volume, et une copie de la troisième série à la réserve des cinq premiers volumes. Il en a été publié une table analytique dans le rapport de 1886-87 (1888), p. 129 à 235.

VIII.

M. Faribault était à peine revenu de sa mission au mois de juillet 1852, que M. P.-L. Morin, dessinateur employé au département des terres, fut envoyé à Paris pour y relever les originaux des cartes et plans intéressant l'histoire de la Nouvelle-France, qui pouvaient se trouver dans les dépôts d'archives. Le 7 décembre 1854, le comité de la bibliothèque faisait rapport à la Chambre qu'il avait examiné avec beaucoup d'intérêt la collection préparée par M. Morin. Mais, comme ces cartes

et plans étaient des décalques pris sur les originaux, M. Morin reçut instruction de les copier sur bon papier, afin qu'ils pussent être conservés d'une façon plus durable et mis en portefeuille.[1] M. Morin reçut 150 louis pour faire ce travail.

Les copies de plans de M. Morin sont encore aujourd'hui à la bibliothèque du Parlement à Ottawa, et il en a été publié une liste descriptive dans le catalogue de 1858, pp. 1614–1621, c'est ce que l'on appelle la "cinquième série" des manuscrits.

M. Morin avait aussi apporté de France une liste de documents historiques que l'on pouvait se procurer dans les différents dépôts de France, mais la question de les faire copier fut remise à plus tard.[2]

M. Morin vendit tout de même à la biliothèque plusieurs copies de manuscrits que l'on trouve énumérés à la page 1612 du catalogue de 1858, et qui ont été reliés en un volume. Ces documents sont de nature variée, ainsi qu'on peut voir par l'énumération sommaire qui suit:

1504 à 1760:—Evénements chronologiques du Canada.
Relation de la prise du fort Nécessité.
Plan du fort Duquesne, et de ses environs.
Relation de la bataille de la Belle-Rivière.
Autre relation de la même bataille, (9 juillet 1755).

Mémoire sur lequel on a interrogé les deux Canadiens (du nom de Pierre et J. B. Talon), qui sont soldats dans la compagnie de Feuquerolles, qui ont fait le voyage de la Louisiane, avec le Sieur de la Salle, concernant l'assasinat commis sur ce dernier, (14 février 1698).

Etat général, signé Panet, des billets d'ordonnances, dont il a fait la vérification sur les bordereaux que lui ont remis les porteurs et propriétaires d'iceux du gouvernement de Montréal, au désir du règlement fait le 22 mai dernier approuvé de son excellence monsieur le gouverneur (30 janvier 1763).

Etat général des monnaies de carte, suivant les bordereaux restés exposés au greffe de Montréal, depuis le 1er juin jusqu'au 30 juin 1763. Copie de l'état général des lettres de change restées en Canada.

On trouve aussi à la bibliothèque un *Index des manuscrits de la Nouvelle-France*, (1732–1763).

La bibliothèque acquit encore de M. Morin le deuxième volume des voyages de Franquet, qu'il avait fait copier à Paris en 1854.[3] Il est analysé à la page 1613 du catalogue de 1858.

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[1] Journ. Ch. d'Ass. 1854, p. 472.

[2] Loc. cit., p. 542.

[3] Cf. *Opinion publique*, de 1876, p. 77, où M. Marmette donne une description de ce manuscrit.

On s'occupait dans le même temps de mettre en ordre les documents déposés au palais de Justice à Montréal. M. Jacques Viger avait été chargé de ce travail en 1849, mais comme il n'avait pu s'en occuper, M. A. G. Belisle fut nommé pour le remplacer en 1852.[1]

Comme on le voit, le gouvernement après avoir laissé d'abord à l'effort individuel des sociétés le soin de s'occuper de la recherche des matériaux pouvant servir à l'histoire du pays, (1824–1851), poursuivait lui-même ce travail avec un zèle digne de tous éloges.

En 1853, sur la proposition du député Christie, la Chambre d'Assemblée décida de faire réimprimer les *Edits et Ordonnances* dont l'édition de 1803 était devenue fort rare. Il fut résolu aussi de faire un choix dans les archives de la province des documents qui pourraient jeter de la lumière sur l'histoire du pays dans le but de les donner à l'impression et de répandre aussi la connaissance des choses du passé dans le public.[2] La deuxième édition des Edits et Ordonnances, revue et augmentée, parut en trois volumes aux cours des années 1854 et 1855. En 1852 et 1853, le gouvernement fit aussi publier en trois volumes les pièces et documents sur la tenure seigneuriale du Bas-Canada, avec la correspondance des gouverneurs et intendants sur le même sujet. C'est une mine inépuisable de renseignements.

A trois heures du matin, le premier février 1854, l'Hôtel du Parlement à Québec était détruit de fond en comble par l'incendie. Il y avait alors dans la bibliothèque 17,000 livres et l'on venait d'en faire le catalogue.[3] Grâce aux prêtres et aux élèves du séminaire qui s'organisèrent en corps de sauveteurs, il put en échapper 9,319 au désastre. Ces livres furent déposés dans trois chambres du séminaire, et les bibliothécaires s'y installèrent. Cette hospitalité fut d'autant plus heureuse que quelques jours après l'incendie l'Hospice des Sœurs de la Charité où les députés siégeaient provisoirement fut à son tour réduit en cendres. Si l'on y avait transporté les livres sauvés de la première conflagration, tout aurait été perdu sans ressources. La bibliothèque était assuré pour 10,000 louis. Les livres sauvés furent évalués à 6,023 louis, et le gouvernement reçut 5,700 louis d'indemnité pour les pertes subies.[4] Les manuscrits recueillis par Faribault en Europe avaient heureusement échappé à la conflagration.

Le 5 mai 1855, le bibliothécaire de la Chambre d'Assemblée, M. Todd, fut envoyé en Europe pour y acheter les livres nécessaires pour reconstituer la bibliothèque détruite. Il devait être aidé dans le choix

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[1] State Book L, p. 551.

[2] Journ. de la Ch. d'Ass. 1853, p. 1025.

[3] Ces volumes avaient été de nouveau apportés à Québec, le 13 août 1851, à la suite du personnel de l'Assemblée.

[4] Journ. de la Ch. d'Ass. 1854, 14 juin, p. 5., 15 nov. p. 317; 14 déc. p. 542.

des livres français par M. Joseph-Charles Taché qui se trouvait alors à Paris où il représentait le gouvernement à l'Exposition universelle.[1]

C'est en 1801, sur la proposition de M. Pierre Bédard, appuyé par M. John Caldwell, que la Chambre d'Assemblée avait commencé l'achat de livres pour la formation d'une bibliothèque.[2] Les premiers règlements de la bibliothèque furent adoptés le 10 mars 1802.[3]

Ils prescrivaient ce qui suit:—

1e. Catalogue des Titres, Editions, Formats, prix d'achat et frais des livres, sera tenu par le Greffier de la Chambre, auquel en sera donné la garde et la responsabilité.

2e. Des Caisses portatives, aisées à transporter en cas de feu, ou autre accident, seront immédiatement faites sous la direction du dit Greffier, et des inscriptions en gros caractères seront mises sur ces Caisses, désignant le contenu de chacune.

3e. La Bibliothèque sera déposée dans la Chambre de Comité, ou le Bureau du Greffier, ou aucune autre partie de la maison, qu'il paroitra le plus convenable à l'Orateur.

4e. Aucune personne n'aura droit d'avoir accès aux livres, à l'exception du Gouverneur, Lieutenant Gouverneur, ou la Personne ayant l'administration, des Membres des Conseils Exécutif et Législatif, et de la Chambre d'Assemblée et des Officiers des deux Chambres. On pourra avoir accès aux livres à toutes les heures durant les Sessions de la Législature, et le Mardi de chaque semaine, depuis dix heures du matin jusqu'à trois heures de l'après-midi, durant les prorogations; mais on ne devra permettre à aucune personne, sous quelque prétexte que ce soit, à l'exception du Gouverneur, Lieutenant Gouverneur, ou la personne ayant l'administration du Gouvernement, d'en emporter aucun hors du bâtiment.

5e. Le Greffier fera régulièrement un rapport à la Chambre, par la voie de l'Orateur, à l'ouverture de chaque Session, de l'état actuel de la Bibliothèque.

On peut consulter dans les journaux de l'ancienne Chambre d'Assemblée du Canada de 1804 à 1838, les rapports du comité de la bibliothèque. Ces rapports sont très intéressants car ils nous indiquent, année par année, les livres achetés. Le greffier dépensait d'ordinaire 300 louis par année pour les nouvelles acquisitions. En 1841, lors de l'Union, la bibliothèque de Québec fut transportée à Kingston sur des barges. Elle se composait dans le temps de 6,722 volumes, suivant le rapport qu'en fit le bibliothécaire Jasper Brewer.

La Chambre d'Assemblée du Haut-Canada avait aussi commencé à organiser une bibliothèque en 1816, mais elle fut négligée jusqu'en 1825,

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[1] Journ. Ch. d'Ass. 1855, p. 1004.

[2] Journ. Ch. d'Ass. 1801, 23 mars, p. 373, 407. La liste des premiers livres qui furent achetés est donnée au long.

[3] Loc. cit., 1802, p. 33, 229.

où l'on s'occupa un peu sérieusement à la reconstituer.[1] Deux allocations votées pour cette fin furent cependant employées ailleurs. Il faut lire l'enquête qui fut tenue en 1837 sous la présidence de Henry Sherwood pour se rendre compte de l'état de cette bibliothèque à cette époque.

En 1842, lorsque les livres de l'Assemblée du Haut-Canada furent transportés à Kingston pour ne plus former qu'une seule bibliothèque avec celle du Bas-Canada on se trouva à avoir en tout 6,634 volumes. On fit deux parts des livres du Haut-Canada, dont l'une (631 volumes) alla à la bibliothèque du Conseil législatif, et l'autre (590) resta à la bibliothèque de l'Assemblée.[2] La plus précieuse acquisition qui résulta de l'union des deux bibliothèques fut celle d'Alphonse Todd, ancien bibliothécaire de la Chambre d'Assemblée du Haut-Canada, qui remplaça bientôt le titulaire en chef, William Winden. Le Parlement Uni voulut avoir une bibliothèque digne du pays et il fut recommandé en 1845 un crédit en conséquence. Une partie de la bibliothèque du juge Fletcher fut achetée, et pendant que la librairie Fabre recevait l'ordre de faire l'acquisition de livres français, la maison Derbishire et Desbarats se chargeait des livres à acheter en Angleterre.[3] En 1845, la bibliothèque suivit le siège du gouvernement à Montréal. Comme les villes de Québec et de Toronto se trouvaient privées de la bibliothèque des Parlements, l'on partagea en 1846 les doubles entre l'Athénée de Toronto et la Société littéraire et historique de Québec.[4]

L'incendie survenu à Montréal en avril 1849 arrêta brusquement le travail de réorganisation de la bibliothèque et l'on venait à peine de se remettre à l'ouvrage que celui de 1854 obligeait à tout recommencer encore.

Les désastres de 1849 et de 1854 inspiraient des craintes légitimes, pour la conservation des manuscrits précieux que l'on avait fait copier à Paris et à Albany, et pour tous les documents précieux disséminés dans les divers dépôts de la province. Aussi, le 3 octobre 1854, M. Chauveau, alors député de Québec, fit adopter par la Chambre, une résolution pour imprimer de suite tous ceux que l'on possédait, et qui avaient

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[1] Cf. Journ. de la Ch. Ass. Haut-Canada, 1825–6, p. 7 et 9; 1826–7, p. 83 et 86; 1828, pp. 109, 115; 1829, p. 37; 1830, p. 13; 1831, p. 53, 101; 1832–33, p. 135; 1833–34 (loi 4 Guil. IV. ch. 52, pour approprier 500 louis à l'achat des livres); 1835, p. 156, 400, 413 et appendice No. 100; 1836, p. 5, 25, et appendice No. 141; 1836–7, pp. 525, 640 (loi attribuant 1,000 louis pour la bibliothèque) et appendice No. 32, (enquête sur la bibliothèque sous la présidence de Henry Sherwood). En 1836, le bibliothécaire, Robert B. Sullivan, a un traitement annuel de 75 louis.

[2] Journ. Ch. Ass. 9 sept. 1842, appendice B. 1843, appendice C.

[3] Ibid. 1844–45, 27 janvier 1845, p. 203 et 378, et appendice C.

[4] Appendice OO, 1846, et Journ. Ch. Ass. 1847, p. 67.

quelque valeur historique.[1] De son côté, M. Faribault était anxieux de faire continuer la copie des documents de Paris, et la Chambre recommanda qu'il fut accordé 200 louis à cette fin.[2] Il restait encore, parait-il, 6,000 pages à faire transcrire. La même année, le Conseil vota cent louis au comte de Rottermund, un géologue de distinction qui avait fait des explorations au Canada, pour lui permettre d'acheter à Paris des livres, des cartes et des échantillons propres à promouvoir la science géologique, et afin de remplacer ceux que l'incendie de 1854 avaient détruits.[3] En train de générosité, l'on vota de même 300 louis, pour acheter des livres de prix et les distribuer dans les écoles.[4] M. Pierre Margry aurait bien voulu lui aussi partager à ces largesses, et il fit l'offre au gouvernement, par l'entremise de M. J.-C. Taché,qui était alors secrétaire du comité de l'exposition à Paris, d'imprimer certains documents relatifs aux ressources naturelles, industrielles et commerciales du Canada, sous la domination française, mais l'on ne crut pas devoir entretenir cette proposition.[5]

Au mois de juillet 1855, alors que le siège du gouvernement était sur le point d'être transféré à Toronto, les membres du barreau et plusieurs citoyens de Québec demandèrent que les archives françaises demeurassent dans la vieille capitale, afin que ce précieux dépôt, qui n'intéressait en aucune façon la province unie, n'eût plus à courir aucun danger.[6] Le gouvernement se rendit à cette demande, et les archives françaises restèrent où elles étaient alors déposées, dans le Château Haldimand à Québec. Et lorsque, l'année suivante, cet édifice historique donna l'hospitalité à la nouvelle Ecole Normale, qui venait d'être fondée, il fut bien entendu que rien ne serait changé au dépôt des archives[7] et que celles-ci continueraient à y reposer en paix.

En 1855, le gouvernement prit la généreuse résolution de voter 1,400 louis, afin de faire réimprimer les "Relations des Jésuites." Il devait être tiré 1,000 exemplaires.[8] L'impression fut terminée en 1858, et l'apparition de ces trois volumes fut saluée avec une expression de sincère administration par les savants du monde entier.[9] L'*American Historical Magazine*, du mois de janvier 1859, (p. 29–30) disait à ce propos: "Nous félicitons les étudiants de l'histoire primitive de

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[1] Journ. de Ch. Ass. 1854–55, p. 150.

[2] Ibid. p. 317. Une résolution du même genre fut adoptée en 1861. Ibid. p. 321

[3] State Book O, p. 68–69, 27 février 1854, app. 262-263.

[4] State Book Q, p. 68, 29 décembre 1855.

[5] State Book P, p. 559, 27 sept. 1855.

[6] Ibid. 14 juillet 1855, p. 310.

[7] Ibid. Book Q, 24 octobre 1856, p. 569.

[8] Ibid. Book P, 25 sept. 1855, p. 551. En 1815, une loi avait été adoptée pour aider M. Bouchette à publier une carte de la province.

[9] Rapport du bibliothécaire du Parlement, 1859, pp. 12–13.

l'Amérique sur cette réédition. Nous connaissions la valeur de ces relations par Sparks, Bancroft et O'Callaghan, mais leur extrême rareté nous empêchait de les consulter. Maintenant, elles sont accessibles à tous, grâce au gouvernement Canadien."[1] Le gouvernement fit présenter un exemplaire de cette belle réédition à la Reine d'Angleterre et à l'Empereur des Français.

En 1857, le R. P. Martin, recteur du Collège des Jésuites à Montréal, sur le point d'entreprendre un voyage en Europe, dans le but de faire des recherches sur l'histoire du Canada dans les archives particulières de plusieurs familles qui jouèrent un rôle dans la colonie, et surtout dans les archives des Jésuites et des Récollets à Rome, demanda et obtint 500 dollars du gouvernement, afin de l'aider à payer les frais de copie des documents et plans qu'il serait obligé de prendre, à la condition que ces copies fussent déposées à la bibliothèque du Parlement pour enrichir le dépôt de nos monuments historiques.[2] La Bibliothèque possède un volume des documents copiés par le R. P. Martin (1857–59).

La même année, MM. Ferland et Faribault s'adressaient au comité de la bibliothèque, afin d'obtenir une aide de 350 louis, pour se procurer en France 6,000 pages de manuscrits, mais celui-ci, désireux d'avoir de plus amples informations, ne fit aucune recommandation à la Chambre d'Assemblée.[3]

En 1858, F.-X. Garneau, qui avait publié une première édition de son *Histoire du Canada* de 1845 à 1852, puis une deuxième édition en 1852, comprit qu'il devait reviser son œuvre à la suite des documents nombreux que le gouvernement venait de faire copier à Paris et à Albany. Dix ans auparavant, en 1848, le gouvernement lui avait déjà voté 250 louis, sur sa demande.[4] Le comité de la bibliothèque souscrivit en 1858, pour 150 copies de la nouvelle édition revisée.[5]

M. Alpheus Todd, qui avait été envoyé en Europe afin de reconstituer la bibliothèque incendiée en 1854, dépensa près de 10,000 louis en achat de livres nouveaux.[6] A son retour de voyage il fut nommé bibliothécaire en chef à la place du Dr. Winder, qui prit sa retraite, et M. Gérin-Lajoie, devint assistant-bibliothécaire.

Le catalogue de la bibliothèque qui fut publié en 1857 et 1858

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[1] Pour les détails sur l'impression des Relations, voir State Book T., p. 312, 325, 582, 611 (1858–59). M. John Lovell projeta dans le temps d'en publier une version anglaise, mais il n'eut pas un nombre suffisant de souscripteurs, et le gouvernement ne crut pas devoir lui venir en aide (State Book U, p. 654–1860).

[2] State Book R, 6 août 1857, et dossier No. 1796, secrétariat d'Etat.

[3] Journ. Ch. As. 6 juin 1857, p. 661.

[4] Archives du Canada, secrétariat d'Etat, dossier 1460, No. 3352 (1848), State Book I, p. 444.

[5] Journ. Ch. Ass. 3 août 1858, p. 937.

[6] Rapport de Todd, Journ. Ch. Ass. 11 avril 1856, p. 9 et 288.

démontre quels trésors précieux on avait pu amasser déjà, alors que quatre années à peine s'étaient écoulées depuis l'incendie.

Nous n'avons ici qu'à nous occuper des documents dont elle était devenu le dépôt central. A part les collections Faribault, Morin et Martin, la bibliothèque possédait encore un grand nombre de pièces manuscrites, entre-autres les papiers Chisholme, achetés de la succession David Chisholme, de Trois-Rivières. Ces papiers comprenaient surtout des commissions, des ordonnances, des instructions aux gouverneurs, de 1760 à 1792. M. Chisholme avait eu l'intention d'écrire une histoire du Canada. On voyait encore sur ses rayons sept volumes de manuscrits, provenant de John Pownall, ancien secrétaire du *Board of Trade*. Après sa mort arrivée en 1795, ces papiers étaient passés entre les mains de son fils Sir George Pownall, qui fut secrétaire de la province du Bas-Canada jusqu'en 1805. Sir George Pownall les légua à H.-W. Ryland, alors secrétaire du gouverneur, et le fils de ce dernier les vendit à la bibliothèque.

Ces sept volumes contenaient des documents provenant du *Board of Trade*, et concernant les colonies anglaises d'Amérique en général, depuis 1704. La liste en est donnée dans le catalogue de 1858, p. 1648–1655.

La bibliothèque possédait encore la carte de Samuel Holland dressée en 1791 et démontrant les nouveaux comtés du Canada, un volume de 370 pages, récit de voyage dans le pays en 1792 et 1793, les voyages et mémoires sur le Canada en 1752 et 1753 par le sieur Franquet, inspecteur des fortifications, une relation des opérations à Louisbourg pendant la guerre de sept ans, le dialogue des morts entre Wolfe et Montcalm, les articles des capitulations de Québec, de Montréal et de Louisbourg, des récits des campagnes de 1759 et 1760 au Canada. L'on s'attendait à recevoir encore de Paris beaucoup d'autres documents que le comité de la bibliothèque se proposait d'y faire copier. Le 22 juillet 1859, le gouvernement vota 600 louis pour l'acquisition des journaux et rapports d'arpentage du territoire du Nord-Ouest par David Thompson (*State Book* U, p. 264).

En 1861, MM. Ferland, Garneau et Faribault demandaient une aide pour faire imprimer un choix de pièces de la collection manuscrite de la bibliothèque qui comprenait déjà plus de 50 volumes in-folio. Le comité de la bibliothèque jugea qu'il valait mieux de compléter la copie des manuscrits que l'on savait exister encore à Paris avant d'entreprendre un pareil travail d'impression.[1] Entre temps, le gouvernement s'occupait de faire copier les registres qui tombaient de vétusté, chaque fois qu'on lui en signalait la nécessité. Ainsi fut transcrit à nouveau en 1860 le premier registre des délibérations du Conseil Supé-

[1] 15 mai 1861, Journ. Ch. Ass. p. 321.

rieur (1663-1664) par M. Amable Belanger, un calligraphe en renom dans son temps.[1] Celui-ci recopia aussi en 1862 les registres des baptêmes, mariages et sépultures de Trois-Rivières (1675-1699), à la demande du juge Lafontaine, qui s'intéressait beaucoup aux choses de l'histoire.[2] Il en fut de même pour plusieurs registres de l'état civil de la région de Québec, à la demande de l'évêque Baillargeon.[3]

Afin de classer les documents manuscrits déposés au bureau du registraire, le gouvernement nommait un garde spécial, en 1862, avec un traitement annuel de 800 dollars.[4] Mais, dans le même temps, l'on abolissait les emplois de garde d'archives aux palais de justice de Québec et de Montréal pour en confier le soin aux protonotaires.[5]

La bibliothèque du Parlement transportée de Toronto à Québec dans l'hiver de 1860 ne put trouver place pour tous ses livres dans le nouvel hôtel qui venait d'être construit sur les ruines de l'ancien. Les livres relatifs aux sciences et à l'histoire d'Amérique furent logés à l'Université Laval. Quant aux livres de droit français, ils furent remis aux commissaires chargés de la Codification.[6] La bibliothèque s'enrichit en 1861, lors du passage du prince Napoléon à Québec, d'une belle collection des livres publiés sous les soins du gouvernement français entre autres de la correspondance et des papiers d'état du cardinal de Richelieu.

Dans l'automne de 1865, les livres de la bibliothèque prirent le chemin d'Ottawa.[7] Ce fut leur dernier transbordement en barge sur la rivière et les canaux du Canada. La première migration avait commencé en 1841. Les livres de droit français laissés entre les mains des codificateurs ne furent versés à Ottawa qu'en 1869.[8] On était resté longtemps dans l'indécision pour savoir si les livres de la bibliothèque ne devaient pas être divisés par moitié entre les provinces de Québec et d'Ontario. Ce ne fut qu'en 1867 qu'on décida enfin de les garder à Ottawa.[9] C'est là qu'on retrouve aujourd'hui tous ces vieux bouquins qui pendant vingt-cinq ans voyagèrent à la suite des législateurs, tantôt à Kingston ou à Toronto, tantôt à Montréal ou à Québec. Un nouveau service de la bibliothèque fut organisé par la loi de 1871 (34

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[1] State Book V, p. 239.
[2] State Book X, p. 357.
[3] Ibid. p. 134, (1862).
[4] State Book X, p. 134.
[5] 12 et 20 août 1863, 21 décembre 1864, State Book Y, p. 683, 704, et State Book AA, p. 543.
[6] Journ. Ch. Ass. 1860, p. 5, 6.
[7] Ibid. 1865, p. 214, et 1866, p. 4.
[8] Ibid., 1869, p. 8.
[9] Journ. Ch. Ass. 1867, p. 7.

Vict. 21), l'année même où l'on posa sous la rotonde la superbe statue en marbre de la Reine Victoria due au ciseau de Marshal Wood.[1]

Depuis 1852 jusqu'à 1868, on peut dire que le comité de la bibliothèque avait agi comme une véritable commission pour l'encouragement des travaux littéraires au Canada. C'est à lui que les auteurs s'adressaient, et c'est lui qui recommandait l'achat de leurs œuvres au gouvernement. C'est à la bibliothèque encore que les auteurs devaient faire le dépôt légal de leurs livres pour conserver leur droit de propriété. Enfin, la bibliothèque était devenue le dépôt central de tous les manuscrits historiques que le gouvernement avait fait copier à l'étranger. C'est à ce dernier titre que nous avons dû nous en occuper si longuement dans cette étude.

A partir de 1868, le comité de la bibliothèque décida de laisser au gouvernement lui-même le soin d'encourager les arts, les sciences et les lettres et de ne plus s'occuper que de l'administration et du choix des livres.[2] L'on posa comme règle qu'on achèterait 50 exemplaires d'un ouvrage canadien de valeur pour échanger avec les autres bibliothèques. En 1870, on estimait que les 50,000 volumes de la bibliothèque valaient 50,000 louis.

Dans les deux décades qui s'étendent de 1845 à 1865, on peut dire que la littérature canadienne française produisit ses meilleurs ouvrages, depuis *l'Histoire du Canada*, de Garneau, qui battit la marche, jusqu'à celle de Ferland qui vint clore cette brillante période. Les Notes de Ferland sur les registres de Québec (1854), celles de Sir Louis Hyppolite Lafontaine sur la famille Lauzon (1859), celles de Langevin sur les archives de Beauport (1860) prouvent que l'on avait commencé à étudier aux sources manuscrites. Les publications des manuscrits par la Société littéraire et historique de Québec, celles des mémoires et documents commencés en 1859 par la Société Historique de Montréal donnent l'élan aux recherches de première main. C'est alors que paraissent les Ordonnances de Maisonneuve et la complétion aux *Relations des Jésuites* par le P. Martin (1860).

On s'occupe aussi en France de notre histoire. Ramé et Michelant rééditent avec des notes copieuses les Voyages de Cartier. Tross publie ses superbes éditions de Lescarbot et de Sagard. Dussieux recueille aux archives du ministère de la guerre les éléments de son étude sur le Canada. Margry commence la publication des mémoires sur la découverte du Mississipi et des régions de l'Ouest, puisés aux archives des colonies. Tailhan nous fait connaître les mémoires encore manus-

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[1] Cette statue qui coûta 2,000 guinées eut le bras droit cassé, quand on la transporta de la Chambre du Sénat à la Bibliothèque. Le sculpteur a su si bien réduire cette fracture qu'il n'y parait plus maintenant.

[2] Journ. Ch. Ass. 1868.

crits de Nicolas Perrot. Faillon publie les vies de Mde. Youville, de la Sœur Bourgeois, de M. Ollier, de Melle. Mance, qu'il couronne par son *Histoire de la Colonie Française au Canada* (1865). Cet auteur érudit, par les notes qu'il écrit en marge de ses ouvrages, nous révèle les trésors que renferment les dépôts d'archives de France, qu'il semble avoir tout parcourus.

Québec est la plus ancienne province du Canada, et il est tout naturel que l'on s'occupe tout d'abord de son histoire. Mais les provinces plus jeunes donnent alors à l'unisson dans cet élan vers les recherches et les fouilles historiques.

La province du Haut-Canada, qui date à peine de soixante-ans, s'occupe en 1847 et en 1851, de reconstituer ses archives détruites à deux reprises différentes en 1812 et 1824. En 1855, la Chambre d'Assemblée du Canada ordonne que l'on fasse prendre en Angleterre, au *Colonial Office*, des copies des journaux de ses délibérations depuis 1792.[1] En 1859, de nombreuses pétitions sont présentées à la Chambre, par des citoyens du Haut-Canada. On y demande que tous les documents relatifs à l'histoire de cette province, depuis la prise du fort de Niagara en 1759, et depuis son premier établissement par les *Loyalists*, soient recueillis. Cette intéressante période de nos annales, disent-ils, est presque inconnue. Les incendies de 1812 et 1824, ont tout détruits. La Chambre d'Assemblée approuve cette démarche si digne d'éloges, et vote cent louis pour commencer des recherches dont elle confie la direction à M. George Coventry.[2] En 1860, le comité de la bibliothèque fait rapport que M. Coventry a commencé son travail, et qu'il a obtenu déjà les meilleurs résultats. Il a eu communication, entre autres, d'une importante collection de manuscrits appartenant à la sucession du lieutenant-colonel Simcoe, premier lieutenant gouverneur du Haut-Canada, et on lui a permis d'en prendre des copies. Les services de M. Coventry ont été retenus, et il va maintenant faire la recherche des documents relatifs aux premiers établissements français sur l'Ohio jusqu'en 1759, à la colonisation du Haut-Canada, jusqu'en 1791, à la guerre avec les Etats-Unis en 1812 et 1815. M. J.-P. Merritt, de Ste.-Catherine, qui a déjà fait des recherches au *British Museum* et au *State Paper Office* à Londres, est chargé d'y continuer son travail. La Chambre vote 300 louis pour ces travaux.[3] Les travaux de Coventry se continuèrent en 1861, 1862, 1863. Les rapports du comité de la bibliothèque en rendent compte.[4]

La Bibliothèque du Parlement Fédéral possède comme résultat de ces recherches:

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[1] Journ. Ch. Ass. 28 mai 1855, p. 1267.
[2] Ibid. 1859, pp. 38, 137, 156, 525, 534.
[3] Ibid. 1860, p. 350, 391, 427, 546.
[4] Journ. Ch. Ass. 1861, p. 321; 1862, p. 6 et 246; 1863, p. 177.

5 volumes des documents Simcoe, (1789–1806).

1 volume de documents manuscrits, concernant le Haut-Canada, (1783–1795).

1 volume de mémoires et relations, concernant les Loyalistes du Haut-Canada, et autres colons originaires.

1 volume de mémoires relatifs au Haut-Canada, (1791–1799).

1 volume, même sujet, (1799–1809).

1 volume, même sujet, (1812–1818).

3 volumes relatifs aux terres du Haut-Canada, (1764–1795).

1 volume, mémoires concernant le Canada, (1759–1775).

1 volume, mémoires du colonel John Clark et W. Merritt.

Journal des voyages de Alexander Henry. Voyages du neveu de Henry, (1799–1816).

En 1857, le gouvernement donna aussi instruction au député régistraire de la province, William Kent, de préparer un index aux octrois de terre dans le Haut-Canada, de 1794 à 1825. Ce travail fut mené à bonne fin.

De son côté, la Nouvelle-Ecosse adopta, dès 1857, une loi pour l'organisation de ses archives. Un fonctionnaire qui porte le titre de *Commissioner of Public Records*, en a la garde et la direction. Il a été publié en 1877, un catalogue des manuscrits qui sont conservés dans les bureaux publics à Halifax. Il décrit les documents qui datent de 1710 jusqu'à 1867.

Le 24 mars 1871, Sir A.-T. Galt présentait devant les Communes du Canada, une pétition signée par 57 des littérateurs les plus en renom de Québec et de Montréal.[1] dans laquelle il était représenté que les auteurs et les chercheurs de ce pays n'avaient pas les facilités d'accès aux archives publiques que l'on trouvait en Angleterre, en France et aux Etats-Unis. Dispersées comme elles sont, disaient-ils, leur consultation est à peu près impossible. On demandait donc qu'elles fussent rassemblées en un dépôt central à l'épreuve du feu, classées et cataloguées, et qu'une loi fut votée pour pourvoir à leur conservation et faciliter les recherches des travailleurs. De la sorte, l'on pourrait pour écrire l'histoire recourir en tout temps aux sources authentiques. Et l'on terminait en invoquant l'exemple de ce qui s'était fait dans cette voie à la Nouvelle-Ecosse et dans les autres pays.[2]

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[1] L'original en est conservé aux Archives du Canada (Letters received, I, 120).

[2] Le Dr. H. H. Miles, dont le nom apparaît en tête de ceux des signataires a publié une étude "*On Canadian Archives,*" dans les mémoires de la Société Historique de Québec, 14 décembre 1870.

Cette pétition référée au comité de la bibliothèque fut transmise à l'honorable Christopher Dunkin, alors ministre de l'Agriculture et des Statistiques.[1] Le Conseil exécutif, sur son rapport favorable, vota un certain montant pour faire une enquête préliminaire,[2] et le 20 juin 1872, M. Douglas Brymner était nommé au nouveau bureau que le ministre de l'Agriculture devait organiser, avec un traitement annuel de 1,200 dollars. Tel fut l'origine de ce que l'on a appelé depuis le bureau des archives du Canada.

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[1] Journ. Ch. Ass. p. 288.
[2] 2 août 1871.

VI.—*Louis Fréchette—Le poète lyrique.*

PAR M. L'ABBÉ CAMILLE ROY.

(Lu le 28 septembre 1910.)

Louis Fréchette fut d'abord, et presque exclusivement, poète lyrique. Impressionnable, facile à attendrir, âme toute gonflée de passions tumultueuses et fugitives, il a éprouvé, à un degré plus ou moins profond de sa sensibilité, des émotions: et ces émotions, il a vite cédé au besoin de le traduire en strophes.

L'amitié, l'amour, le souvenir; les paysages, les joies et les tristesses; la lumière et la vie, l'ombre et la mort, ont tour à tour sollicité sa muse, et lui ont dicté ses premiers vers. Son inspiration était surtout faite de sentiments. A travers les thèmes obligés du lyrisme, il laissa bien passer des idées, mais un petit nombre d'idées: assez abondantes pour donner de la consistance aux développements, mais ni assez fortes, ni assez nombreuses pour que l'œuvre entière en fut puissamment consolidée.

Louis Fréchette eut l'imprudence d'écrire dans la préface de *Mes Loisirs*: "Ce livre contient-il une idée?—Non!" C'est une calomnie, sans doute, qu'il se fit à lui-même; mais il indiqua en même temps et trop justement ce qu'il ne faut pas chercher d'abord dans ses vers. Ecrire "par amour pour l'art,"[1] et pour exprimer "le caprice du moment," ne fut par la règle exclusive du poète: elle ne l'est pas dans *Mes Loisirs*, elle le sera de moins en moins dans les recueils qui suivront; mais il importe, croyons-nous, d'observer dès maintenant que, dans la poésie de Louis Fréchette, le sentiment est bien l'élément principal, prépondérant, et aussi le plus personnel. Et il faut remarquer encore que ce sentiment eut des habitudes, des préférences successives: il variait avec les préoccupations changeantes de la vie, et avec les angoisses de la sensibilité.

Il y eut, chez Fréchette une véritable évolution du sentiment, et de la conscience: évolution qui ne fut, d'ailleurs, que le mouvement naturel de toute âme qui se développe et qui s'ouvre tour à tour aux réalités intimes et aux spectacles extérieurs. N'arrive-t-il pas, en effet, et, à peu près chez tout homme—au moins chez presque tous les artistes en vers—que l'âme s'absorbe d'abord tout entière en elle-même, se complaise dans ses premières méditations, se raconte pour s'apercevoir mieux dans l'expression de son propre rêve; puis elle va vers tant de

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[1] *Mes Loisirs*, Préface.

choses qui la distraient et l'attirent, elle se disperse sur le monde, elle parcourt l'espace ou le temps, quitte à revenir un soir, fatiguée de ses courses, au foyer de sa vie personnelle pour s'y recueillir encore et s'y reposer?

Louis Fréchette, à vingt ans, éprouva lui aussi le besoin de faire au public la confidence de ses premiers émois, et de lui dire quel écho trouvaient en son âme les bruits et les harmonies de la nature; puis il sortit de lui-même, il se répandit au dehors, il se blessa aux premières pierres du chemin, il s'irrita aux premiers contacts de la vie réelle; il esquissa l'image affreuse qui, lui semblait-il, avait passé sous ses regards. Dégoûté du présent, il se réfugia dans le passé, il considéra tant d'actions vaillantes qu'il voulut célébrer; il mesura, dans son rêve historique, les grands personnages dont il essaya de profiler dans sa *Légende* le torse vigoureux. Instruit, enfin, par la vie, assagi par toutes les leçons qu'il avait données, apaisé par la gloire, il revint aux calmes émotions de la conscience, aux joies familiales, aux commerces intimes dont on voit peut-être, dans son dernier recueil, dans les *Feuilles Volantes*, la plus pénétrante et la plus sincère expression.

Non pas, certes, que ces phases successives de la sensibilité de Louis Fréchette soit complètement tranchées et distinctes, sans compénétration de l'une dans l'autre. L'âme ne se découpe pas aussi nettement. Il sera facile de reconnaître toujours, tout le long de la carrière du poète, les premières inspirations qui ne meurent pas, et l'on trouvera dès les premiers recueils ce goût de l'épisode merveilleux, de la poésie historique qui ira s'élargissant dans la *Légende*, et jusque dans les *Feuilles Volantes*.

De même, sous la variété des thèmes et des sujets traités, on peut surprendre une manière assez uniforme du poète. Que Fréchette soit à l'âge où le cœur chante ses premières amours, ou qu'il soit au moment où sa colère l'excite contre les politiques; qu'il soit à l'heure où son patriotisme s'exalte dans l'épopée, où qu'il soit enfin aux jours plus recueillis où il s'enferme dans la joie des affections familiales, il fait voir et garde la même façon de s'émouvoir, il use des mêmes procédés. Confidentiel ou rêveur, comme Lamartine; emphatique, éloquent, à la façon de Hugo; comme tous deux, curieux de prendre aux regards du lecteur une pose avantageuse, Louis Fréchette reste, tout le long de son œuvre un fervent romantique. C'est à l'école des maîtres du romantisme qu'il s'est formé; c'est à leur flambeau, que, jeune étudiant, il alluma sa verve; toute sa vie il subira l'influence de leur art prestigieux. Louis Fréchette, toute sa vie, sera disciple avant d'être lui-même.

Et cela ne veut pas dire qu'il prendra aux autres la substance de ses vers, et qu'il n'y pourra mettre le meilleur de sa propre pensée, et qu'il ne trouvera pas pour s'exprimer le mot qui jaillit d'une âme ardente et sincère; mais cela laisse entendre que les souvenirs de lectures ont été

souvent pour lui comme des points de départ, les motifs inspirateurs de ses chants, une invitation pressante à méditer et à s'échauffer: ils étaient souvent l'aiguillon qui stimulait la muse paresseuse ou endormie.

Au reste, il n'est pas facile de démêler dans les œuvres d'un disciple de Lamartine, ou d'Hugo, ce qu'il y eut de bien personnel au poète, et ce qu'il y eut de suggéré, ou d'emprunté. Aucune poésie n'a été plus humaine que la poésie romantique, parce qu'aucune n'a exprimé plus complètement toute la sensibilité de l'homme. Et il est donc malaisé d'attribuer seulement à l'imitation ce qui peut n'être après tout que l'émotion spontanée d'une âme qui se sent, qui se livre, qui s'abandonne. C'est entendu que les romantiques, depuis Chateaubriand, ont célébré le mystère des solitudes, où l'âme se repose, et rêve. Mais qui osera dire que Fréchette n'était pas personnel quand un jour, au bord de la Loire, sur le seuil de la chapelle solitaire de Bethléem, il éprouva le bienfait de cette paix romantique?

Enivrement des solitudes!
Au seuil du vieux portail fermé,
L'aile des douces quiétudes
Rafraîchissait mon front calmé.

Adieu, chagrins et pensées sombres!
Je sentais—ô ravissement!
Comme un essaim de chastes ombres
Penché sur mon isolement.[1]

C'est encore un sentiment bien humain que celui de l'amour, et il devait donc pénétrer, lui aussi, dans les vers de Louis Fréchette. Celui-ci, d'ailleurs, n'en a pas abusé. Ni Lamartine, ni surtout Musset ne paraissent, ici, avoir exercé une grande influence sur la sensibilité ou l'imagination du poète. Il y a bien déjà dans *Mes Loisirs* plusieurs pièces où l'on sent frissonner une âme qui s'éveille sous le souffle de la passion, mais nulle part cette passion ne devient absorbante, excessive, encombrante. Le barde adolescent chante son *premier amour*:[2] mais déjà il n'en connaît plus la date certaine; même il en atténuera l'expression, quand, plus de dix ans après, il la voudra rééditer.

Une *barcarole*[3] gracieuse, d'autres pièces courtes et faciles, traduisent sans violence des sentiments qui se montrent sans audace. Une fois Louis Fréchette a dit simplement sur la femme ce qu'en pensent depuis longtemps ceux qui ont avec confiance appuyé sur elle leur vie, et

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[1] *Feuilles Volantes.* La chapelle de Bethléem, p. 128-129.

[2] *Pêle-Mêle,* p. 171. Cette pièce, datée de 1860, se trouve une première fois, dans *Mes Loisirs,* p. 109, sous le titre *Louise,* avec la date de 1862. Dans *Pêle-Mêle,* quelques vers diffèrent un peu de ceux que l'on lit dans *Mes Loisirs.*

[3] *Mes Loisirs,* p. 173.

les vers du poète, où se traduisent une simple philosophie, sont tout de suite allés se loger dans la mémoire de tous les amoureux. Le bon peuple canadien—celui des campagnes du moins—chante encore ces couplets où Fréchette fait de la femme le centre d'une religion très ancienne, couplets dévots où le cœur récite, sans qu'aucun scepticisme, sans qu'aucun désespoir, sans qu'aucun égoïsme le puisse contredire ses actes de *foi, d'espérance* et de *charité.*[1]

Il y avait, d'ailleurs, en Fréchette une sensibilité réelle, à la fois mobile et profonde. Et si cette sensibilité, appliquée à l'expression de la passion, n'a jamais guère dépassé la galanterie d'Oronte, elle s'est, au contraire, sincèrement émue chaque fois qu'elle a été mise en contact avec tant de choses attendrissantes dont se composent la vie et tous nos chers souvenirs.

La poésie du souvenir! elle remplit l'âme de Fréchette, et à la fin de sa vie elle s'échappe en flots pressés. C'est le vieux chalet du village qu'il aime à revoir dans ses rêves ou dans ses promenades parce qu'il lui rappelle ses plaisirs d'adolescent; il le décrit en strophes alertes; il se souvient qu'un soir, dans la croisée, lui apparut "souriante au couchant vermeil," une fraîche tête d'enfant; il s'émeut encore, il regarde, espérant voir:

> Refleurir à cette fenêtre
> La douce fleur de ses quinze ans![2]

La joie profonde de ceux qui vieillissent, c'est de pouvoir se replonger souvent dans les souvenirs anciens; ils retrouvent là, comme dans une fontaine de Jouvence, la fraîcheur d'un printemps disparu. Pourquoi, d'ailleurs, faut-il attendre que nous ayons vieilli pour goûter les joies de notre jeunesse? Fréchette, qui s'appliqua trop souvent à assombrir lui-même ses vingt-cinq ans, reportait volontiers plus haut, plus loin encore sa pensée, et il chantait ces années exemptes de trop amers soucis où l'on n'a guère à s'inquiéter que de son thème et de sa version, et où lui, l'écolier vagabond, promenait jusqu'à Nicolet l'indiscipline de ses fantaisies. C'était l'âge,

> Où tout n'est qu'espérance, enivrement, aurore,
> Où sous les purs rayons de l'horizon vermeil,
> La vie ouvre son aile, et l'âme semble éclore
> Comme une fleur céleste aux baisers du soleil.

C'était l'âge

> Où l'on rit, où l'on aime,
> Où l'on voit chaque jour passer devant ses yeux

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[1] *Mes Loisirs,* p. 183, *La Foi, l'Espérance et la Charité.*
[2] *Feuilles Volantes, A Quinze Ans,* pp. 85–95.

Quelque lambeau doré de l'éternel poème
Que chante aux cœurs naïfs l'avenir radieux.[1]

A l'occasion des fêtes du cinquantenaire du Collège de Lévis, le poète devenu vieux accourut sous le toit agrandi qui avait accueilli son enfance; il s'émut jusqu'aux larmes:

En croyant voir passer, le front nimbé d'aurore,
Le fantôme vivant de sa jeunesse en fleur.[2]

Une fois il est arrivé que Fréchette s'est souvenu pour rire et non pour pleurer. Il habitait alors Chicago. De la cité américaine et tapageuse il revit en un éclair de la pensée sa jeunesse folle, comme eût dit Villon, ses rêves, ses illusions, les heures perdues et joyeuses de sa vie d'étudiant, tout ce

Flot de poudre d'or qu'emporte le vent!

Il écrivit à son ami Alphonse Lusignan une longue poésie, d'allure rapide, légère, qu'il intitula *Reminiscor*, et à laquelle il donna comme épigraphe le vers de Martin Vezy: "Le souvenir, c'est tout, c'est l'âme de la vie."

Il rappella à Lusignan les joyeux passetemps, et les escapades de ce temps de basoche:

Oui, je l'aime encore ce temps de folie
Où le vieux Cujas, vaincu par Musset,
S'en allait cacher sa mélancolie
Dans l'ombre où d'ennui Pothier moisissait.

Nos quartiers étaient à peine accessibles:
Splendide grenier, mais logis mesquin;
Confuse babel d'objets impossibles:
La toge romaine au dos d'Arlequin!...

Il me semble voir la table rustique
A la jambe torse, au pied de travers,
Où nous écrivions en style érotique
Nos lettres d'amour et nos premiers vers...

Et quand venait mai dorer notre chambre
Ouvrant la fenêtre au printemps vermeil,
Nous respirions l'air tout parfumé d'ambre
Qui venait des prés tout pleins de soleil...

Nous aurions voulu, tant nous sentions battre
D'ardeur et d'espoir nos cœurs de vingt ans,
Ivres de désirs, monter quatre à quatre,
—Fous que nous étions!—l'échelle du temps.[3]

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[1] *Epaves Poétiques*, p. 67. Au Collège de Nicolet. A l'occasion du centenaire de sa fondation.

[2] *Epaves Poétiques*, p. 95. Stances. A l'occasion du cinquantième anniversaire de la fondation du Collège de Lévis.

[3] *Pêle-Mêle*, Reminiscor, p. 77.

"Quand venait mai dorer notre chambre:" Ce souvenir de printemps qui met un rayon de joie dans l'âme de l'exilé, nous montre déjà comme s'attendrissait au bon soleil, et sous l'effluve des exubérances de la nature, la jeune sensibilité du poète. Louis Fréchette nous a dit lui-même la mystérieuse influence qu'exerça sur sa fraîche imagination, le spectacle toujours nouveau des paysages québécois; et l'on ne peut donc s'étonner qu'il ait aimé la nature, qu'il ait goûté la fraîcheur des bois, qu'il se soit abandonné volontiers à la caresse des brises parfumées, qu'il se soit plu à rêver sous le ciel bleu.

L'une de ses premières poésies n'est pas autre qu'un *Soir au bord du Lac Saint-Pierre*;[1] elle est datée de 1860, et le poète avait donc 20 ans. Cette méditation amoureuse est un souvenir de son séjour à Nicolet: elle est chaude comme une passion qui s'éveille, elle est facile et gracieuse, un peu banale, comme une rêverie juvénile:

Doucement balancé par la brise mourante,
Le lac applanissait sa nappe transparente
Où déjà s'étendaient les ailes de la nuit;
Les échos se taisaient au fond du bois sauvage.
Et sur le sable du rivage,
Le flot venait mourir sans bruit.

La lune déployait sa chevelure blonde
Et ses tremblants reflets se déroulaient sur l'onde
Comme un ruban d'argent sur un voile d'azur;
La brise caressait la mobile ramée,
Et son haleine parfumée
S'endormait avec le flot pur.

Enfin, c'était à l'heure où la verte ramure
Mêle aux accents du soir un suave murmure,
Où la feuille frissonne aux baisers du zéphyr;
A l'heure où des ondins la troupe se rassemble;
A l'heure où chaque étoile tremble
Dans une vague de saphir.

Il y a deux façons pour le poète—et pour toute âme sensible—de jouir de la nature: ou bien il la regarde, il la contemple pour en recevoir une émotion qui s'accorde avec les états de conscience les plus subtils, ou bien il l'étudie pour la décrire et pour la peindre. L'homme, égoïste, rapporte facilement tout à lui-même; il s'imagine volontiers que tant de merveilles prodiguées en la création, que tant d'images splendides qui s'offrent à son regard, que tant de tableaux riches de couleurs où s'accusent les dessins les plus pittoresques, ne sont faits que pour le plaisir de ses sens et de son esprit. Il exprime alors, de la nature,

[1] *Mes Loisirs*, p. 41.

toute la jouissance délicate qu'elle lui offre; il l'accomode à sa conscience; même il suppose volontiers qu'elle ne se fait coquette, gracieuse, séduisante, qu'elle ne se met en frais, que pour lui plaire:

Sur la plaine, d'azur et d'ambre illuminée,
Dans les bruines d'or, nos regards croyaient voir
La verdure sourire et les rayons pleuvoir.[1]

Louis Fréchette écrivit ces vers au souvenir d'une promenade au bord de la Creuse, un beau jour d'automne, dans la campagne où il faisait bon vivre quelques heures d'une bonne et pieuse amitié. Son âme d'artiste faisait alors servir à ses joies intimes la grande fête de la nature. Et comme la nature se faisait belle, il ne put s'empêcher de fixer sur ses paysages un regard attentif; il essaya d'en décrire la poésie matinale:

Aux branches des taillis, au velours des gazons,
La nuit à pleines mains avait semé des perles;
Sous la feuille sifflaient les pinsons et les merles;
Les taons sonnaient la charge autour des églantiers;
Et, par files, suivant le détour des sentiers,
Joyeux, et nous faisant un salut de la tête,
Des couples d'amoureux s'en allaient à la fête,
Ayant mis le matin leurs habits les plus beaux,
Et faisant sur le sol résonner leurs sabots.[2]

Fréchette descriptif, peintre de paysages, n'abuse guère de la couleur et du détail. Sa manière est plutôt sobre. Il n'est pas un descriptif, au sens plein que l'on donne à ce mot. Mais parce qu'il n'abuse pas, il choisit; il indique d'un trait rapide et discret ce qui l'a davantage intéressé; et ses descriptions empruntent à ce procédé une grâce suggestive qui leur donne plus de prix. Voyez comme il nous montre cette chapelle de Bethléem qu'il visite au bord de la Loire:

Elle s'appuie, humble et petite,
Sur ses contreforts descellés,
Où des touffes de clématite
Brodent leurs festons étoilés.

Les grands chênes pleins de murmures,
Où ronflent les vents assoupis,
De leur ombre et de leurs ramures
Caressent ses pans décrépits...

A gauche, là, sous la corniche,
Au-dessus d'un bassin tari,
Derrière un treillis, dans sa niche,
Une statuette sourit.[3]

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[1] *Feuilles Volantes,* Au bord de la Creuse, p. 41.
[2] *Feuilles Volantes. Ibid.* p. 53.
[3] *Feuilles Volantes,* p. 122–123.

Ce sont là des descriptions que le poète ajoute en passant à ses récits, pour les varier, et dont il fait de discrètes parures. Mais il lui est arrivé quelquefois de décrire pour décrire, de s'appliquer à la tâche de représenter les choses, d'en tracer les lignes, d'en bien délimiter les contours, et c'est justement à des paysages du pays natal qu'il a donné ce soin. A-t-il toujours réussi à dessiner et à peindre? a-t-il toujours suffisamment projeté dans la strophe les reliefs et les perspectives? Nous ne le croyons pas. Il semble bien que certains sonnets des *Oiseaux de Neige* qu'il a groupés sous le titre collectif de *paysages* pourraient être plus finement ouvrés, et nous procurer des visions plus précises. L'on attend plus du sonnet descriptif que de la strophe lyrique qui laisse voir en passant un morceau d'horizon, ou qui déroule un peu négligemment la toile flottante des décors. Souvent, dans ces sonnets qui veulent être des miniatures, Louis Fréchette passe trop vite du trait qui fixe et montre les choses à la réflexion morale ou à l'épithète vaporeuse qui atténue les lignes et noie dans le vague tous les dessins. C'est ce qui l'empêche, par exemple, de nous donner du lac de Belœil, du Saguenay, des Mille-Iles, qu'il a d'ailleurs joliment esquissés, la vue plus nette, plus complète, plus aigue, que l'on eût souhaitée.

Il a mieux réussi, semble-t-il, et justement parce que le sujet demandait moins de précision, à caractériser dans un petit tableau de genre, dans une aquarelle légère, chacun des mois de l'année canadienne.[1]

C'est janvier;

.....au ciel, des milliers d'aurores boréales
Battent de l'aile ainsi que d'étranges oiseaux.

Vient février:

Aux pans du ciel l'hiver drape un nouveau décor;
Au firmament, l'azur de tons roses s'allume....

Maint coup sec retentit dans la forêt qui dort;
Et dans les ravins creux qui s'emplissent de brume,
Aux franges du brouillard malsain qui nous enrhume
L'Orient plus vermeil met une épingle d'or.

Mars:

C'est le mois ennuyeux, le mois des giboulées;
Des frimas cristallins l'étrange floraison
Brode ses fleurs de givres aux branches constellées....

En juin,

L'été met des fleurs à sa boutonnière

[1] *Les Oiseaux de Neige.* L'année canadienne.

Pendant le mois de juillet,

Depuis les feux de l'aube aux feux du crépuscule,
Le soleil verse à flots ses torrides rayons;
On voit pencher la fleur et jaunir les sillons....

Voici novembre:

Aux arbres dépouillés la brise se lamente;
A l'horizon blafard, l'aile de la tourmente
Fouette et chasse vers nous d'immenses oiseaux gris...

Louis Fréchette a quelquefois décrit dans ses vers nos mœurs, nos joies canadiennes. Se souvenant avec Désaugiers "qu'un bel hiver vaut un printemps," il a joliment campé dans quelques strophes pittoresques celui qu'il appelle notre "bonhomme Hiver."[1]

Le bonhomme Hiver a mis ses parures,
Souples mocassins et bonnet bien clos,
Et, tout habillé de chaudes fourrures,
Au loin fait sonner gaiment ses grelots.

A ses cheveux blancs le givre étincelle;
Son large manteau fait des plis bouffants:
Il a des jouets plein son escarcelle
Pour mettre au chevet des petits enfants....

Puis le poète fixe dans la strophe quelques reflets et quelques spectacles de la saison froide et joyeuse.

Quand le soleil luit la neige est coquette;
Mol et lumineux, son tapis attend
Le groupe rieur qui, sur la raquette,
Au flanc des coteaux chemine en chantant.

Dans les soirs sereins, l'astre noctambule
Plaque vaguement d'un reflet d'acier
La clochette d'or qui tintinnabule
Au harnais d'argent du fringant coursier.

Au feu du soleil ou des girandoles,
Emportée au vol de son patin clair,
Mainte patineuse, en ses courses folles,
Sylphe gracieux, fuit comme un éclair.

Le bonhomme Hiver est une naïve allégorie, et Louis Fréchette a eu souvent recours à ce procédé qui consiste à personnifier la nature et ses éléments, procédé facile, habituel aux poètes, et qui s'accorde avec les plus heureuses inspirations. L'homme qui porte en lui-même une vie

[1] *Feuilles Volantes*, p. 137.

consciente, prête volontiers aux choses qui l'entourent la puissance de vouloir le bien ou le désir de faire le mal.

Le sentier a l'air traître et l'arbre a l'air méchant

écrivait Victor Hugo, dans cette même pièce où il voit

le troupeau des nuages qui passe,
Poursuivi par le vent, chien hurlant de l'espace,[1]

et Louis Fréchette avait trop fréquenté le maître de l'allégorie, ce grand professeur d'images hardies que fut l'auteur de la *Légende des siècles*, pour ne pas recourir souvent lui aussi à ces mêmes moyens littéraires.

"L'ombre était solennelle," écrit-il dans sa *Légende d'un peuple.*[2] Et dans un autre endroit du même recueil, il fait une longue apostrophe à la "Forêt" canadienne, à celle qui a vu passer sous ses dômes séculaires les Indiens farouches, puis nos pères défricheurs et créateurs de métropoles; il fait de tous ces chênes pensifs, de tous ces grands pins mystérieux un chœur puissant qui célèbre les gestes anciens:

Votre ramure, aux coups des siècles échappée,
A tous les vents du ciel chante notre épopée.[3]

Dans cette nature que Dieu a faite à l'usage de l'homme, tout devient symbole à celui qui sait la comprendre, et pénétrer le mystère de sa vie. Une fleur fanée, des feuilles mortes, des aurores lumineuses traduisent à nos âmes ou suggèrent des rapprochements ingénieux. Fréchette n'a peut-être pas écrit de vers plus sincères, plus émus, parfois plus douloureux, que ceux qu'il a consacrés à ce vieux nid délabré qu'il aperçut un jour d'hiver, pendu aux branches d'un buisson. Tout ce morceau est à lire pour celui qui veut connaître la sensibilité du poète, en mesurer l'étendue, et pour qui veut savoir quelle philosophie tour à tour attristée et consolante, quel symbolisme gracieux se peut dégager des vieux nids délabrés qui pendent aux branches des buissons.[4]

Et je songeai longtemps à mes jeunes années,
Frêles fleurs dont l'orage a tué les parfums;
A mes illusions que la vie a fanées,
Au pauvre nid brisé de mes bonheurs défunts!

Il est facile au poète de se transposer lui-même dans les spectacles de la nature, de communier avec eux par un échange subtil d'idées ou

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[1] *Légende des siècles.* Le Petit Roi de Galice, III.

[2] *Première Messe,* p. 48.

[3] *La Légende d'un Peuple.* La Forêt, p. 45.

[4] *Pêle-Mêle,* Sursum Corda, p. 9. Cette même pièce reparaît dans les *Fleurs Boréales,* p. 81, sous le titre de *Renouveau,* et dans les *Epaves Poétiques.* p. 85, sous le premier titre, *Sursum Corda.*

de sentiments; il lui est possible aussi d'assimiler à ces spectacles les agitations de sa propre conscience. Ce n'est plus alors le paysage qui devient un état d'âme, c'est l'âme elle-même qui se fait paysage. Louis Fréchette, comme tous les romantiques, a souvent usé de ce procédé. C'est aux heures sombres surtout qu'il eut ces visions intérieures où sa propre vie lui apparaissait comme une route désolée, son âme comme une gerbe de fleurs flétries, ses amours premières comme une sombre nécropole.[1]

N'est-il pas remarquable, d'ailleurs, que toutes les âmes chagrines, que tous les mélancoliques et les attristés ont aimé la nature? qu'ils l'ont aimée pour cette chanson monotone et caressante, pour ce refrain berceur qu'elle répète à leur conscience, mais aussi pour cette impression qu'elle leur donne qu'elle n'est qu'une image agrandie de ce paysage tendre ou vaporeux, plein d'ombres et de mystères, qu'ils portent en eux-mêmes.

Louis Fréchette fut plus qu'un mélancolique. Ou plutôt, mélancolique, il ne le fut qu'à quelques heures de sa vie. C'est le pessimisme qui a le plus souvent troublé, obscurci sa pensée, le rêve intérieur de ses méditations. Nous avons dit avec quelles exagérations il se plaisait à amplifier ses malheurs, et comment cette âme sensible n'apercevait l'épreuve qu'à travers l'œil grossissant du microscope.

> Souvent, j'ai failli croire, à force de souffrir,
> A la fatalité sur mon front suspendue....[2]

C'est en 1876 qu'il confiait cet aveu à celle qu'il venait d'épouser; quatre années auparavant, en 1872, à l'époque des luttes irritantes, il avait écrit un jour de printemps ensoleillé:

> Tout va palpiter d'allégresse;
> Les jours dorés vont revenir,
> —Moi je n'aurai pour toute ivresse
> Que l'ivresse du souvenir.[3]

* * *

Qu'y avait-il dans les souvenirs du poète de trente ans qui pût le consoler des nostalgies de l'heure présente?—Il y avait, certes, la réminiscence lointaine et douce des jours où l'enfant vivait près de sa mère, avant que la mort cruelle vint briser les harmonies du foyer. Et c'est peut-être pour cela que Louis Fréchette, heureux avant sa treizième année, a tant aimé chanter les enfants et les berceaux. Cela le faisait

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[1] Eg. *Pêle-Mêle.* Rêves envolés, p. 177. A mon Filleul, p. 49.
[2] *Pêle-Mêle,* p. 269. A ma Femme.
[3] *Epaves Poétiques,* p. 173. Le Souvenir.

se replonger dans le souvenir d'un bonheur qui fut trop court, mais dont le rappel mettait encore quelque joie dans ses jours tristes.[1]

Il y avait aussi, dans les souvenirs lointains, la consolation que procurent à l'enfant l'émotion pieuse, les premiers élans vers le ciel, ces naïves adorations dont le poète fait un thème pour ses strophes. Combien de fois Fréchette a chanté les premières communions! Et chaque fois il a trouvé pour dire les joies de ces matins si purs, des mots tendres, paternels, tout pleins de religion et de piété.[2]

Si le mysticisme parfois consolait Fréchette des amertumes de la vie, si le poète s'est plu à faire jaillir souvent des profondeurs intimes de la conscience le sentiment religieux, personnel et sincère, il n'en faudrait pas conclure que c'est cette note confidentielle qui domine dans ce qu'on pourrait appeler les poésies religieuses de Fréchette. A côté des pièces mystiques, il y en a d'autres, plus nombreuses, je pense, où il entre plus de développements oratoires que de méditations calmes, plus de rhétorique sacrée que de sensibilité pieuse. Louis Fréchette a aimé s'exercer sur des idées générales, sur les bienfaits de la religion, sur l'action patriotique, merveilleuse, de l'Eglise au Canada.

Dès son premier recueil, au moment où le pape luttait pour la conservation du patrimoine pontifical, le jeune poète, en des vers dont le goût n'est pas toujours bon, exécrait les persécuteurs de Pie IX; il terminait cette longue pièce par le cri triomphant de l'espérance catholique:

> Le monde peut crouler, mais l'Eglise jamais![3]

Dans son poème sur *Jean Baptiste de la Salle*, il raconte la vision du prêtre, et il trace le large tableau des luttes successives de l'Eglise contre ses ennemis toujours renaissants; il stigmatise la philosophie des incrédules:

> C'était, plus tard, le souffle infernal de Satan
> Brisant leurs ailes d'or aux légendes d'antan;
> Du scepticisme froid c'était la plaie immonde
> Sans cesse élargissant sa tare sur le monde;
> C'étaient de l'idéal les temples oubliés....[4]

Il loue le zèle héroïque des fils de la Salle qui se font les éducateurs des petits, les apôtres de la lumière:

> Et ces humbles—fut-il jamais rien de plus beau?—
> Par milliers aujourd'hui, sublimes caravanes,
> Des grandes vérités célestes et profanes
> Vont jusqu'au bout du monde agiter le flambeau.[5]

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[1] Cf. *Pêle-Mêle*. A Hilda, p. 197. Elégie, p. 159.
[2] *Feuilles Volantes*, p. 169. *Epaves Poétiques*, p. 107.
[3] *Mes Loisirs*. Le premier de l'An 1861, p. 47.
[4] *Feuilles Volantes*, p. 17.
[5] *Feuilles Volantes*, p. 36.

Dans son *Ode* à Mgr. de Laval, il exalte l'œuvre protectrice du clergé canadien:

> Pour sauver notre race et défendre nos droits,
> Le temple se fit citadelle.[1]

Ce sont là des idées belles, communes aux honnêtes gens, qui valent ici surtout par l'expression grandiloquente dont le poète les a habillées, et qui témoignent aussi de la fidélité de Fréchette à ses premières convictions. D'ailleurs, on ne pourrait trouver, je crois, dans tous les poèmes de Fréchette, aucune trace des hésitations de sa foi, de ces négations prudhommesques, de ces sourires sceptiques dont il aimait au temps de sa jeunesse ardente étonner les passants. Sa poésie est chrétienne, comme celle de presque tous nos poètes, et elle se soucie de refléter dans la lumière plus ou moins vive des strophes l'âme instinctivement croyante, qui l'a méditée, l'âme profondément chrétienne du peuple qu'elle doit édifier.

* * *

Nous avons parlé de rhétorique religieuse chez Fréchette: ne serait-il pas à propos d'ajouter que Fréchette fut un lyrique essentiellement oratoire?—et qu'il le fut, à un haut degré, dans la *Légende d'un Peuple*?—Ses effusions pathétiques prennent volontiers la forme du discours; son vers ressemble souvent à ces périodes sonores, ambitieuses, qui jaillissent comme des fusées de la tribune aux harangues. Fréchette était vraiment taillé pour les luttes du forum: il avait de l'orateur les plus précieuses qualités physiques: la voix chaude, le geste large, la haute stature, qui lui promettaient les conquêtes de la foule, l'empire sur les assemblées délibérantes. Il se trouvait à lui-même une vocation de tribun; il fut député, pas assez longtemps; il rêva toute sa vie de pérorer à la Chambre; on assure qu'il se fût contenté d'être sénateur. Mais il ne fut que greffier d'un Conseil Législatif, d'une sorte de congrégation d'hommes sages, plus prodigues de leurs avis que de leur éloquence. Fréchette se vengea de la fortune en faisant des discours sur le Parnasse. Il aurait pu dessiner en marge de ses strophes les rostres symboliques. Le flot oratoire ne pouvant passer par ses lèvres, il le fit couler au fil de la plume; il en inonda parfois les pages de ses livres. L'on pourrait jusque dans les premiers recueils du poète retrouver la trace de cette éloquence. La *Voix d'un exilé* est souvent toute pleine d'accents oratoires. La dernière partie de ce poème étrange vibre d'une ardente passion. Le poète rappelle les résistances fameuses de 1837, suivies de trop dures vengeances; il dit les angoisses et toutes les audaces du peuple:

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[1] *Epaves Poétiques*, p. 15.

L'on respirait partout comme un vent d'épopée;
Dans son manteau de deuil la nation drapée
Ecrasait ses bourreaux d'un mépris souverain;
Et le patriotisme, archange aux traits de flammes,
Electrisait les cœurs, et soufflait dans les âmes,
Comme dans des clairons d'airain.[1]

Dans son deuxième recueil, *Pêle-Mêle*, l'on trouve parmi les premières pièces, ce poème intitulé *Jolliet*, que Fréchette composa, en 1873, à l'occasion du deux-centième anniversaire de la découverte du Mississipi, poème où il a écrit quelques-uns de ses meilleurs vers, quelques-uns de ceux que soutient le mieux dans une belle envolée le souffle oratoire. La strophe y est souvent ample, large, épique.

Le grand fleuve dormait couché dans la savane.
Dans les lointains brumeux passaient en caravane
De farouches troupeaux d'élans et de bisons.

Drapé dans les rayons de l'aube nationale,
Le désert déployait sa splendeur virginale
Sur d'insondables horizons.

L'Inconnu trônait là dans sa grandeur première.
Splendide, et tacheté d'ombres et de lumière,
Comme un reptile immmense au soleil engourdi,
Le vieux Meschacébé, vierge encor de servage,
Dépliait ses anneaux de rivage en rivage
Jusques aux golfes du Midi.[2]

L'auteur fut si satisfait de cette pièce, il la jugea si éloquente, et d'une allure si grande, qu'il la réédita, la transporta de recueil en recueil, de *Pêle-Mêle* aux *Fleurs Boréales*, jusqu'à ce qu'il la logea enfin, et définitivement, comme en son lieu naturel, dans la *Légende d'un Peuple.*

Dans les *Feuilles Volantes*, Louis Fréchette a retrouvé quelques-unes de ses périodes les plus somptueuses pour célébrer le grand éducateur que fut Jean Baptiste de la Salle; il y a répandu des flots d'éloquence sur trop de choses qui y entourent le héros, ou qui le masquent et souvent le font oublier. Hugo et Barbier lui fournissent tour à tour l'inspiration de fulgurantes tirades.

Fréchette choisit, d'ailleurs, et d'instinct, les sujets où pouvait se donner libre cours son talent oratoire; et c'est pourquoi, il allait tout naturellement à ceux-là qu'il faut magnifier, à ceux-là qui suggèrent de fortes émotions, ou qui offrent en leurs canevas, quelques éléments d'épopée. Déjà, dans *Mes Loisirs*, il avait complaisamment traité l'*Iro-*

[1] Cf. *Pêle-Mêle.* La Voix d'un Exilé, p. 313.
[2] *Pêle-Mêle*, p. 65–66.

quoise du Lac Saint-Pierre,[1] une légende comme en racontait, en ce temps-là, l'abbé Casgrain, un conte merveilleux dont on amuse et étonne l'imagination des enfants. Fréchette reprit ce récit, il le corrigea, et le perfectionna, et il le fit entrer plus tard dans *Pêle-Mêle*.[2] Dans tous les recueils qu'il a publiés on pourrait ainsi retrouver cette préoccupation constante de dramatiser, de raconter avec fracas, d'amplifier, de discourir, de haranguer.[3] *La Légende d'un Peuple* devait naître de ce besoin d'émotions violentes: elle nous fut donnée comme le produit d'un esprit qu'avait séduit et enflammé la rhétorique.

La *Légende d'un Peuple* est, en effet, une sorte d'épopée oratoire: une épopée comme n'en eussent pas conçu Homère, ni Turoldus. Aussi bien les temps de *l'Iliade* et de la *Chanson de Roland* ne reviendront-ils jamais. Simplicité des primitifs, naïveté des peuples enfants, croyances ingénues des âmes sincères, sublimité familière des héros: tout cela anime, enchante les poèmes anciens, ravit leurs lecteurs; mais tout cela ne suffit plus à nos âges de raffinement intellectuel, à nos esprits aiguisés par la dialectique, à nos âmes blasées par trop de civilisation. Il faut autre chose pour intéresser d'autres consciences; et l'épopée moderne, telle que la construisit d'abord Victor Hugo, telle que la façonnèrent Leconte de Lisle, de Heredia, cherche dans d'autres émotions un autre succès. Elle déroule, sous des regards étonnés, les plus amples, et les plus extraordinaires spectacles: défilé des siècles qui se succèdent, des religions qui se remplacent, des dieux qui s'en vont, des hommes qui passent; théories majestueuses, solennelles, où processionnent les peuples, où s'enveloppent de lumière ou d'ombre, de gloire ou de honte, les personnages qui sont les héros augustes ou méprisables de l'universelle épopée.

Louis Fréchette n'avait pas à célébrer tant de sujets si vastes: sa muse n'eut pas un vol si téméraire. Mais il pensa qu'il pouvait réduire ces cadres qu'avaient imaginés les chefs de l'école nouvelle, qu'il les pouvait ramener à des proportions mieux ajustées à son esprit: il voulut faire avec son pays ce que d'autres avait fait avec tous les pays, et pour les siens ce que d'autres avaient donné à l'humanité. La *Légende des Siècles* se rétrécit jusqu'à la *Légende d'un Peuple*; *les Trophées*, *les Poèmes antiques* ou *barbares* ne furent plus qu'un poème canadien.

Nous savons bien comme il est injuste de rapprocher ainsi le nom de Fréchette de noms historiques qui l'écrasent, et son œuvre de chefs-d'œuvre qui l'éclipsent. Mais la faute en est à Fréchette lui-même si nous avons dû rappeler, à propos de sa *Légende d'un Peuple*, des doc-

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[1] Cf. p. 23. Cette légende fut composée en 1861.
[2] Cf. p. 215.
[3] Voir encore *Feuilles Volantes*, p. 61, *l'Espagne*.

trines qu'il a voulu appliquer, et des poèmes qu'il a vraisemblablement imités.

La matière de sa poésie, au moins, et dans une grande mesure, est substantiellement originale: j'entends que c'est de la matière du Canada. Si le poète se souvient de ses modèles en taillant ses strophes, il travaille sur un fonds qui est nôtre, et que la poésie n'avait pas encore aussi attentivement exploité. Louis Fréchette eut toujours, d'ailleurs, le culte de notre histoire; notre passé fut toujours pour lui plein de rumeurs épiques. Entendez ce qu'il dit de Québec, la citadelle "drapée dans son manteau de roc":

Sa gloire est une chaîne aux immortels anneaux;
C'est la ville des preux et des grands coups d'épée;
Et quand le vent, la nuit, siffle dans ses créneaux,
On sent passer dans l'air des souffles d'épopée[1]

Ce qu'il affirme de Québec, Louis Fréchette le redira de toute notre histoire, "écrin de perles ignorées."

poème éblouissant
Que la France écrivit du plus pur de son sang!. . .
Annales de géants, archives où l'on voit
A chacun des feuillets qui tournent sous le doigt,
Resplendir d'un éclat sévère ou sympathique
Quelque nom de héros ou d'héroïne antique![2]

Il découpe donc dans ce "poème éblouissant," dans ces "annales de géants," de vastes tableaux, des scènes sublimes ou familières, des drames sanglants, des silhouettes prestigieuses, des perspectives pleines de mirage, et il en compose ce qu'il appelle la *légende* d'un peuple. Cette légende a trois âges distincts, trois époques où elle se développe en des décors variables, et où elle se transforme en des actions toujours nouvelles. L'époque des origines aventureuses, où la hardiesse des pionniers se confond avec la foi des apôtres; l'époque de la grande bataille, où le sang des vaincus teint de pourpre l'aile blanche du drapeau qui se referme; l'époque des résignations patientes, des résistances obscures, des sursauts généreux, des espérances fières, qui n'est pas encore terminée. . . A la France est dédiée cette légende, qui se greffe comme une fleur sur la sienne, et qui enrichit de nouveaux couplets sa chanson de gestes.

Dans ce recueil, Louis Fréchette s'est vraiment livré tout entier: sensible, enthousiaste, ironique, patriote, éperdument canadien. C'est pour ces poèmes de la *Légende* mieux encore que pour les *Fleurs Boréales* et les *Oiseaux de Neige* qu'il eût mérité qu'on le baptisât "poète national": puisque dans notre jeune pays il faut absolument donner ce

[1] *Feuilles Volantes.* A Madame Albani, p. 115.
[2] *Légende d'un Peuple.* Note historique, p. 13, édition de 1890.

nom à quelqu'un, et puisqu'ici ni poètes ni journalistes ne veulent laisser chômer ce titre et cet honneur. Si le poète national est bien ainsi que l'a défini Edmond Rostand, s'il est celui qui prend un contact profond avec la terre natale, "avec le tuf noir et doux," pour qu'en lui monte comme un chant la sève nourricière, s'il est, en tous pays de France, le Chantecler de la fable:

Alors, mis en contact avec la bonne terre
Je chante.....
La terre parle en moi comme dans une conque,
Et je deviens, cessant d'être un oiseau quelconque,
Le portevoix en quelque sorte officiel
Par quoi le cri du sol s'échappe vers le ciel.

Fréchette a bien, dans la *Légende d'un Peuple* plus qu'en aucune autre de ses œuvres, tenté de réaliser cette définition: c'est ici surtout qu'il a essayé de rendre avec une fidèle application la chanson de la terre, de l'histoire, de l'âme canadiennes.

Non pas que cette chanson, passant par ses lèvres, ou—plus exactement et sans métaphore—par sa plume, ait toujours trouvé l'accent profond, sincère, original, qui lui convienne. S'il est un recueil où Fréchette a souvent trahi ses artifices, où il a usé de la rhétorique, où ne pouvant faire jaillir du sol où il s'appuie une pensée originale et forte, il se contente des couplets usés de l'éloquence traditionnelle, c'est bien la *Légende d'un Peuple.*

Mais il y a dans ce livre, et il faut les signaler d'abord, des envolées fières, des pages où le lyrisme se soutient à des hauteurs ensoleillées. Le prologue annonce lui-même le grand effort du poète pour s'égaler au sujet qu'il traite. C'est l'*Amérique* qui surgit dans les lointains inconnus, et qui offre à l'audace des découvreurs sa terre vierge. Quel événement dans l'histoire de l'humanité!

Oui, toute une moitié du globe
Dénouant, spectacle inouï,
Les plis flamboyants de sa robe
Aux yeux du vieux monde ébloui.![1]

Le poète salue avec piété le continent nouveau, l'Amérique, le sol natal:

Amérique!—salut à toi, beau sol natal!
Toi, la reine et l'orgueil du ciel occidental!
Toi qui, comme Vénus, montas du sein de l'onde,
Et du poids de ta conque équilibras le monde!
Quand, le front couronné de tes arbres géants,
Vierge, tu secouais au bord des océans,

[1] Cf. *Légende d'un Peuple,* p. 5.
[2] Cf. *Idem,* p. 6.

Ton voile aux plis baignés de lueurs éclatantes;
Quand, drapés dans leurs flots de lianes flottantes,
Tes grands bois ténébreux, tout pleins d'oiseaux chanteurs
Imprégnèrent les vents de leurs âcres senteurs;
Quand ton mouvant réseau d'aurores boréales
Révéla les splendeurs de tes nuits idéales;
Quand tes fleuves sans fin, quand tes sommets neigeux,
Tes tropiques brûlants, tes pôles orageux,
Eurent montré de loin leurs grandeurs infinies,
Niagaras grondants! blondes Californies!
Amérique! au contact de ta jeune beauté
Ou sentir reverdir la vieille humanité![1]

C'était un monde nouveau, mais c'était un monde prédestiné qui se révélait aux marins "penchés à l'avant des blanches caravelles." L'Amérique devait à son tour recueillir les lumières de la foi. Emergeant tout à coup des flots ignorés, elle répondait à un appel de Dieu. Quand Colomb ne croyait suivre que son étoile,

La grande main dans l'ombre orientait la voile.[2]

Peut-être même Fréchette n'a-t-il pas assez montré cet aspect surnaturel de notre épopée, ni assez expliqué le sens mystique de notre histoire. Car notre histoire fut à la fois humaine et divine, remplie d'actions, et parfumée de prières. Le poète a bien tâché de nous le faire entendre dans la première partie de la *Légende*, où il célèbre avec fanfare les hardiesses de l'Eglise se frayant à travers la forêt et dans des consciences nouvelles sa voie lumineuse. Mais il se laisse trop facilement distraire de cette idée essentielle dans les autres parties de son poème. Et l'on ne reçoit pas assez de la lecture de ces deux derniers chants l'impression de la vie réelle, profonde, religieuse, providentielle—et j'allais l'écrire encore—mystique de notre peuple.

Aussi bien, Louis Fréchette insiste-t-il presque exclusivement sur les violentes secousses, sur les crises aigües qu'il considère comme les moments historiques de la vie nationale, oubliant trop que toutes ces agitations ne constituent qu'une moitié de l'existence vraie du peuple. Il lui arrive même de ne laisser voir que par le dehors, que par ce qui est extérieur et de surface ces actions tragiques. C'est encore parce qu'il n'a pas assez pénétré jusqu'en son fond le plus sacré la conscience populaire, parce qu'il n'a pas assez aperçu dans les plus intimes et les plus religieuses aspirations de sa race, les motifs constants et le soutien de toutes ses grandes actions, qu'il fut trop impuissant à marquer l'unité de notre vie, et qu'il n'y a souvent entre toutes les pièces de sa *Légende* d'autre lien que celui d'un patriotisme bruyant, ou bien celui-là, plus fragile encore, de la chronologie.

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[1] Cf. *Idem*, p. 6-7.
[2] Cf. *Idem*, p. 8.

Mais cela n'empêche qu'il n'ait parfois très heureusement raconté certains épisodes mouvementés de cette "légende." Le *prologue, notre Histoire, Ante lucem, Châteauguay, Papineau, Chénier,* sont des poèmes, qui ne sont pas sans défauts, mais où l'on sent palpiter l'inspiration vraie.

D'autre part, des récits familiers ou tragiques comme le *Pionnier, Jean Sauriol, Spes ultima, Vive la France* jettent à travers l'épopée une note nouvelle, simple, vive, alerte, y font voir une sorte d'abandon de bonhomie, qui repose des fortes émotions et des strophes trop sonores. Louis Fréchette pratique assez heureusement un genre très aimable que François Coppée avait mis à la mode; il excelle parfois dans ces récits, où le vers, qui court rapide, tout près des choses, n'a pas besoin de se charger de beaucoup d'idées.

Mais le plus souvent, c'est la forme oratoire que le poète jette comme une somptueuse draperie sur les sujets qu'il développe. Tant de bravoure, tant d'héroïsme, tant de sacrifices appellent, pour s'en parer, les périodes de l'éloquence. Les sujets à panache vont bien à Fréchette; le panache l'attire, l'émeut; avec complaisance, il fait bouger sur les cimiers cette chose légère, audacieuse et mobile! Et l'on admire avec lui et l'on applaudit les découvreurs qui osent, les martyrs qui s'immolent, les guerriers qui passent, les épées qui se croisent, les victimes qui tombent, les drapeaux qui s'envolent.

Mais, ici, l'auteur ne fait pas toujours une œuvre suffisamment originale et pleine. Et cela tient justement à ce qu'il s'abandonne trop volontiers à ce genre oratoire où l'inspiration tombe souvent de toute la hauteur où elle s'est élevée. L'effort pour planer fatigue vite le vol du poète. L'esprit de Fréchette ne peut longtemps se maintenir sur les sommets de l'épopée, parce que la pensée qui le porte, et qui le devrait soutenir, n'est ni assez forte, ni assez substantielle. La rhétorique vit de lieux communs: c'est fort légitime "depuis plus de sept mille ans qu'il y a des hommes, et qui pensent," mais à la condition qu'elle puisse rafraîchir, renouveler ces idées communes qui appartiennent à tous. De quoi la rhétorique de Fréchette n'est pas toujours assez capable. Le lieu commun, chez lui, se recouvre trop souvent des oripeaux de l'éloquence du vingt-quatre juin; il se confond trop souvent chez lui avec la banalité: et il prend alors le sens défavorable, péjoratif, qu'il a trop souvent mérité.[1]

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[1] Nous avons entendu Fréchette, vers 1903 ou 1904, faire à l'Institut Canadien de Québec, et très sérieusement, une conférence sur les siècles de Périclès, d'Auguste, de Léon X, de Louis XIV, et sur le XIXe siècle. Il nous a paru qu'il fallait une certaine inexpérience des choses de la littérature pour entreprendre de traiter, en une heure, un pareil sujet, et un goût assez prononcé pour le lieu commun; l'événement nous a confirmé dans cette opinion.

Lieux communs quand le poète entreprend ses épiques descriptions, lieux communs, quand il glorifie certains héros, lieux communs, quand il vaticine sur l'histoire universelle.

C'est à propos des *Fleurs Boréales* et des *Oiseaux de Neige* qu'on a fait remarquer le manque de précision des ambitieuses descriptions de Louis Fréchette, et qu'il n'y a pas chez lui une assez originale conception de la nature et de ses rapports avec l'homme. "Fréchette se contente d'impressions toutes faites, rend plutôt l'émotion du voyageur vulgaire que du poète voyant et sentant autrement que la foule. Il écrirait presque, comme M. Perrichon, sur son carnet de voyage: "Du haut de la Mer de glace que l'homme est petit!"[1]

S'il s'agit d'histoire du Canada—et la *Légende d'un Peuple* en est remplie—on n'aperçoit pas assez dans les poèmes de Fréchette, les pensées neuves qui auraient pu donner quelque prix à tant de sujets usés par les orateurs de notre Saint-Jean-Baptiste. Et c'est pour cela que certaines pièces, qui exigeaient du poète plus de personnalité, sont faibles: *Le dernier Drapeau blanc, Les Plaines d'Abraham, Fors l'honneur, Vainqueur et vaincu.* C'est, dans ces pièces, les plus beaux gestes épiques qu'il fallait célébrer, et, vraiment, ces gestes n'y ont pas l'ampleur qui convient; on n'en a pas dégagé toute la signification, ni tout le symbolisme. On a l'impression du déjà vu, ou du déjà entendu quand on lit les vers où s'agite à travers les clichés traditionnels l'imagination du poète.

Est-ce même pour répéter quelqu'un de ces clichés que Louis Fréchette, après tant d'orateurs qui l'ont proclamé sur les tréteaux, affirme que la bataille de Saint-Denis nous a conquis la liberté?[2] Il semble bien, pourtant que, si généreux qu'ait été l'enthousiasme des insurgés de 1837-1838, ce n'est pas une charte de liberté qui fut le prix de leurs sacrifices. La constitution de 1840, dont nous dota l'Angleterre, ne fut pas précisément une récompense: elle fut, au contraire, le plus périlleux des châtiments, et ce n'est pas la faute des maîtres, et ce n'est pas non plus un mérite attribuable aux insurgés, si nos parlementaires canadiens, entre autres Louis-Hypolite Lafontaine, ont su tirer de cette "union" bâtarde des fruits de liberté. Le "Vieux patriote" de Fréchette aurait pu lui-même s'en souvenir.[3]

A certaines heures de notre "légende" et de ses méditations, Louis Fréchette regarde plus loin que la frontière canadienne, et vise plus haut que les sommets laurentiens: il enveloppe d'un coup d'œil le monde civilisé. Des régions de la philosophie il plonge sur l'histoire moderne des

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[1] Cf. article de Gustave La Mothe, paru dans le *Polybiblion*, et reproduit par la *Revue Canadienne*, tome XVII, p. 643, année 1881.

[1] *La Légende d'un Peuple*, Saint-Denis, p. 249.

[1] Cf. *Légende d'un Peuple*. Le Vieux Patriote, p. 274.

regards qu'il essaie de faire paraître aigus. Il esquisse des théories, il prononce des doctrines politiques. Non seulement dans la *Légende d'un Peuple*, mais dans presque tous ses recueils, depuis *Mes Loisirs* jusqu'aux *Epaves Poétiques*, le poète aime exposer une philosophie, développer des idées générales, juger l'œuvre de l'Histoire.

Il est, cependant, plus visiblement préoccupé de ce souci dans ses derniers livres. Les lectures et la vie l'ont fait plus longuement médité sur les choses; elles l'ont chargé de plus de souvenirs; elles ont accru ce bagage d'idées communes que l'esprit va recueillant au hasard de toutes ses observations. Et ce sont ces pensées, ces convictions, ces conclusions que le poète disperse dans ses strophes. Il les revêt parfois de formes très éclatantes: Voyez l'*Amérique* dans la *Légende*, *Jean-Baptiste de la Salle* et l'*Espagne*, dans les *Feuilles Volantes*, le *Quatorze Juillet* dans les *Epaves Poétiques*.

Or, dans toutes ses tirades, dans tous ses développements historico-philosophiques, il y a un lieu commun que Fréchette développe avec une inlassable complaisance: c'est l'idée, la doctrine, le bienfait de la liberté. La vie du peuple canadien n'est-elle pas un long, un patient effort vers la liberté? la découverte de l'Amérique ne fut-elle pas, pour le monde, une promesse de liberté? Et parce qu'aucune nation peut-être n'a travaillé plus que la France à la genèse laborieuse de la vertu qui délivre, parce que c'est la France qui en apporta sur nos bords le don précieux, c'est à cette mère que Louis Fréchette répète le refrain de notre gratitude.

> Toi dont l'aile plana sur notre aurore, ô France!
> Toi qui de l'idéal connais tous les chemins!
> Toi dont le nom, fanfare aux accents surhumains,
> De tout peuple opprimé sonne la délivrance![1]

C'est ainsi que le poète chantait en 1877, c'est sur ce mode qu'il redira souvent notre admiration pour une patrie dont il fait bon de nous souvenir toujours.

Et Louis Fréchette a raison de chanter la France, créatrice de liberté. La France chrétienne, pénétrée de la foi qui détruit les servitudes, a semé, tout le long de ses chemins historiques, des principes de délivrance. Aussi, aimer notre première mère-patrie, c'est le mouvement naturel de nos âmes françaises, et chanter cet amour, c'est, dans notre littérature, un thème ancien, facilement banal, mais qui peut toujours être nouveau. Louis Fréchette l'a souvent repris, et quelquefois il en a vigoureusement relevé l'expression. Il y a dans ces poèmes où il célèbre la France, une piété filiale sincère, qui trouve le mot franc et juste. Se souvient-il de l'arrivée de *la Capricieuse* devant Québec, de l'émoi

[1] *Pêle-Mêle*, A. M. Prosper Beauchemain, p. 259.

profond des Canadiens qui revoient "flotter au vent le drapeau des aïeux," il écrit aussitôt:

> Nos poètes chantaient la France revenue,
> Et le père, à l'enfant qu'étonnait tout cela,
> Disait: Ce pavillon qui brille dans la nue,
> —Incline toi, mon fils!—c'est à nous, celui-là![1]

Seulement, Louis Fréchette s'est quelquefois mépris sur l'histoire, et sur la mission de la France, sur le symbole de ses drapeaux. Il attribue trop exclusivement aux "trois couleurs" la signification libératrice. Il s'abuse sur les origines de la liberté; et il oublie que le drapeau tricolore, qui eut bien ses heures généreuses, a aussi couvert les plus tyranniques persécutions. Il se laisse entraîné dans le courant des lieux communs de l'éloquence républicaine. Il déclare avec emphase que la liberté sainte ne fut donnée au monde que par la révolution. C'est le quatorze juillet qui a affranchi l'humanité![2] Avant ce jour, les peuples croupissaient dans la servitude. Pour un rien Louis Fréchette daterait, lui aussi, de 1789, l'histoire de la France et de la civilisation. Il a brodé sur ce thème quelques-unes de ses strophes les plus pompeuses. C'est même à la révolution qu'il se sent pressé de donner le crédit de la découverte de l'Amérique;[3] déjà au quinzième siècle, elle fermentait dans les cerveaux, menaçant de détruire "les vieilles doctrines," et de ruiner "l'éternelle servitude." Et l'on reconnait ici les formules chères à tant de jacobins qui s'en sont tant servi! Certes, nous ne nions pas que la révolution n'ait accompli des réformes nécessaires, et supprimé des abus intolérables; mais nous n'en pouvons conclure qu'elle fut l'initiatrice de tous les progrès. Et Louis Fréchette, au lieu de faire remonter la révolution jusqu'à 1492, aurait fait bien mieux de faire descendre le christianisme jusqu'à 1789! religion civilisatrice, qui, en vérité, a préparé tous les affranchissements, et qui, pour avoir traversé tant de barbaries, et tant de préjugés, ne pouvait que lentement porter aux générations le bienfait de toutes les légitimes libertés!

Mais l'on sait que le poète de la *Légende* et des *Epaves* était doublé d'un farouche républicain, et qu'il abhorrait l'ancien régime. République, vertu, liberté, s'opposaient dans son imagination à cette autre trinité: monarchie, corruption, tyrannie. Lisez plutôt la *petite Histoire des Rois de France.*[4] Quand on a été capable d'imaginer une brochure si manifestement injuste, on est préparé à enfourcher tous les dadas de la rhétorique républicaine. Ce petit livre, qui fut écrit avec du fiel et de la

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[1] *Légende d'un Peuple.* La Capricieuse, p. 287.

[2] *Epaves poétiques.* Le Quatorze juillet, p. 19.

[3] *La Légende d'un Peuple.* L'Amérique, p. 3.

[4] *Petite Histoire des Rois de France,* par Cyprien (Louis Fréchette) chroniqueur de *La Patrie.*

boue, porte l'empreinte d'une pensée lamentablement étroite: et il est regrettable que l'auteur de tant de poèmes très louables se soit quelquefois souvenu du rédacteur de la *petite Histoire.*

Nous n'avons à juger ici ni la monarchie ni la république: leurs causes à toutes deux sont trop chargées pour qu'on les puisse apprécier d'une phrase ou d'un trait de plume. Mais nous aurions souhaité que Louis Fréchette se fût rappelé, à certaines heures de réflexion violente, qu'il écrivit à vingt ans, sur notre dix-neuvième siècle, sur le siècle démocratique, coupable comme les autres de tant de tyrannie, cette strophe:

> Pauvre siècle qu'on nomme un siècle de lumière,
> Où l'on voit, aux palais comme sous la chaumière,
> Fermenter le désordre et le mépris des lois!
> Où des bandits sortis des tripots et des bouges,
> Hurlant sous leurs longs drapeaux rouges,
> Jettent l'éclaboussure à la face des rois.[1]

Nous aurions aimé que le poète, qui a si délicieusement exprimé quelquefois le sentiment religieux, se fût moins candidement laissé prendre, dans certaines pages en prose qu'il a écrites aux sophismes facilement oratoires d'une philosophie toute superficielle et toute d'opposition: philosophie qui s'est acharnée, non seulement contre la monarchie, mais aussi contre l'Eglise. Fréchette a quelquefois avoué le libéralisme intempérant qui faillit détruire sa foi. Certaines attitudes intellectuelles furent chez lui, avons-nous dit, snobisme plutôt que conviction réfléchie. Mais ce snobisme coûte cher parfois à la dignité de l'esprit; il s'irrite facilement contre ce qu'il dédaigne; il s'emporte contre ce qui le gêne; il se dédouble en passions mesquines; il envenime l'erreur qu'il propage, il déshonore les vérités qu'il défend, et il fait écrire en style colérique, après la *petite Histoire des Rois de France,* les *Lettres à M. l'abbé Baillargé.*

La *Légende d'un Peuple* est donc, de tous les ouvrages de Louis Fréchette, celui où l'on aperçoit le mieux toutes les variations et toutes les inégalités de son talent. Il y a incrusté quelques-uns de ses plus beaux vers, et il y a glissé quelques-uns des plus faibles. Il y a développé ses plus hautes pensées; il y a risqué quelques-unes des idées qui s'accordent le plus mal avec l'inspiration accoutumée de ses poèmes. La *Légende d'un Peuple* résume, elle prétend résumer notre histoire; elle représente à coup sûr tout l'esprit de celui qui l'a conçue. Et nous pouvons donc rapporter de la lecture de ces chants une définition de la poésie de l'auteur. L'art de Fréchette est un effort presque continue vers l'éloquence; sa poésie veut être surtout une pensée oratoire dans un vers sonore.

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[1] *Mes Loisirs.* Le premier de l'an 1861, p. 49.

De la nature même d'une telle poésie, nous pouvons déduire quelques-uns des procédés de l'auteur, et, par exemple, l'exagération voulue ou inconsciente de l'idée, du mot, ou de l'image. Cette muse a presque toujours une tendance à enfler la voix. Elle s'y essaya, on s'en souvient, dans la *Voix d'un exilé*, et elle a souvent répété ce bruyant exercice.

Il arrive cependant que cette exagération n'est que la légitime vision du rêve poétique. Dans la pièce si ample, si enthousiaste, qu'il a consacrée à Papineau, Louis Fréchette condense en deux beaux vers toute l'action patriotique de son personnage:

Il fut toute une époque, et longtemps notre race
N'eut que sa voix pour glaive et son corps pour cuirasse.

Il définit l'éloquence de ce vieillard, retiré dans sa solitude, vivant seul:

laissant ses mains octogénaires,
Qui des forums jadis remuaient les tonnerres,
Vieillir en cultivant les fleurs!

Sa voix, sa grande voix aux sublimes colères,
Sa voix qui déchaînait sur les flots populaires
Tant de sarcasme amer et d'éclats triomphants,
Sa voix qui, des tyrans déconcertant l'audace,
Quarante ans proclama les droits de notre race,
Enseignait les petits enfants!

Puis, suggestionné par les mots, il découpe dans la lumière la taille du tribun populaire:

Souvent, lorsque le soir de ses lueurs mourantes
Dorait de l'Ottawa les vagues murmurantes,
Au-dessus des flots noirs, sur le coteau penchant,
Où l'aigle canadien avait plié son aile,
On voyait se dresser sa taille solennelle
En face du soleil couchant.

Il en fait maintenant une sorte de héros splendide et surhumain. Il le situe en des attitudes olympiques. Un soir qu'il se sent mourir, Papineau—astre fatigué qui descend à l'horizon—veut regarder encore le soleil couchant; il s'assied à sa fenêtre et plonge sa tête dans la lumière:

Et dans un nimbe d'or, clarté mystérieuse,
On eut dit que déjà sa tête glorieuse
Rayonnait d'immortalité!

Longtemps il contempla la lumière expirante,
Et ceux qui purent voir sa figure mourante,
Que le reflet vermeil de l'Occident baignait,

Crurent—dernier verset d'un immortel poème—
Voir ce soleil couchant dire un adieu suprême
A cet astre qui s'éteignait![1]

Mais c'est une autre exagération—énorme cette fois—que ce compliment que l'auteur de *Pêle-Mêle* adresse à un peintre de ses amis qui, après seize ans de séjour en Italie, revient au Canada:

Peintre, tu nous reviens, ainsi que l'aigle immense
Qui, faisant trève un jour à son sublime essor,
Avant que dans les cieux sa course recommence,
Se repose un instant pour disparaître encore.

Arrivé tout à coup des sphères immortelles,
Où sans craindre leurs feux tes pieds se sont posés,
Tu resplendis encore, et l'on voit sur tes ailes
La poudre des soleils que ton vol a rasés.[2]

Cette naïve emphase n'a d'égale que les strophes fameuses que Louis Fréchette adressait à Sarah Bernardt.

C'est elle! c'est Sarah la grande!.....

Frissons des lyres, choeurs sacrés, harpes d'Eole,
Bruits de gloire tonnant dans des gerbes d'éclairs:
C'est elle! regardez flamber son auréole
Sur l'azur chatoyant des beaux horizons clairs!

Il ne restait plus au poète idolâtre, pour pousser à bout la piété, que d'écrire—et il l'a écrit:

Elle vient, saluez! Foules, baisez sa trace![3]

De l'exagération oratoire au galimatias, il n'y a qu'un pas, et Fréchette l'a quelque fois franchi. Il emploie alors des mots qui débordent l'idée à ce point qu'ils la font inintelligible. Il écrira du Mississipi:

Et ton onde répète aux tièdes océans
L'épithalame étrange et les *concerts géants*
Des glaciers où tu prends ta source.[4]

Il dira de l'Amérique:

L'Amérique, c'est la *soupape* des Titans,
Le *balancier* qui vibre entre les mains du Temps:
Double objet qui, donnant au vieux monde un sol libre,
Prévint *l'explosion* et *sauva l'équilibre*![5]

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[1] *Légende d'un Peuple*, Papineau, *passim.*
[2] *Pêle-Mêle.* A un peintre, p. 192.
[3] *Epaves poétiques*, A Sarah Bernardt, p. 103.
[4] *Pêle-Mêle.* Le Mississipi, p. 24.
[5] *Feuilles Volantes.* L'Espagne. p. 68.

C'est le cas de dire de Louis Fréchette, égaré dans le nuage des métaphores grandiloquentes, ce que Guizot, je crois, disait un jour de Lacordaire: "Il vole plus haut qu'il ne voit."

C'est sans doute de Victor Hugo que Louis Fréchette apprit à oser ainsi l'exagération oratoire. C'est à lui, à coup sûr, qu'il emprunta le procédé des énumérations tapageuses, fulgurantes, tintamarresques, pédantesques:

L'Espagne eut Cespedès, cet autre Michel-Ange,
Cervantes le profond et Mendoza l'étrange,
Calderon, de Vega, Santos, Montemayor,
Velasquez, Juan Calvo, Murillo, Salvador,
Zurbaran, Hernandez, Medina, Mercadante,
Tous les talents depuis Phidias jusqu'à Dante,
Tous les héros connus d'Achille à Spartacus:
Elle eut Léonidas, et Coclès, et Gracchus....[1]

De Hugo encore, il prit le goût des épithètes sombres, qu'il accole violemment à une abstraction:

L'enchevêtrement *noir* des préjugés boiteux.[2]

Du même maître il apprit à voir en couleur *fauve* beaucoup de choses, même des choses qui ne sont pas fauves du tout, ou qui ne le sont que par symbolisme.

O fauves parfums des forêts![3]

....Après avoir, plus de deux mois durant
Vogué presque à tâtons sur l'immensité *fauve*.[4]

Et ces bois, ces vallons, ces longs coteaux dormants,
Qui n'ont encore vibré qu'aux *fauves* hurlements
Des *fauves* habitants de la forêt profonde.[5]

Pour la première fois, sur ces *fauves* rivages....[6]
C'était le désert *fauve* en sa splendeur austère[7]
Malgré la saison *fauve* et ses froids corrodants[8]
Un beau soleil couchant versait des lueurs *fauves*[9]
Le spectacle était *fauve* et grand comme l'enjeu....[10]

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[1] *Feuilles Volantes*, l'Espagne, p. 67.
[2] *Légende d'un Peuple*. Le gibet de Riel, p. 297.
[3] *Fleurs boréales*, p. 61.
[4] *Légende d'un Peuple*, p. 37.
[5] *Ibid*, p. 42.
[6] *Ibid*, p. 49.
[7] *Ibid*, p. 56.
[8] *Ibid*, p. 106.
[9] *Ibid*, p. 125.
[10] *Ibid*, p. 158.

Image encore hardie que celle où Louis Fréchette définit les travaux audacieux du dix-neuvième siècle:

Qu'il allume sa lampe au tonnerre, ou qu'il mette
Les rênes de l'algèbre au col de la comète....[1]

De bonne heure, déjà dans *Mes Loisirs*, le poète s'exerçait à ces prenantes métaphores:

Guerre, vampire affreux dont la lèvre sinistre
Suce le sang des nations![2]

Un jour, il dit les progrès accomplis depuis la découverte du Mississipi:

Où le désert dormait, grandit la métropole;
Et le fleuve asservi courbe sa large épaule
Sous l'arche aux piliers de granit![3]

De bonne heure aussi, et très souvent ensuite, Fréchette trouva l'image gracieuse ou largement expressive.

Quand le printemps doré vient éployer son aile
Sur la nature en fleurs[4]

Dans la *Légende d'un Peuple*, il chante le vieux frêne des Ursulines sous lequel Madame de la Peltrie catéchisait les petites huronnes:

Aigrette énorme au front du vaste promontoire,
Colosse chevelu dans le roc cramponné,
Il avait vu passer bien des jours sans histoire
Au sommet de Stadaconé.[5]

Voyez encore ce beau spectacle de la *première moisson*

Bientôt le blé jauni tombe à faucilles pleines;
La javelle, où bruit un essaim de grillons,
S'entasse en rangs pressés au revers des sillons,
Dont le creux disparaît sous l'épaisse jonchée;
Chaque travailleur s'ouvre une large tranchée;
Et, sous l'effort commun, le sol transfiguré
Laisse choir tout un pan de son manteau doré.[6]

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[1] *Feuilles volantes*, p. 23.
[2] *Mes Loisirs*, p. 55.
[3] *Pêle-Mêle*, p. 73.
[4] *Mes Loisirs*, p. 13.
[5] *Légende d'un Peuple*, p. 111.
[6] *Ibid*, p. 55.

La versification de Fréchette, d'une bonne tenue classique, profite encore des qualités acquises au siècle dernier par l'art des vers. Tantôt il emploie l'alexandrin à césure fixe, solennel, le long duquel il distribue avec variété les accents rythmiques. C'est ainsi qu'il annonce du haut des clochers de Saint-Malo le départ de Cartier.

Le carillon mugit dans les tours ébranlées.
Du haut des bastions, en bruyantes volées,
Le canon fait gronder ses tonnantes rumeurs
Et, salués de loin par vingt mille clameurs,
Au bruit de l'airain sourd et du bronze qui fume
Cartier et ses vaisseaux s'enfoncent dans la brume.[1]

Tantôt il introduit dans ses couplets les vers à césure unique et mobile, le trimètre plus souple, d'une cadence plus riche. Il sait aussi couper avec art, et pour produire un effet voulu, l'hémistiche. S'il veut, par le rythme, nous donner l'impression de l'obstacle qui surgit, il écrira en multipliant les repos:

La côte, noirs rochers, se dresse inabordable....[2]

Pour montrer, avec les efforts de la marche, l'espace immense qui s'étend sous les yeux du voyageur, il écrit, après un vers ternaire, le vers large où l'hémistiche s'ouvre avec l'horizon:

En route! Et devant lui, de l'aube au crépuscule,
Le vaste horizon s'ouvre, et le désert recule.

Fréchette n'hésite pas à faire l'hiatus, lorsque le mouvement du vers l'y autorise.

On entendit partout ce cri: A Notre Dame!

Il n'y a pas ici, en réalité, de voyelles qui se heurtent; l'oreille n'a rien à souffrir de leur rapprochement.

Au reste, Fréchette est l'un de nos premiers poètes, le premier, peut-être qui se soit scrupuleusement appliqué à l'art d'écrire en vers. Il est ici plus ingénieux, plus varié que Crémazie, et plus artiste.

Il lui arrive, cependant, à lui comme à Crémazie, d'étendre lourdement son vers, de faire des phrases longues, traînantes, où se multiplient les *qui* ou les *dont*, quand ce ne sont pas les participes présents ou les gérondifs qui appesantissent l'hémistiche.

Sur la rive, un balcon d'aspect oriental
Emerge d'un massif d'érables *qui* se groupe
Au fond de l'anse *où* dort une svelte chaloupe
Dont le flanc touche à peine au limpide cristal.[3]

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[1] *Légende d'un Peuple*, p. 36.
[2] *Légende d'un Peuple*, p. 38.
Ibid, p. 97.
[3] *Oiseaux de Neiges*, p. 199.

Ces lourdeurs sont plus rares dans les derniers recueils de Fréchette. Dans la *Légende d'un Peuple*, la période est mieux conduite; elle s'avance d'ordinaire, bien découpée, alerte, sans effort, jusqu'à la proposition finale qui la complète sans la faire languir.

Il est remarquable, d'ailleurs, que Fréchette eut toujours le souci de perfectionner sa versification; l'histoire de ses œuvres est justement l'histoire de ses progrès successifs. Les *Feuilles Volantes*, par où le poète semble clore sa carrière, sont peut-être le recueil où il y a le moins de faiblesses profondes.

Soucieux, d'ailleurs, de ne laisser après lui que les pièces les meilleures qu'il a composées, Louis Fréchette a soigneusement préparé une dernière édition de ses poésies; il en a prudemment éliminé les morceaux médiocres. Il a groupé sous le titre d'*Epaves* celles-là de ses premières pièces qu'il croyait pouvoir échapper encore quelque temps au naufrage. Et il a eu raison de faire lui-même ce premier triage, et de rassembler ainsi des essais qui ont une précieuse valeur documentaire. Il a écrit lui-même, très justement, à propos de ces premiers essais. "Ils sont non seulement l'expression d'une pensée ou d'un rêve en embryon, mais on y trouvera de plus la trace des efforts littéraires qui ont caractérisé toute une époque intellectuelle dans notre pays. On peut y suivre pour ainsi dire pas à pas les développements d'une âme en proie aux hantises d'une poésie dont elle ignorait le langage, les règles et les procédés, et qu'elle essayait de traduire sans modèles, sans traditions et presque sans maîtres."[1]

Il est curieux, en effet, de suivre ainsi l'effort du poète, et de voir comment peu à peu, par la lecture, par l'étude, par l'imitation, il précise son talent, il l'oriente, comment il finit par constituer sa propre originalité.

Cette originalité, nous l'avons dit déjà, consiste en une manière oratoire qui ressemble....à celle de plusieurs autres: mais, elle est faite aussi, ne l'oublions pas, d'une sensibilité ardente, d'une émotion large, de cet amour du pays, de notre histoire, de ses héros, grands ou obscurs, de cette sorte de fierté, de cet orgueil national qui éclate comme une fanfare dans les strophes de l'épopée. Et puis, souvenons-nous bien que l'originalité indépendante de toute imitation est une puissance peu commune: ce n'est presque pas un paradoxe que d'affirmer qu'il faut commencer par imiter quelqu'un pour être original. Et nous ne saurions donc blâmer Fréchette d'avoir voulu ressembler à ceux qui lui paraissaient le mieux représenter son idéal. Comme tout disciple, comme tout poète dont la pensée ne surabonde pas, il s'est quelquefois trop souvenu de ses lectures; à certaines heures, il a composé avec sa mémoire plus

[1] *Epaves poétiques.* Préface, p. 8.

qu'avec son esprit; et cela diminue d'autant sa personnalité. Mais est-il bien utile de rechercher dans l'œuvre du poète ces réminiscences de mots ou d'idées qu'on y pourrait relever. Nous ne le pensons pas; et nous estimons plutôt mesquine, jalouse, stérile, la critique qui s'applique à dénicher au cœur des strophes, ou dans le repli des hémistiches, telle image ou tel vocable heureux qu'elle aperçut en d'autres œuvres.[1] Ce métier devient particulièrement oiseux si, tout entier au besoin de dénoncer les plagiats ou les imitations coupables, on oublie, selon une comparaison pittoresque bien connue, que "c'est encore imiter quelqu'un que de planter des choux."

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Nous ne croyons pas devoir insister ici sur d'autres œuvres de Louis Fréchette, sur celles qu'il a écrites en marge de son œuvre essentielle, qui est lyrique. Il s'est essayé, par exemple, dans l'art dramatique. Mais les pièces qu'il a composées ne révèlent aucun aspect nouveau de son talent. *Papineau* et *Veronica* rappellent plutôt le poète de la *Légende d'un Peuple* cherchant surtout dans les phrases éloquentes l'effet théâtral.

Deux livres en prose: *Originaux et Détraqués, la Noël au Canada,* montrent en pleine lumière le conteur amusant qu'il y eut en Fréchette, et qui apparut quelquefois à certaines pages de la *Légende.* Il y a bien des charges excessives dans les *Originaux et Détraqués,* et d'énormes plaisanteries que parfois l'auteur souligne avec trop de soins; mais il y a là aussi certaines peintures de mœurs qui ont leur prix. Il y a là surtout l'écho joyeux du parler populaire, et une sorte de vocabulaire—un peu gros parfois, semble-t-il, parce qu'il y est trop accumulé—mais qui ne manque assurément ni de pittoresque, ni d'intérêt philologique. Nos cousins de France aiment à lire ces pages où ils retrouvent tant de choses de la chère province.

C'est encore l'esprit populaire, l'âme paysanne, la bonne vie canadienne que racontent les histoires de Noël. Les tableaux sont ici plus frais, moins vulgaires; ils n'en sont pas moins précis, chargés de détails significatifs, et sur leurs réalités, un peu frustes encore, flottent les mystères de la poésie religieuse. Il y a dans la *Noël au Canada* quelques-uns des plus jolis contes de Fréchette.

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[1] Nous laissons à ceux qui ont le goût de ces petites occupations le soin de consulter *Le Lauréat, critique des œuvres de M. Louis Fréchette,* par W. Chapman, in-8, 328 pp., Québec, 1894.

Mais c'est le poète qui survivra surtout en cet écrivain; c'est de sa poésie que le loueront nos arrière-neveux. Et s'ils veulent être justes envers sa mémoire, s'ils veulent lui assigner sa place dans l'histoire de la poésie canadienne, ils n'oublieront pas que Fréchette est né dans notre pays à une époque où le Canada était bien plus qu'aujourd'hui éloigné de la France, à une époque où il était difficile encore d'entendre la leçon des maîtres de là-bas, à une heure où l'on ne faisait que d'essayer de fonder ici une tradition littéraire.

Louis Fréchette a lui-même indiqué tout à la fois l'intérêt et les inconvénients de sa situation historique. Il écrivit à propos de ses premiers recueils: "On y découvrira surtout les défauts et les qualités du milieu ambiant, l'avènement d'une génération qui, malgré ses tâtonnements et ses hésitations, a parcouru jusqu'à nos jours un chemin qu'on ne saurait mesurer sans quelque satisfaction, et peut-être sans quelque profit, si ceux qui sont venus après elle veulent la juger avec impartialité."[1]

De son premier recueil *Mes Loisirs*, à son dernier les *Feuilles Volantes*, on mesure, en effet, le chemin qui a été fait, et l'on ne peut s'empêcher d'admirer davantage le poète qui a franchi toutes ces étapes. Venu immédiatement après Crémazie, presque contemporain du poète exilé, mais désireux de contribuer pour sa part à cette sorte de renaissance des lettres canadiennes que promettait 1860, il dut mettre dans son travail de formation toutes les hésitations et toutes les audaces de l'inexpérience. Cependant il apportait à la tâche quotidienne une âme vibrante, une âme qui eut bien aussi des excitations factices, mais d'où se sont échappés parfois, comme des traits de flamme, quelques-uns des plus beaux vers qu'il y ait dans la poésie canadienne.

Inégal, comme tous les poètes que nous avons eus, et comme tous ceux qui chantent encore, Louis Fréchette a pu monter quelquefois à des hauteurs que les autres, chez nous, n'ont pas dépassées. Et certes, c'est un mérite qui vaut la peine qu'on le remarque, que celui qui fait d'un artiste l'égal de tous ses rivaux. Aussi patriote que Crémazie, plus que lui soucieux de la forme, et plus appliqué à multiplier les rythmes; plus assidu que M. Pamphile LeMay au travail de la lime, plus que lui curieux de développer ses dons et d'étendre les ailes de la strophe, mais moins que lui capable de prendre contact avec la bonne terre, et d'y sentir vivre et palpiter l'âme des choses; moins diffus, moins obstiné que M. Chapman dans le lieu commun et dans la banalité, mais habile comme lui à trouver l'image qui éblouit, à lancer le trait qui s'envole; moins subtil en ses délicatesses qu'Alfred Garneau, mais plus que lui pourvu de ressources; plus puissant que M. Adolphe Poisson, plus

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[1] *Epaves poétiques.* Préface, p. 8.

varié et plus fascinateur que M. Nérée Beauchemin, Louis Fréchette se place au centre de ce groupe qui fut pendant longtemps chez nous le chœur harmonieux des Muses. Plus grand que quelques-uns de ces contemporains par cette imagination fertile, par cette sensibilité éloquente qui furent ses meilleures qualités, il les surpasse tous, à certaines heures d'exaltation, ou d'enthousiasme, de la hauteur même du panache héroïque dont il aima surmonter son front. Mais le panache n'est pas de l'homme; il est quelque chose qui s'ajoute à lui, et qui le fait seulement paraître plus grand.

Maintenant que Louis Fréchette est disparu, d'autres poètes vont venir—quelques-uns sont déjà venus—qui vont essayer de rendre autrement, et plus parfaitement encore, tant de choses inexprimées de l'âme canadienne. Ils réussiront sans doute—c'est notre espérance—à marquer notre poésie d'une empreinte plus originale. Ils auront eu pour travailler, et dès la première heure, bien des instruments commodes que n'avait pas d'abord Louis Fréchette, et ils reçoivent du milieu même où ils vivent une plus forte excitation intellectuelle. Mais il leur sera difficile, croyons-nous, d'émouvoir plus sûrement que n'a fait Fréchette l'âme populaire, et de contribuer plus efficacement que l'auteur des *Fleurs Boréales* ou de la *Légende d'un Peuple* à faire aimer jusqu'en la France lointaine notre histoire. Aussi quelque prodigue que soit pour nos poètes de demain la gloire, la patrie canadienne n'oubliera jamais celui qui le premier aura tenté de raconter en vers sa merveilleuse épopée.

ROYAL SOCIETY OF CANADA

TRANSACTIONS

SECTION II.

ENGLISH HISTORY, LITERATURE, ARCHÆOLOGY, ETC.

PAPERS FOR 1910

I.—*A Rare Find in the Canadian Archives,*

Being a Tragedy entitled *Liberty Asserted*, by John Dennis; dedicated to Antony Henley.

By MRS. GEORGE BRYCE, Member of Manitoba Historical Society.

(Communicated by the President and read September 27, 1910.)

The author of this drama, a copy of which is to be found in the Dominion Archives, John Dennis, was born in London, 1657, and died in the same city in 1734.

He was educated at Harrow and in Caius College, Cambridge. He took his M.A. in Trinity Hall in 1683. He is said to have been disgraced at college and deprived of a scholarship for having attacked a fellow-student with a sword.

After leaving Cambridge he had the advantage of travel in France and Italy, and on his return to England he was associated in fashionable and literary circles with such men as the Earls of Pembroke and Mulgrave, Dryden, Congreve, Moyle, Wycherley, Southerne, Garth, etc.

Dennis commenced literary work in 1692. Theophilus Cibber in his "Lives of Poets," speaks of him as having written various poems "in the Pindaric way." Dennis also wrote a number of dramas, the best known of which were, Rinaldo and Armide, Iphigenia, and the subject of this paper, Liberty Asserted.

He, however, had his chief reputation among the literary men of his own day as a critic and indeed he has been estimated as such down to the present time. In 1711 he published three letters on the genius and writings of Shakespeare, which include some of his best critical work.

He antagonised two of the great writers of his day, Addison and Pope. His attack on Addison's Cato gave rise to several severe articles and rejoinders in the Spectator. Johnson's Life of Addison gives the salient points of Dennis's criticism.

Of the two great contemporaries, Dennis seems to have been most familiar personally with Pope. On one occasion when the latter paid a visit to Dennis in his room he found pinned on the walls many sheets of Addison's Cato with epithets such as, "absurd," "preposterous,' attached to them.

In 1711, Dennis attacked Pope in "Reflections Critical and Satirical" upon a Rhapsody called "Essay on Criticism." Pope seems to have felt the onslaught keenly and after many years during which he

suffered much through Dennis's severity of judgment he was finally provoked to take his revenge by satirizing Dennis in the Dunciad. It seemed to be a common state of things in the days of Pope for literary men to have inveterate quarrels.

An estimate of Dennis's standing may best be had by quoting a few literary opinions.

Richard Steele, who suffered through Dennis's critical attacks said of him: "Unhappy being! Terrible without! Fearful within! Not a wolf in sheep's clothing but a sheep in wolf's."

Isaac D'Israeli sums up his estimate of Dennis in a few pithy sentences: "He exercised the despotism of a literary critic. His learning was the bigotry of criticism. It was ever Aristotle explained by Dennis."

Cibber says concerning Dennis's dramatic writings: "He saw with concern that love had got possession of the tragic stage, contrary to the authority of the ancients and the example of Shakespeare. He resolved to deviate a little and not make his heroes whining slaves to their amours. He made love appear violent but yet to be subdued by reason, and give way to some other more noble passion, as in Rinaldo—to glory; in Iphigenia—to friendship; and in Liberty Asserted—to the public good."

Cowper said in 1786: "Pope and Addison had a Dennis, and Dennis, if I mistake not, held up as he has been to scorn and detestation, was a sensible fellow, and passed some censures upon both those writers, Englishman with the legitimate prejudices of the revolution, detesting the French, abominating the Italian Opera and deprecating as heartily the triumph of the Pretender as the success of a rival's tragedy."

James Russell Lowell calls Dennis, "One of Pope's typical dunces, a dull man outside his own sphere as men are apt to be, but who had some sound notions as a critic, and thus became the object of Pope's fear and therefore of his resentment."

Lounsbury on Dennis, 1891: "In literary matters he was born a dissenter. He belonged by nature to the opposition and the cardinal principle on which he acted was to find fault with any new thing that had met with general approval. He could not fail to be at times right."

Edmund Gosse, 1897: "Dennis had a foolish attitude towards his younger contemporaries, but in his prime he was a writer of excellent judgment. He was the first English critic to do unstinted justice to Milton and to Molière, preparing the way for the literary verdicts of Addison."

At the beginning of his career Dennis was possessed of independent means, but in his old age, suffering from blindness, he was reduced to extreme poverty. Kindhearted actors and actresses gave him a benefit night. Pope had an opportunity of being magnanimous on being asked

to write a prologue to the performance, but the prologue, spoken by Theophilus Cibber, was a satire throughout and must have hurt poor Dennis had he not been too old to comprehend its spirit. The closing lines show its nature,

> "If there's a critic of distinguished rage,
> If there's a senior who contemns this age,
> Let him to-night his just assistance lend
> And be the critic's, Briton's, old man's friend."

Antony Henley to whom Dennis dedicated the drama, *Liberty Asserted*, was a graduate of Oxford and a friend of Lord Dorset and Lord Sunderland. He was a politician and sat in Parliament for Andover from 1698 to 1700, and later for Weymouth and Melcombe Regis. He was one of the literary circle who welcomed Swift when he came from Ireland to London.

A musician, Henley played on several instruments with skill and was regarded as an authority on music. He was a patron of the Purcells and to him the younger Purcell dedicated his work, "Brutus Alba."

Dennis says in his dedication to Henley, "The play owes its birth and its very being to you, for it was you, Sir, who gave the happy hint upon which the poem was founded."

The tragedy, *Liberty Asserted*, was played successfully in the New Theatre, Little Lincoln's Inn Fields, in 1704. This theatre was opened under the management of Betterton, the tragedian, in 1695, with a brilliant galaxy of actors and actresses. The personnel of this company was nearly the same as that which enacted *Liberty Asserted* in 1704.

Dennis says in his preface, that he owed much to Betterton and to Southerne, the dramatist, for advice in the construction of the drama and preparing it for the stage.

The tragedy had its historical setting in the wars between the English and the Iroquois on the one hand and the French and Hurons on the other.

The Dramatis Personæ were as follows:—

Frontenac, Governor of New France.
Miramont, kinsman to Frontenac.
Beaufort, General of the English who came to the assistance of the Iroquois.
Ulamar, General of the Five Nations.
Zephario, Head of the Angians, one of the Five Nations.
Arimat, an angian
Two Ambassabors.
Officers, Guards, Messengers.
Sakia, Mother of Ulamar.
Irene, Daughter of Zephario.
Okima, Confidant to Sakia.

The following was the cast:

Frontenac	Bowman.
Miramont	Betterton.
Beaufort	Powell.
Ulamar	Booth.
Zephario	Freeman.
Sakia	Mrs. Barry.
Irene	Mrs. Bracegirdle.
Okima	Mrs. Porter.

A few words may be said of the four most famous actors who took part in the drama.

1635-1710—The great tragedian, Betterton, opened, as we have seen, the New Theatre, Lincoln's Inn Fields, which took the place of a former play-house there of which Sir William Davenant was the patentee. Betterton acted on the opening night as Valentine in Congreve's Love for Love, Mrs. Bracegirdle taking the part of Angelica. He was most famous as a tragedian for his impersonation of Hamlet. To him was due the improvement of theatrical scenery in England. France was much more advanced in this aid to histrionic art than was England at that time, and Betterton was sent to Paris by Charles the Second to make a study of the subject. Through him shifting scenes were introduced instead of the immovable tapestry hitherto in use. Booth was a pupil of Betterton and was second only to his great master. He first won notice by his representation of Addison's Cato.

1658-1713—Elizabeth Barry had the honour of playing before Charles the Second, the Duke and Duchess of York being present. The latter, Mary of Modena, when Queen of England, lent Mrs. Barry her coronation robes for the impersonation of Queen Elizabeth in the "Earl of Essex." Mrs. Barry acted in all the tragedies of the day, but only in one comedy, Vanburgh's "Provoked Wife." Betterton said she was incomparable and Dennis says in his preface to "Liberty Asserted," that the part of Sakia was so admirably and inimitably acted that no stage in Europe could boast of anything that came near to her performance. It has been said that she wept genuine tears upon the stage. And one critic, Colley Cibber, asserted that although Dennis's tragedy, Iphigenia, was not moving in itself yet he could not refrain from shedding tears when Mrs. Barry took the principal role. She was the first of those connected with the stage for whom a benefit was given. Such an honour had hitherto been reserved for authors; but James the Second commanded one for Mrs. Barry.

Anne Bracegirdle, 1653-1748, had the advantage of being trained by Betterton and his wife, formerly Mrs. Sanderson, an accomplished actress of the time. Mrs. Bracegirdle achieved her chief triumphs in the works of Congreve. She had a long and popular career on the

English stage; but when Mrs. Oldfield arose to be her rival and she found on one occasion that her own attractions were waning, she refused ever to appear again.

The Story of The Play.

The locality of the drama, Angia, is not easily identified. The author says in his preface that it is synonymous with Agniè, a name given by the French to the Mohawks, the most powerful tribe of the Iroquois confederacy. It strongly resembles Angwehonwe, an appellation of the Iroquois, meaning "Superior People." Lahontan speaks of Agniè as the abode of the Iroquois and seems to place it between the Hudson River and the present Canadian limits. In Dennis's time the boundaries of Canada would not be very well defined and we may suppose that it was in Lahontan's Agniè that the scene of the tragedy was laid.

The fortunes of two of the characters of the play, Sakia and her son, Ulamar, create the chief human interest of the plot. Sakia was a woman of the Huron tribe who, about twelve years before the events of the drama had, with her son, been taken captive in a war between the Hurons and Iroquois. The two exiles had been kindly treated by their captors and allowed every privilege but that of returning to their own country.

In the opening of the drama we learn that the French and Hurons had treacherously broken a treaty made between themselves and the Iroquois, and a battle had ensued. Okima, the confidential friend of Sakia, announces to her the great victory that had been gained by Beaufort, the English commander and her son Ulamar, who, although only twenty years of age had, by his prowess and military skill, chiefly taught him by Beaufort, attained to the leadership of the Iroquois.

Instead of rejoicing over the glory won by her son, Sakia manifests the keenest disappointment. She had secretly hoped that the Hurons would gain the victory as it would mean for her deliverance from slavery and a return to her native country. She could then make efforts to find her husband, of whom she had not heard for many years. She exclaims in her sorrow:—

> "My son's mistaken valour has outdone us
> And thou, O Miramont, art lost forever."

This impulsive allusion to Miramont is the first intimation we have of the secret that is weighing upon Sakia's mind. Okima reasons with her friend, pointing out to her the privileges she and her son have enjoyed at the hands of the Iroquois and reminding her that Ulamar is not in accord with his mother's sentiments but is at heart an Iroquois. Sakia retorts in anger that she owes nothing to the Iroquois—that she had

spent twelve tedious years among them and that it was at the request of generous Beaufort that her captors had been so indulgent.

Beaufort had led the Iroquois in the expedition when Sakia and Ulamar had been taken prisoners and he had always manifested the deepest interest in their welfare.

Okima further causes Sakia distress by saying that possibly the next day Ulamar would be more closely allied to the Iroqouis, as Zephario, the chief, had promised the hand of his beautiful daughter Irene, to Beaufort or Ulamar, whichever should perform the most valorous deeds in the battle and that Beaufort had declared in favour of Ulamar as most worthy of this reward. Sakia deprecates that idea, saying that Beaufort, being an aspirant to the hand of Irene, the Iroquois would not dare to offend the English by giving her to Ulamar.

Distracted by so many conflicting interests Sakia feels impelled to confide in someone and she reveals to Okima, under promise of secrecy, her marriage in the Huron country to a French officer named Miramont. Whilst she dwelt among the Hurons she had been known by the name Nikaia, and her son by that of Miramont, after his father, although he had been born in secret and brought up in her household as a little slave that her husband had presented to her father. To the change of names by the Iroquois she attributed her husband's inability to trace his wife and son. He had been absent holding a fort for the French king when they were taken captive.

Sakia gives the following reasons for keeping her marriage a secret. Her husband had been the younger son of a French noble family and was thus a dependent of the King. They had been married by a humble French priest and should the "haughty Canadian priesthood" come to know of it they would use their influence with the French monarch to bring disgrace upon her husband because she had not become a Christian. As for her son he had been brought up among the Iroquois to hate the French so intensely that the information concerning his birth might arouse in his mind an aversion to his father whom he could not remember. Should the Iroquois come to know that Ulamar was French they would certainly no longer allow him to lead them to battle and this would be a blow to Ulamar without for the present furthering her own wishes.

Sakia also relates how on one occasion when her husband was sick of his wounds and his recovery was doubtful, he had made her promise that she would never allow her son to make an alliance with an Indian maiden; but that she would endeavor to have him taken home to France where he might marry someone in his father's own rank. This was the secret of her aversion to the union of Ulamar and Irene, although she admitted that Irene was in every way beautiful and good.

Okima advises Sakia to strengthen herself with the Iroquois by this marriage, as her return among the Hurons might still compromise her husband with the French; but Sakia recoils from the idea of making such an alliance with her husband's enemies, and assures Okima that she no longer fears the anger of the French priesthood, as through conversations with Beaufort she and Ulamar were inclined to adopt the Christian faith.

The friendship between Beaufort and Ulamar is a strong element in the drama. More faithful than even Palamon and Arcite, they were ever ready to make sacrifices for each other, even in the matter of Irene, with whom they were both in love. Irene had never shown any preference for either of them, so that their fate seemed to depend on the decision of Zephario and his wise men.

On his return from the battle, Beaufort pays a visit to Sakia. He discusses with her the position in which he and Ulamar stand to each other as aspirants to the hand of Irene. Sakia tries hard to persuade Beaufort to urge his own claims, saying that one who could so generously praise a rival must have performed heroic deeds himself. She speaks of the debt of gratitude Ulamar owes Beaufort for many kind and generous acts and indeed for his life, for at the time they were taken captive Beaufort had snatched the child Ulamar from under the threatening dagger of a cruel foe. Ulamar then should be the one to give place, but Beaufort says Ulamar has amply repaid all these obligations and that they had mutually sworn to take no advantage of each other in this sacred affair of love.

A messenger then announces the return of Ulamar from the battle and that he waited Beaufort at the latter's home to consult with him regarding terms of peace offered by the French. Beaufort assures Sakia that no treaty of peace will be accepted after the recent treachery of the French and Hurons.

Sakia is grieved because Ulamar seems to avoid her and she begs Beaufort to send him to her that she may have an interview with him before terms of peace are discussed. She has now fixed her hopes on a cessation of war and an exchange of captives as her remaining chance of deliverance from slavery and a return to her own people.

In the second act Ulamar arrives to visit his mother as requested. They meet with affectionate greetings; but these over, Sakia upbraids Ulamar with having deserted her and resisted her absolute commands. She also reproaches him with having fought against his own country and embrued his hands in her dear blood, and she asks him pathetically:

> "Can'st thou so utterly forget
> That thou wast born on the Huronian Lake?"

It is in this scene that Ulamar makes his first assertion on behalf of liberty, saying

> "Forever blest be that eternal power
> That gave me a human comprehensive mind
> That can look down on narrow principles,
> For every brave man's country is the Universe,
> His countrymen mankind, but chiefly those
> Who wish the happiness of all the rest,
> And who are friends to all their fellow-creatures.
> And such are all the Iroquoian tribes;
> Such the unconquered English; free themselves
> And loving all who actually are free,
> And all who sadly sigh for liberty,
> But hating tyrants and their slaves alike
> And equally contemning both as fallen
> Below the dignity of human nature."

Sakia suggests to Ulamar that in the late fought field he might have met his father in his foe and turned his arms against that sacred life. Ulamar replies that in order to spare his kindred he had shunned the Hurons and turned his arms against the French. Sakia exclaims satirically:—

> "Have a care! Thou sayest mankind's thy kindred,
> Among the French thou too might'st find relations."

To disprove an accusation Sakia makes against him that he cannot see anything noble in the warlike French, Ulamar narrates an incident of the recent conflict.

In the heat of the battle Ulamar had observed a French officer "mowing down the Iroquois like ripened corn." The followers of this brave man, as they cheered him on, shouted "Long live Miramont." Ulamar describes how he had singled out this warrior as a worthy opponent, had fought with him, disarmed him and had raised his hand to slay him. He is interrupted during his recital by his mother's extreme agitation and on his showing solicitude she tries to excuse herself by saying,

> "I am always on the rack when blood is spilt."

Ulamar replies,

> "Now then, be calm, for here no blood was spilt,
> For looking sternly in my foeman's face
> In his undaunted eyes I saw his soul
> So grand, so awful, and so truly noble,
> That I revered the sight and held my hand
> And gave him liberty, the salt of life,
> And sent him to his own."

Sakia's agitation still continues. She is sure that Ulamar's opponent in the battle was his father. She stares as in a trance, starts convulsively and utters dark sayings to which Ulamar has no key. He is alarmed and exclaims:

> "May Heaven long preserve my mother!"

Someone is approaching who must not see her in this disorder. He leads her out and returns. It is Beaufort that enters. In the succeeding interview he and Ulamar agree that the disposal of Irene's hand shall not affect their friendship, Beaufort saying:

> "Let him that wins Irene not be blest by halves
> Let him not lose his friend

Seeing Irene approaching, Beaufort retires. Irene is surprised at his seeming to avoid Ulamar and herself. She comments also on the sadness of his look. Ulamar thinks Beaufort is thrice blest because Irene is concerned for him. He now makes a declaration of love to Irene although he does not hope that she will show him any preference. In his love affair alone Ulamar is humble; in other respects he is confident and self-assertive. He thus addresses Irene:

> " 'Tis not that angel's face, nor angel's form,
> That form surpassing all your lovely sex.
> 'Tis not that winning pomp of outward grace
> Which upon you as on its queen attends,
> But 'tis your mind that captivates my soul.
>
> . . . .
>
> But while you captivate the gazing world
> You still remain serene as if that Heaven
> Designed you not to love but be adored.
>
> . . . .
>
> Smiling you kill and know not that you strike
> And we with pleasure die."

Irene tells Ulamar that he is mistaken in thinking that she is so cold, as she does love someone. Ulamar wishes to know if it is Beaufort to whom she has given her heart, as if so he is willing to die rather than stand in the way of his friend's happiness. Irene answers thus by describing the one she loves:

> " 'Tis not my lover's form ensnares my heart,
> Though his our Angian maidens all adore,
> But when I saw a youth in his first bloom
> Lead our brave Iroquois with more success
> Than our most ancient and experienced warriors,
> Perform such wonders for his country's safety
> And for the liberties of human kind

To which he sacrifices his repose
And even his life; and hazards the enjoyment
Of what he loves much dearer even than life.

. . . .

Through the slight disguise Irene draws over her confession Ulamar can perceive that it is himself she pictures; but his rapture is qualified when she adds:

"Thy god-like virtue which enflamed my heart
Has in my heart produced the noble pride
Of imitating so much excellence,
And if my countrymen decree me Beaufort's
For Beaufort I'll retrieve my heart and never see thee more."

Beaufort re-enters accompanied by Zephario. The decision has been made; the Iroquois send grateful thanks to Ulamar for all that he has done for them, but inasmuch as Beaufort had in a terrible onslaught of the enemy saved the life of Ulamar, so dear to the Iroquois and so necessary, he receives the reward of valour—the hand of Irene. Irene on being asked gives her consent; but Beaufort says:

"A strange consent, despair is in her eyes and death in his."

Irene says she will be faithful to Beaufort. Though she loves Ulamar she belongs to Angia, not to herself. Beaufort thanks the Iroquois for their most estimable gift, but he adds:

"I but accept it to bestow it here."

He gives Irene to Ulamar.

Zephario speaks his approval thus:

"The deed is noble for 'tis wise and just.
The English ever were a gallant nation,
And foes to force and friends to liberty."

He then announces that the marriage must be consummated at once. The Angians had learnt from their captives that the recent treacherous attack had been made at the instigation of a French officer who had seen and loved Irene and who had taken this means of getting her into his power. Every band had received orders to seize upon her person. Should another such attempt be made Irene would have a strong protector in Ulamar.

The marriage ceremony then takes place.

In the third act there is a long interview between Ulamar and his mother. In their previous meeting Sakia had been so agitated that she had forgotten the main object she had in view, the making of peace.

She begins by trying to interest Ulamar in the prospect of meeting with his father. She describes her husband in the following terms:

> "The best and bravest of mankind is he.
> And O! he loves thee, son—he lives for thee,
> . . . . and me he loves
> As if some god came down to adore his creature
> And then a wisdom and tongue might charm
> The ears of listening angels,—know my son
> Thou wilt be fond—be proud of such a father."

Ulamar, as he has often done before, begs her to tell him his father's name; but Sakia informs him that all knowledge of his father depends on two conditions—the acceptance of the proffered terms of peace and the renunciation of the daughter of Zephario. Passionately Ulamar rebels against the latter stipulation and he reveals his marriage thus:

> "This day our hands were joined; this very hour,
> With solemn invocation, I implored
> The eternal mind and every power to witness
> That naught but death would part my love and me."

Sakia then tells Ulamar that he can never meet with his father as he hates the Angians with a mortal hatred; but Ulamar replies that when he sees Irene all his hatred will cease, and when his mother speaks of his father's ambitions for his son and describes the kind of wife he had dreamed of for him, Ulamar says:

> "What he designed then, Providence has done,
> My father when he sees her will be charmed,
> My father loudly will approve my choice."

Sakia seeing that she cannot influence Ulamar with regard to his marriage leaves that subject but continues to harp on the making of peace. She represents strongly the advantages it will be to herself and to Ulamar to be re-united to her husband and she dwells long and loudly on her own suffering and grief, addressing to Ulamar the following reproachful words:

> "Thou hast refused to dry thy mother's tears
> But prov'st a cruel and a bitter child to me,
> Untouched by all my grief, unmoved by all my love."

Ulamar protests and says that, taught by Beaufort, he had been more submissive than was common among Indian youths.

Sakia further says that Ulamar will soon be absolved from all filial duty as he can never see his father and yet a little while he will have no mother, meaning that unless peace is concluded and an end put to her woes she will destroy her own life. Ulamar is much moved

and bids her be patient until he has heard what the French and his own allies have to propose. Accepting this as giving her leave to hope, she embraces her son and withdraws.

Left alone Ulamar soliloquizes. His words are expressive of a struggle between his faithfulness and attachment to the English and Iroquois and his love for his mother. He reflects on his mother's past devotion to him and he is greatly agitated.

He is called away to join his friends and meet with the French ambassadors.

When the ambassadors announce the desire of the French and Hurons to make peace, Zephario, Beaufort and Ulamar taunt them with being the cause of the war by their past treachery and say that the French now wish to gain by diplomacy what they had failed to win by force of arms. The ambassadors plead that their governor, Frontenac, disowns the recent treacherous attack. It had been a private enterprise which the governor had resolved to punish. They say also that the French monarch has sent orders to Frontenac:

> "To make a solid and lasting peace
> With all the warlike five Iroquoian tribes;
> A peace so firm that 'tis his royal will
> That you and all his subjects will be one."

In this proposal may be noticed a desire to separate the English and the Iroquois interests. The French urge strongly the advantage this arrangement would be to the Iroquois, but their arguments are not at all convincing. Whilst they are still discussing the matter, a slave of Sakia's arrives and drawing Ulamar aside tells him that his mother "stands with her threatening dagger in her hand." Ulamar bids the slave tell his mother that "Her harsh command will be obeyed."

He then turns to the French envoys and tells them that although the Iroquois will not agree to become part of a community, they are willing to accept the following terms of peace:

1st.—A cessation of hostilities between us and you, and your confederates the Hurons.

2nd.—A treaty of commerce between us and you.

3rd.—An exchange of all the captives.

Beaufort, surprised, in vain tries to interrupt Ulamar. The French agree to the terms. Zephario agrees to the treaty of commerce as being for the advantage of his tribe.

One of the ambassadors expresses great satisfaction and asks if the English will now be dislodged. Beaufort replies that they need not fear the English as he will that night encamp his troops a league from the town where they will be ready to march towards New York in the morning.

Ulamar promises also that the Angians will be disarmed.

Beaufort further says that the English will punish this defection of the Iroquois by leaving them to the mercies of their new allies which he characterizes as dreadful cruelty.

A touching scene next takes place between Beaufort and Ulamar. Ulamar fears that he has forever lost his friend and he tries to justify himself by saying that his mother's life had been involved. Beaufort then gives utterance to a sentiment which is several times made prominent in the drama.

> "Yes, yes, I guess the cause,
> And this is what has captivated Europe
> Where they domestic interest most prefer
> Before the weal and honour of their country,
> Though private good on public weal depends
> And he who for his house betrays his country
> Betrays his family, betrays his children
> All his posterity to shameful ruin
> And makes them poor, precarious, abject, base,
> Instead of happy, rich, or great, or brave,
> And this, fond youth, thou surely too wilt find."

Seeing Ulamar's distress Beaufort assures him of continued love. He reminds Ulamar that he had that very evening given up Irene to him which argued no common friendship. He thus laments their parting

> "And yet thou hast deprived me of thyself too,
> Irene now is thine and thou art hers
> She soon will comfort thee for Beaufort's absence
> But only death can drive away my grief
> For I shall never, never see thee more."

Ulamar begs Beaufort to delay his departure; but Beaufort answers that he cannot trust the French and Hurons not to attack his troops and he must convey them to a place of security. Ulamar then shows solicitude for Beaufort's own safety, saying:

> "It is a gloomy and tempestuous night
> And thou hast a long league to march alone,
> And yet thou sayest there may be danger near."

But Beaufort replies:

> "O! I have lost all that I hold most dear!
> The entirely wretched need no danger fear."

Act IV begins with a soliloquy of Ulamar, commencing:

> "Beaufort, thy loss sits heavy on my soul
> For I shall never see thy like again."

He betrays discouragement as he compares the English with his present confederates. Thoughts of Irene bring him some consolation.

Sakia now enters and is much elated at the terms of peace just agreed to. She congratulates Ulamar on possessing all that's good and all that's fair and she bids him prepare for new transports on the morrow as he is to behold the best of fathers. She foretells that her husband will see in Irene the lovely image and the perfect mind his rich fancy had pictured for his son. Irene entering, Sakia bestows upon the happy pair a thousand blessings. She then withdraws leaving Ulamar and Irene alone.

For Irene's sake Ulamar triés to animate this meeting with a lover-like exaltation; but Irene does not respond to his humour. She is downcast and says:

> "A sadness sits upon my soul—a black presage,
> That whispers I must lose thee, Ulamar."

Ulamar tries to calm her fears by saying that it is mere melancholy fancy, but as if to confirm her forebodings a dreadful groan is heard with succeeding shrieks and groans; then sounds of battle and slaughter which startle Ulamar. Arimat, an Angian, rushes in wounded and dying. He informs Ulamar that the French have proved treacherous have rallied their broken troops, returned by stealth and attacked the town. Ulamar is about to fly to arms; but Arimat assures him it is too late to fight, for all the Angians except a few were slain and that this dauntless handful were still keeping the enemy at bay, so that Ulamar, the hope of the Iroquois, the prop of liberty, might have time to escape. He urges Ulamar to fly, and having thus delivered his message he falls to the earth and dies. Irene also begs Ulamar to save himself and says she will follow him to life or death. Ulamar answers that it cannot be for life as there is no flight for him; he will die fighting but not unavenged. At the same moment Zephario staggers in wounded and dying. He exhorts the others to die also to escape the fate that may overtake them. Irene laments her father.

Immediately after, the French and the exhausted Angians rush in fighting. Ulamar joins his countrymen and is struggling against odds. Frontenac, the governor and Miramont, his relative, appear. Miramont begs Frontenac to withdraw his men as he alone is sufficient to cope with the Angians. Ulamar and Miramont recognize each other as the combatants of the morning. Miramont having stayed his arms presents Ulamar to Frontenac and informs Ulamar that he had previously made Frontenac promise that he should be safe and free. Ulamar resigns his sword to Miramont and expresses surprise that one whom he had regarded as so noble in the morning should be engaged in such treachery. Miramont says he disapproves of the treachery and would have no part

in it. Frontenac speaks in the same strain; but says he has to obey a superior power, meaning France, and adds that he has had orders from the French monarch:

> "To spare no force, nor art, nor cost, nor fraud
> To seize upon the general of the Angians."

He had expected to find the general among the Angians at the gate of the town where they had made such a noble defence. He asks Ulamar for information regarding this leader as the other slaves had been dumb to his questioning.

When Frontenac finds that the general of the Angians is before him in the person of Ulamar, he can hardly believe that one so young could aspire to lead an army; but he says:

> "I see thou hast a soul above thy years
> And that exalted soul must scorn a lie,
> Thou art the general then as thou hast said it.
> Here, take him guards and lead him to his fate."

There is then a violent scene between Miramont and Frontenac. Miramont claims the promise of Frontenac that Ulamar should be safe and free, but Frontenac answers that the sentence of death is not from himself but from the French king and that he himself will be ruined if he does not obey superior authority. Miramont insists that his own honour is involved, as it was because of his pledge that Ulamar had delivered up his sword and he declares that he will defend Ulamar with his own life. Frontenac calls on the guards to seize Miramont for insubordination. Miramont resists the guards and is wounded. Frontenac is softened when he sees the blood of his kinsman being shed. He calls off the guards and gives Miramont hope that his wish will be fulfilled. They now turn their attention toward Irene, still present, and when the circumstances of the unhappy lovers are made known to them, Frontenac and Miramont are greatly moved. Miramont intercedes for them, reminding Frontenac that he himself had greatly suffered by being torn asunder from those he loved. Miramont further argues that it is in the interest of the French king to spare this valiant youth and he proposes that Ulamar be asked to forsake the Iroquois and attach himself to the French. Frontenac thinks Ulamar too noble to entertain such a proposal, nevertheless he makes it, and at Miramont's request gives Ulamar half an hour to decide on his course.

Irene is left alone with Ulamar, Frontenac naturally thinking that she will persuade him to join the French and try to save her husband's life at all hazards. They are given in charge to the guards. Miramont makes this proposal, not that he wishes or expects Ulamar to prove a traitor to his adopted country. We learn from an aside that, failing

the clemency of Frontenac, Miramont has a plan for the deliverance of Ulamar and he wishes to gain time. Frontenac says to Ulamar at parting:

> "And now, Angian, life or death are in thy choice.
> If thou wilt swear to embrace our interests,
> A glorious instrument thou mayest become
> To make these nations subjects to our sway
> And then thou shalt be happy, shalt be great
> And under us rule all the Iroquoian tribes
> If thou refusest thou shalt surely die."

Ulamar and Irene are now left alone. They regard it as a farewell interview, for Irene is too noble to urge Ulamar to save his life at the expense of his country. Ulamar reproaches himself with being the cause of all their woe. For the sake of his kindred he had risked his country's welfare and now on his own household the curse had speedily fallen. Thinking of her possible fate when left alone, Irene wishes to die before Ulamar. She contrasts her own future lot with his, saying touchingly:

> "The transitory pains of death with thee
> Will soon be o'er, but I shall bear them long.
> Of thy sad death how long may I be dying
> For I have neither enemy nor friend
> That will deliver me."

She delicately leads up to the thought that she must die and that Ulamar's hand must strike the blow. He understands her meaning when she says:

> "Thou hast a poniard tho' thy sword be gone."

Ulamar draws the poniard but points it at his own heart saying it is he that deserves to die. Irene remonstrates with him and passionately entreats him not to leave her behind. They struggle for possession of the dagger. Guards enter and separate them. The time being elapsed, Ulamar is led away again to meet Frontenac. Irene is placed with the other captive women.

In the closing act Frontenac again tempts Ulamar with the promise of power among the Indian tribes if he will help the French to subdue them; but Ulamar answers:

> "Thou mistak'st thy man, I have a soul
> That scorns a tyrant and a slave alike
> And thou would'st have me both."

He then surprises Frontenac by making a counter proposal. He exhorts the Governor to throw off the French yoke under which he and others were groaning, promising,

"I'll make thee king of all Canadian tribes,
And the brave English and the Iroquoian nations
Shall both support thy claim."

Frontenac is indignant and exclaims:

"I'll hear no more, say, wilt thou live or die!"

Miramont begs Frontenac to listen to Ulamar. Detached from the heavy responsibilities that weigh upon Frontenac. Miramont is more at liberty to express his opinions. He describes his own sufferings and even those of Frontenac, through the tyranny of the French king, saying in conclusion:

"Pray, what power is this that awes us so,
What force has he but what we fondly give him,
For what we wrongly call his power, is ours."

Ulamar thus contrasts the offer made by Frontenac to him with that which he makes to Frontenac.

"Thou would'st have me betray my trust, my country,
The solemnest and most sacred of all trusts.
I would have thee deliver those thou rulest,
And free them from the bonds that rend their hearts.
To what height then thy happiness would soar,
How would thy virtue and thy glory shine!
Then impious war would here forever cease!
Which never came upon these happy groves
Till thy false race first landed on our shores
For 'tis for liberty *we* war, not empire."

While they thus debate a messenger enters and shouts, "To arms! To arms, my lord!" He speaks of lights moving upon the mountain side and says:

" 'Tis thought the routed Angians who escaped
Are now returning with their English friends
And by their lights direct their nightly march.
Directly towards the southern gate they turn."

Frontenac prepares to lead his forces himself towards the southern gate. As he leaves he gives strict commands that Ulamar is to be guarded and gives him ten minutes more to choose between life and death. Miramont and Ulamar are now left alone, Miramont entreats Ulamar to embrace the French cause, only for an hour, assuring him that at the end of that time he will find that he, Miramont, has been a true friend and has risked all to save him. But Ulamar answers:

"Virtue oft deserted for an hour
Resents it deeply and upon the wing
Is gone past all recall."

An officer now enters and asks for Ulamar, and on learning that he stills holds out against the proposal of the governor, he sternly orders him to prepare for death at once. Miramont begs the officer to stay for a moment, but the officer says he dare not delay. Ulamar utters a last farewell to absent Irene. He entreats Miramont to protect her when he shall be gone and the charge is solemnly accepted.

The mother of Ulamar now enters. She had hardly expected to see her son alive. On seeing him so helpless in the hands of his enemies, she laments the part she has had in bringing upon him such dire misfortunes. The officers are inclined to put an end brusquely to the clamour she makes; but Miramont begs them be patient. With him delay means everything. One of the officers goes to inform the Governor that they are being hindered in the execution of his orders. In this interview Sakia meets with Miramont but there is no recognition. She and this Miramont have never met before. In answer to her questioning he admits that it was he who had fought with her son in the morning. From him also she learns that there had been another Miramont, a kinsman, in Canada. He had returned to France to assume the family title on the death of his elder brother, but he was no longer in France, he had gone to a better world. Sakia breaks into passionate weeping at the thought of her husband's death, so that Miramont cannot finish his story. Frontenac now enters, frowning. He has found no enemy at the southern gate and he has been told that his orders concerning Ulamar are not being obeyed.

Sakia is appalled on seeing him enter. She thinks it is the spirit of her dead husband as she has often seen him in dreams, and she believes he is displeased because she has not joined him in the other world. She calls to him that she will come, she throws herself upon the ground and draws a dagger to take her own life. Frontenac recognizes her as his long lost wife, calls her by her Huron name, raises her and in loving terms bids her live. Frontenac is further surprised to find in the general of the Angians, condemned to death, his own son. Ulamar offers to submit to the death sentence to save his father from disgrace with the French king, but Frontenac lost in admiration of his son's noble character is so inspired with the spirit of liberty that he exclaims, "Perish all tyrants and their black commands." He so delights his son by his utterances on behalf of liberty that Ulamar exclaims:

> "O, that some angel with his golden trump
> Would make that voice through the wide world resound
> That the celestial sound might rouse mankind to liberty."

Irene now enters and is warmly welcomed by Ulamar. He reminds his father that he has asked nothing for himself, but he now prays him to look with favour on Irene.

Irene receives as warm a welcome as Ulamar could desire.

Irene is the first to tell them of the return of Beaufort. It had been the first care of that "godlike man," as she calls him, to seek her out and tell her of the wonderful discoveries that had been made and the happy change that had been brought about in the fortunes of herself and Ulamar. He had thereby saved her in her misery from a "dire attempt upon her life."

Frontenac and Ulamar consult about their future plans and Ulamar assures Frontenac that,

> "Before the sun has finished three careers
> The warlike English and the united Iroquois
> Shall hail thee king of all Canadian France."

Beaufort now enters; he informs Frontenac that the rallied Angians and the English are all within the town. Their presence is best explained by Beaufort's own words;

> "Two hours are scarce elapsed since this brave man
> To me despatched a messenger express [meaning Miramont.
> Inviting me to come and save Ulamar,
> And for my entrance gave a certain signal.
> I on the wings of warmest friendship flew."

Frontenac enquires of Miramont the state of mind of his French troops.

Miramont replies:

> "They with the English and the Angians unite
> And peace and joy on all their looks appear.
> Impatiently they wait for your consent
> To cry, Hail Frontenac and liberty!"

Ulamar makes a complimentary speech thanking his friends Beaufort and Miramont for all that they have done for him and on behalf of liberty. Beaufort utters the closing sentiments:

> "To Heaven unanimously praise be given
> And thankful for this wonderful deliverance
> Resolve that Heaven alone shall o'er you rule,
> And cast not off your Maker's sway for man's.
> Be governed still by nature and by law
> And let your monarch still be God's vice-gerent
> And execute his Master's will, not his.
> Thus governed we are absolutely free
> Heaven and good kings give perfect liberty.
>
> . . . . . May all France like you
> Have their eyes opened and with horror see
> How to their tyrant's will they offer up

Their children and their whole posterity,
The thing that Heaven and nature most abhors.
May the see this like you, like you detest it,
Then grow like you impatient to be free,
With us asserting God-like liberty."

Criticism.

As is well-known it was quite common for the great masters of the English drama to deviate from the line of historic accuracy in their works for the purposes of the plot. Shakespeare and Marlowe are instances of this. It is but fair to state that so far as the writer has been able to ascertain, the family relationship of Frontenac to the Huron tribe, introduced into the drama, is pure fiction.

The didactic speeches on behalf of liberty in the drama are quite too long, and the introduction to the printed copy tells us they had to be curtailed for representation on the stage. Lack of humour throughout may also be thought a defect. There is none of the by-play of minor characters that so often lights up a lagging scene in a play, and no "poor fool and knave," as in King Lear, "labours to out-jest" Beaufort's heart-struck sorrows.

Nevertheless, there is repartee and epigram and the incidents move so rapidly there is very little feeling of tedium. Although the political and warlike motives of the piece are kept prominently to the front, the human interest, the friendship, the love, the family affection, is by no means overshadowed.

The dramatic unities are observed; the French regulations being followed, that the drama should be enacted in one place and the time allotted to it one day. In the last act the principal characters are gradually grouped together ready for the falling of the curtain. The fashion that prevailed in Charles the Second's time, that every play, even a tragedy, should end happily, to please that pleasure-loving monarch, is imitated.

The Purpose Aimed at in The Play.

Dennis, in his preface to this drama, defends himself against the imputation that it was written in a party spirit on behalf of the Whigs. He says, "The party for whom this play was writ are all those who have any concern for their country, their relatives, their friends and their children, and the party it was writ against are those who care not a farthing for any of these." He also repudiates the idea that it was written in a spirit of rancour against the French people. He asserts that it is not against the French as a nation that he has any unfriendly feeling, but that it is the tyrannical rule of the French monarchy that

he holds up to condemnation. In proof of this he points to the fact that he has introduced two noble French characters, Frontenac and Miramont into the drama, and to this may be added that it is a French governor that Dennis chooses as worthy to be king and rule over independent Canada.

There are three leading principles akin to each other advocated in the drama. The first of these is indicated in the title "Liberty Asserted"—the right of every people to have a voice in its own government and to refuse to be subject to arbitrary sway.

The second is purity of administration—putting public weal before private interest. The third is liberty in the concrete—an independent Canada, free from the evils of war, stirred up by European nations, chiefly the English and French, continually laying claim to her fair heritage.

General Estimate.

That this drama at first so well received did not find a place among English classics and can now only be found among the treasures of our archives may be due to various causes. Dennis, by his severity as a critic, made many enemies among the literary men of his day and we doubt not that any work of his thus set before the public gaze would suffer from the rancour of the former victims of his pen. The defects of the drama itself, already mentioned, must also be taken into account, although its production, undertaken as it was by so many brilliant actors and actresses, showed that it furnished scope for histrionic talent.

The English sentiment to which Dennis appealed, was in some degree ephemeral. The people were still rejoicing over their deliverance from the arbitrary rule of the Stuart dynasty, an event kept in mind by the constant efforts of the Stuarts, under the ægis of France, to regain the English throne.

The constitutional monarchy secured to them on the accession of William and Mary was still matter for congratulation and the English could hardly fail to contrast their own government with that of the monarch that coined the phrase, "L'état c'est moi," or to sympathize with the spirit of discord then arising in France which later proved so fatal to the House of Bourbon.

The English were inclined to peace and the military aggressions of Louis XIV on the continent of Europe kept them constantly in the turmoil of war, whilst the struggles between the French and English for supremacy on the North American continent fostered a spirit of national rivalry. All these sentiments were woven into the fibre of the drama with considerable aptitude and would naturally make it

attractive to the public audiences of the period. It was a drama for the time but not for all time.

On the death of Dennis in 1734, Aaron Hill, a friendly critic wrote:

> "Though here revenge and pride withheld his praise
> No wrongs shall reach him in his future days
> The rising ages shall redeem his name
> And nations read him into lasting fame."

Though this prophecy is not likely to be fulfilled, yet the principles for which Dennis strove have prevailed in the world's history.

We are to be congratulated on the fact that, while the main object of our Canadian archives, under the successful management of Dr. Doughty, is to gather material serviceable for the making of our Canadian history, yet among its treasures a few rare and unique productions of English literature occasionally find a place.

II.—*Laurenciana.*

By LT.-COLONEL WILLIAM WOOD.
Author of
"The Fight for Canada."

(Read the 28th September 1910.)

PREFACE.

A river, like a man, is the triunion of body, soul and spirit.

Everyone knows the St. Lawrence as a giant body for all the world to wonder at. But few know it as the home of a much greater soul and spirit, the inspiration of all who heed its best appeal.

We are insistently told that our modern civilization is making for every kind of mental and moral righteousness. So it may, in the end. But, as an age of exploitation is always apt to mistake comfort for civilization, we must expect to find the St. Lawrence making only a statistical appeal to most of our people to-day. Higher aspects are nearly hidden by immediate surroundings of horse-power, gallons, and dollars and cents. But the fact that this is so does not imply any real incompatibility between the different aspects. "Business is business" is an excellent definition of a most excellent thing. And, using the word "business" to cover every form of honest money-making, the definition becomes still better, by reason of its implications. We can no more exist without business than we can without food. Business is always and everywhere indispensable for every people and, to a greater or less extent, for every individual man, woman and child in the world. Moreover, it supplies the necessary material basis for all higher things. So I have nothing whatever to say against business here, although I look at the life of our River from quite a different point of view. On the contrary, I am always ready to cry "business is business" with the best of them. But I do this because I believe that business is really business, pure and simple—the root of existence, not the flower of life.

The flower of life is Service—the service of God in Religion, and the service of Man in Statesmanship, War and the Intellectual Life. Service is greater than business, immeasurably greater; for it is the soul and spirit of life, not the mere body of existence. But it is mainly done for business people, who naturally form the bulk of mankind. It is sometimes done by them; and then they deserve greater credit, other things being equal, than people habitually engaged in service, because they must first rise above their business, while service itself exalts its devotees. Besides, there are kinds of applied business which

rise into service by virtue of their application. So it is quite plain that service and business are as intimately correlated in human affairs as mind and body are in the individual man. This may seem an absurdly trite and obvious point to argue in a preface; little more than a formal way of saying that it takes all sorts to make a world. But the point is worth some elaboration, since devotion to any kind of service, and especially to the intellectual life, is thought a poor "business proposition" in a generation so materialized as to think one sort alone —and that a purely commercial sort—will make any world worth having. Our people are apt to forget what they owe to "The River of Canada," what this River owes to the sword and the cross, and what it may still owe to the pen and the brush. And they are equally apt to be heedless of the fact, and resent it when brought to their notice, that the service of genius is the only thing that ever has or ever can make any people great. Everything that makes our life worth living comes from the original and creative minds of men of genius. These men are so few that all of them, in all ages put together, would not nearly equal the population of one small town. Yet without them man could not be man. They are the units of life, other men are the ciphers. All the ciphers in the world are no better than a single cipher. And all the countless ordinary men would never have made any advance without the leadership of the few extra-ordinary men. But these few would never have moved mankind unless some bond of sympathy had turned units and ciphers together into a concrete number. Take a simple illustration. Shakespeare, in and by himself, is merely 1. As none of his readers could have written his plays, all of his readers are simply so many ciphers, in that particular respect. But put unit and ciphers together, and all the otherwise futile ciphers become parts of an effective whole, which is 10, or 100, or 1,000, or 1,000,000, or more, according to the number of ciphers under the influence of the unit. Thus each is needful to the other, because a unit alone would be purely selfish, and therefore could do no service, while the ciphers alone could never do anything at all, even for themselves.

Our greatest New-World disability is our blindness to this very aspect of interdependent need. Most of our people think a whole nation can live on business alone and that it can buy service like any other "goods." But every people forms a body corporate of all the human faculties; and the health of this body depends on the due exercise of all its vital organs. There is evolution by atrophy downwards as well as upwards. And disuse of our higher organs will assuredly bring the nemesis of reversion to a lower type. Business is the food and stomach, service the head and heart. We cannot exist without the one, nor live without the other. And this dual unity

is the reason why service must grow out of a national yearning for it, why statesmanship is more than a branch of business, why fleets and armies cannot be hired like journeymen, why pure science is of an altogether higher kind than any commercial application of it, and also the reason why you can no more separate use and beauty in any great art than you can separate soul and body in a living man. Unity involves idiosyncrasy: can we appreciate the higher faculties of other bodies when we do not appreciate those of our own? The thing is impossible. Take the five senses of Art—music, literature. architecture, sculpture and painting. They all grow out of the higher forms of life, yet are essential parts of it. Then, how can we appreciate, at all events as a people, their less intimate appeal, as the growth of other lives, when we have no native yearning for their more intimate appeal at home?

We need business for our existence as much as any people. But we shall never do more than exist unless we have an exalting touch beyond. For the real life of any country depends entirely on its power of producing and appreciating units of genius devoted to the service of God and Man.

But I forbear to meddle with these great matters any further, lest a still more pretentious preface should make a flatter anti-climax of a tentative introduction to a possible book.

Any general view of the whole of the Laurentian waters may also itself be a too pretentious introduction for a book which is gradually growing out of various and variously published notes about the one special part of them where I happen to be a traveller at home—the Lower St. Lawrence from Montreal to the Sea. But this part is the greater because of that whole.

These notes are purely personal, the mere record of impressions made by the life of the river on one who loves every single feature of it:—its sights and sounds; its many different craft, from birch-bark canoes to first-class battleships; its beasts and birds and fish; its Indians and hunters, fisherfolk and habitants, discoverers, explorers, sailors, soldiers, statesmen, saints, its men of science and its men of art—in a word, all that has made it, and all that we hope will continue to make it worthy of its old renown as "The Great River," "The River of Canada." But, personal as they are, I think these notes worth making now, when old and new are meeting along its course as they have not before and can not again. And I venture to hope that when the genius comes to make its life immortal he will re-make my ciphers with his own units into what will serve a more propitious future.

INTRODUCTION

The King of Waterways

I. When Naaman the Syrian turned away from Elisha in a rage it was by a comparison of rivers that he showed his passionate pride in the glories of his own land—"Are not Abana and Pharphar, rivers of Damascus, better than all the waters of Israel?" Yet, if Jordan were as nothing in comparison with the rivers of Damascus, were not Pharphar and Abana themselves as nothing in comparison with Euphrates, "that great River, the River Euphrates," whose fame will echo down the centuries of faith for ever? Besides, there were other and still larger streams, of Asian and African renown, and real and fabled immensity. There were giants in those days among the old-world rivers.

But a new world came into the ken of man, and set other and mightier standards of natural greatness among the rivers of the earth. Imagine the wonder of the first western voyagers when they drew up the fresh water of the Amazon, while they were still far out of sight of land, and surrounded by what they had still supposed to be the vast saltness of the South Atlantic! What a river, which could pour its own "pomp of waters unwithstood" over the very ocean! Later on, this same river was found to be so astonishingly navigable that the largest sea-going ships could pass inland, without a hindrance, for at least three thousand miles—as far as England is from Equatoria! Surely this must be the greatest of all fresh waters, old or new! It springs from the Andean fastness of perpetual snow, receives the tribute of a hundred tropical streams—each one of which surpasses many a principal river of Europe—and then flows out to sea, a long day's sail and more, on its own triumphant course, still the Amazon and still fresh.

But if the whole of the Amazon and all its tributaries, and all the other rivers in the Old World and the New, with all their tributaries, and every lake in every land as well, were all to unite every drop of their fresh waters, they could not equal those which are held in the single freshwater reservoir of the five Great Lakes of the St. Lawrence! So, if the St. Lawrence River itself, and its many tributaries and myriads of minor lakes, are added in, we find how much more than half of all the world's fresh water is really Laurentian. But even this is not all. There is more salt water in the mouth and estuary of the St Lawrence than in all the mouths and all the estuaries of all other rivers. Moreover, all the tides of all these other rivers do not together form so vast a volume as that which ebbs and flows inlandward between Belle Isle and Lake St. Peter, nine hundred miles apart. Thus, in each and all the elements of native grandeur, the Laurentian waters

—salt and fresh, tidal and lake—are not only immeasurably first among their rivals, taken singly, but unchallengeably first compared with all their rivals united together, throughout the whole world beside.

Mere size, however, is a vacuous thing to conjure with—except before press-ridden audiences, whose minds have been perverted to machine-made ends. And even the St. Lawrence would be nothing to glory in if it could only boast a statistical supremacy of so many gallons of water. But its lasting appeal is to a higher sense than this, to the sense of supreme delight in the consummate union of strength and beauty, in beauty that is often stern and wild, and strength that is sometimes passive; but always to both together.

II. Look at those most eastern gateways of the whole New World—the Straits of Cabot and Belle Isle. The narrow passage of Belle Isle may flow between a grim stretch of Labrador and a wild point of Newfoundland; but it is a worthy portal, and its Island a worthy sentinel, with seven hundred feet of dauntless granite fronting the forces of the North Atlantic. The much wider Cabot Strait is sixty miles across; but both its bold shores are in view of each other. Cape North is four hundred, Cape Ray a thousand feet higher than Belle Isle. There can be no mistake about the exact points at which you enter Laurentian waters, when you have such landmarks as these to bring abeam. Nor is there any weak touch of indistinction about the Long Range of Newfoundland, which runs north and south between these straits for over three hundred miles, often at a height of two thousand feet. This Long Range forms the base of the whole island stronghold, which throws its farthest salient the same distance forward to Cape Race, whose natural bastion served for centuries as the universal landfall of all American voyages.

Newfoundland is an "island of the sea," if ever there was one. Nowhere else does the sea enter so intimately into the life of a country and a people, calling—always calling—loudly along a thousand miles of surf-washed coastline, echoingly up a hundred resounding fiords that search out the very heart of the land, whisperingly through a thousand snug little lisping tickles—but calling, always calling its sons away to the fishing grounds, east and north and west, and sometimes to the seafaring ends of the earth.

Newfoundland is as large as Wales and Ireland put together; yet it stands in an actual contraction of the mouth of the St. Lawrence, which is four hundred miles across from Battle Harbour to Cape Breton. Inside, the Gulf is another hundred miles wider again, between Labrador and Nova Scotia, and large enough to hold England and Scotland. So the entire mouth of the St. Lawrence could easily contain the whole

of the British Isles. The three principal Gulf Islands are historic Cape Breton, garden-like Prince Edward Island, and Anticosti, which, though the least of the three, is over a hundred and twenty miles long. There is a whole zone of difference between the north and south shores of the Gulf, between the gaunt sub-arctics of Labrador and the tall maize fields and lush meadow lands of Acadia, where, as the old French writers all assure us, "everything will grow that grows in France, except the olive."

The Gulf is the deepest of river mouths—a deep sea of its own, round all its shores, with lonely deep-sea islands—St. Paul's, Brion, the Magdalens, and Bird Rocks. The Magdalens are a long and brilliant crescent of yellow sand-hills, bright green grass, dark green clumps of spruce, and red cliffs of weathered sandstone. But Deadman's Island stands gloomily apart, its whole bulk forming a single monstrous corpse, draped to the water's edge. The Bird Rocks are two sheer islets, ringed white from base to summit with lines of sea-gulls. A lighthouse now occupies the top of the larger Rock; but, on a moonlight night, the smaller still looks like a snow-capped mountain, from the mass of gannets asleep on it.

The Gulf has many wild spots, but none so wild as Labrador. And this is all the more striking, because of the closeness of civilization, old and new. At Bradore Bay you are in view of the continual come and go of ocean liners. Yet, along the shore, from here west to Natashquan, you will find plenty of waste places, with nothing between them and the Pole, except a few Indians and Eskimo. No part of the continent of America is so close to Europe as Labrador, which may also have been the first part of the New World visited by the Norsemen in the tenth century. Yet the interior of it is less known in the twentieth than Central Africa or Alaska. It is of immense extent. Both its north-to-south and east-to-west beelines are over a thousand miles. And between these four points lie wildernesses of rocky tablelands, covered with a maze of waters. It is a savage land—ruthless and bare and strong—that seems to have risen overnight from chaos, dripping wet. The bewildered streams hardly know which way to find the sea. Most of them flow along the surface in changeable shallows, as if they had not had time to cut their channels; and many lakes discharge in more than one direction. Labrador, indeed, is to-day very much as the Great Ice Era left it thousands and thousands of years ago. But even glacial times are modern compared with its real age. Its formation is older, far older, than man; even if we go back to his earliest anthropoid ancestors, hundreds of thousands of years ago. It is older than the original progenitors of all our fellow-beings, millions of years ago. For it is the very core of the great azoic Laurentians,

the only land now left on the face of the earth that actually stood by when Life itself was born.

Here, among the islands, where you can see the untamed mainland on one side and the tameless sea on the other, here—though you may have been round the oceans, and gazed your fill on Alps and Himalayas—you feel the scene transcend all others in the poignancy of its contrast between eternal Nature and evanescent Man. Your little lonely craft is no greater here, in this vastitude of time and space, than that curled speck of down from a sea-bird's breast, poised for an instant on a smooth of water. And you yourself, another infinitesimal speck, are here no more than one among the myriad millions of the Animal Kingdom, living out one momentary flash of your fretful life between primeval water and primeval land. These ranges are the real and only rightful heirs to the title of "the everlasting hills." And not only this, but their entire adamantine mass is of the same substance which forms the roots of all the other mountains in the world. They are not very high where you see them from the Gulf. But they rise, ledge after ledge, towards the remote interior; and they and the whole country are, in another sense, still rising from the depths, with such irresistible, though gradual, force that archipelagoes of islands break away from the margin, like loose pebbles, as each new ledge emerges.

The sea has always been the same. But the two thousand miles of the Laurentians, with the far-spreading country beyond, are the only lands still remaining "such as creation's dawn beheld." So here, as nowhere else, each sunset takes us back to the childhood of Earth and the beginning of Time.

> Nature mourned when sank the first Day's light,
> With stars, unseen before, spangling her robe of Night.

What a dread obsession this would be—what a numbing weight of horror on the wings of the spirit, and what an image of abysmal things, if we ever did attempt to soar—were it not that we feel salvation in the mere power of flight, which reveals us to ourselves as primordially one with all Earth was, and is, and is to be:

> The presences of Nature in the sky
> And on the Earth; the Visions of the hills
> And souls of lonely places.

And, knowing this, I do not fear, but welcome, the spell of the Laurentian hills, which draws me back to them, again and again, with the same keen spring of desire that I felt when, as a boy, I first anchored one twilight within sound of their solitudes, and

. . . . they to me
Were foreign, as when seamen at the dawn
Descry a land far off and know not which.
So I approached uncertain; so I cruised
Round those mysterious islands, and beheld
Surf and long ledges and loud river bars,
And from the shore heard inland voices call.

And, in the selfsame way, I welcome the spell of the Laurentian sea, off shores that have borne her company since before the very peopling of her waters.

Who hath desired the Sea? Her excellent loneliness rather
Than forecourts of Kings, and her outermost pits than the streets where men gather
Inland, among dust, under trees—inland where the slayer may slay him
Inland, out of reach of her arms and the bosom whereon he must lay him.
His Sea at the first which betrayed—at the last which shall never betray him,
His Sea that his being fulfils—
So, and no otherwise, so and no otherwise, hillmen desire their hills.

The long, bare Labrador coast line becomes less thinly wooded as it runs south-west; and, every now and then, it is vividly brightened by a magnificent seascape. The big, bewildered rivers of the interior generally find a decided course to run some time before they reach salt water, and come down strengthened by each tributary and quickened by every rapid till they are eager to slash their way into the thick of the opposing tidal streams of the St. Lawrence. The last of them is the greatest of all. The Saguenay is a river and a fiord both in one. Five large and many smaller rivers run into Lake St. John; but only one runs out, and that one is the Saguenay. Through its tumultuous Grand Discharge it soon rushes down nearly three hundred feet to sea level, where it enters its fiord and ebbs and flows its remaining sixty miles in a stream a thousand feet deep between precipitous Laurentian banks two thousand feet high. Its flood currents are comparatively weak; but on the ebb of a full spring tide it comes straight down with tremendous force and without a single check, over a mile wide and a hundred fathoms deeper than the St. Lawrence, till its vast impetuous mass suddenly charges full tilt against the submarine cliffs that bar its direct way out to sea. The baffled rapids underneath shoot madly to the surface, through which they leap in a seething welter of whirlpools and breakers, to dash themselves, with renewed fury, against all surrounding obstacles. A contrary gale, when this tide is running its worst—and there's war to the death between the demons of sea and sky in all that hell of waters.

But this is at the inland end of the estuary. The seaward end meets the Gulf round the shores of Anticosti, between three and four hundred miles below the Saguenay. To whom can Anticosti be a land

of desire, except as a game preserve in the interior? From the sea it is one long, low, bleak weariness of hard flat rock and starveling vegetation. The woods look like senile wrinkles on the face of the land. They are stunted, gnarled and distorted by their convulsive struggles to keep a foothold against the relentless wind. They have to interlock their limbs to do so successfully, and this to such an extent that you may walk over their densely matted tops.

To the south lies a stretch of the Gaspé cliffs, longer than Anticosti, sterner than Labrador, and higher than the canyon of the Saguenay. The peninsula of Gaspé, with its solid backbone of the Shickshocks rising four thousand feet above ground, is like the odd half of a range on the Atlantic Labrador, broken off lengthwise and sheer, and then set into the softer South, with its sheer side turned towards the St. Lawrence. For a hundred and thirty-seven miles there is not a sign of an inlet on that iron coast. There are a few tiny rills spurting through narrow clefts, and with perhaps a fishing hut or two beside their mouths. But there is no landing-place for anything larger than an open boat, though the deep sea flows against the very precipice, so that you might lay whole fleets alongside. No wonder seamen give it a wide berth! The rocks are sharpened to fangs where wind and water meet; and once they flesh their teeth in you ——!

Halfway up from Anticosti is Pointe de Monts, on the north shore, where the Estuary narrows very suddenly, the mountains on the Gaspé side diminish and recede, and the curious double-topped hill called the Paps of Matane serves to show that the bank of soundings and line of settlements are beginning. The rest of the south shore has now softened into gentler outlines, forested on top, cultivated below, and humanized by a succession of white little villages gathered round their guardian churches: flocking houses and a shepherding church. At Green Island we are opposite the Saguenay, where the Estuary ends and the River begins.

III. From main to main, from the mouth of the Saguenay to Cacouna Island, is only eighteen miles across: and the hitherto wide, clear and single deep-sea channel suddenly becomes comparatively narrow, obstructed, double and shallow. There are the Saguenay headlands and reefs on the north, Red Island with its big and dangerous two-pronged bank in mid-stream, and Green Island with its own terrific triangular death-trap on the south. The Saguenay dashes against and over and round the reef that partly bars its mouth. Red Island Bank stands straight in the way of the flood of the St. Lawrence, which comes up, unobstructed the whole way and two hundred fathoms deep; till it reaches these sudden narrows. And Green Island Reef is thrust out into the centre of swirling currents that change so much

and so often as to go completely round the compass twice in every day. What with the great depths and quick shoalings, the immense widths and sudden contractions, the reefs, the islands, the Saguenay, the tides, the ten differents currents, and all the other restless things that make wild water —there is no other place to compare with this for the wonder of its seascapes. Here, in a single panorama, from the Tadousac hills or the crags of Cacouna Island, you can see a hundred seascapes come to birth, live and die in glory, all in one day and night. How often have I watched them shift and change, like floating opals! I have watched the literal "meeting of the waters," where the last of the River ebb meets the first of the Estuary flood, and have seen the league-long snake writhing in foam between them. And, here again, in calm, unclouded weather, I have seen blade after blade of light flash along the surface, as if the sun had damascened them.

Nature has divided the whole St. Lawrence into seven distinctive parts. But man has not given them seven distinctive names; and no part requires a name more than the part between Quebec and the Saguenay, the part of all others that Nature and Man have united in making unique. In default of a better, let us call it "The Quebec Channel," as the next part above it is sometimes, and usefully, known as "The Montreal Channel." Then, if we acknowledge all the straits connecting the Gulf with the sea as the real mouth, we shall have our seven names complete. "The Mouth" should cover all the lands and waters of the actual outlets, that is, the Atlantic straits of Canso, Cabot and Belle Isle, and the islands of Cape Breton and Newfoundland. "The Gulf" is too well known to need defining. "The Estuary" runs up from Anticosti to the Saguenay; "The Quebec Channel" from the Saguenay to Quebec; "The Montreal Channel" from Quebec to Montreal; and "The Upper St. Lawrence" from Montreal to the "Lakes," which speak for themselves.

IV. For scenery and historic fame together the Quebec Channel easily bears the palm. The south shore, with its picturesquely settled foreground, undulating up to wooded hills behind, and the north, with its forest-clad mountains rising sheer from the water's edge, are admirably contrasted and harmonized by the ten-mile breadth of the River which divides them. Opposite the lower end of the Island of Orleans, thirty miles below Quebec, both north and south shore ranges sweep back in gigantic semicircles, which only approach each other again the same distance above the city; so that when you stand upon the Heights of Abraham you find yourself on a Titanic stage in the midst of a natural amphitheatre two hundred miles around. Here

the salt water meets the fresh, the Old World meets the New, and more than half the history of Canada was made.

The Montreal Channel flows between almost continuous villages on both banks; the hills recede to the far horizon; and there are touches of Holland in occasional flats, with trim lines of uniform trees and a windmill or two against the sky. In Lake St. Peter, half way up the Channel, the last throb of the tide dies out. At the end of the Channel, and from the top of Mount Royal, you again see the panorama of the hills. On fine days you can make out the crest of the Adirondacks, the southern outpost of the Laurentians, nearly ninety miles away. The view at your feet is very different. It is that of a teeming city, already well on its triumphant way into its second half-million of citizens. Having looked down upon its present extent, and then all round, at the enormously larger area of contiguous country over which it can expand, you might remember that this city, the Mountain itself, and the open lands behind, form, after all, only a single island among an archipelago at the Mouth of the Ottawa, which is by no means the greatest among the tributary streams of the St. Lawrence.

The Upper St. Lawrence is full of exultant life, showing its primeval vigour in a long series of splendid rapids. Rapids always look to me like the muscles of a river, strained for a supreme effort. But man has accepted the challenge, running the rapids when going down stream and working his way up by canals, which are as worthy of admiration for their disciplined, traffic-bearing strength as the rapids are for their own strenuous untutored beauty. The banks are nowhere very bold or striking. But there is plenty of human variety blended with pleasant vestiges of Nature. Farms, orchards, villages, parks, towns, meadows, trees and rocks and woodlands, alternate with each other till the Thousand Islands are reached, at the beginning of the Lakes. Here there are hundreds of channels, great or small, eddies innumerable, ripples, calms, and a few secluded backwaters—all threading their way, fast or slowly, through a maze of rocky, tree-crested islets, and glinting or dappled in the sun and shade. Nature must have been making holiday when she laid out this labyrinth of water-gardens for her own and her devotees' delight. And man makes holiday here himself. But what a holiday! Half the scene is defaced by sham palaces and sham castles and other brick and stone abominations in the style that's advertised as "real baronial." All of it is worried by fidgetty motor boats, the reek of suburbia, and every other jarring note that millionairish shoddydom can make most stridently out of harmony with the natural surroundings. The pity of it is that once the Philistines have made the place more than half their own they have not gone

on to make it wholly so. There might, then, be at least something more or less in harmony with itself. Why should not all the islands, buildings, boats and everything else that can be labelled, be appropriately marked with the net cash prices paid for them? This would save so much art criticism! Would it not, indeed, be the very last word of all criticism?

V. The five great Laurentian lakes are so immeasurably greater than any other lakes in the world that when you say, simply, "The Great Lakes," you are universally understood to mean these and no others. Except for mountain shores with snow-crowned summits, such as enfold many a lake in the Alps and Rockies, they lack no element of grandeur. Their triumphal march takes them through hill and plain, wilderness and cities; while the charge of their hosts shakes the very earth at Niagara, and shows their might to all her peoples.

It is hard to realize now that Niagara was never seen by a white man till nearly two centuries after John Cabot first set foot on Laurentian soil. The Falls were never heard of by the earliest discoverers. Then they became a rumour, a name, a mystery, an object of wonder and desire. The Senecas who lived near them were as fierce as their rapids, and the French pioneers kept aloof. Even so late as 1669 La Salle only heard their thunderous roar, without seeing them, as he passed by on his way to the West; and it was not till nine years later that he stood among the four white men who had the first view of this stupendous work of Nature.

Lake Huron is the second wonder of the Lakes; and not a modern scenic wonder only; for the Great Spirit, the *Manitou,* has always taken up his abode upon the island called after him whenever he has come to earth. Georgian Bay is almost another Great Lake, and contains not thousands but tens of thousands of islands. Yet this mere size is nothing to the beauty of sky and pellucid water on a still midsummer afternoon; when the Huronian blue of each seems to blend into a third and more ethereal element, light as the air yet buoyant as the water, in which canoes seem, fairy-like, afloat between them.

The third wonder is Lake Superior, a clear, cool, blue immensity and sheer depth of waters like the sea. Its surface is six hundred feet above the Atlantic, but its bottom has soundings as much again below. Its north shore is a crescent of stern and wild Laurentians, as high as the Saguenay's and hundreds of miles long. And, as the St. Lawrence fronts the ocean with portals that can be plainly made out from the deck of a ship a whole degree away, so here, two thousand miles inland, it has another and an inner gateway to a farther west, in the huge lion-like mass of Thunder Cape, a second Gibraltar in size and strength and actual form.

VI. East and west it is a far cry from the salt sea to the fresh. But, in the life of north and south, it is a farther still, even at the same time of year, from Belle Isle to Pelee in Ontario. In the height of the summer at Belle Isle death-cold icebergs, hundreds of feet thick and acres in extent, are often to be seen; while at Pelee Island luxuriant vineyards are ripening for the wine-press, in the latitude of Oporto, Naples and Constantinople. Yet from Belle Isle to Pelee Island is only half the way between the Straits and the innermost headwaters of the St. Lawrence!

But again, the essential unity of the great River is no less wonderful than the striking diversities of its seven parts. Winter lays the same tranquillizing hand upon it everywhere, stilling it into the regenerative sleep from which it is awakened by the touch of Spring. And everywhere, along the headwaters, lakes and river channels, and thence to the sea, along the South Shore and its tributaries, over unnumbered leagues of waterway, and through every imaginable scene of woodland and meadow, plain, hill, valley, crag and mountain, the three open seasons bear sway sufficiently alike to find true voice in one and the same song of spring, another of summer, and yet another of the fall.

LAURENTIAN SPRING.

The lyric April time is forth,
With lyric mornings, frost and sun;
From leaguers vast of night undone
Auroral mild new stars are born.

And ever, at the year's return,
Along the valley grey with rime,
Thou leadest, as of yore, where Time
Can nought but follow to thy sway—

The trail is far through leagues of Spring,
And long the quest to the white core
Of harvest quiet, yet once more
I gird me to the old unrest.

So another year has passed,
And to-day the gardener Sun
Wanders forth to lay his finger
On the blossoms, one by one;

Then will come the whitethroat's cry—
That far, lonely, silver strain,
Piercing, like a sweet desire,
The seclusion of the rain—

And, though I be far away
When the early violets come
Smiling at the door with Spring,
Say—"The Vagabonds have come!"

LAURENTIAN SUMMER.

I am sailing to the leeward,
Where the current runs to seaward,
Soft and slow;
Where the sleeping river-grasses
Brush my paddle as it passes
To and fro.

On the shore the heat is shaking,
All the golden sands awaking
In the cove;
And the quaint sandpiper, winging
O'er the shallows, ceases singing
When I move.

On the water's idle pillow
Sleeps the overhanging willow,
Green and cool;
Where the rushes lift their burnished
Oval heads from out the tarnished
Emerald pool.

Where the very water slumbers,
Water-lilies grow in numbers,
Pure and pale;
All the morning they have rested,
Amber-crowned and pearly-crested,
Fair and frail.

Here, impossible romances,
Indefinable sweet fancies,
Cluster round;
But they do not mar the sweetness
Of this still, mid-summer fleetness
With a sound.

I can scarce discern the meeting
Of the shore and stream retreating
So remote;
For the laggard river, dozing,
Only wakes from its reposing
Where I float.

Where the river mists are rising,
All the foliage baptizing
With their spray,
There the sun gleams far and faintly,
With a shadow soft and saintly
In its ray.

And the perfume of some burning
Far-off brushwood, ever turning
To exhale;
All its smoky fragrance dying,
In the arms of evening lying,
Where I sail.

My canoe is growing lazy
In the atmosphere so hazy,
While I dream;
Half in slumber I am guiding,
Eastward, indistinctly gliding
Down the stream.

LAURENTIAN FALL.

Along the lines of smoky hills
The crimson forest stands,
And all the day the blue-jay calls
Throughout the autumn lands.

Now by the brook the maple leans,
With all her glory spread;
And all the sumachs on the hills
Have turned their green to red.

Now, by great marshes wrapt in mist,
Or past some river's mouth,
Throughout the long, still, autumn day,
Wild birds are flying south.

VII. I rejoice to the full in the glories of our Laurentian seasons; and rejoice in especial with Bliss Carman, Pauline Johnson and Wilfred Campbell. Yet their three poems remind me how much more we think of the scenes than of the sounds in Nature. Why is this; for, in all Nature, we have nothing more deeply varied than the sounds of water, from the softest breath drawn by a little infant lowland river to the cataclysmal roar of a hurricane at sea? If we have an inward eye that is the bliss of solitude, have we not also an inward ear, through which Nature may call our soul of memory? I think it must be so; for Nature is visible spirit, spirit invisible Nature; and though there is neither speech nor language, their voices are heard among them.... twin voices: the inward voice of the human soul and the outward voice of many waters. These things are a mystery, a symbol and a name—the thread of life between the macrocosm of Earth and Sea and the microcosm of Man and the Soul. The Eleusinian mysteries were wrought within sound of the sea, which beats through all the religious poetry of the old free Greeks. The first Teutonic name for the

soul was taken from the symbol of the sea—*saiws*, the sea; *saiwala*, a little sea, a soul. And this symbolic connection has never been broken by the poets of Teutonic race.—

> Seele des Menschen,
> Wie gleichst du dem Wasser!
> Schicksal des Menschen,
> Wie gleichst du dem Wind!
>
> The mind, that ocean where each kind
> Doth straight its own resemblance find;
> Yet it creates—transcending these—
> Far other worlds and other seas.

Can it be that the ear is duller than the eye to the infinite appeal of water? At least, I like to think it is not always so. Each year, when I go down the River, the different currents, eddies, reef-tail swirls and tide-rips greet me with voices as individual as those of any other life-long friends. I recognize them in the dark, as I should recognize the voices of my own relations. I know them in ebb and flood, in calm and storm, exactly as I know the varying moods and tones of men. And, knowing them thus, I love them through all their changes. And often, of a winter's evening, they wake the ear of memory within me by a symphony of sound that has now become almost like a concerted piece of music. It steals in on me; swells, vibrates and thunders; and finally dies away again—much as a "Patrol" grows from *pianissimo*, through *moderato*, to *fortissimo*, and then *diminuendoes* slowly into silence.

Always, when it begins, I am in my canoe, and there is a universal calm. All I hear, aft, is the silken whisper of the tiny eddies drawn through the water by the paddle, and, forward, the intermittent purl of the cutwater, as it quickens and cleaves in response to every stroke. Next, alongshore, I hear the flood tide lipping the sand, pulsing slowly through reeds and sedges, and gurgling contentedly into a little half-filled cave. Then the stronger tidal currents join in, with the greater eddies, reef-tail swirls and tide-rips, "and all the choral waters sing." Then comes the breeze; and, with it, I am in my yawl. It comes at first like that single sigh of the air which drifts across the stillest night, making the halyards tap the mast a little, the yacht sheer almost imperceptibly, and the rudder swing just enough to make the main-piece and pintles whimper gently in their sleep. But it soon pipes up, and I am off, with the ripples lapping fast and faster as the yacht gathers way. Presently I am past the forelands, where the angry waves hiss away to leeward. Then, an ominous smooth and an apprehensive hush, as the huge, black-shrouded squall bears down on the wings of the wind, with a line of flying foam underneath, where its myriad feet

are racing along the surface. And then the storm—the splendid, thrilling storm:—the roar, the howls, the piercing screams, the buffetings, the lulls—those lulls in which you hear the swingeing lash on shore and the hoarse anguish of the excoriated beach:—and then the swelling, thunderous crescendo and the culminating crash. And, after that, the wind diminishes, little by little, and finally dies away. And, when it ceases, all the choral waters sing again. And when these, in their turn, have played their part, I hear the half-muffled gurgle that tells me the tidal cave is almost full. And, at the last, I hear the reeds and sedges rustle softly, as the end of the flood quivers between their stems; and tide, and reed, and sedge, and the lipping on the sand, the purl of the canoe, and the silken, whispering eddies from my paddle, all mingle, faint, and melt away once more into the silence out of which they came.

VIII. This is the voice I hear so often—the natural "voice of many waters," which, like the divine one that spoke in revelation, also proceeds out of a throne. For the St. Lawrence, this King of Waterways, is more than royal, more, even, than imperial—it is the acknowledged suzerain of every other waterway, from the Mountains to the Sea, and from the Tropics to the Pole.

The farther afield the old discoverers went the more they found that the St. Lawrence was the royal road to the gateways of the continent. For its own basin is so intimately connected with the subordinate basins of all the other rivers that these men could go, in the same canoe, by paddle and portage, from any part of its course to any part of the coast—eastward to the Atlantic, between the Bay of Fundy and New York; southward, along the Mississippi, to the Gulf of Mexico; and northward, either to Hudson's Bay or, down the Mackenzie, to the Arctic Ocean. Only the western divides were too great a barrier. But you could come within sight of their summits, which themselves looked down on the Pacific. So east and west, and north and south, you could go freely, through whole kingdoms of vassal streams, by the sole virtue of one passport from the suzerain River.

And what men they were, who went these endlessly venturesome ways, who forced every gate they came to, and then pushed on, undaunted, into other realms of the unknown!

Cabot and his Englishmen were the first to tread the mainland of America, and they did so on Laurentian soil. Their year, 1497, was just four centuries before the one in which a Dominion of Canada, historically based on the St. Lawrence, sent its representatives to the Diamond Jubilee of the Queen of Cabot's land. And their day, the 3rd of July, was the very one on which, a hundred and eleven years later, Champlain founded Quebec, from which these representatives sailed.

But the English, true to their traditions, were satisfied with the seaboard so long as it served the purpose of their trade. Thirty years after Cabot's landfall at Cape Breton, the first letter ever sent from the New World to the Old was, so to speak, "posted" at St. John's, Newfoundland, on the 3rd of August, 1527. Nine years later Newfoundland was still the happy hunting ground of English exploitation, when "Master Hore" and thirty lawyers of the "Innes of Court and Chancerie" came out to make their fortune. Were any briefless barristers, before or since, ever engaged in such extravaganza? How on earth did they expect to make money when there were no other people to make it out of? They acquired some useful experience; but everything else was a disastrous failure. They stole a ship to get home, and only ate one lawyer for the general good when forced to live on each other.

IX. We are so accustomed to Newfoundland as the oldest of English colonies, and to Canada as the senior British Dominion beyond the Seas that we forget how long the St. Lawrence was a French river. It has been British for only one hundred and fifty years; but it was French for two hundred and twenty-five, just half as long again. And those parts of it which were most intimately associated with the four French heroes—Cartier, Champlain, Frontenac and Montcalm—are full of French speech and memories to the present day.

What a seaman Cartier was! Think of the tiny flotilla with which he explored the St. Lawrence in 1535,—three vessels, with a combined tonnage less than that of a modern ferry-boat! He coasted Labrador without a graze, searching everywhere to find the westward passage to Cathay; for he actually intended to sail through an unexplored New World, with his handful of men, to reach the most distant part of the Old! If anyone with seafaring tastes would like to read a pithy book of adventure, let me recommend him to try Jacques Cartier's *Brief Recit, & succincte narration, de la navigation faicte es ysles de Canada, Hochelage & Saguenay & autres, avec particulieres meurs, langaige, & ceremonies des habitans d'icelles: fort delectable a veoir. Paris*, 1545. There is a good reprint by *Tross: Paris:* 1863. This famous book is really quite as *fort delectable* to read as Cartier thought the country was to see. It is short enough to finish at one steady sitting, and no harder in French than Shakespeare is in English.

Jacques Cartier is one of those men you can't help liking. You would somehow infer that he was "a jolly good fellow," even if you had never heard of the entry respecting him at a baptismal fête:—*Jacques Cartier et autres bons biberons.* Yet he was as careful and skilful as he was bold and genial. The mere record of his voyages is proof positive of his having been a born leader of men. He never lost a vessel, though many were the ones he piloted through unknown waters. His

eye was quick, his judgment sound, his pen terse. He says he couldn't find a cartload of good earth in the whole of Labrador, and that it must be the country God had reserved for Cain. This was true enough of a land that had never borne a harvest since it rose from the depths. But Cartier's interests were navigational; and, making due allowance for difference of opportunity, his hydrographical descriptions will bear comparison with those of the Admiralty surveys of our own time. Compare, for instance, the description he gives of Cumberland Harbour with the one in the last edition of *The St. Lawrence Pilot.* A casual entry in his log about another Labrador harbour had a most momentous result in geographical nomenclature. On the 10th of August he happened into a little salt-water bay of no particular importance. Yet from this stray circumstance more than half the fresh waters in the world have taken their general name! He was a pious soul, observant of saints' days; and so his entry runs: *Nous nommasmes la dicte baye la baye Sainct Laurens.* Nobody knows how or why this name left its first home, in what is now called Pillage Bay, and set out to conquer the whole of what is now the Saint Lawrence. But so it was. Those were great days for sporting chances in the matter of names and places. Cartier gravely enters the names of the three "Kingdoms" which he passed through in as many hundred miles on his way to Montreal, the Kingdoms of Saguenay, Canada and Hochelaga. What different destinies these three names have had since then! Saguenay has now shrunk to a single stream, Canada has grown to a Dominion the size of Europe, and Hochelaga has faded away into a memory and nothing more!

On the 8th of September, the anniversary of the day on which the pettifogging politician Vaudreuil surrendered New France to Amherst at Montreal two hundred and twenty-five years later, the staunch sailor Jacques Cartier landed at St. Joachim to meet Donnacona, the "King of Canada," whose capital was at Kebek, the "Narrows" of "The Great River." It is a curious reflection that if Sir John Macdonald's suggestion had not been over-ruled by a timid Colonial Secretary we should now be living under another "King of Canada," George V. Cartier had two "Canadians" with him, Taignoagny and Domagaya, whom he had taken home from Gaspé the year before and now brought back as interpreters. And here we might remember something else to his credit. All the whites treated all the Indians as their natural subjects. But, while Columbus and the Spaniards enslaved or butchered them on all occasions, Cartier and the French treated them more as foundlings, to be made the obedient servants of both the King of France and the King of Heaven. Donnacona, like all the chief men in Canada, excelled in florid oratory; and the country of the Ottawas was even then marked on European maps as the scene

of action between the cranes and pigmies. But any Indian might well wax eloquent over such an astounding event, which he must have found quite as wonderful as we should find the arrival of a couple of lost friends in a flotilla of airships manned by a crew from Mars. Donnacona was friendly, and did his best to dissuade Cartier from going higher up the River by telling him how ferocious the people were in the next kingdom. Cartier, however, pushed on till he arrived off the fortified capital of Hochelaga, where his fearless yet kindly bearing and his marvellous equipment won him the unbounded admiration of the Indians, who, like all virile people, thought highly of a leader that looked fit for either peace or war. What a sight it was; that handful of hardy pioneers among those thousands of savages, who sang and danced round enormous bonfires, in token of welcome, all night long, close beside the two little open boats which were the only link of connection with civilization in all that illimitable wild! When Cartier landed, the inhabitants brought their sick and maimed for him to touch, "as if," he says, "they thought that God had sent me to cure them." True to his principles and faith, he opened his Testament at the Gospel of St. John and read aloud to the awestruck multitude: *In principio erat Verbum, et Verbum erat apud Deum, et Deus erat Verbum.* Then he climbed the *Mont Réal,* which has ever since borne the regal name he gave it, when, first of all the white men, he gazed from its summit, on a still October afternoon, at that wide magnificence of mountain and plain, brightened by the long sheen of the River, and all aglow with the crimson forest, as if the sunset lived the whole autumnal day in the glory of the maple leaves.

X. Turn where we may to Jacques Cartier's log-book, we are sure to find his unfailing touch of human interest. But there's an equally interesting touch whenever he refers to our other fellow-beings; and I cannot leave him without a word about what he saw of them.

When he first came up he found the River swarming with animal life. The walrus was common all over the northern part of the Gulf. Whales of the largest kind were plentiful, and the smallest, the Little White Whale, known as the White Porpoise, made inland runs as crowded as those the salmon used to make in the early days of British Columbia. Seals innumerable flocked together along the shores. And fish—well, the waters were far more alive with them then than they are in the choicest spots during the best seasons now. Cartier's keen eye noted all this, as well as many birds, which he described with such discriminating touches that they can be easily identified to-day. The *apponatz* is the unfortunate Great Auk, big as a Michaelmas goose, black and white in plumage, with a crow-like beak, and unable to fly. The *godez* were the guillemots, still locally called "guds." The *richars* are

puffins, queer owl-parrot-like sea-birds, red-beaked and footed, and nesting like rabbits.

The Great Auk is extinct; so is the Labrador duck. The walrus has long been exterminated in Laurentian waters. The whale, too, will soon be as extinct as the auk and the dodo, if modern whaling goes on much longer. And all at the hands of that most wanton of the beasts of prey, "civilized man."

Now, I do not at all mean to range myself among the sentimentalists by putting "civilized man" into the pillory of inverted commas. I am a firm believer in war, sport and meat. I believe in war because all the best breeds of men have excelled in war, because war is a great and good factor in evolution, and because excessive peace tends to rot the body politic away in the midst of the smug materialism of its "average man." Besides—apart from some really whole-souled enthusiasts—most pacifists are those who, as individuals, dislike all risks to their comforts or their skins, who, as classes, hate whatever enhances the value of the hero, and who, as peoples, naturally shrink from any ordeal which may prove them unfit. I believe in sport, in any form of true sport which means fair play and no favour to either side, and which requires exceptional skill or courage or both. A man is within the pale when he never indulges in wanton slaughter or individual cruelty, and when he instinctively observes the indefinable difference between a sportsman and a "sport," which is exactly the same as between a gentleman and a "gent." Wild animals don't die what we call natural deaths; they starve or get killed. And they don't suffer from nerves, like town-bred humanitarians. An animal that has just escaped death will resume its feeding or fighting or play as if nothing had happened. So the sportsman is only one more incident in the day's work, and his clean shot the happiest of deaths in the wild. No true sportsman would ever wound without killing as soon as possible, no matter if he lost the rest of his bag by doing so. Nor would he ever kill, even beyond the reach of any game laws, at a season when the loss of a parent might cause the lingering death of the young. So, within these limits, I believe in sport as, within its own righteous limits, I believe in war. I also believe in meat, simply because we are the great *omnivora*—a good and sufficient reason by itself.

Yet my whole heart goes out to all my fellow-subjects in the Animal Kingdom. I am an evolutionist, through and through, and fully recognize that every other animal is essentially the same as myself in kind, whatever vast distinctions there are between us in degree. I cannot imagine, much less desire, a dogless heaven. I rarely pull a trigger. I am a perfect exemplification of the sarcastic definition

of fishing as a hook at one end and a fool at the other. I delight in being a sympathetic soul in the natural life of my non-human kindred. I would gladly stop every form of human interference that involves unnecessary pain—such as trapping and bull-fights, and anything else in which man is able to torture his fellow-beings without risking his own skin, except in brutal bravado, like the matador. I would also stop all butchery, cruelty and extermination for which the caprices of fashion are responsible. Down at Cobb's Island they butchered twenty-eight thousand beautiful sea-swallows for ten cents a head, wholesale. In Astrakhan they kill the pregnant mother with every refinement of cruelty, so that her agonies may give the fur of her unborn offspring a more fashionable curl. And in Florida the snowy egret is threatened with extermination by plume-hunters in the breeding season, when the birds are in their most attractive feather, and death is more cruel than at any other time. These plume hunters will stick at nothing, even murder—they killed Bradley, the bird warden the other day—in order to get dollars from the dealers, who supply the milliners, who both stimulate and pander to the whims of fashion. Beauty in dress is good; just as beauty of person is entirely excellent. But beauty in dress is not worth having in the mere matter of a particular ornament at the expense of butchery and torture; and, in cases of extermination, the very thing for which our human greed kills out the species that produces it must itself be lost. Man, being in the machinery age, is able to destroy every strong and beautiful animal in the whole world, if he so decides. But when he can feed, clothe and adorn himself and womankind without such destruction; and when he can have legitimate sport as well, without upsetting the balance of Nature, what an arrant fool and vile knave he would be to break the spell of the wild and, with it, half the joy of the Earth!

I say this and I mean it, every word. But I entirely believe in the struggle for existence, all the same. And I think it wholly justifiable to fight on all occasions when two contestants inevitably cross each other's path and neither will give way, whether they be empires, masses or individuals. So, when man and other animals clash, man is right to fight for his own hand. This is, in fact, a kind of war, and quite as justifiable. But it should be conducted under the most humane conditions possible—what a difference the single letter *e* makes between *human* and *humane*! There is a time for war and a time for peace; and both are right in this life of ours, with its endless opposites and compromises. But, while war is war, between whatever parties it is waged, so murder is murder, throughout the whole animal creation, and all avoidable pain is a criminal offence in the eyes of universal justice, even when inflicted on what we call pests and vermin.

XI. I can never read books like Jacques Cartier's log and Audubon's Journals, and then compare their day with ours on the actual ground, without feeling the keenest pangs of regret for all we have lost. By this I don't mean to cry for the moon, or wish for an impossible return to incompatible conditions. And I know perfectly well that human history is the most interesting, human development the most important, and human life the most valuable. But it is in our own civilised human interest that I most regret the wanton and shameless destruction of wild life that has so often taken place, and that is still taking place, in Canada, as in all new countries. There are three stages in our attitude toward wild life, corresponding to the three stages in our own historical development—the pioneering, the exploiting, and the national. Of course these stages overlap and intermingle, and all of them exist side by side to-day in different parts of the country. But each has a spirit of its own. The pioneering age is frankly at war with the wilderness. The exploiting age is heedless, wasteful and wantonly destructive in its overmastering desire to get rich quickly at all costs. And the national age at last produces a leading public, wise enough to follow the foresightful few in saving what is left. We are just reaching the national age at a few centres of population, and we should now do our utmost to check the excesses of the exploiting and pioneering ages, without hampering their legitimate growth. We can do this by preserves and sanctuaries. Game preserves appeal to influential bodies of well-to-do sportsmen; and the preservation of all wild animals that have a commercial value appeals to strong business interests; so that public and private preserves have a double chance. But sanctuaries hardly touch the fringe of practical Canadian politics, as they cannot be justified to the ordinary man in easy terms of dollars and cents, and most people who do think them worth while are inclined to suppose that we can afford to leave their actual establishment to the next generation. Yet this is precisely what we cannot do, without grave risk of losing the opportunity for ever.

There are two kinds of sanctuary. One is to protect certain animals anywhere in town and country. The other is to protect a certain part of wild nature for all the animals whose habitat it is. The Americans have already set us noble examples of both kinds, and the sooner we follow them on a larger scale than hitherto the better for us and our posterity. Let us take the great waste places that remain before it becomes too late, and choose those parts of them which commercial man covets least and wild life needs most. The surplus inhabitants of these sanctuaries will help to replenish the neighbouring preserves—an argument that will go home to sportsmen and those

who are economically interested in sport. But the highest of all arguments in favour of sanctuaries is that they will soon be the only places where the spell of Nature will have any force at all. And it is good for man to feel this penetrating spell from time to time. It is good, even if only for the one reason that anything with a touch of native distinction is worth preserving from those dull levellers who think it so progressive to make everything disgustingly like everything else. We cannot live without bread or dollars—granted, and with both hands. But man no more lives by dollars alone than he lives by bread alone. And if he is to have any spot left on the face of the Earth where he can refresh his soul by communion with a world different from his artificial own, he must establish sanctuaries.

And sanctuaries, to be worth while, must be really sanctuaries. Let us make up our minds about those parts of wild Nature that should be absolutely set apart from exploitation, in exactly the same way as we make up our minds that a certain part of our time and money and attention is better spent on the soul and spirit of our life rather than on its material body. So we should take most of our forests for timber, most of our waterfalls for use as "white coal," most of our land for farming, and most of our wilds for food, fur or sport. But there cannot be a shadow of a doubt that we should greatly enrich our lives as a whole, and the exaltable side of them in particular, by leaving a few wild spots in Nature's keeping. And if someone should object that, after all, these wilds and their appeal are only for the few, I should point to the ever-increasing public who delight in the call of the wild, even though they may only have heard it through word and picture. And, finally, if it should be objected that no natural products could, under any circumstances, do as good service to man in a sanctuary as in the way of trade, I should point to the worst of forests and ask whether it is not serving a higher purpose on its native soil than when it is converted into the best of pulpwood for the Yellow Press.

The Laurentian waters have many a place well fitted for a sanctuary:—in Newfoundland, on the Magdalens, Bird Rocks and Bonaventure Island; along the North Shore in several spots, from the sea to the Saguenay; and, again, on Lakes Huron and Superior. My own, if I could make one, should be along some great reach of northern coastline, far down the Lower St. Lawrence.

Here I would have seals and whales of all kinds, from the common but timid little harbour seal to the big horse-heads and the gigantic hooded seals, the grizzlies of the water; and from the smallest of all whales, the twenty-foot little white whale, miscalled the porpoise, all the way up to the "right" or Greenland whale, big as any monster of old romance. The white whales are still comparatively plentiful

in certain spots. I have seen a run of them go by, uninterruptedly, for over an hour, many abreast, all swimming straight ahead and making the air tumultuous with the snorts and plunges that accompanied every breath. This, however, is rare. You will generally see them at their individual best in bright, sunny weather, when their glistening white, fish-shaped bodies come curvetting out of the water in all directions; or when they play follow-my-leader and look like a dazzling sea-serpent half-a-mile long. But, in the middle of all this and the corresponding flip-flop game of the seals, you may see both white whales and seals streaking away for dear life. And no wonder, for over there is that unmistakable dorsal fin, clean-cut and high, jet black and wicked-looking, like the flag of the nethermost pirate. It belongs to the well-named Killer, the *Orca Gladiator* of zoology, often miscalled the grampus. He is at once the bull-dog, the wolf and the lion of the sea; but stronger than any thirty-foot lion, hungrier than a whole pack of wolves, readier to fight to the death than any bull-dog, and, with all this, of such lightning speed that he can catch the white whale, who can overhaul the swiftest seal, who, in his turn, can catch the fastest fish that swims. He is the champion fighter and feeder of all creation. A dozen fat seals will only whet his appetite for more. With a single comrade he will bite the biggest "right" whale to death in no time. I have known him catch a white whale off Green Island Reef and be away again like a flash, gripping it thwartwise in his mouth. Think of a beast of prey that can run off with an elephant and still outpace a motor boat! Fortunately for the rest of the seafolk the Killer is not very plentiful, since he is almost as destructive as civilised man. Bigger again than the killer, twice his size at least, is the great fat, good-natured humpback, the clown of the sea. On a fine, calm day, the humpbacks will gambol to their hearts' content, lol-lopping about on the surface, or shooting up from the depths with a tremendous leap that carries their enormous bodies clear out of the water and high into the air, and shows the whole of their immense black-and-white-striped bellies. Then they turn over forwards, to come down with a sumphing smacker that sets the waves rocking and drenches an acre or two with flying spray. And last, and biggest of all, bigger than any other living creature, is the Greenland whale, the "Right Whale" *par excellence;* and nothing the animal kingdom has to show is so impressive in its way as to see the waters suddenly parted by his gleaming black bulk, which in a moment grows to leviathan proportions before your astonished eyes.

Would you barter the lasting companionship of all this magnificent strength for one mess of commercial pottage, especially when it is the fitting counterpart to the soaring beauty of the birds? Go out before

dawn on any reef where fish are plentiful, and you'll feel the whole air astir with dim white wings. Look up above the Bird Rocks in clear weather, and you'll see the myriads of gannets, each the size of an eagle, actually greying the sky with their white bodies and black-tipped wings. Or watch the gulls wherever they congregate—the big Blackbacks, with their stentorian "Ha! hah!", the Glaucus, the vociferous herring gulls, and the little Kittiwakes, calling out their name persistently, "keet-a-wake, keet-a-wake." Their voices are not musical—no seabirds' voices are—though they sound very appealing notes to anyone who loves the sea. But all the winged beauty that poets and painters have ever dreamt of is in their flight. Lateen sails on Mediterranean blue are the most beautiful of sea forms made by man. But what is the finest felucca compared with a seagull alighting on the water with its wings a-peak? And what are seagulls on the water to those circling overhead, when you can lie on the top of an island crag looking up at them, and they are the only things afloat between you and the infinite deep of Heaven?

Nearer down in my sanctuary there would be plenty of terns or sea-swallows, with their keen bills poised like a lance in rest. They are perpetually on the alert, these light cavalry of the seagull army; and very smart they look, with their black caps, pearl-grey jackets and white bodies, set off by red bills and feet. They become lancer and lance in one, when they suddenly fold their sweeping wings close in to their bodies and make their darting dive into the water, which spurts up in a jet and falls back with a "plop" as they pierce it. Just skimming the surface are the noisy, sooty, gluttonous, quarrelsome shearwaters, or "haglets," who have got so much into the habit of making three flaps to clear the crest of a wave, and then a glide to cross the trough, that they keep up this sort of a hop-skip-and-a-jump even when the sea is as smooth as a mill pond I would throw them a bucketful of chopped liver and watch the fun, camera in hand. Actually on the water are long lines of ducks. My sanctuary would be full of them. From a canoe I have seen them in the distance stretching out for a mile, like a long, low reef. From the top of a big cliff I have seen them look like an immense strip of carpet, undulated by a draft, as they rose and fell on the waves. And when they took flight in their thousands, their pattering feet and the drumming whir of their wings were like hail on the grass and thunder beyond the hills. As you paddle alongside a crannied cliff you wonder where all the kittens come from, for the rocks are fairly sibilant with their mewings. These are the young Black Guillemots, or sea-pigeons, whose busy parents are flying about, showing a winking flash of white on their shoulders and carrying their bright carmine feet like a stern light. I would

choose cliffs for a sea-pigeon loft, a mile or two long. The higher ledges of other suitable cliffs would certainly be lined with white-breasted puffins, murres and razor-billed auks. The auks and murres stand up as if they were at a real review, but the puffins, or "sea-parrots," with their grotesque red beaks—like a false nose at a fancy dress ball—and pursy bodies set low on stumpy red legs, always look like a stage army in comic opera. And there's a deal of talking in the ranks—the puffins croak, the auks grunt, and the murres keep repeating their gutteral name—"murre, murre."

Now look along the sanctuary shore, where you have been hearing the plaintive "ter-lee" of the plover, the triple whistle of the yellowleg, and the quick "peet-weet" of the sandpiper or "alouette." In the season you will always find the little sandpipers running about like nimble atoms of the grey-brown beach, as if its very pebbles bred them. No birds have a more changeful appearance on the wing. Some distance off, with their backs to you, they are a mere swarm of black midges. But when, at the inner end of their loop of flight, they see you and turn, all together, they instantly flash white as gulls and large as swallows.

If you have a stealthy foot and a quick eye you will have a good chance of getting near my Great Blue Heron, when he is stooping forward over promising water, intent as any other angler over a likely pool. He is a splendid fellow, tall as you are when he stands on tip-toe looking out for danger. And I always enjoy his high disdain for the company of intrusive man, when he flaps silently away, with his grand head thrown back, his neck curved down, and his legs listlessly trailing. A very different bird is the clamorous Canada goose or "Outarde," during migration. I would choose a likely spot for the lines of migration to pass over. On a still day you can hear the vibrant, penetrating *honk*! *honk*! long before the black, spreading V of the hurrying flock appears on the horizon. As they get nearer they sound more like a pack in full cry. And when they are overhead they might be a mass-meeting ripe for a riot.

Very different, again, are the hawks and eagles. They would be represented by the osprey, which we call the "fish hawk," and the bald-headed eagle, who surely ought to be a sacred beast in the United States, because his image appears on their adorable money. Of course I would protect both Killers and eagles, to give the same spice to sea and sky as the old robber barons used to give to the land. Besides, they help to preserve the balance of Nature by destroying the weaklings; unlike the sportsman, who upsets it by killing off the finest specimens. It is a common sight enough, but one of unfailing interest, to watch an osprey hover expectantly, and then plunge, like a javelin,

straight into the back of the fish he has marked down, checking his impetuous way, just as he reaches the water, by a tremendous down-sweep of his wings and a simultaneous curve of his fanned-out tail. But the eagle beats this by swooping for the fish he makes the osprey drop and catching it easily before it has reached the surface. Our eagles, however, do most of their own hunting, and prey on anything up to a goose three feet long and bulky in proportion. But it is not close-to that the eagle looks his kingly best. And I like to see him majestically at home in the high heavens, and to think of him as resting on nothing lower than a mountain peak lofty enough to wear the royal blue by right divine.

He clasps the crags with crooked hands,
Close to the sun in lonely lands,
Ringed with the azure world he stands.

And now it is sunset:—

Its edges foamed with amethyst and rose,
Withers once more the old blue flower of day.
There, where the ether like a diamond glows,
Its petals fade away.

A shadowy tumult stirs the dusky air;
Sparkle the delicate dews, the distant snows;
The great deep thrills—for through it everywhere
The breath of Beauty blows.

But the sea-bird hours are not yet over. From out of the darkness comes the long, far-thrown, re-echoing cry of the Great Loon, pulsing through the veins of the night and charged with I know not what weird call of the great wild places of the Earth. And as it lingers, dies away, and is caught up again, I remember those dim white wings of dawn; and I lie down to sleep richly content with all the long day's wealth that Nature gives me.

Such is the sanctuary I dream of—a place where man is passive and the rest of Nature active. But on each side of it I would have model game preserves where man would not be allowed to interfere with the desirable natural balance of the species, but where, within this limit, he could exercise in sport that glorious instinct of the chase which he once had to exercise in earnest for his daily food. And first among all forms of sport I would choose harpooning—I mean real harpooning, by hand alone; as I would entirely forbid the use of the modern battery or any other implement of commercial butchery. If you want proper sport, with a minimum of dependence on machinery and a maximum of demand on your own strong arm, clear eye and steady nerve, then try harpooning the white whale from a North-Shore

canoe. To begin with, the canoe is, of all possible craft, the nearest to Nature. There is no apparatus between you and it and the water, except a paddle, and the paddle gets its fulcrum and leverage directly from your own body. Every motion,—fast or slow, ahead, astern, or veering—is also directly due to your own bodily self. And your pleasure, your sport, and often your very life, entirely depend upon the courage, skill and strength with which you use your muscles. The canoe must be seaworthy enough to ride out a storm; yet light enough for two men to handle under all circumstances, and for one man to handle alone when working for a throw. If you would see man to perfection as a beast of prey, take the stern paddle and watch the harpooner forward—his every faculty intent, his every muscle full-charged for a spring, and his whole tense body the same to the harpoon as the bow is to the arrow. But if you would actually feel what it is to be this human bow and arrow, you had better begin by making sure that you are absolutely at home in a canoe in all emergencies. Then take the harpoon and poise it so that the rocking water, your comrade in the stern, the mettlesome canoe, yourself, your line and your harpoon can all become one single point of energy whenever that sudden white-domed gleam tells you the whale is head-on and close-to for just one thrilling flash of a second.

Thus, sanctuaries and game preserves each have their own peculiar interests and delights. But there is one supreme interest and delight they share together. This is the Pageant of Evolution—a pageant now being played under the eye of the flesh, but only as part of an infinitely greater whole, that began we know not when nor where, that is tending we know not whither, and that will end we know not how. It is a pageant always growing greater and greater, as the mind's eye finds higher and ever higher points of view. And it is a pageant with the same setting all over the World—except on the St. Lawrence. I have dwelt on this difference before; but I return to it, because it gives us one deep note of significance that is lacking everywhere else. It consists, of course, in the immeasurable age of the Laurentians, which, being older than Life, are, therefore, a land co-eval with the sea and sky. Think of this triune stage of sky and sea and primal land, set up by God so long before He put his creatures there, these millions of years ago! Then watch the actors. First, and slowest of all in their simplicity, the plants; and animals so lowly that they have hardly got beyond the frontiers of the vegetable kingdom. Next, the rest of the immense sub-kingdom of *Invertebrata*. And, after them, the fishes and reptilia, and the birds, who are directly of reptilian origin. And then the mammals, who, after infinite travail, have produced one

species which we, in our human conceit, call *homo sapiens*. But this is a ridiculous name for the mass of mankind. It ought to be applied only to those very few original and creative minds whom we acknowledge as men of genius, and without whom the root and stem of all our life could never have brought forth its flower.

XII. With man we come back again to history. And the St. Lawrence is historic, so historic, indeed, that the mere names on its roll of honour are alone enough to stir the hearts of all who live along its shores—Jacques Cartier, Champlain and Laval; Frontenac, Wolfe and Montcalm; Lévis, Murray and Carleton; de Salaberry, Brock and Tecumseh; the Fathers of Confederation, the South African Contingents, the Quebec Tercentenary,—these are the men and events whose names will go down to posterity, when all the merely material triumphs of which we make so much ado will be as totally forgotten as such triumphs have always been before, except in so far as they formed part of things beyond and above themselves.

And for those who are thinking about these greater things at all . . . . . let them work on in the faith that an appreciative posterity will be brought a little nearer by what they are doing now, that this "Great River," this "River of Canada," will presently give birth to the genius who will reveal its soul, and that its people will then divine its presences of Nature, see the visions of its everlasting hills, and be themselves regenerate in the consecration and the dream of it forever.

III.—*Nova Scotia under English Rule; from the Capture of Port Royal to the Conquest of Canada, A.D.* 1710-1760.

By REV. W. O. RAYMOND, LL.D.

(Read September 27, 1910.)

The maritime provinces of the Dominion are very nearly co-extensive with the tract of country that in the days of the French regime bore the name of Acadia. Possibly the day may come when these provinces may deem it well to reunite under one local government, in which event a return to the ancient name of Acadia would be eminently fitting.

The earlier history of this part of the Canadian Dominion naturally divides into (*a*) the Pre-historic, or Indian, period, (*b*) the Acadian period, and (*c*) the Pre-loyalist period. This paper will deal with the later portion of the Acadian period, and will serve as an introduction to the progress of settlement in Nova Scotia during the Pre-loyalist period, the consideration of which is reserved for another paper.

During the century that followed the attempt of the Sieurs de Monts, Champlain and Poutrincourt to establish a colony in Acadia, the centre of authority remained, for the most part, at Port Royal. But Port Royal had a chequered experience and, while it remained for the greater part of the century in possession of the French, it was repeatedly taken by the British, only to be restored to its former owners by conquest or by treaty. Samuel Argal, Sir Wm. Alexander, Sir David Kirk, Col. Robert Sedgewick and Sir Wm. Phips in turn held possession and for fully a century, from the time of its first occupation by the French, Port Royal was doomed to be the foot-ball of fortune. It was not until the brave Commander Subercase, overpowered by a superior force, surrendered to General Nicholson in September, 1710, that the ancient stronghold passed permanently into the hands of the British. The treaty of Utrecht, three years later, confirmed the English in possession; but for the next fifty years they held Acadia by a very slight tenure, and, had it not been for the efforts of the people of New England in various emergencies, the country would undoubtedly have again passed under French control.

By the treaty of Utrecht "all Nova Scotia, or Acadia, comprehended within its ancient boundaries," was ceded to the English. At once there was a disagreement as to the "ancient boundaries." The English insisted that the territory north of the Bay of Fundy—now the Province of New Brunswick—was undoubtedly part of Acadia. The French, on their part, stoutly asserted that Acadia included nothing more than the peninsula of Nova Scotia. The dispute lasted for nearly half a century, sometimes confined to wordy warfare over the council

board and anon a leading cause of strife on the bloody battlefield. The issue was at length decided in favour of the English by the stern arbitrament of the sword. The peninsula of Nova Scotia having been conceded to the English, it became the aim of the French to prevent them from obtaining any foothold north of the Bay of Fundy. The Governor of Quebec, the Marquis de Vaudreuil, wrote to the English governor at Annapolis Royal in 1718, strongly objecting to any English vessels entering the River St. John, which he claimed as one of the rivers of Canada and entirely within the French dominion. He encouraged the Acadians to withdraw from the peninsula, promising them lands on the River St. John on application to the missionary Loyard, who was empowered to grant them. As a consequence some of the Acadians removed thither.

Not until the capture of Quebec in 1759 was there any really well considered effort to introduce English-speaking inhabitants in considerable numbers, although the province had for nearly half a century been regarded as a British possession. It will be necessary, before proceeding to speak of the efforts of Alexander McNutt and his contemporaries to further the colonization of Nova Scotia in the days of Governor Lawrence, to consider the course of events under Lawrence's predecessors.

The restoration of all Acadia to France was narrowly averted at the time of the peace negotiations at Aix-la-Chapelle in 1748. However, the Nova Scotia peninsula remained in possession of Great Britain. To the chagrin of the people of New England, Cape Breton was restored to France, and the re-establishment of the old stronghold of Louisbourg proved a menace to the security of the adjoining British colonies. The territory to the north of the Bay of Fundy was claimed by each of the rival nations and was a bone of contention for the next ten years.

Whether the restoration of Louisbourg to France by the treaty of Aix-la-Chapelle was an act of prudence or of folly on the part of the rulers of Great Britain is a matter that we need not here discuss. The re-establishment of French power in the ancient stronghold, however, led the Lords of Trade and Plantations to establish an important British post at Chebucto to serve as a counterpoise. This post was named Halifax, as a compliment to the Hon. George Dunk Montague, Earl of Halifax, the president of the Lords of Trade.

Up to this period no real progress had been made by the English in the colonization of Nova Scotia. The governor had hitherto resided at Annapolis Royal, with a garrison of two or three hundred soldiers and a handful of dependants. The French population of the peninsula was much greater and comprised several thousands of Acadian peasants, scattered along the valley of the Annapolis river, the shores of

Minas Basin and the Bay of Chignecto. Although professing neutrality, the Acadians naturally sympathized with their mother country in her prolonged struggle with England. They repeatedly declined the oath of allegiance to the Crown of Great Britain and were known to be unfriendly to British rule. Their removal from the province had been discussed by the authorities of Nova Scotia and New England on several occasions. It was, however, the opinion of William Shirley, the Governor of Massachusetts, that their removal at this juncture would be attended with very hazardous consequences and that it should be avoided if possible.[1]

First Proposals Concerning the Introduction of English Settlers into Nova Scotia.

The scheme for the establishment of a settlement of English people at Chebucto originated with the people of Massachusetts, by whom Nova Scotia was regarded in the light of a ward. The establishment of such a colony, well fortified and garrisoned, it seemed to them, would be invaluable for offensive and defensive operations in Acadia, to say nothing of the commercial advantages that would naturally follow, of which the shrewd New Englanders were not unmindful.

Shirley believed that the frontiers of New England were never safe so long as French power dominated Acadia, and as the French were strongly established in Cape Breton he was alive to the necessity of planting English settlers in Nova Scotia in order to make it in point of fact, and not merely in name, an English colony. In his letter to the Secretary of State (the Duke of Bedford), dated February 18, 1749, he expresses his preference for New England settlers as being familiar with the cultivation of new lands, staunch Protestants and of rooted allegiance to the British Crown. He recommends New England troops for the garrisons and expresses his conviction that if spirited exertions are made the province will in ten years have an English-speaking population large enough for self-government.

Although so little had yet been accomplished, the idea of introducing English settlers had frequently been considered on both sides of the Atlantic. Shortly before the capture of Port Royal in 1710, the royal instructions for raising troops in New England for the expedition under Nicholson contained these words: "You shall assure them (the New Englanders), in our name, that such of them as contribute to the reduction of Port Royal, and any of the country and places adjacent belonging to the enemy, shall have a preference both with regard to the soil and trade of the country, when reduced, to any

[1] Murdoch, History of Nova Scotia, Vol. II, p. 130.

other of our subjects."[1] This was interpreted by the New Englanders to signify that the lands of the French would be given to those taking part in the expedition if they desired to settle upon them when their regiments were disbanded.

In November, 1711, Governor Vetch wrote to the Lords of Trade and Plantations in praise of the resources of Nova Scotia, the fertility of its soil, the abundance of its minerals, marts and naval stores and the richness of its fisheries. "What I am now about to say," he adds, "is in my humble opinion the most effectual and easy way to make this a populous and flourishing country. The first thing is that your Lordships would be pleased to advise Her Majesty (Queen Anne) to give, as an encouragement to all her Protestant subjects of Britain and Ireland who are willing to come over and settle in the country, free transportation, tools and twelve months' subsistence, as she was pleased to do with the Palatines in New York." He also requested that two clergymen should be sent who could speak French, hoping that they would be able to induce many of the Acadians to become Protestants. He was convinced that the situation of the garrison of Annapolis Royal would be more secure if four or five hundred Protestant families were settled near them. However, the home authorities would not commit themselves to any policy of development, and their instructions to the Governors of Nova Scotia were largely directed towards the keeping down of expenses.

By the treaty of Utrecht, such of the Acadians as were not disposed to become British subjects were allowed to remove with their effects, within the space of one year, to any part of the French dominions. Those who chose to remain as subjects of Great Britain were guaranteed the free exercise of their religion, and were by Queen Anne's permission to enjoy their lands and tenements without molestation. Those who did not choose to become British subjects were permitted to sell their property before removing elsewhere.

A large number signified their intention of removing to Isle Royale (or Cape Breton). Governor Vetch asserts that they would not have offered to go "had they not been not only importuned but threatened by the French officers, in the French King's name, to be treated as rebels if they did not remove." Vetch was anxious to have them remain upon their lands, as he was apprehensive that the accession of a large number of inhabitants would make Isle Royale a very powerful French colony. He argued that one hundred French, natives of America, familiar with the woods, able to march on snowshoes and

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[1] Collections of the Nova Scotia Hist. Soc., Vol. IV, p. 22.
Nova Scotia Published Archives, p. 7.

accustomed to the use of birch canoes, were of more value and service than five times their number of raw men newly come from Europe.

Three months later Colonel Vetch wrote another letter to the Lords of Trade concerning the state of affairs in Nova Scotia, in which he observes:—

"As to the french Inhabitants In that Country, by what I can learn there is not many of them removed, notwithstanding the discouragements they mett withal some time ago. They will no doubt gladly remain upon their plantations (some of which are considerable) providing they may be protected and encouraged by the Crown, and as no country is of value without Inhabitants, so the removal of them and their cattle to Cape Brittoun would be a great addition to that new colony, so it would wholly ruine Nova Scotia unless supplyed with a Brittish Colony, which could not be done in severall years, so that the french Inhabitants with their stocks of catle remaining there is verry much for the advantage of the Crown, provided that it shall be found practicable to keep them faithfull to their aledgence in case of a war with france, which will be hard to doe while the priests remain amongst them to whose dictates they are absolutely devoted."[1]

Opinions of early English Governors respecting the Acadians.

Lieut. Governor Caulfield succeeded Vetch in the administration and was at first favourably impressed with the attitude of the Acadians, but at the close of his term of office thought differently, for he writes:— "My sentiment of them is very much altered from my former one and believe that there is but little dependence on their friendship, tho', at the same time, I am persuaded it will be with reluctancy they leave the Country, most of those who had formerly gone being again returned; but for the better improvement of the country English Inhabitants are absolutely necessary."

Governor Philipps had a still more unfavourable opinion of them, for he writes in 1719, that they were "growne so insolente as to say that they will neither sweare allegiance nor leave the Country." He states further that at the time of the surrender of the province to the Crown of Great Britain "it was stipulated in their behalf to have their choice either to remain in the Province, if they would transfer their allegiance, or, in case of the alternative, to dispose of their estates and effects to the best advantage; to determine which one year's time was allowed them; but at the expiration thereof, finding their new masters in no condition to oblige them to the obsevance of the one or the other, they have remained upon their possessions in contempt of the

[1] Transactions Royal Society of Canada for 1888, part I, p. 56.

Government, awaiting the opportunity of a rupture between the two Crowns to re-establish their former Government, and in the mean time are daily in secret inciting the Indians to robbery and murder, to the destruction of trade and hinderance of settling the Country."[1]

Philipps, nevertheless, desired to retain the Acadians within the province, although he admits in his letter to Secretary of State Craggs, of the 26th May, 1720, that the task is beyond him, for "once joined in a body, with the help of the Indians to favour their retreat, they can march off at their leisure by the way of the Bay of Verte, with their effects, and distroy what they leave behind without danger of being molested by his Garrison, which scarce suffices to secure the Fort in its present condition."[2]

He thought it probable, however, that they would be obedient to Government so long as the two crowns should continue in alliance but in case of a rupture "they will be," he says, "so many enemyes in our bosom, and I cannot see any hopes or likelyhood of making them English, unless it were possible to procure their Priests to be recalled, who are tooth and nayle against the regent, not sticking to say openly that 'tis his day now, but will be their's anon." In the same letter he displays his lack of confidence in the Acadians in the words following: "You will please to observe that the lands at Minas, which afford great quantitys of wheat yearly and are the best farms as yet in the country, are lyable to be all drown'd by cutting a dyke, which the Inhabitants at going off will not want ill nature to do. It would be great pity those farms should want Inhabitants when vacated by the French and great inconveniency to the Garrison which they supply with plenty of fresh provisions."

In July, 1720, Philipps tells of the efforts of the French governors to strengthen Isle Royale by persuading the Acadians to migrate thither. "Among other things," he says, "they are told that the promise made them (by the English), of enjoying their Religion is but a Chimera, which they must not depend upon, for they will quickly be reduced to the same state with his Majesty's Popish subjects in Ireland and their Priests deny'd them. I endeavour all I can to undeceive them, but scarce hope to find more credit with them than their Priests. If these prevaile there will be a great many fine possessions become vacant. I believe it would not be difficult to draw as many people almost from New England as would supply their room, if it were not robbing a neighbouring Colony, without gaining much by the exchange, therefore hope there are schemes forming at home to settle this Country

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[1] Nova Scotia Published Archives, p. 19.

[2] Nova Scotia Published Archives, pp. 31, 34.

with Brittish subjects in the Spring, before which time these Inhabitants do not think of removing."

The hopes of the governor were doomed to disappointment. The problem that gave so much trouble thirty-five years later might probably have been solved had the Lords of Trade followed the policy he had indicated. They took no action, and it was not until the lapse of forty years that any serious effort was made to people the province with English-speaking inhabitants.

Mascarene urges that the Acadians must take the Oath of Allegiance or be removed from the Country.

Paul Mascarene at this time drew up a report on the state of Nova Scotia, which was endorsed by the Governor and Council and sent to the Lords of Trade for their consideration. Mascarene very pointedly expressed the opinion that if Great Britain expected to reap any permanent benefit from the acquisition of Nova Scotia, there should be no further delay in promoting its settlement with people whose loyalty was undoubted. He accordingly recommended "that the French inhabitants should not be tolerated any longer in their non-allegiance, but might have the test put to them without granting them any further delay, for which," he says, "it is requisite a sufficient force be allowed to make them comply with the terms prescribed them, which force ought to be at least six hundred men, to be divided to the several parts already inhabited by the French and Indians, and might be at the same time a cover to the British Inhabitants who would come to settle in the room of the French." For the encouragement of new settlers Mascarene proposed that they be given free transportation, free grants of land and some of the cattle confiscated from those of the French who should choose to withdraw from their lands rather than take the oath of allegiance.[1]

With the small force at his command Governor Philipps was puzzled how to deal with the problem that confronted him. He informed the Lords of Trade that the Acadians seemed determined not to swear allegiance and yet to have no expectation of removal, for they went on with their tillage and building as if they had no thought of leaving the country. "It is likely they flatter themselves," he adds, "that the King's affaires here will allways continue in the same feeble state. I am certain that nothing but a demonstration will convince them to the contrary."[2]

Seven years had now elapsed since the signing of the treaty of

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[1] Nova Scotia Published Archives, p. 43.
[2] Nova Scotia Published Archives, p. 51.

Utrecht and the sentiments of the Acadians had varied little during those years from the declaration they had made to the Recollet missionary, Felix Pain, in 1713;[1]—"We will never take the oath of fidelity to the queen of Great Britain to the prejudice of what we owe to our king, to our Country and to our religion; and if any attempt were made against one or the other of these two articles of our fidelity, that is to say to our king and our law, we are ready to quit all rather than to violate in the least thing one of these articles. Besides we do not know in what manner the English will use us. If they burthen us in respect of our religion, or cut up our settlements to divide the lands with people of their nation, we will abandon them absolutely."

Bravo Acadiens! No one, least of all a descendant of the U.E. Loyalists, can find fault with such a declaration of fidelity to king and country and religion. But admirable as the sentiment may be in the abstract it must be admitted that from the English point of view it did not render those who held such views desirable inhabitants of a province in which British authority was extremely weak.

A suggestion looking to the ultimate deportation of the Acadians was made about this time to Gov. Philipps by Secretary of State Craggs in a private communication. The Secretary of State refers to the fact that the Acadians may decide to abandon their lands in the peninsula and retire to Isle Royale where they will serve to reinforce the French. "This," he says, "must not be; they must eventually be transferred to some place where, mingling with our subjects, they will soon forget their language, their religion and remembrance of the past and become true Englishmen. For the moment we are too weak to undertake this deportation—encourage them with any hopes you choose—provided you obtain the desired end, which is to prevent their departure." Craggs, it may be observed in passing, was an unscrupulous politician, who was afterwards disgraced, and died on his way to the Tower.

The Lords of Trade propose a plan for the settlement of Nova Scotia.

It seemed at length that the British ministry was about to do something for the development of the province, for in February, 1727, the King in Council ordered the Lords of Trade and Plantations to submit a scheme for the civil government of Nova Scotia, and also to report what encouragement might with advantage be held out to English-speaking settlers. The Lords of Trade prepared a report in which, after mentioning the proposals that had been made from time to time for promoting English settlements (all of which had failed on account of the risks the settlers ran through lack of protection), they make the

[1] Murdoch's History of Nova Scotia, Vol. I., p. 336.

following proposals. That forts be built and garrisoned; that free transport be provided for the settlers; each to receive a grant of fifty acres upon his arrival; double that quantity to be granted to carpenters and other artificers; the same to soldiers in garrison who should turn planters, their pay to continue for one year after the grant, every soldier to have leave to carry his wife with him, transport to be paid by Government; encouragement to be given to intermarriage with the Indians; grants now restricted to 500 acres to any one person to be extended to 1,000 acres, free from fines and quit rents for ten years; the Governor and Council to be empowered to make laws until there should be a sufficient population for an Assembly.

Here at least was a definite, though somewhat crude, plan, which with a little elaboration might have been fruitful of results; but no immediate action was taken and the old policy of *drift* was followed.

Meanwhile the Acadians continued to multiply and to feel a more deeply rooted affection for the land of their forefathers. A dozen years had now passed without a change of political masters. They began to realize that the existing state of affairs was likely to continue, and so, upon being again requested to swear allegiance to the British Crown, they offered to take the oath on condition that they should not be compelled to bear arms against the French or Indians. The authorities of Nova Scotia, however, would not consent to such a modification of the oath.

It would be tedious to enumerate the attempts made by the various governors and administrators of Nova Scotia to induce the Acadians to take an unqualified oath of allegiance. All were unsuccessful until Governor Philipps in 1730, after an absence of eight years in England, prevailed upon them to take the following oath:—

"Je promets et jure sincèrement en foi de chrétien que je serai entièrement fidèle et obéirai vraiment sa Majesté le Roy George le second, qui je reconnais pour le souverain seigneur de L'Accadie ou Nouvelle Ecosse. Ainsi Dieu me soit en aide."

Controversy respecting the Oath of Allegiance.

The Acadians always declared that when they took this oath it was upon the understanding that they should be exempted from bearing arms. Commenting on this Hannay observes, "If that were the case, it only goes to show that twenty years after Acadia had become a British province the French inhabitants still refused to regard themselves as British subjects." Governor Philipps evidently did not regard them as a very loyal people for, writing in November, 1732, to the Duke of Newcastle, he says: "I have sent to their Lordships a report of the gentlemen of the Council upon the present state of the Province, which

I am sorry should be in such a poor condition, as it really is in, after having been so long as upwards of twenty-one years (which may be said imaginarily only), under the English Government; for the inhabitants here, being all French and Roman Catholics, are more subjects to our neighbours of Quebec and those of Cape Breton than to his Majesty, whose Government by all their proceedings (notwithstanding their oath of fidelity), they seem to despise."[1]

Nor could Paul Mascarene guarantee their loyalty eleven years later, for he wrote to the Secretary of State in December, 1743, "The Inhabitants of this province, except what belongs to the two garrisons of Annapolis and Canso, are all French Roman Catholics, who were allowed on taking the oaths of allegiance to keep their possessions and enjoy their religion. These Inhabitants cannot be depended on for assistance in case of a rupture with France; it is as much as we can expect if we can keep them from joining with the enemy or being stirred up by them to rebell. To prevent this I have used the best means I could since I have had the administration of the affairs of this province, especially by making them sensible of the advantage and ease they enjoy under British Government, whereby to wean them from their old masters; but to do this effectually a considerable time will be required—this province in the meantime is in a worse condition for defence than the other American Plantations which have inhabitants to defend them, whilst far from having any dependence on ours we are obliged to guard against them."

Mascarene adopted a policy of conciliation, which proved so far successful that when Duvivier, the French commander, besieged the English at Annapolis Royal the Acadians declined to take up arms and this contributed not a little to the failure of his plans. Still, the idea of substituting English settlers in the room of the Acadians was not abandoned, for about this time Mascarene wrote to Shirley, "If new measures are to be taken and these inhabitants can be removed and good Protestant subjects transplanted in their room, nothing can be of greater advantage to the Brittish interest in general, and to that of the Northern Colonies in particular, and especially to that of this province."

The removal of the Acadians, in Mascarene's opinion, could only be brought about by the co-operation of the neighbouring colonies and, if projected by them, he suggested that the preparations be carried on "without our knowledge, and talkt of even in Boston as little as possible." A copy of Mascarene's letter was sent to the Duke of Newcastle in December, 1745, together with a representation from the Council of Nova Scotia respecting the conduct of the Acadians since the

[1] Nova Scotia Published Archives, p. 101.

reduction of Port Royal by Nicholson in 1710. The general conclusion embodied in the report was "that if not utter enemies, they cannot be accounted other than unprofitable inhabitants" and, "upon the whole it is most humbly submitted whether the said French inhabitants may not be transported out of the province of Nova Scotia, and be replaced by good Protestant subjects."[1] Though opportunity did not come for the execution of this policy until ten years later, there can be little doubt that it remained latent in the minds of the authorities of Nova Scotia. The idea certainly did not originate with Governor Lawrence, as has been commonly supposed.

The state of affairs in Nova Scotia during the next few years was extremely critical, although the capture of Louisbourg by Warren and Pepperrell in 1745 afforded a measure of relief. Mascarene claimed that if the French plans had proved successful while they held Louisbourg, they would have gained possession of Acadia, thereby adding to their strength several thousands of men fit to bear arms, not to mention their Indian allies, and that in less than a year they might have overrun New England. Possibly he exaggerated the danger; but his statement serves to explain the keen interest which the people of New England began to take in the affairs of Nova Scotia. Had Louisbourg not been restored to France by the treaty of Aix-la-Chapelle, the project of the expulsion of the Acadians might never again have been heard of.

The difficulties which the governors of Nova Scotia had to face were chiefly due to the neglect, or apathy, of the British ministers, who seemed careless as to whether they kept possession of Acadia or lost it. At the outset the Acadian problem was of minor importance. It might easily have been solved if the English government had followed the advice of Governor Vetch, which was that the Acadians who would not take the oath of allegiance should be removed to Martinique, or some other French colony, and their places supplied with settlers from England or Ireland. The Acadians were at that time a mere handful of people, and if removed, as suggested by Vetch, would have been placed in not uncongenial surroundings. But years had elapsed; no English colonists had appeared, nor was there the smallest sign that the Home Government would trouble itself to attract any. Meanwhile

[1] See Canadian Archives for 1894, p. 110. In connection with the repeated references to "Protestant subjects," it is to be noted that after the English Revolution, religion and politics were very closely interwoven in regard to the relations existing between England and France. Protestantism seemed to be as closely identified with the administration of British affairs in America as Roman Catholicism was with the national policy of France.

the number of the Acadians in the peninsula had increased to more than 12,000 souls.

France continued to regard the recovery of her lost colony as an object of prime importance. D'Anville's expedition and that of La Jonquière the next year both had in view the reconquest of Acadia.

Governor Shirley's efforts to make Nova Scotia a strong British Colony.

William Shirley, the Governor of Massachusetts, was by all odds the most watchful and strenuous defender of British interests in America. If France was bent on recovering Acadia, Shirley was no less resolved to keep it. He regarded it as the key of the British American colonies, and repeatedly urged the English ministry to strengthen it. If Nova Scotia were lost, he contended that there could be neither peace nor safety for the other colonies. He assured the Duke of Newcastle that if a thousand French troops should land in Nova Scotia all the Acadians would rise to join them, besides all the Indians. This, too, was the opinion of the French Governor and of the Intendant at Quebec, who wrote in September, 1745, to their colonial minister, "The inhabitants (of Acadia), with few exceptions wish to return under the French dominion, and will not hesitate to take up arms as soon as they see themselves free to do so; that is as soon as we become masters of Port Royal or they have powder and other munitions of war and are backed by troops for their protection against the resentment of the English."

Shirley continued to write most perseveringly to the Duke of Newcastle upon the defenceless state of Nova Scotia. In his letter of May 10, 1846, he says, "I think it my indispensable duty to suggest again to your Grace my Fears that the Enemy will soon find an opportunity of snatching Accadie, by some sudden stroke, from his Majesty's Government, unless there be a Removal of the most dangerous of the French Inhabitants from thence, and transplanting English Families there in their room, which I think very practicable, from hence."

Later, he writes that the Province of Nova Scotia will never be out of danger whilst the Acadians are suffered to remain upon their present foot of subjection. Nevertheless, Shirley's mature judgment did not at this time favour so drastic a procedure as a general expulsion. His remarks in this connection are so striking that I venture to quote them, in slightly abbreviated form, from his letter to the Duke of Newcastle of the 21st November, 1746:—"It is indeed now to be wished that General Nicholson had upon the first Reduction of the Colony removed the french Inhabitants, when they were but a few, out of the Country, as was done at Louisbourg; and that during the Interval of Peace the Colony had been planted with Protestant subjects: But after their having remained so long in the Country upon the foot of British

subjects, and making Improvements on their Lands for one or two Generations, and being grown up into such a Number of Families, to drive 'em all off their settlements without farther Inquiry seems liable to many objections. Among others it may be doubted whether it would be a just usage of 'em. It is true that the Notion of their Neutrality, entertained for some time by the English as well as themselves, is ill-grounded; But if it is considered that this Notion was founded upon an act of the late Lieut. Governor Armstrong, whereby he took upon himself to grant Exemption from bearing Arms upon any Account whatever, on their consenting to take an Oath of Allegiance to his Majesty, it may perhaps be deemed too rigorous a Punishment for their behaviour to involve the innocent with the guilty in the Loss of their Estates, and the Expulsion of their Families out of the Country. It is not improbable but that there may be many among 'em who would even prefer his Majesty's Government to a french one, and have done nothing to deserve such a forfeiture; some Allowances may likewise be made for their bad situation between the Canadians, Indians & English, the Ravages of all which they have felt by Turns in the course of the War, during which they seem to have been continually placed between two fires; the force and menaces of the Canadians and Indians, plundering 'em of whatever they wanted & deterring 'em in the strongest manner from having any Communication with His Majesty's Garrison, on the one hand; and the resentments of the Garrison for their withholding Intelligence & supplies, on the other.

"Wherefore it seems a matter worthy of your Grace's consideration, whether under such doubtful circumstances the driving all the french Inhabitants of Nova Scotia off their Settlements and thereby very greatly strengthening the Enemy upon this Continent and depopulating the Province for some time (how long may be uncertain), is more eligible than treating 'em as Subjects, confining their Punishment to the most guilty & dangerous among 'em & keeping the rest in the Country and endeavouring to make them & their Posterity useful members of Society under his Majesty's Government. I can't omit observing to your Grace, that it would be exceeding difficult to fill the Chasm which driving off the Inhabitants would make in the Country: During the Rupture with France it would certainly be impracticable, and I doubt whether it would not be so when peace shall be made with France, if the Indians should continue at War with us."[1]

There is much force in Parkman's observation that if the Newcastle Government had vigorously carried out Shirley's recommendations with regard to the policy pursued in Nova Scotia, the deportation of

[1] See Parkman's "Half Century of Conflict," Vol. II, p. 343.

the Acadians in 1755 would never have occurred. Time and again the Lords of Trade commended Shirley's proposals but hesitated to take action because of the expense involved.

Unhappy Situation of the Acadians.

The situation of the Acadians was now really pitiable. France claimed them on the one hand and England on the other, and both demanded their obedience without regard either to their feelings or their interest. Le Loutre terrified them with his savages, in order to make them renounce the English allegiance and support the French. The English governors threatened to banish them if they were not faithful to King George. There can be little doubt that their oath of allegiance to the British Crown had been taken, in the first instance, upon the understanding that they would not be forced to bear arms against the French or their old Indian allies. They were now commonly known as the "Neutral French." This term served but to add to their perplexity, and in their ignorance and simplicity they hardly knew to which side they owed allegiance. They were the humblest and simplest of peasants and their illiteracy was such that only a few could even read or write. The most potent influence employed to turn them against the English was not their natural affection for France or their race sympathy, but the power of their religion. They were taught to look to their priests for guidance both in temporal and spiritual matters, and as nearly all of these, like the Abbé le Loutre, were ardent patriots, it is little wonder that their influence was inimical to the sovereignty of King George.

"It was the duty of the British ministry," says Parkman, "to occupy the province with a force sufficient to protect the inhabitants against French terrorism, and leave no doubt that the King of England was master of Acadia in fact as well as in name. This alone could have averted the danger of Acadian revolt and the harsh measures to which it afterwards gave rise. The ministry sent no aid, but left to Shirley and Massachusetts the task of keeping the province for King George. Shirley and Massachusetts did what they could, but they could not do all that the emergency demanded."[1]

Shirley told the Duke of Newcastle plainly in 1747 that New England had furnished for years the only succor and support the Garrison at Annapolis Royal had received, and that the General Assembly of Massachusetts were growing tired of having the burden of defence thrown upon them, and desired his Majesty's more immediate interposition for the protection of Nova Scotia.

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[1] Parkman's "Half Century of Conflict," Vol. II, p. 220.

The Founding of Halifax.

We come now to consider the first really important move in the development of the province by the British government, namely the founding of Halifax.

The credit of suggesting the establishment of a fortified post at Halifax, or Chebucto Harbour, as it was then called, belongs, perhaps, to Paul Mascarene, who wrote to the Lords of Trade in October, 1748, that it would be a wise step to establish a number of English families on the Atlantic coast and to erect fortifications necessary for their security.[1]

A few months later Shirley proposed a scheme for settling 2,000 families from Europe, 2,000 families from the Colonies in America and 2,000 disbanded soldiers in various parts of Nova Scotia at an estimated cost of £131,700. He proposed to mix Protestant settlers with the Acadians, taking part of the marsh lands for the new settlers, the Acadians to be indemnified with woodland and upland. He believed that unless the French were intermixed with Protestant English they would remain a separate body and eventually become strong enough to subvert the King's government.

The Lords of Trade took the initial step in the direction recommended by sending out Cornwallis with a colony of 2,500 persons, many of them disbanded officers, soldiers and sailors. These immigrants sailed from England in thirteen transport ships in May, 1749, arriving at Chebucto about the end of June. They at once set to work and were comfortably settled in their log houses before winter. The population of the town was augmented during the summer by arrivals from Louisbourg[2] and New England. A number of German Protestants from the Palatinate arrived in the course of the same year and were established at Dartmouth, whence they proceeded to Lunenburg in 1753. The founding of Halifax, however, was but the planting of a garrison, a military movement rather than an intelligent scheme of colonization.

Nevertheless, in view of what followed, the founding of Halifax by Cornwallis in 1749 must be regarded as by far the most important step yet taken by the English in the development of Nova Scotia. It is right that due credit should be given to the Earl of Halifax, First Lord of Trade and Plantations, by whose energy and influence the ministry in England were led to establish the settlement. This accomplished and far-sighted statesman was the only son of the second Earl of Halifax, whom he succeeded in 1739. He married in 1741 Miss

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[1] Canadian Archives for 1894, p. 131.

[2] Louisbourg was evacuated by the English at this time under the provisions of the treaty of Aix-la-Chapelle.

Anne Dunk, a rich heiress, and assumed the name of Dunk in addition to that of Montague. He was appointed President of the Lords of Trade and Plantations in 1748. Among other important positions, he filled the offices of a major-general in the army, First Lord of the Admiralty, and Lord Lieutenant of Ireland. At the time of his death he was Principal Secretary of State in the British Cabinet. As an instance of his liberal spirit it is recorded that having found the expenses attending the post of Lord Lieutenant of Ireland to be very great, he obtained an additional grant of £4,000 per annum for all subsequent Viceroys, at the same time declining the emolument for himself. As First Lord of Trade and Plantations he contributed so largely to the development of the commerce and well being of the British possessions in America as to be styled the "Father of the Colonies." He died in 1771 and was buried in Westminster Abbey, where a beautiful memorial by the famous sculptor Bacon was erected in his honour.

The next ten years proved a period of much unrest. Peace nominally prevailed between France and England, but peace did not bring tranquillity.

Although Acadia, according to its ancient boundaries, had been awarded to Great Britain by the late treaty, the French endeavoured to confine the English to the peninsula, claiming that the territory north of the Bay of Fundy was still under their jurisdiction and had never been ceded to the English by the King of France. This claim Shirley and Cornwallis stoutly repudiated. The French, however, continued to hold possession of the River St. John and also erected a fort north of the isthmus of Chignecto which they named Fort Beauséjour. The Abbé le Loutre now began to use every means in his power to induce the Acadians to forsake the peninsula and remove to the New Brunswick side of the Bay of Fundy, which the French claimed to be within their jurisdiction as a part of "the Continent of Canada."

Governor Cornwallis and the Acadians.

Cornwallis urged the Acadians to remain and take the oath of allegiance to the British Crown. His words to them were couched in conciliatory language:—

"My friends," he wrote, "the moment that you declared your desire to leave, and submit yourselves to another government, our determination was to hinder nobody from following what he imagined to be his interest. We know that a forced service is worth nothing, and that a subject compelled to be so against his will, is not very far from being an enemy. We frankly confess, however, that your determination to leave us gives us pain. We are well aware of your industry and your temperance, and that you are not addicted to any vice or

debauchery. This province is your country; you and your fathers have cultivated it; naturally you ought yourselves to enjoy the fruits of your labour. Such was the desire of the King our master. You know that we have followed his orders. You know that we have done everything to secure to you not only the occupation of your lands, but the ownership of them for all time. We have given you also every possible assurance of the enjoyment of your religion, and the free and public exercise of the Roman Catholic faith. When we arrived here we expected that nothing would give you so much pleasure, as the determination of His Majesty to settle this province. Certainly nothing more advantageous to you could take place. You possess the only cultivated lands in the province; they produce grain and nourish cattle sufficient for the whole colony. It is you that would have had all the advantages for a long time. In short we flattered ourselves that we would make you the happiest people in the world. We are sorry to find in our government persons whom it is impossible to please, and upon whom our declarations have produced nothing but discontent, jealousies and murmurings. We must not complain of all the inhabitants; we know very well that there are ill-disposed, interested and mischievous persons among you who corrupt the others. Your inexperience and your ignorance of the affairs of government, and your habit of following the counsels of those who have not your real interests at heart make it an easy matter to seduce you."

The motives that inspired Cornwallis thus to address the Acadians we need not go far to seek. Their presence was of substantial benefit to the province.[1] To drive them from their lands would have been bad policy since they would have gone to Isle Royale and have greatly added to the strength of the French in that quarter. Better to have them remain as "neutrals" than that they should join themselves to the French in their strongholds. Cornwallis quite appreciated the fact that the infant colony could hardly do without them, as they furnished cattle, grain, firewood and general supplies to both Halifax and Annapolis Royal.

The assertion has frequently been made, by writers who have participated in the controversy respecting the Acadian Expulsion, that if the Acadians had not been hindered by the English governors they would, on more than one occasion, have voluntarily retired from the peninsula; and the inference drawn is that they remained on their

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[1] Hopson, who succeeded Cornwallis, wrote to the Lords of Trade in 1752: "Mr. Cornwallis can inform your Lordships how usefull and necessary these people are to us, how impossible it is to do without them, or to replace them even if we had other settlers to put in their places." [Canadian Archives for 1905, part III p. 56.]

lands because they could not leave them. The argument upon this head is not at all convincing. The earlier governors, Vetch, Caulfield, Philipps, Armstrong and Mascarene, repeatedly state that it was impossible with the means at their command to prevent the Acadians leaving the country, if they were disposed to do so, and Governor Lawrence, so late as January, 1754, said that great efforts were being made by the French commanders to induce them to withdraw from the peninsula and he was unable to prevent some from going, though the greater part were too much attached to their lands to leave them. In view of the fact that so many of the Acadians who were transported to the Atlantic colonies in 1755 were able to traverse immense distances and to return to Nova Scotia, in spite of the tremendous obstacles in their way, it is impossible to believe that those who lived along the Annapolis valley and at Grand Pré, Piziquid and Chignecto could not have found means to leave the peninsula at almost any time prior to the expulsion if they had been really anxious to do so.

Policy of the Marquis de la Jonquière and Abbé le Loutre.

The French governors at Quebec were very unwilling to give up the hope of repossessing Acadia. With this idea in mind they determined to render the foothold of the English as insecure as they could. The Marquis de la Galissonnière and the Marquis de la Jonquière adopted the policy of employing the savages to deter the English from making settlements. They found an able coadjutor in the Abbé le Loutre. Their policy was attended with such success that Governor Lawrence, upon being asked by the Lords of Trade why he did not proceed with the colonization of Nova Scotia, replied with some acerbity, "What can I do to encourage people to settle on frontier lands when they run the risk of having their throats cut by inveterate enemies, who easily effect their escape by their knowledge of every creek and corner?"

Indian atrocities at Dartmouth, Chignecto and other places kept the infant colony in constant alarm, and at times the hold of the English on the country seemed very precarious. The administrators of the government in Nova Scotia became more and more convinced that a policy of inaction would in the end prove fatal to their interest. Two things, it was agreed, were essential, namely, the introduction of English settlers in large numbers and compelling the Acadians either to swear unqualified allegiance to the British Crown, or, in the event of their refusal, to take measures for their removal from the country.

It was felt that a supreme struggle with France was impending, on the issue of which depended the question of sovereignty upon the American continent. The general situation in Nova Scotia was by no

means encouraging. From the head of the Bay of Fundy to Annapolis Royal, a stretch of one hundred and fifty miles, not an English settler was to be found; nor was there one on the eastern shores of New Brunswick or upon the valley of the Saint John. The French and Indians were the only inhabitants, for no man of English nationality had ventured, or was permitted, to settle amongst them. Cornwallis had proposed to settle a body of "Foreign Protestants" at Minas, but his successor, Hopson, asked that no more settlers of that description should be sent, for if those already arrived were settled among the French the latter would leave. This, Hopson said, they had no intention of doing, nor did he wish them to go.

Under the administration of Cornwallis the hold of the English upon the Nova Scotian peninsula was strengthened very considerably. The building of the town of Halifax at Chebucto, the presence of several regiments of British troops and the establishment of fortified posts at Grand Pré, Piziquid and Chignecto, gave to the few English settlers a sense of security they had not before enjoyed. Colonel Charles Lawrence commanded an expedition which established a post at Chignecto and in an encounter there with Chevalier la Corne displayed much personal bravery. Lawrence was considered by Cornwallis to be a man of good sense and ability and of honour and veracity.

British Ministry at length begins to further the settlement of Nova Scotia.

The importance of planting settlements in different parts of Nova Scotia is referred to in the royal instructions issued to Governor Cornwallis when he came out from England in 1749, so that from this period onward the colonization of Nova Scotia may be regarded as forming a part of the policy of the Lords of Trade.

Colonel Hopson succeeded Cornwallis in 1752. During his short tenure of office he tried to get on amicably with the Acadians, expressing to the Lords of Trade his fears that ill consequences would follow any attempt to compel them to take an unqualified oath of allegiance. The Lords of Trade decided to leave the matter in his hands, adding, in their reply, the following words, which are important in the light of after events:—"We must, however, recommend it to you to enforce this measure when the circumstances of the Province are such that it may be done with safety, leaving it to you to determine the time and manner of doing it, *who being on the spot* are a much better judge of it than we can be."

Colonel Lawrence succeeded Hopson as Governor in 1753. He was a man of an entirely different type and his policy quite the reverse of that of his predecessor. Whatever may be said as to the humanity or inhumanity of his dealings with the Acadians, there can be no question

as to his soldierly qualities, ability and force of character. He was at this time in the prime of life, having been born at Portsmouth, in England, in 1709. He was a man of fine physique, standing six feet two inches, and was, according to his biographer, "a picture of strength and rugged health, of frank and pleasant manner and largely endowed with that mysterious element of character we to-day call, for want of a better name, magnetism."[1]

There can be no doubt that Lawrence commanded the confidence of the British Government, for the Lords of Trade left matters largely to his judgment; but if the Acadians were cognizant of any element of *magnetism* in his character, history has not recorded it. Lawrence was undoubtedly more the soldier than the diplomat. He was accustomed to command and to be obeyed. The attitude of the Acadians annoyed him greatly, and he was disposed to deal with them in a summary fashion. Accordingly, after consultation with his council and the admirals on the station, he determined to give them one more opportunity of taking the oath required of them, with the understanding that if they failed to do so steps would be taken without further parley "to rid the country of such perfidious subjects."

The Controversy as to the Acadian Expulsion.

No attempt will be made in this paper to deal adequately with the vexed question of the Acadian expulsion, yet, in any careful consideration of the measures which Governor Lawrence subsequently adopted for the development of the province, the question cannot well be passed over in silence.

A careful study of the documents bearing upon the expulsion will satisfy the honest investigator that the last word is not likely soon to be spoken concerning it. Even the most impartial writer will find

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[1] See sketch of Governor Lawrence by James S. McDonald in Collections of the Nova Scotia Hist. Society, Vol. XII, p. 19.

Col. Charles Lawrence was the third son of Lieut.-General John Lawrence, who served in Flanders under Marlborough. In his 18th year young Lawrence was gazetted an ensign in the 11th Devon regiment. He came to America with the Regiment in 1729, and was engaged in outpost service against the Indians. In 1733 he accompanied his regiment to the West Indies and returned to England in 1738. After three years' service as a military attaché at the War Office, he entered the 54th Regiment, and served as Captain in the Flanders campaign of 1745. He was slightly wounded at the terrible battle of Fontenoy. After the return from Flanders he was gazetted Major in 1747, and sailed to New York with his regiment, proceeding not long after to Louisbourg. When the English were obliged under the treaty of Aix-la-Chapelle to leave that place, he came to Halifax and was thenceforth closely identified with the history of Nova Scotia until his death in 1760.

some difficulty in arriving at definite conclusions upon some of the points involved. At the same time, a very superficial writer, if a partizan, will find it comparatively easy by careful selection of his materials to show—if it please you—either that Charles Lawrence was a patriotic and far-sighted administrator, or that he was an obstinate and brutal tyrant! But this surely is not the way to study history.

After carefully weighing the evidence adduced by Parkman, Murdoch, Hannay, Akins and Sir Adams Archibald, on the one hand, and by Haliburton, Savary, Casgrain, Richard, Poirier and Gaudet, on the other; and after a careful study of the publications of the Nova Scotia Historical Society, the transcripts in the Archives department at Ottawa, and other available evidence, the following points seem, to the writer of this paper to be fairly well established:—

1. That after the ratification of the Treaty of Utrecht in 1713, the Acadians were repeatedly urged by the French commanders and their priests to abandon their lands in the peninsula of Nova Scotia, but were very reluctant to do so.

2. That, although the English governors endeavoured to hinder their desertion of the peninsula, the weakness of the garrison at Annapolis Royal was such that the Acadians could readily have found opportunity to retire to Isle Royale, or to some other place under French jurisdiction, had they so desired.[1]

3. That finding the Acadians were of service to the colony and that their removal would strengthen the French at Louisbourg and elsewhere, the governors of Nova Scotia became anxious to retain them within the province, and, having failed to induce them to take an unconditional oath of allegiance, adopted a temporizing policy and permitted them to remain as "Neutrals."

4. That the circumstances of the age rendered it well nigh impossible to separate religious creed and national policy; it was, therefore, natural that the French missionaries should join hands with the military authorities in their endeavour to keep the Acadians in a state of hostility to the English—the Abbé le Loutre even threatening to set the Indians upon them and to place them under the ban of the church if they dared to take the oath of allegiance.

5. That Lawrence and Shirley shared the unfavourable opinion entertained by the English in America with regard to the Acadians as old-time allies of the savages, suspecting them (perhaps unjustly) of being instigators of their barbarities, and believing them to be inimical to British rule and ready at the first convenient opportunity to be openly hostile.

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[1] See on this head Parkman's Half Century of Conflict, Vol. I, p. 189.

6. That after he had committed himself to the policy of deporting the Acadians, Lawrence was unrelenting, and acted with the sternness of a soldier and with little consideration for the feelings of the unfortunate victims of his policy.

7. That New England was more directly implicated in the expulsion than was the British Ministry, in view of the following facts: that the Governor of Massachusetts was jointly concerned with Governor Lawrence in devising the plan of deportation; that the details of the expulsion were carried out by Massachusetts troops, and that Massachusetts vessels, chartered from Massachusetts merchants, officered and manned by Massachusetts captains and crews carried the Acadians into exile.

8. That, prior to the expulsion, the Acadians had been so repeatedly threatened by the governors of Nova Scotia, in connection with their refusal to take the oath, without any punishment consequent upon their refusal, that they were lulled into a state of false security and would not believe they were really to be deported until Winslow began to put them on ship-board.[1]

9. That the Acadian expulsion did not attract anything like the attention in England that many modern writers have supposed, but was obscured by other events of world-wide interest to such an extent that in the eyes of the Lords of Trade it was deemed a matter of local importance, which could very well be left to the discretion of the Governors of Nova Scotia and Massachusetts.

From the controversial point of view the most vital question of all remains to be considered, namely, was Lawrence justified in adopting so extreme a measure as a general deportation, upon the refusal of the Acadians to take the oath of allegiance? On this point the opinion of Canadian writers probably will never be unanimous.

The writer of this paper has honestly endeavoured to divest himself of the prejudices that naturally arise in connection with race and religion, and to view the events leading up to the Acadian expulsion from an impartial standpoint. In so doing he has been driven to the conclusion (unlooked for at the outset) that the course pursued by all of the parties concerned was quite natural under the circumstances of the case.[2]

The policy of the Marquis de la Galissonnière and the Marquis de la Jonquière was not an unnatural one for those who wished to pro-

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[1] See foot-note, page 82 *supra*.

[2] I am gratified to find that in the discussion which followed the reading of this paper at the meeting of the Royal Society, Mr. W. D. Lighthall, one of the Fellows of this Society, who has given time and thought to the subject, stated that he had reached the same conclusion.—W.O.R.

mote the cause of New France under trying and perplexing conditions. It may be perfectly true that the action of the French governors in employing the missionaries, le Loutre, Germain and Gaulin, to incite the Indians to acts of hostility at a time when peace prevailed between the rival crowns was unjustifiable, but such proceedings were characteristic of an age which acted in accordance with the maxim "all is fair in love and war." There was little confidence at the time on the part of the opposing leaders with regard to the designs of their rivals, and neither the one nor the other was disposed to be too scrupulous in securing an advantage. The treaty of Aix-la-Chapelle did not bring peace in America.

The Acadians, in their simplicity, were at a loss how to act and hesitated as to their course of action until they were involved in a common ruin. That they would have been wiser to have shown more decision is easily said, but in view of what they were and the situation in which they were placed, the line they followed seems a natural one.

The conduct of the French missionaries, too, was not unnatural. They were ardent patriots, for the most part, and Church and State were so closely united in their day that the priests were regarded by the Acadians and the Indians as their natural leaders in both temporal and spiritual affairs. The Abbé le Loutre was surely an extreme specimen of his class and his actions bordered on phrenzy at various times, drawing upon his head the censure of his ecclesiastical superiors.

The attitude of the English inhabitants of Nova Scotia and of the people of New England towards the Acadians implied want of confidence and dislike. They had suffered much at the hands of the savages, who had devastated their settlements, and were believed to have been inspired in their hostility by their French allies. There was also an element of religious bigotry that intensified the mutual dislike that subsisted between the two races. The temperate historian who reads the anathemas uttered by either party against the religion of its rival may deplore the lack of charity, but realizes how natural it all was.

The controversy over the Acadian expulsion has been, even in recent days, too much influenced by religious and racial instincts. The conduct of Winslow and of Lawrence, on the one hand, and of La Jonquière and the Abbé le Loutre, on the other, have been alike execrated by partizan writers.

Governor Lawrence's part in the Acadian Expulsion.

There are, doubtless, many Canadians who will dissent from the statement that the course taken by Charles Lawrence was a very natural one, in view of all the circumstances of the case, but is there good reason

to doubt that he acted along what he believed to be the line of duty? Putting aside for the moment the sad details of the expulsion, we may face, from an academic standpoint, this question: Is it permissable for a government, desirous of building up a strong and vigorous colony, in the face of a rival nationality with which it is in conflict, to remove from its borders a class of inhabitants whom it believes to be disloyal and a source of peril? To this it seems to the writer there can be only one answer. But was this the question Charles Lawrence and his associates had to face? Or did they honestly *believe* that such an emergency had arisen? Here again opinions may differ.

In any consideration of the policy for which the governors of Nova Scotia and New England were jointly responsible in 1755, it must be borne in mind that the idea of a general deportation of the Acadians was not a new thing. It had been suggested ten years before by so mild a governor as Paul Mascarene, who gave it as his opinion that the most practical solution of the problem of making a strong British colony of Nova Scotia would be to remove the Acadians, and to give their lands to settlers from New England or to Protestant settlers from Europe and the British Isles.[1] Various suggestions made by the Governors of Nova Scotia along those lines have been already mentioned in this paper.

It is difficult in these days of the *entente cordiale*, which King Edward, of blessed memory, did so much to create, to realize that a century ago each of the great powers of western Europe regarded the other as its hereditary enemy. In the period now under review profound distrust prevailed in America between the colonists of New England and those of New France. Long years of conflict had greatly embittered their relations and the antipathy had been accentuated by the atrocities begotten of the contact of either race with American savagery. New England undoubtedly suffered most from the prolonged border warfare; indeed, there was hardly a hamlet or a village on the frontier that had not been the scene of a tragedy.

For many years the situation of the Governors of Nova Scotia had been beset with difficulty. Granted that much may be said in favour of the Acadians, the fact nevertheless remains that, with singular unanimity Vetch, Caulfield, Philipps, Armstrong, Mascarene and Cornwallis expressed the opinion, that they were inimical to British rule and ready at the first favourable opportunity to side with the enemy.

In order to form a proper estimate of the conduct of Lawrence, Shirley and Winslow in connection with the expulsion, it is necessary

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[1] See Canadian Archives for 1894, p. 109.

to view the measures they adopted from the standpoint of their day. As one who has written forcibly on this phase of the question points out, nothing is so easy as to be wise after the event. Could the principal actors in the tragic expulsion have foreseen what would happen in the course of the next few years, they might have been saved the recollection of one of the most painful chapters of Acadian history.[1] But they did not know, and the experience of the past gave them small reason to hope that within four years the French strongholds of Louisbourg and Quebec would pass permanently into British possession, and the influences that had so long emanated from thence would be no longer a cause of unrest in Acadia.

Whether justifiable or not, it is certain that the policy of Lawrence and Shirley was adopted in what they considered a serious emergency. The situation in America in 1754 had become so critical that the two governors were instructed to take joint action for the defence of Nova Scotia.[2] Lawrence informed Shirley that he had received information that the French proposed, as soon as they had repaired their fortifications at Louisbourg, to attack Chignecto. "Your Excellency must undoubtedly be sensible," he adds, "what an advantage we shall gain upon the French by attacking them first, more especially as their chief dependence is in the Indians and our deserted[3] French inhabitants, who most probably will leave them when they find they are not able to keep their ground, but who would infallibly assist them if they should begin with us."

In order to carry out the plan of striking the first blow, it was determined to raise 2,000 troops in New England for service in Nova Scotia, the expense to be paid out of the Imperial grant to the latter province. Lawrence claimed that the assistance of New England was absolutely needed at this time, for should the enemy be successful in their contemplated attack on Chignecto they would certainly attempt the reconquest of Acadia. He admits also that he was anxious to show "a proper resentment" against French encroachments upon British soil in Nova Scotia and elsewhere.[4]

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[1] Collections of N.S. Hist. Society, Vol. V, p. 37.

[2] The two Governors were congenial spirits. Shirley wrote to Lawrence on November 7, 1754, "It gives me a real pleasure that I have the honour of being joined in this service for procuring a happy deliverance of His Majesty's northern colonies from the danger of the present neighbourhood of the French in their encroachments within your Honour's Government, with a gentleman of whose zeal and abilities for promoting the service of our King and Country in this instance I have so high an opinion."

[3] The "deserted French" were those of the Acadians who had left their lands in the peninsula and retired to the north of the isthmus of Chignecto under the protection of Fort Beauséjour.

[4] See Nova Scotia published Archives, p. 378.

The idea of re-peopling the lands which the French had abandoned at Beaubassin[1] suggested itself to Shirley's fertile brain, and he wrote to the Secretary of State that the defection of the Acadians of Chignecto had left a large tract of rich arable land vacant, upon which there was room for perhaps a thousand families to settle. He recommended that settlers should be procured from Great Britain, New England or the north of Ireland, "persons of Industry and Sobriety and acquainted with Husbandry, whose fidelity and attachment to His Majesty's Government might be depended upon." Such settlers, he considered, would form "an exceeding good barrier to the Peninsula by securing the Isthmus, and serve as a curb to the French inhabitants of Mines and Annapolis River.

The Acadians of the peninsula failed to realize the seriousness of the situation in which they were about to be placed. Lawrence and Shirley were men of action and they now had a sufficient force at their disposal to enforce submission. Their first move was to get possession of Beauséjour, which surrendered to General Monckton on the 16th of June, 1755. The next step was to demand from the Acadians an unqualified oath of allegiance to the British sovereign. The unfortunate people were placed in a serious dilemma. They had for some time attempted to steer a middle course—not absolutely to break with their compatriots of Canada and Cape Breton, yet at the same time to show some deference to the government under which they lived; not to forsake their lands at the instigation of La Corne and Le Loutre, but at the same time not to swear unqualified allegiance to the King of England. Their attempt to please two masters pleased neither, and in the end lost them their country.

A few extracts from the correspondence of those who were most directly concerned in their deportation will suffice to show that little confidence was felt in the professed neutrality of the Acadians by either Lawrence or his subordinates. Colonel John Winslow wrote on July 3, 1755, "as to how far the Mean Submition Made by ye French (to say no worse) Fickel Inhabitants, commonly cal'd the Nutrals, or their brethren the Indians are to be Trusted, I submit in My opinion Litle Stres is to be laid on their ever being Good."

Lawrence's profound distrust appears in his instructions to Captain Murray, dated August 9th, in which that officer is instructed to "take

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[1] Upon the arrival of the expedition under Lawrence at Chignecto, in April, 1750, the Indians, acting, as was supposed, under the direction of La Corne, reduced the settlement of Beaubassin to ashes. It comprised about 140 houses and two churches. The inhabitants crossed the river Misseguash and threw themselves under the protection of the French commander, who not long after established Fort Beauséjour for their defence.

an oppertunity of Acquainting the Inhabitants that if any persons attempt, by Indians or others, to Destroye or otherwise Molest his Majesty's Troops, you have my orders to take an Eye for an Eye, a Tooth for a Tooth and in shorte Life for Life from the nearest Neighbours where such Mischiefe is Performed."

Capt. Sylvanus Cobb wrote on the 24th of September to Col. Winslow, "I have the Pleasure by Honest Crooker to hear of your welfare and fine Success in Securing so Many of the Bogers. I hope you will Continue in Such Success til you have routed all such Enemys from the Land."

Winslow writes on September 29th from his camp at Grand Pré, "I know all, and more than they Feel, they Deserve, yet it hurts me to hear their weeping and waling and Nashing of Teeth, I am in Hopes our affairs will soon put on another Face and we Get Transportes and I rid of the worst peace of Service yt Ever I was in."

It is claimed on behalf of the Acadians that Lawrence and his subordinates were unduly prejudiced against them. This may be so. The object of these quotations is merely to show that, if language means anything, those who were responsible for their deportation had absolutely no confidence in their loyalty to Great Britain, and believed their presence in Nova Scotia to be detrimental to British interests.

The Expulsion a War Measure.

The expulsion of the Acadians, whether justifiable or not, was a war measure.[1] It was carried out in accordance with the standards of morality which prevail when rival nations are engaged in deadly strife. Lawrence made no attempt to act with gentleness. Rightly or wrongly he distrusted the Acadians and believed them to be a source of danger in any emergency that might arise, as well as an insuperable barrier to the introduction of English-speaking people. Accordingly, on the 28th of July, with the approval of his Council and of Boscawen and Mostyn, the admirals on the station, he decided that if they persisted in refusing to take an unqualified oath of allegiance they should be removed forthwith and distributed among the colonies to the southward.

Before this conclusion had been formally approved, or any instructions had been issued to carry it into effect, news arrived of the terrible disaster that had befallen General Braddock's expedition against Fort Duquesne. The news of this disaster was brought to Halifax, on the 23rd of July, 1755, by the brig *Lily*, Captain Morris, one of

[1] See remarks on this head by Dr. W. F. Ganong in the Transactions of the Royal Society, Series II, Vol. X, English section, p. 35.

Mr. Saul's flour vessels from New York.[1] The destruction of Braddock's army rendered the condition of affairs very serious from the British standpoint. Lawrence dreaded its effect upon the Acadians. It seemed not improbable that an attempt would now be made from Louisbourg to reconquer Nova Scotia. The New England troops had only been enlisted for one year and would not remain long. Whatever was to be done by them must therefore be done speedily. On receiving the tidings of Braddock's defeat, Shirley wrote to Lawrence:—"This is undoubtedly an heavier stroke than ever the English upon this Continent have met before." He hoped the effect would be "to raise the spirit and resentment of the several colonies against the French," and he asked Lawrence to consider "whether the danger with which His Majesty's interest is now threatened will not remove any scruples which may heretofore have subsisted with regard to the French Neutrals, as they are termed, and render it both just and necessary that they should be removed."[2]

The fate that was now to befall the unfortunate Acadians was all the more sorrowful in that it was on their part so unexpected. They had been warned and threatened repeatedly by the English governors, it is true, but as no serious consequences had ever followed in the wake of these warnings they were satisfied that they might follow the same policy that they had followed in the past.[3] At this time they occupied nearly all the cultivated lands in Nova Scotia. The lands were fertile and easy of access. They governed themselves, for the most part,

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[1] Collections of the Nova Scotia Hist. Society, Vol. XII, p. 42.

[2] Murdoch's History of Nova Scotia, Vol. II, p. 286.

[3] That the Acadians believed that the English would never really banish them is quite evident. Lawrence wrote to Winslow in August 1755, that no danger need be apprehended at Grand Pré, for the people (notwithstanding the fact that they had been threatened with expulsion for refusing the oath of allegiance) imagined themselves to be *living in great security*. Lawrence also wrote to Murray that the Acadians should "be kept in the dark as to their destination, as much as may be, for should they be of opinion Privatly (and I believe they certainly are) that the Government will not after all remove them from their Possessions, they have the Less temptation to be Doing Mischief whilest the Transports are getting round."

On the 5th of September Winslow notified the people of Minas, in the presence of his soldiers, that they were to be removed from the province and their lands, cattle and effects forfeited to the Crown; but in a letter written to Lawrence twelve days later he says: "I believe that they did not then, nor to this day do imagine that they are actually to be removed." Even after another month had expired we find this entry in his journal: "October 6th, with the advice of My Captains made a Division of the Villages and Concluded that as many of the Inhabitants of each as Could be Commoded should proceed in the same Vessel & That whole Familys go together, and sent Orders to the several Familys to hold themselves in readiness to embarke with all their Household Goods, &c, but even now *Could not persuade the People I was in Earnest.*"

and enjoyed the privileges of their religion, their priests being subject to no other restriction than that they were not to use their position to promote disloyalty on the part of their people to the Government under which they lived. No taxes or duties were required of them. Their circumstances were yearly improving and they were rapidly increasing in numbers. The fate to which they were doomed might have been avoided had Lawrence possessed greater patience or had they been more wisely led.

Winslow's journal has been published in full in the Collections of the Nova Scotia Historical Society. It tells the pitiful story of the expulsion. The number of those removed from the province is usually stated to have been between 6,000 and 7,000 souls.

Proposals for placing English speaking People on the Lands formerly cultivated by the Acadians.

In one particular the authors of the deportation were disappointed. They had hoped to substitute, almost immediately, a loyal population for one they had pronounced disaffected, but they failed for some time to find settlers for the vacant lands. The Massachusetts soldiers, to whom they were offered, would not stay in the province, and it was not until the lapse of five years that English settlers began to occupy the waste fields of the Acadians. This was doubtless due in a large measure to the war with France.

Governor Lawrence, however, realized the importance of an immediate attempt at colonization. In his letter to Colonel Monckton, of August 8, 1755, he gives the following instruction:—"When the French inhabitants are removed, you will give orders that no person presume to take possession of any of the lands until a plan of the whole has been laid before me, and terms of encouragement to English settlers deliberately formed and made publick." On the 18th of October he wrote to the Lords of Trade that the removal of the French had left vacant large tracts of good land, ready for immediate cultivation, and that he should use his best endeavours to encourage people from the neighbouring colonies to settle upon them. A bitter Indian war, however, now broke out, and the development of Acadia was once more at a stand. The matter of promoting the settlement of the country, nevertheless, had now assumed an importance in the eyes of the Lords of Trade that it had not heretofore possessed. They wrote to Governor Lawrence in July, 1756, in the following terms:—"As the recall of the two thousand New England troops puts an end to any view which might have been entertained of converting them into settlers upon the lands left vacant by the transportation of the French inhabitants, we shall remain extremely anxious till we hear what occurs

to you with respect to the settlement of those lands, which appear to us to be an object of the utmost importance, and on the right determination of which the future strength and prosperity of the Colony greatly depends."

Benjamin Green, one of the Council of Nova Scotia, went to Boston in January, 1756, with instructions to discuss with Governor Shirley the question of re-peopling the evacuated lands "with good Protestant subjects" from New England. Shirley wrote to Lawrence shortly afterwards on the subject, expressing his fears that the present state of hostilities in North America would seriously interfere with the accomplishment of the project. He also states that the present constitution of government in Nova Scotia may prove an obstacle to its settlement, since the people of New England have a preference for being ruled by a governor, council and *House of Representatives*, and set much store by a Charter Constitution. He adds: "All that occurs to me at present that can be done for drawing settlers from this continent to the evacuated lands in Nova Scotia, is a publication of the terms upon which they may be encouraged to settle there, and the protection from an Indian or French enemy they may expect in the district where they are to sit down."

In the course of the war with France, which had now begun, Governor Lawrence served with distinction at the reduction of Louisbourg and Colonel Monckton (who was now Lieut.-Governor of Nova Scotia) took possession of the valley of the river St. John and built Fort Frederick on the site of the abandoned French fort at the mouth of the river.

The surrender of Quebec the next year was the last dramatic act of the final campaign between England and France for supremacy on the North American continent. Meanwhile, the province of Nova Scotia had established a House of Assembly and, with representative institutions, was in a position to take measures for its own development as a British possession. The story of the beginning of this development under Charles Lawrence and his successors must be delayed for another paper.

IV.—*The Fenian Raid of* 1866 *and Events on the Frontier.*

By BARLOW CUMBERLAND, M.A.
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(Presented by DR. W. WILFRED CAMPBELL, and read Sept. 27, 1910.)

The President, the Rev. Dr. Bryce, at the meeting of the Royal Society of Canada, held last May, gave a narrative of events connected with the Queen's Own Regiment in which he had served (in the University College Co.) as Lance-Corporal, and of the advance of Col. Booker's Column from Port Colborne to Ridgeway and Fort Erie, being the movements of the western wing of the forces then defending the Niagara Frontier.

The movements of the Eastern wing, being that of Col. Peacock's Column from Chippewa, of which the "10th Royals" in which I was then serving formed a part, not having hitherto been written, it was desired that I should give a paper recording them.

Much has been written of the movements of the Western Column culminating as it did in the action at Ridgeway, but little has been given of the Eastern. It is thought well that both should be recorded.

A narrative of events in which the narrator has personally participated must of necessity be somewhat individualistic, the "ego" frequently intervene, but, as palliative for this, it is out of such leaflets of personal observation and record that material is afforded for the assistance of subsequent combined historical narrative. The aroma of the period is formed on contemporaneous experiences instead of from colourings of sympathetic invention.

THE CONDITIONS PRECEDING THE RAID.

As prelude to the events it may be well to give somewhat of the conditions which preceded the movements of the Forces on the Frontier.

During the early months of the spring of 1866 rumours had been rife of the possibilities of a forward movement being made against Canada by the combined forces of the Fenian organization then so active in the United States. England, as said their orators, was "to be humiliated through her territory in Canada, the Irish Flag of Freedom was to be raised over the Union Jack on British soil, and a vital blow be struck for the freeing of Ireland from the Saxon Yoke."

The time was opportune. On the American side thousands of trained soldiers were being disbanded from the armies in both the Northern and Southern divisions of the Civil War, and were restless

from their enforced inaction. While many had returned to their peaceful employments there was still a considerable percentage who were ready for any adventure, however reckless, which might restore to them the excitements of camp life. In addition to those who were of Irish descent, there was plenty of available material of kindred sort, and of these conditions the Fenian leaders took full advantage. It was now, or never, that their years of promises were to be fulfilled, and the flagging subscriptions to their cause be again aroused.

On the Canadian side the cry of "Wolf" has been so often raised on the borders, only to fade away, that not a few of the Canadian people had settled down into incredulity and into apathy. Militia expenditures were looked at askance or not warmly supported, perhaps due to an increased sense of security from the added regiments of the regular army which the British Government had sent over and distributed through Canada for its defence. Some there were who, affected by the creed of anti-militarism, opposed any forms of drill or military organization, and expressed their reliance upon the intervention of the American Government to prevent any Fenian invaders from ever leaving the boundaries of the United States; but many others there were who considered that to trust solely to the British Government for defence, and to a foreign Government for protection, was neither honourable nor patriotic. Preparations for self protective action were therefore maintained by the more zealous, and the fervour of volunteering which had been roused by the Trent "Affair" of 1861, was by these earnestly continued.

The Call to Arms.

The authorities at Ottawa had been keeping careful watch, and as a preliminary precaution a section of the Canadian Volunteer Force, some 10,000 in number, of which the Toronto Regiments formed a part, was on 8th March, 1866, called out, not for continuous active service but for daily drill at their several headquarters.

I was then an undergraduate student in residence at Trinity College, and a private in the "Trinity College Company," No. 8, of the Queen's Own, a sister company of the "University College Company," No. 9, of the same regiment in which President Bryce was serving, these being the two "Student Companies" of the Battalion.

The enrolled students then attending Trinity College were not of themselves sufficiently numerous to quite fill the ranks of a full company, members were therefore accepted from kindred young men of the city families, the Grasetts, Hagartys, Harmans, Evans and others, and it is interesting to note, that of the whole number of 62 then serving in the Company, 18 of the 49 who were collegians were after-

wards ordained in the ministry of the Church, and most of the others of the company became working laymen in the Synods and organizations of the Anglican communion. Thus truely did the Trinity maxim, "Fear God and Honour the King,"assert its virility.

The first call to arms was disruptive of the continuity of educational routine. To some it was an interference with the earnestness of their studies in preparation for the final University examinations in June, to others a welcome interlude in the rigidity of college discipline, and an outlet for the sportive tendencies of vigorous youth.

The hours of drill for the Volunteers had been so arranged that there should be as little interference for the city men as possible with their daily avocations; but at college the morning chapel bell still rang, some lectures continued, and evening "Gates" were still incumbent to the inflexible porter at the college entry. I fear me there was little thought for the professors' grinds, for how could a fellow search for the most appropriate allusion in the pages of his Liddle & Scott, or puzzle out a differential calculus when, after drill, his table was encumbered, and his sofa sprawled over by youthful forms, while with tunics released and loosened belts, they chatted to the accompaniment of the congenial pipe, and slaked their dusty throats (as we used to do in those days), with the steward's mild beer from the buttery. Intricacies of the firing movements, the evolutions of company drill, the anticipations of actual service in the field, were much more engrossing topics than the mutabilities of the aorist, or of the advance of the Israelites to the Promised Land. The incongruities of a green uniform peering through the voluminous folds of a surplice in the choir in chapel, or adorned in lecture but not concealed by the ragged remnants of a college gown, were but common accompaniments of the martial period. The Church Militant had been merged in the campaign expectant and proprieties had to give way to the imperative necessity of punctual attendance at the musters in the drill shed.

So, too, no doubt, it was the same at University College, for once again it was in Toronto, as our poet Mair wrote of the gathering in York in 1812:

> "What news afoot?
> Why everyone's afoot and coming here
> York's citizens are turned to warriors.
> The learned professions go a-soldiering.
> *Tecumseth.*"

Among the memories of this period is a garrison parade held one Sunday in St. James' Cathedral. The church had then two high galleries, one on the west and the other on the east side of the central

nave, both of which, much to the improvement of the edifice, have since been removed. The church was completely filled with the soldiers, regulars and volunteers. The Trinity College Company, together with the other companies of the Queen's Own Rifles, were placed in the lines of seats in the upper West gallery facing the nave. At the recital of the Apostles' Creed, when all the congregation rose to their feet, the Trinity company by an intuitive movement simultaneously faced to the left towards the chancel, an undesigned coincidence from force of Chapel habit which, thus italicizing the location of the company in the gallery, afterwards caused some amusing comment.

This spell of daily drill, after continuing for three weeks, was discontinued, and we returned again to the even but much interrupted tenor of college study, yet only to have it all completely stopped by the final call to arms.

The volunteers had been instructed to hold themselves in readiness for any immediate summons and drill had been kept up on one day in each week.

I had in the interval received appointment as Ensign in the 10th Royals, the regiment which had been raised in 1860 under my father, Col. Cumberland, and from the command of which he had retired in the autumn of 1865 upon his appointment as Provincial A.D.C. to Lord Dufferin.

Although not gazetted until December, 1866, I had at once undertaken my new duties, turned in my equipment as a private in the Queen's Own, and was in May in the service of the 10th Royals.

The second call was sudden. On the evening of the 31st of May during a concert being held in the Music Hall, Toronto, public announcement was made from the platform, that a raid on the Niagara frontier was impending, the Queen's Own had been called out for active service and were to assemble in the drill shed at 4 next morning. The news was fast distributed through the city, and much regret was felt that the 10th had not also been summoned.

Then began at Trinity a hurry and a scurry of preparation. The night was far gone in the furbishing of uniforms and accoutrements and the getting of things ready for the journey. The welcome news came later during the night that the 10th were also to parade at noon next day for movement to the front. In the early morning, donning my uniform as ensign which I kept in my room at college, I sallied out to my father's house on College Street, adjacent to the University buildings, chafing on the way under the delays of the overcrowded rattle-trap horse cars which were then the only means of conveyance in Toronto. Arriving at home I found that an enterprising fellow collegian, a private in the Trinity company, who boarded with a clergyman in the

neighbourhood, had been in advance of me. He was a personâ gratâ with my mother and sisters who had fitted him out with my newest underwear, many of my belongings and still worst of all my shoulder satchel. The 10th had been ordered to provide themselves with food for 24 hours, so perforce I paraded to the drill shed with a large brown paper parcel under my arm containing my food and chattels.

Most of the Queen's Own had sailed at 6.30 a.m. in the steamer "City of Toronto" for Port Dalhousie, and the balance (120) were to leave for the same place at 2 p.m. on her return.

The drill shed, a large building with arched roof of single span (since destroyed), was situated on the west side of Simcoe Street, adjacent to the old Parliament Buildings and extended through from Wellington Street to Front Street. It was built in the hollow of the old Russells Creek, a portion of whose valley is still to be seen in the Lieutenant Governor's garden, and the hard earth floor of the shed was far below the level of Wellington Street. From this street a stairway led down to a small entrance door at the north end and at the south end were the broad double doors by which the regiments marched out direct on the lower level to Front Street.

The scene was one of much excitement, the surrounding streets being filled with people, but only members of the regiments were admitted entrance to the building by the sentries at the doors.

The 10th Royals, as did the Queen's Own, paraded in fullest strength. Many men who had passed through the regiments pressed forward to be re-enrolled. We had in our company No. 1, two ex-officers who volunteered as privates, Capt. Clarence Moberly and Capt. John G. Ridout, formerly of the 100th Royal Canadians who had been adjutant of the 10th in 1865, and as the company with them was over strength they agreed to serve without pay and at their own expense. Every old uniform, whether soiled or ill-fitting, was eagerly accepted, haversacks, of which the regiment had a goodly supply, bulged largely with the men's extras and provisions. I obtained one of these, and gloated over my Esau brother of the Q.O.R. that it held more than my errant satchel could for him. Overcoats were rolled and fastened by straps, placed over the left shoulder in bandolier fashion, encircling the body but leaving the right arm free, 40 rounds of ball cartridges, for the muzzle loading Enfields with which we were armed, were served out to each man, but there were no knapsacks nor water bottles.

At 4 p.m. the broad south doors were opened and on Friday, 1st June, under command of Major Boxall, Col. Brunel being detained in Montreal, the regiment headed by its band marched out.

Immediately we were surrounded by the throngs of friends who pressed forward, filling the road alongside with the column marching

in fours, along Front Street, west to Bathurst Street, where we were to entrain at the Great Western, Queen's Wharf, Freight Shed.

Two hundred and fifty of the 47th Regiment (regulars), under Lt. Col. Villiers, had already been entrained at the station. We were soon placed in the cars, and amid a torrent of cheers from the throngs who had surged upon the bridge and upon the ramparts of the old fort overlooking the railway yard, the train started on its way at 4.30. We ran through Hamilton without stopping. The overhead bridges and the sides of the railway cutting were crowded with people enthusiastically cheering as indeed was also done at every hamlet on the way.

On the train the utmost good fellowship and hilarity prevailed; greetings were lavishly returned to the young women who, as we passed, sent their waving signallings. Stops and delays were numerous and the men, many of whom owing to the hour of the assembly and the hurry of preparation had missed their mid-day meal soon, like boys off on an excursion, had made a big hole in the provender in their haversacks.

The Advance to Fort Erie.

It was dark when we passed St. Catharines, and night when we reached Suspension Bridge at 11 p.m. Here there was to be a halt for an hour waiting orders and we were to stay in the station. No definite arrangements having been made by the authorities for provisioning the men, some of the officers considered it a good opportunity for obtaining further supplies and to do a little foraging. Capt. McMurrich and Lieut. Patterson of our company soon effected arrangements with a neighbouring hotel and our company were taken over in squads and given a full meal. It was during one of these that our immaculate bugler boy first gained that notoriety for escapades which ever afterwards continued to be earned by him. Being very much of a boy, he had a boy's fondness for investigation, so that fooling with a rifle which he had picked up in the hotel he snapped the trigger. Fortunately the muzzle was pointing upwards and the bullet went through the ceiling causing a hurried rush to find out if any one was in the room above. No further harm was done, but the men learning a good lesson and the boy didn't sit down quite so comfortably as previously.

The telegraph wires were not working and as the condition of the track, which had only lately been laid down, was unknown, the railway authorities decided not to start the train until dawn, but we were put again into the cars to spend the night.

In the early morning the train was transferred from the Great Western Railway to the new Erie and Niagara branch, and about 5 a.m. we were unloaded at Chippewa. Here we joined the 19th Lincoln Battalion, 350 men under Lieut. Col. Currie and the St. Catharines

company of garrison artillery, who had preceded us from St. Catharines, on Friday and had reached Chippewa at midnight. Col. Peacock and the regulars had arrived there at dusk on the same evening and all had bivouacked on the open common near the bridge across the Chippewa River.

Col. Peacock's orders over night had been that breakfast was to be served early so that his force might move at 6 a.m.; but in the morning finding that the volunteers had not been supplied with any provisions and had spent the greater part of the night on the train, and knowing that the brigade had a march ahead with an expected engagement with the Fenians at its end, decided that it was absolutely necessary that the volunteers should have a meal before starting.

This as my memory serves me and those of others with whom I have consulted, was mainly prepared for us by the men of the 16th regiment, so that no time should be lost.

The meal was served out, camp broken up, and we marched off the ground at about 7 a.m. on June 2nd.[1]

This eastern column under Col. Peacock consisted of Royal Artillery, Col. Hoste's Battery, 90 horses; 200 men and 6 Armstrong guns; detachment 47th Regiment, 16 officers, 250 men, under Lieut. Col. Villiers; 16th Regiment, 350 men, 16 officers, under Major Grant; 19th Lincoln, 350 men, 30 officers, under Lieut. Col. Currie; 10th Royals, 420 men, 30 officers, under Major Boxall. Total 1,600 men, 6 guns, but no cavalry.

It was a fine sight, as after having been formed up in brigade the troops successively taking their places in the route march, moved off with the Grey Battery and their guns in the centre.

After a short distance out from Chippewa the route changed to move along the river road, following the river bank, winding around the reaches and points where the currents passed on their way to the Falls. The early mists had faded away and soon the morning sun beat down in fullest strength, presage of a sweltering day.

After preceding along the river road for about an hour, during which many of the men sang choruses as they marched, a sudden turn was made at Black Creek inland, almost at right angles, and we left the river behind. The pace hitherto had been fairly quick; but soon it was hastened, and then the rumour came down the line that the Queen's Own and 13th were engaged with the Fenians at some point ahead. Then the rate was increased, paces lengthened and every man strove his utmost to press quicker forward. It was the first hot day of the summer season, one of those days when the air unrelieved by any moving

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[1] Capt. J. A. Macdonald of the St. Catherines Garrison Artillery, who were left behind to guard the base at Chippewa, says he was on the guard tent, and that it was nearer 7.30 before the column started.

breeze seems too hot and heavy to breathe, when clothes are heavy and perspiration comes without exertion. Our men in the unaccustomed weight of heavy shakoes, close buttoned thick tunics, and with military overcoats over their shoulders and heavy leather ammunition pouches which banged on their buttocks at every step, suffered much from the speed and the heat. Their thirst was insatiable and being without water bottles they would drop out of the ranks to lap up the water in the ditches alongside the roads only to be still more overheated by running up to take their places in the ranks again. We were marching immediately behind the 16th and the sight of one of their men falling over, after taking a long drink, assuaged their desire and made them more willing to take the advice of their officers that a pebble carried in the mouth was the best palliative against thirst. The regulars suffered even more than our men, for in addition to their warm clothing they were in heavy marching order with full kit and knapsack and carrying extra rounds of ammunition, sixty rounds of the heavy Enfield ball cartridge. Poor fellows, they struggled bravely on but many were obliged to sit down and rest on the roadside, loosening off their knapsacks while the column still swept on and leaving many behind.[1] Our men suffered most from their feet. The volunteers were marching in their own usual civilian, every-day city shoes, many with high heels and narrow toes, quite unfitted for a forced march on a hot day over hardened ruts, made slippery by dust, on a sun-baked country road.

It may not have been strictly in accordance with the then military regulations, but our Company impressed and hired a passing farmer and his team. Putting the waggon in the middle we loaded it with overcoats and haversacks and gave the sore ones a chance for a few minutes of alternating rest, men and officers carrying at times two rifles each so that weary shoulders might have a little relief. In such way we kept our company together and came into the stopping place at the end in full strength. The regulars lost many of their men on the way.

Halt at New Germany.

Notwithstanding the heat and difficulties the fast pace had been kept up without a halt until at 11 a.m. A stop was made at a place called New Germany, now called Snyder, a mile and a half from Stevensville for which we had set out. We then learned that an action between the Fenians and the volunteers had taken place somewhere near by, but it was all over, and we were to remain where we were while it was being ascertained in what direction the Fenians had gone. It was a terrible

[1] Col. Hoste afterwards reported that his foot Escort of regulars had been so much diminished that he felt it unsafe to proceed.

disappointment to find we were too late, for we had done our best and the column had made a really fast march.

Different estimates have been made of the distance marched, and it has been variously reported at from 9 to 10 miles. I have recently had it measured and find the distance by the route we came from Chippewa to New Germany is 12¼ miles. There is a shorter and more direct route of 9 miles; but as the bridges on this had been reported unfit for artillery we had been brought by a detour to the longer route along the river road, like around the three sides of a parallelogram, to join the other route. At any time 12¼ miles in four hours, or in three and a half hours if we left at 7.30 a.m., is good walking; but for armed troops and on such a day it was a really creditable effort, but not having ended successfully in bringing us into action has not received much credit. Yet the recollection of that forced march to get up in time to the fighting line will not easily be forgotten by those who engaged in it.

The rest was welcome, tired limbs were stretched out upon the sward, and the neighbouring farm houses foraged for supplies—fat pork, hard tack and bread soaked in the sizzling fat was the menu for the day. "Is this all we are going to get?" said one private. "Well, well," replied the sergeant looking at his officers who were sitting on the top of a rail fence eating their share, "Wot's good enough for the officers is good enough for us."

The good people of St. Catharines had been good enough to promptly send up supplies for their regiment, and some of ours were lucky in getting cuts from their good quarters of beef as the waggons passed by us to the 19th.

Everyone regretted that we had not been up for the early engagement but were full of hopes, and were told that we would have our chance later on in the day. So we cheered ourselves with the thought and got ready.

It would have amused some at home if they had seen the junior ensign at work busy with scissors and sponge on the sore footed ones set out in a row before him on a bank, with their boots and stockings off. Feet were sponged, blisters pricked, bare places mended up with goldbeaters, skin, and soles cooled and soaped to be ready for another try after the Fenians. Luckily the hunting "huzziff" with its camp contents had not gone off with the satchel, for narrow toed civilian shoes are poor things to carry volunteers when out on active service.

News had come that the Fenians were retreating back towards Fort Erie and at 5.30 we were started off to chase after them. Just after we had marched off the Governor General's Body guard under Major George T. Denison, came up and we moved to one side of the road to let

them by, giving them a rousing cheer as they gallopped past towards the head of the column. Dusk came on as we hurried forward. After we had gone about 9 miles a bank of woods closed in, into which a rise in the road entered, and we saw some men on horses in the opening. It quickly became dark and a part of the 47th and our No. 1 company of the 10th were sent out in skirmishing order as advance picquets to the right of the road. The column halted and the whole force bivouacked in the open for the night.

Our company lay under the lee of a rail fence, from the other side of which the fields sloped up towards the woods. The ground on which we were placed was fresh ploughed and soggy and no lights or fires were allowed.

Luckily our restless bugler boy with his wandering tendencies discovered a stack of straw in a field to one side of us, so the captain permitted one at a time from each of our double picket files to go and get an armful, and before long the whole company was bedded and out of the mud. The dark, still night was spent in watchful quiet and the remaining contents of the haversacks shared and eaten with relish.

At earliest dawn (3rd June), three men were seen coming towards us over the fields from the woods at the right. Being challenged they threw up their hands and running forward climbed over the fence and asking to be taken at once to headquarters, were sent along our line towards the main road to Col. Peacock. "Good heavens," said one as they passed by, "That's Col. Dennis, but he has cut his long whiskers off." So indeed it was. The shaven, haggard faced man, with slouched cap and tousled common clothes was the same man, but very different in appearance, from the stately Colonel Stoughton Dennis, District Commanding Officer of the 5th District, with handsome uniform and flowing Dundreary whiskers, who had gone out in command of the Queen's Own only two days before. "What in the world has happened?" "What has become of the Queen's Own?" were some of the questions that at once went around. A few minutes afterwards as it was fairly light we were up and off.

As we approached Fort Erie, which was 2½ miles from our bivouac, the troops were extended in a wide sweeping semi-circle to envelop the fort and town, and so to close in on the Fenians whom we expected to bring to a fight with their backs to the river.

Again No. 1 company was in luck for we were sent forward as an advance party to search the woods and houses in front of our part of the line. The first persons we encountered were several men of the Welland Battery, and Private Hindes of the Trinity College Company, and Private Junor of the University Company of the Queen's Own, who had been taken prisoners by the Fenians on the previous day and

had just escaped. They told us a little of the events, and that early that morning a large body of the Fenians had gone back to the American shore but that there were still many left about the town. Continuing our advance the company searched every haystack and building. In a little one storey and a half building it was thought there was a Fenian concealed in the attic, so notwithstanding the voluble protestations of the Irishwoman in possession, Captain (then private) J. G. Ridout, was hoisted up through the trap door to make search. He soon came down, not by the way be went up but through the ceiling, bringing with him, not a prisoner but a cloud of broken plaster and dust, and landing in the middle of the bed which doubled up and broke under his weight amid a volley of words from the proprietress. Luckily he didn't land in the middle of the room on the bayonets of the men who had crowded into it, but the appearance of the burly ex-adjutant all covered with cobwebs as he extricated himself from the bed clothes was altogether too farcical to be serious, so the expurgations and danger were smothered in uncontrollable laughter. In searching another house a strong arm yanked a man out of a cupboard in which he was hiding, and sent him swirling into the middle of the room. He acknowledged himself to be Father McMahon and had been with the Fenians.

He was tried at Toronto and sentenced to death but soon afterwards was released and sent across the border.

In another room a dead Fenian was lying. This house we afterwards learned was that of a man named Canty, who had long been suspected as a Fenian and who when they had come over had brought out a sword and announced himself as a major in the "Patriot Army." On a table in the middle of a neighbouring barn was the body of a man (afterwards known to be Lieut. Lonergan of the Fenian forces), with his shirt open exposing the death wound in his body, and on the floor alongside another dead Fenian.

The regulation Springfield U.S. Army rifles and accoutrements marked U.S. captured showed their official origin. When as was our wont, prodding with bayonets the hay and straw in the mows on either side, a rustle was heard and a faint voice saying, "Don't shoot, I'll come out," when a poor wounded fellow with his arm in a sling emerged from the straw.

These prisoners with others (some 12 or 13 in all), picked up as we worked forward, were left behind under guard; but alas when we reached the heights overlooking the town and river there before us lay the tug and scows with the Fenians close to the American shore with an American gunboat near by.

The quarry had stolen away and we were disappointed of the fight we had hoped for.

In Camp at Fort Erie.

Locations for the regiments of the brigade were at once laid out along the high shores. The day was spent in clearing our camp ground, making pits for the cooks, etc., and generally getting things in order.

Our camp was alongside a road leading from Port Colborne. About 5 o'clock in the afternoon the Queen's Own arrived. They had come by train from Port Colborne, 5½ miles, to Sherks Crossing, the place where they ought to have left the train the previous day, and from thence with a short halt at Ridgeway, the scene of their struggle, had marched in by road to Fort Erie. As they came in sight the mutual recognition of the Toronto regiments was enthusiastic, camp work was abandoned, the road lined and the cheers resounded. The 10th were just preparing a meal which was at once offered to their brothers and of which many of them returned to share. It was all we saw of them for they moved off during the next night to Stratford.

We camped that night in the position allotted to us; but as Fenians were reported to be still in the neighbourhood guards and outlying picquets were set out. Tents had been served out late, but there were no poles nor pegs, so we lay on the ground and each squad spreading out its tent over them as a covering slept in well earned rest after their hard marching and 40 hours of exertion.

Early next morning we improvised tent poles out of a neighbouring rail fence and got the tents up.

The 10th when first raised had been formed as a mechanics' or Engineers battalion and though changed to an infantry regiment its recruitings' still continued to be made from those classes of employments. There were thus many artizans in the ranks and specialists among the officers. Full advantage of this was taken and parties were detailed to lay out drainage and water supply, restore the tracks of the Erie and Niagara Railway which had been pulled up in places by the Fenians and repair buildings and rolling stock. There was, as well as the regular military duties, plenty of work to be done proving the utility of the regiment as a workingman's battalion. The men were keen, perhaps somewhat given to hilarity, but under the training they received soon improved wonderfully in drill and discipline. In physique the regiment was found by actual measurement on parade to compare favourably with any other, whether regular or volunteer, in the brigade.

On the second night in camp (June 4th), an event occurred which caused much excitement. The regiments of the brigade, extended in long lines on the brow of the hill, had been ordered to maintain guards and outpost picquets in the rear of each of their camps. I happened that night to be in charge of the main guard of the 10th. The rear picquets had been placed within touch of one another in the woods on

the rising ground behind us. About 11 o'clock a rifle shot rang out at our immediate rear and at once every one was alert and the "Assemble" bugles sounded along the lines of the brigade. On hurried consultation with the acting-major it was agreed that I should take the balance of the guard which was lined up at the guard tent and strengthen the picquets in the direction of the shot and that he would send out a company at once to relieve me. We doubled out and gaining the wood found the men at their posts when one of them, a funny little old chap, explained how he had fired the shot. "I heerd somethin' movin' about in the dark but I couldn't see nothin' so I crouched down and listened. I heerd branches cracklin' so I challenged him, but divil an answer did he make, so I shouted, 'Stop, or I'll shoot ye,' but niver a word did he say but kep' comin' on, so I blazed at him and he ran, I heerd the leaves rustlin' as he went."

The relief company under Capt. Mussen came quickly up and I hurried back with the guard. The regiment was standing motionless, in close column on the parade ground. We had scarcely got back to the guard tent when up galloped a party on horseback, being Colonel Lowry and his staff. It was a narrow squeak for what would have been said if they had found the tent empty and the guard away?

After making enquiries the Colonel went over to the battalion and there expressed himself pleased with the steadiness of the men under a sudden night alarm. Among the staff was my father, who seeing me as they rode away said, "Hello, so it's you. Didn't the old regiment do well? Come and see me in the morning." He had come over on the staff of Col. Lowry and it was the first I knew of it.

The regiment remained under arms for an hour or so but nothing further occurred.

In the early dawn we searched the wood and found only a peaceful cow grazing quietly with a bullet score on her flank. Private Billy Cordingly had to stand any amount of chaff and "Billy Cordingly's cow" became one of the stock jokes of the camp; but the episode was not without its value for the Brigade.

Next morning, accepting the invitation given, I went down to the water front and found the father with Col. Lowry and members of his staff comfortably established in the directors' car of the Northern Railway, which had been brought over from Toronto. The "Alabama," the name by which the car was known, was then used as the headquarters office of Col. Lowry, who was in command. Besides being the business centre it became also a congenial rendezvous, for the steward, the "inimitable" Parker could put up good meals, and was a deft hand at the composition of those appetizing mixtures in which thirsty souls delight, and hospitality abounded.

The evening coteries were indeed pleasant gatherings to which, although only a junior ensign, I was, by my connection, admitted when off duty. Col. the Hon. John Hillyard Cameron, Col. Wolseley and many others, contributing their comments on campaigning and world wide experiences, while Capt. Hogge of the 47th acted as A.D.C., a round faced, mellow complexioned officer, whose "smiles" were frequent and acceptable.

The usual camp duties and interminable drill were not all that fell to our share for the regiment, as did all the others, supplied its quotas for outlying picquets.

The Newbigging Farm at Frenchman's Creek, some 2½ miles down the river from Fort Erie, towards Chippewa, was a very favourite post, for the young ladies of the house were comely and genial so that the duties of picket were accompanied by much pleasurable companionship.

The main body of the Fenians, we learned, had camped at the farm on the 1st of June, the day they landed. Their arms and ammunition had been distributed to them on the scows when crossing the river. After forming up in the town they had marched down along the lake shore road arriving at Newbiggings about 8 a.m., some 700 or 800 in number, and carrying seven or eight green flags. On these were, as one of their men had said, the "Harp of Ould Ireland," and one of them displayed a harp above a crown. Some of the breastworks of fence rails, which they had constructed along the banks of the creek facing towards the direction of Chippewa, were still to be seen. These were made of rails piled four or five feet high with others set on top forming a sloping roof screen for the rifle pits. When leaving after midnight, and going inland on the early morning of the 2nd they had set fire to the bridge across the creek and burned or thrown into the river a large quantity of arms of which they appeared to have had a large surplus supply.

Another favourite outlying post was at the other end of the position of the forces at the car ferry of the Buffalo and Lake Huron Railway. This was about 1½ miles up the river from the town and near the old Fort Erie which had played so important a part in the war of 1812. Here the cars of the trains were transferred to a large ferry steamer on which they were carried across the river to the Buffalo side. The inspection of the passengers by going through the cars, and attending the arrivals and departures of the steamer were pleasant interludes in the twenty-four hours of duty.

An event which caused much and excited comment might be mentioned. The Fenian dead we had found we had buried in a pit dug below the hill. Two days afterwards, by Col. Lowry's permission, one of them was exhumed and taken over to Buffalo for interment.

That night, at a public meeting in Buffalo, of Fenian sympathizers, a fervid orator named Fitzgerald, created intense indignation by expatiating upon the inhumanity and outrages of the Canadians, which he said "was worthy of the brutal Saxons." He declared that the bodies of the fallen had been horribly mutilated and that of Lonergan had been almost scalped. A headquarters' enquiry, which at once followed, proved that every care had been exercised; but we were advised that when burying the dead without coffins it is better to place them with faces downward, and the false report was publicly refuted by Col. Lowry in a letter to the American consul. It is ill founded, virulent statements such as made, which create international animosities, for the truths and refutations seldom come to all the hearers or readers.

During our stay at Fort Erie we were not without recreation. Our energetic bugler boy had brought to our camp two horses which he had found straying about on the day of our arrival. One of these, although with mane and tail closely cropped, was promptly claimed by our adjutant, the horse and its rider, who was not celebrated for his horsemanship, having parted company during the advance. The other, never being claimed, may have been "borrowed" elsewhere by the Fenians so the officers of our company had ample opportunity for riding around the neighbourhood, including sundry visits to the Newbigging farm.

Our company was rich in negro minstrelsy, and Privates Lee Jacobs and Dave Farrell were professional clog dancers. A pair of barn doors were set up in front of our tents for a stage, and on "off nights" entertainments given, much for the amusement of the other companies who flocked to the concerts at "No. 1." After matters had been settled down many visitors came over from Buffalo, parties of ladies and gentlemen, to see the unusual sight of a British brigade in camp. We entertained them to the best of our ability and formed and received much pleasant association.

Thus the hours of duty and relaxation passed quickly away; but we were glad when at noon on the 19th June we entrained for home. We did not reach Toronto until after 10 p.m., the night was dark and disagreeable, the streets empty, the people had all gone home, so we marched along in quiet and dismissed at the drill shed. Next morning the mayor and officials came down to our parade full of regrets. They had given a public reception to the Queen's Own on their arrival from Stratford at 3 p.m. on the previous afternoon; but by some omission they had not received any notice of when the 10th would come back and so they had not been able to arrange a similar reception for us. Regrets, too, were warmly expressed in both regiments that the Queen's Own and 10th Royals had not been together from start to finish.

The 10th had not, much as they wished it, been under fire; but had done much campaigning and good work in active service in the field, greatly for the benefit of the men and the creation of a spirit of readiness for action, which has ever remained in the regiment.

The Plan of Campaign.

There has been so much controversy upon the plan of campaign under Col. Peacock and its performance, so many misconceptions, mainly the outcome of the hurried and not fully informed reports made in newspapers during the first few days of its progress, that it is well to give a resumé of it and the consensus of opinions as expressed at the time at headquarters, of which I had exceptional opportunities of learning.

General Napier, at Toronto, was in full command of all the forces in Upper Canada, now Ontario. The local command of the Niagara Frontier force was entrusted to Col. Peacock of the 16th, who with his regiment was then at St. Catharines, which was to be the central point for his operations. The main object was to protect the Welland Canal and to prevent any advance on it by the Fenians, who were reported on June 1st to have landed at Fort Erie.

A western force of the Queen's Own from Toronto and the 13th Regiment of Hamilton had been dispatched by the Welland Railway to Port Colborne to join the Welland Battery. Having arrived there in the evening of 1st June this was at first under the command of Col. Dennis and subsequently of Col. Booker.

Col. Peacock had moved at once from St. Catharines and by the Erie and Niagara R.R. arrived at Chippewa on the same evening of June 1st and was there joined by reinforcements early in the morning of June 2nd thus completing the eastern force.

The problem as arranged by Col. Peacock was to effect a co-operation between these two forces under his immediate command and by moving on the inner lines of the area of operations protect the canal during these movements and then by a united sweeping advance drive back the Fenians to the frontier if they should be advancing inland.

To take charge of their rear he ordered that a steamer and detachment should be sent from Port Colborne to the Niagara River there to patrol the river at Fort Erie to prevent any further reinforcements coming over, and those of them on the Canadian side from recrossing to the American side.

This was communicated by wire to Port Colborne, and to secure and emphasize his plan he sent Capt. Akers of the Royal Engineers from Chippewa to Port Colborne to assist and guide the volunteers who were without any officer of the regular army.

The geographical position was somewhat of a triangle with the Welland Canal and Welland Railway as its base and Fort Erie its apex. The sides being, southerly side Port Colborne to Fort Erie, 19 miles; northerly side, Chippewa to Fort Erie, 15 miles; Stevensville mid-way between the two starting points and 10 miles inland from Fort Erie was selected to be the point of junction. Col. Dennis' force was to proceed either north by the Welland Railway to a point opposite to Stevensville, there to detrain and march direct east to Stevensville, or to proceed east some miles by the Buffalo and Lake Huron Railway and then march north to Stevensville. The routes and the time of leaving Port Colborne to be settled by Capt. Akers after consultation after his arrival at Port Colborne. Col. Peacock and the eastern force were to leave Chippewa at 6 a.m. and march southerly by road to the point of junction. Both forces were to time their movements so as to meet at Stevensville between 10 and 11 a.m. on the morning of June 2nd.

As the routes of both columns would thus cover the Welland Canal and be kept between it and the Fenians who might be advancing from Fort Erie, the plan was considered by all the critics to have been entirely judicious and that it would have been effective, if it had been properly carried out.

Col. Dennis at Port Colborne, learning the Fenians were on the shore of the river at Newbiggings, devised a new plan of his own by which the western force was to advance alone, direct to Fort Erie while he with the men of the Welland Battery were to sail in the "Robb" by lake to Fort Erie and there to co-operate on the rear of the Fenians.

Capt. Akers arrived at Port Colborne at 1.30 a.m. (June 2nd). The proposed change was then wired to Col. Peacock at Chippewa and without waiting for a reply Capt. Akers sailed with Col. Dennis in the "Robb" at 4 a.m. thus abandoning the volunteer force which he had been sent to accompany and direct. Before sailing Capt. Akers instructed Col. Booker that if he did not hear from Col. Peacock approving of the change, he was at 5 a.m. to leave Port Colborne by Buffalo and Lake Huron train to Ridgeway Station, and from there march inland to Stevensville.

Col. Peacock did not approve of this change, and at 4.15 a.m. finding, in order to give the volunteers a meal, he would be delayed an hour in leaving, wired Col. Booker to delay his start to a similar extent. Before this message reached Port Colborne, Col. Booker with his forces had started, and it being sent after them on a hand car was only delivered to him at 7.30 at the beginning of the action with the Fenians. Capt. Akers afterwards admitted that he had told Col. Booker to leave an hour earlier than was necessary, as he did not think that the volunteers

would start on time! Had he remained at Port Colborne he would have known that the men were put into cars over night and so were ready to leave, as they did at the exact train time. In addition to this earlier departure the train went four miles nearer to Fort Erie than was intended, and so the Booker force was at Ridgeway station only three miles from Stevensville, and four hours before Col. Peacock expected to be there.

Had it not been for these misdirections of Capt. Akers the two forces would have joined and together met the Fenians but through them it was that the Fenians were enabled to meet one force alone, and sooner than was expected. Perhaps also, had a trained officer been present the volunteers would not have so valiantly but inconsiderately thrown themselves at once upon the opposing foe, but would have taken up a position for defence until their supports had come up.

The Fenians, instead of remaining on the shore of the river had during the night marched inland for the canal. Col. Dennis and Capt. Akers arrived at Fort Erie in the "Robb" at 8 a.m. (June 2nd), and found the main body of the Fenians had left. Instead of patrolling the river, he landed his men and made some prisoners of some stragglers whom they put in the hold of the steamer. About 3 p.m., while on land, they were attacked by the main body of the Fenians returning from Ridgeway with disastrous effect, notwithstanding the gallant efforts of the Dunville company and the Welland Battery, three of whom were killed and five wounded, among whom were Capt. King and Lieut. Schofield, the little force of only 54 having been far outnumbered. We saw the house to which a number of them had retreated, which was fairly riddled before they surrendered.

Col. Dennis concealed himself and fled in disguise, Capt. Akers escaped in a buggy by the shore road along Lake Erie to Port Colborne, and the "Robb," without officers or soldiers after receiving a running fire from the Fenians, went off to Port Colborne to deliver her prisoners to the jail. The river being left thus unguarded, the tugs brought the barges back to the Canadian side and at 2 a.m. June 3rd, the main body of the Feinans went on board and left our shores.

To this change of the plan made without authority, and the folly of these two officers, were considered to be due the mis-connections of the day and the final escape of the Fenians.

The career of Col. Stoughton Dennis with the Canadian Militia from that time ceased, and Capt. Akers was suspended by Col. Lowry upon his arrival next evening at Fort Erie.

The course of Col. Peacock in stopping at Chippewa until all his forces had had a meal before starting on their march for the expected action was considered to be absolutely correct. It was further justified

by the subsequent event that the western force having been without meals (for biscuits and red herring served out in the cars cannot be considered a meal), were after their action, obliged to return to Port Colborne for supplies.

The long delay (6 hours) at New Germany of Col. Peacock's column was considered to have been most unfortunate. It was admitted that it was absolutely nceessary to find out, before moving, whether the Fenians were still advancing towards the canal. Here the absence of cavalry with the force was again felt. Had there been any, the fact that the Fenians were retiring towards Fort Erie could have been ascertained much earlier than was done by local scouts. The advance could have been made more promptly, and the force instead of bivouacking over night outside the woods could have been brought into contact with the Fenians at Fort Erie that same afternoon and before the tugs came over for them. Col. Peacock supposed, however, that this would have been prevented by the "Robb" patrolling the river.

The Inadequate Equipment of the Volunteer Militia.

Another subject which received much comment was the inadequate equipment of the volunteers for active service in the field.

In physique, drill and ardour they were all that could be desired, the months of preliminary training having brought good results, and in equipment for parade drill at headquarters they were excellently supplied, but were entirely without proper provision for service in the open.

The 13th had overcoats but no straps with which to carry them, no knapsacks, haversacks or water bottles. The Queen's Own had straps, some companies had a few haversacks but nothing else, and their ammunition was not served out until they arrived at Port Colborne. There was also, only one horse between these two regiments for all their officers of mounted rank. The 10th and 19th had overcoats and haversacks and nothing more.

There was no commissariat, few cooking utensils, no supply of provisions except what the men themselves had provided, no camp tools and no tents. The wonder is that, unfed and unequipped, all did so well but had it not been for the assistance of the regulars and the generous supplies sent forward by the citizens of their respective cities the volunteers would have fared ill while the militia authorities were coming to their senses.

An acute lesson was learned and all this has since been remedied, so that when sudden calls for active service came again in 1885 for the North West and in 1890 for South Africa, both men and full equipments were immediately ready. Improvements have still continued, until in

the gathering of the militia from all parts of Canada at the Tercentenary celebration at Quebec in 1908 the Canadian Army for the first time in its history, took the field completely equipped in every particular; cavalry, artillery, foot, army service, hospital and commissariat, a perfect organization which received the commendation of Lord Roberts.

Had there been such conditions in 1866 much trial of makeshifts and endurance would have been saved to those who then answered their country's call.

The Delayed Neutrality of the United States.

In closing these personal reminiscences of the Fenian invasion of 1866 and in view of the fact that diplomatic thanks were then promptly transmitted to the United States by the Governor-General and the British Government, it may be well to add some records upon the neutrality of the United States Government and its people, gleaned from recollection and a somewhat extensive reading of the documents and papers of that period.

Andrew Johnstone, the Vice-President had, upon the assassination of Abraham Lincoln in April, 1865, succeeded to the presidency. A position of political unrest followed. The new president from Tennessee, a man of doubtful views and character, had been chosen for the election contest, not for his personal abilities but as a sort of running mate to attach support from the war democrats and the south to Lincoln, the potent presidential candidate of the north.

The evil of the separation of the Executive power from the Legislative which is so embarrassing in the constitution of the United States, and so contrary to the responsible system of our modern British Constitution, at once became evident.

The new President and his Congress, which was dominantly Republican, came into immediate and constant conflict, so much so that finally the President was placed under impeachment. Under such circumstances the broader dealings of the nation with other nationalities were submerged under the exigencies of party politics and local partizanship.

The rival armies of the Civil War had been disbanded, a million of men set free from military service. The Fenian agitators, unchecked by either political party and perhaps encouraged by animosities aroused by the recollections of the destruction done by the "Alabama," blatantly conducted their agitation and open preparations for the invasion of Canada in the early spring of 1866 had been publicly announced and conducted. Yet neither President nor Congress interfered.

From the 10th May, 1866, the Marine Insurance Companies, foreseeing trouble, refused to insure cargoes through the Welland

Canal, all American vessels were withdrawn from it, and the Northern Transit Co., an American line of steamers operating through the upper lakes to Oswego on Lake Ontario, stopped their trips.

In later May, depots of arms were made at various places along the American northern frontier, among others at Erie and Buffalo. The instructions were that the agents were to store the arms and advertise auction sales of arms and military equipments and so explain their possession. The agent at Erie failed to insert his advertisement so for want of this his stores were seized by the local authorities.

The Fenian agent at Buffalo was more judicious and it was advertized that an auction sale of muskets, rifles and military equipments would take place by P. O'Day at his store in Pearl St., on Friday morning, June 1st.

The enterprising newspaper reporters, moved by the current rumours, investigated the premises and some of the samples and the many rows of boxes piled up in the store, but were informed that the goods would not be opened for exhibition until the morning of the sale. All these in the public prints prior to, and on 29th May.

On Tuesday the 29th, a railway concentration to the frontier was begun from Nashville, Louisville, Cincinnati, Indianapolis and Columbus towards Buffalo, and from New Haven and Boston towards the eastern frontier.

As the small parties came into Buffalo they disappeared among the residents, for the larger parties, coming by special trains containing three hundred and fifty men or more, the trains on arriving at Buffalo were stopped outside the city near the Union Iron Works, and the men were quickly dispersed to the houses of the friends of the brotherhood.

The men were clad in every imaginable way, some in Confederate gray; but most wore the black felt U.S. Army felt hat. It was evident that they were largely discharged soldiers from the northern and southern armies.

On the evening of 30th May, General Sweeney, chief of the Fenian Brotherhood announced in Buffalo that something would be done at once to rescue the order from disgrace.

Notwithstanding these open evidences of an intended movement on Canada the United States authorities took no steps to prevent it.

Early on 1st June the sale at O'Day's began and amid much amusement the arms were sold singly, and by the case at $1.00 each. The auctioneer being asked what had become of the large piles of cases which had been seen two days previously, laughingly said that he was afraid the rascally Fenians had taken them away. It had been publicly known that there would be an "Excursion on the River," from Black Rock early that morning. Nine waggons with cases were seen going

down the streets toward the landing place, a tug and two scows were provided and the excursionists getting on board were taken across the river to Fort Erie.

They were the advance party for the invasion of Canada.

During all this period the garrison of the United States Federal Army at Fort Parker at Buffalo was maintained at only 50 men and no orders were given for their interference with the Fenian movements. The United States revenue cutter "Michigan" was also in the port. That this steamer did not get out early enough in the morning of the 1st to prevent the Fenians crossing, was next day accounted for by the commander saying that his engineer was on shore and so the delay occurred, but it is also to be noted that again on the morning of the 3rd she did not arrive at the river in time to prevent the tug and barges going across again to Fort Erie to bring the Fenians back, nor until after they had returned to American waters.

The peculiar relations existing between the central government of the United States and the militia of a State was also evidenced.

General Grant in command of the Federal Army issued orders on June 2nd appointing General Barry to the command at Buffalo with a reinforcement of 200 men and also requested that "The State Authorities" should call out the Militia on the frontier to prevent hostile expeditions leaving the United States.

These orders for "prevention" were not given until after the Fenians had been driven back out of Canada.

The barges with about 500 Fenians on board had been brought to anchor close to the American shore under the charge of the "Michigan." At an interview held on board the cutter on the 3rd between Col. Lowry and General Barry as "no demand for the return of the Fenians was made," so little guard was kept over them that during that night they slipped over the sides, took boat to the shore and next morning there were only 200 left. These were released on their own recognizance to appear in court and on the 5th all were discharged on their own parole.

Not until the 6th of June did President Johnstone issue his proclamation declaring the intervention and position of the United States.

Meantime parties of Fenian reinforcements kept coming into Buffalo and on the 7th June a body of 1,200 Fenians advanced at the eastern frontier from St. Albans and were repulsed by the Canadian forces at Pigeon Hill.

The numbers of Fenians in Buffalo still continued to increase, 900 being reported to have arrived on the 8th and it was estimated that there were then between 3,000 and 4,000 in the city. These became so troublesome and a menace to the citizens that the United States Government

offered them returned railway tickets to their several destinations which they gradually accepted and so departed. Thus both the Executive, and the political parties had avoided making interference and of risking the hostility of any of their voters until after the Fenian attempt had been defeated.

This menace of the interference of party politics in the foreign relations of the United States with their neighbours will always be present under their form of constitution.

The President being elected by a public vote is the continuing representative of a political party and his actions as the head of the executive are moved by consideration of what will be desirable for the advantage of himself or of his party at the next election. When, as in this case, he is at personal issue with his Congress a still greater impediment to speedy and judicial action is further introduced.

The illusion of depending upon the active neutrality of an adjoining nation had been abundantly proved in 1837 when secret clubs known as "Hunters Lodges" had been organizing in many American villages on the shores of the St. Lawrence. In these moneys were raised for procuring arms and enlisting men for the expedition against Canada which followed. The readiness of the volunteer militia of Kingston dislodged them from Hickory Island when they had landed; but it was not until they had retreated to the United States that the State militia were called out at Cape Vincent and Clayton.

A similar condition existed in 1812 when the war was brought on by the political aspirations of Madison and the "war hawks" of Clay and the South, and again in 1866 when the invasion of Canada was made possible by a desire not to antagonize the solid vote of the Irish adherents

That the Americans as a nation would ever attack Canada is unbelievable; but political exigencies may hamper their intervention and sudden excitements of local bodies get beyond control.

Especially is this the case now that the Rush-Bagot Convention of 1817 for the peace of the lakes has been virtually annulled and strongly armed gun-boats are in active volunteer service in all the large border cities in the United States on the inland lakes. A "Flag incident" brought on by thoughtless partizans might suddenly blaze into recriminations and reprisals and set the two nations unwillingly by the ears. In State and in Federal politics a yellow press and an approaching election could readily cause delay in action, guided by self-seeking politicians.

The true peace of Canada is to be found not in trusting to intervention by any foreign government, but to readiness for honourable self-defence.

A fear of militarism is not a prelude to peace but to subservience and attack. In 1837 and in 1866 if the troops, even in their then imperfection, had not been ready to be placed in a few hours upon the frontier, a foothold might have been obtained and hordes would have followed and greater loss of life have been occasioned. Peace was won by readiness. The patriotic maintenance of our volunteer militia in full numbers and equipments is not in antagonism to any one else, not to create a desire for war, but to prevent it, to improve our self-reliance and to keep our country and our homes in peace.

V.—*The Loyalists in Prince Edward Island.*

By PROF. WILBUR H. SIEBERT and FLORENCE E. GILLIAM of Ohio State University.

(Presented by Dr. A. G. DOUGHTY and read September 28, 1910.)

The general conditions which led to the influx of large numbers of Loyalists into Canada from the American colonies during the Revolution of 1776 and at its close are well known. They resolve themselves into the provisions of the anti-Loyalist legislation passed by the revolting States,[1] the threats and persecutions to which those people were subjected who supported the British cause by word or deed, the failure of the United States Government, or of the separate States, to accord any redress to the Loyalists for losses of property, and the grants of land in Canadian territory made by the British Government in an endeavour to repair the losses sustained by its distressed adherents from the States. In a general way these conditions may be held to account for the settlement of the Loyalists in numerous places in various parts of Canada from Detroit on the west to the Island of Cape Breton on the east.

When, however, we take up any given place of refuge, for the purpose of examining the history of its connection with the American Loyalists, we find at once that special causes must be reckoned with. Thus, there were considerations chiefly of a personal nature which induced many Loyalists to resort to London as the seat of government in far-away England; and other considerations more local in character which influenced numbers of "Tories" from Georgia and Florida to seek a congenial refuge under the British flag in some of the neighbouring West Indies.

It is our purpose in the present paper to examine the special causes and circumstances under which a considerable number of Loyalists settled in Prince Edward Island, and to set forth their subsequent history in that place.

Prince Edward Island lies in the Gulf of St. Lawrence adjacent to the northern shore of the peninsula of Nova Scotia. In 1767 the entire island, then known as the Island of St. John, was disposed of in various grants by the Crown, and was annexed to the provincial government of its neighbour on the south. In 1768 a large majority of the proprietors presented a petition to the king, praying that the island be erected into a separate government. The petition was granted, and Captain Walter

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[1] See "Anti-Loyalist Legislation during the American Revolution," by Prof. J. W. Thompson in *Ill. Law Rev.*, Vol. III, Nos. 2 and 3.

Patterson, one of the island proprietors, was appointed governor. The existing name of the island led to much confusion and inconvenience. There was Cabot's Island of St. John off the west coast of Cape Breton, Gomez's Island of St. John which was Cape Breton itself, the river St. John, and other instances of the name. Governor Patterson complained of mails going astray, and asked to have the name changed. That of Prince Edward Island was therefore adopted.[1]

The proprietors seemed to feel themselves under no obligation to pay their quit-rents and the island officials found it very difficult to keep the government machinery in motion. The governor became involved in a quarrel over the sale of lands, and felt it necessary to get the influence of such people as the Loyalists, who were now, at the evacuation of New York by the British troops, coming from that and other states to settle in Nova Scotia. The proprietors saw a chance to escape the payment of quit-rents on any land granted to Loyalists and found thus a special interest in their coming. Hence, in examining the causes for the settlement of the Loyalists in Prince Edward Island we must first consider the apparently liberal offer made by the proprietors of the island itself in 1783. This offer was set forth in a petition delivered to Lord North, declaring their desire to afford asylum to such distressed fellow-subjects as preferred a settlement on the island to one in Nova Scotia, and asking for such an abatement of quit-rent as would render the island an attractive place of settlement for American Loyalists. The petition asserted as its motive the wish to further the prosperity of the colony.[2]

This step naturally received encouragement from the British Government. Accordingly, the governor, by advice of the Council, issued a proclamation promising certain lands to those who should choose to become settlers in the same manner as in Quebec and Nova Scotia.[3] And when this procedure did not prove entirely satisfactory, the Island legislature, in 1790, passed an act, which was approved by His Majesty the King of England in 1793, empowering the governor, lieutenant-governor, or other commander-in-chief for the time being, to give grants of such portions of the lands resigned by the proprietors as were then in possession of Loyalists and reduced soldiers.[4] The governor

[1] Warburton, Historical Sketch of Prince Edward Island.

[2] The text of this paper is quoted in the Act of the Legislature of 1790. See *Revised Statutes of Prince Edward Island*, 30th George III, ch. 5.

[3] The proclamation is quoted in the report of the Committee appointed in 1833 to investigate the complaints of the Loyalists. See *Journal of the House of Assembly of Prince Edward Island* for the year 1833.

[4] See *Revised Statutes of Prince Edward Island*, 1790. 30th George III, ch. 5.

received royal instructions concerning the grants which embodied very liberal terms for the settlers.[1]

Further than the encouragement thus offered, we have as an active cause of Loyalist settlement in Prince Edward Island, the collapse of Shelburne, "that great city that was to be," founded after the American war by refugees in Nova Scotia.[2] Many of the disappointed settlers of Shelburne saw the proclamation of the governor of the island, and went there in the hope of retrieving their fortunes.[3] One of these, who arrived in 1784, afterwards informed a committee of the legislature that he had been induced to come by several proclamations posted about the streets of Shelburne offering lands to Loyalists on their arrival; and another tells of having been informed of the proclamation by an agent of Governor Patterson, who assured him that he could easily get land as a settler.

That these methods on the part of the authorities met with a measure of success is shown by some important records of the time. On June 12, 1784, a muster of Loyalists was taken on the island, which gives the number of men as two hundred and two, with enough women, children and servants or slaves to make a total of three hundred and eighty persons.[4] During the summer and early autumn of the same year several groups of Loyalist families arrived from Shelburne: thus we find it noted that twenty-seven men, together with women and children, came in on July 26; twenty-six men, also with women and children, on September 13, fifty-five on September 19, and twelve on September 25.[5] These figures give an aggregate of one hundred and twenty men alone (the figures for an accurate count of the women and children not being at hand), who are recorded as arriving from Shelburne during the interval of two months from July 26 to September 25, 1784.[6] Counting in all the Loyalists who were duly reported in the records of the summer and fall of this year, 1784, we have a total say of six hundred, more or less, who had made their way to Prince Edward

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[1] Quoted in the report of the committee appointed in 1833 to bring in a bill for the relief of the Loyalists. See *Journal of the House of Assembly of Prince Edward Island*, March, 1833.

[2] See Crosskill: *Prince Edward Island, the Garden Province of Canada*, p. 18.

[3] Interviews appended to report of the committee to whom was referred the Loyalist Petition. See *Journal of the House of Assembly of Prince Edward Island* for the year 1833.

[4] Brymner, *Report on Canadian Archives*, 1884, p. xli.

[5] Letters and Records of C. Stewart. See *Muster Rolls of Loyalists and Soldiers*, 1784, Vol. 376.

[6] Crosskill in his little handbook, *Prince Edward Island, the Garden Province of Canada* (1906), p. 18, has understated the number of arrivals from Shelburne, placing the figure at about one hundred.

Island. It is therefore clear (unless about two-thirds of these intending settlers departed during the year and a half between June, 1784, and January, 1786), that there is a large discrepancy in the statement of Governor Patterson, who is said by Warburton to have written to the Secretary of State, in January, 1786, that only about two hundred settlers had arrived and some families from Rhode Island, who expected others soon to come from the United States on account of heavy taxes and want of trade.[1]

Doubtless, Governor Patterson and his colleagues were disappointed in the number of settlers which the offer of lands in their pleasant and fertile island secured; but it must be remembered that Prince Edward Island was competing for residents with the idyllic western portion of the Nova Scotian peninsula and with the rich and lovely valleys of the St. John and St. Lawrence rivers, localities in which thousands of Loyalists were finding homes. Under these circumstances one may reasonably say that the island fared well in the number of Loyalists who sought its shores. That a considerable exodus of these immigrants may have taken place is not improbable in view of the charlatanry practised on them by both proprietors and officials when they presented their claims for homestead lands. The story of the many wrongs committed against the settlers will be narrated later on.

It may be asked from what States these Loyalists came. The majority of those whose origin is known came from New York. Occasional references indicate that some had formerly lived in Boston, Mass., Rhode Island and other parts of New England, while some came from remoter sections, for example, North and South Carolina.

A wide variety of social condition was shown by the new settlers. Disbanded officers and men from Loyalist regiments, such as Butler's Rangers and the King's Rangers were to be found among the population. Sabine, in his *American Loyalists*, gives sketches of some of these, among them several who were connected with the King's Rangers, and who after settling appear to have written others inviting them to follow.[2] The civilians were represented by men of former wealth and rank, as also by farmers and artisans of the middle class. We hear of persons of both high and low degree among the recent settlers who, like the Loyalists of all other localities, had gone through the most trying vicissitudes on account of their devotion to the Crown, some of them members of the wealthy class of New York who became involved by giving aid to British troops, and again a New York gun-smith who relates the danger he encountered in supplying arms to the British, and

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[1] Warburton, *Prince Edward Island, an Historical Sketch*, p. 30.

[2] Pp. 243, 359, 439, 572, 625, 646.

adds that he acted as one of their army guides during most of the war but got nothing for it.

In general it may be said of these new members of the island community that they were capable and industrious people, recognized as valuable settlers, and became the founders of thrifty, prosperous and continuing families. The provincial librarian, Mr. W. H. Crosskill, writing in 1906, says in this connection:[1] "Many well known families of to-day, thrifty and prosperous citizens of such fine farming districts as Bedeque, Pownal, Vernon River, etc., are descendants of those who in 1783 preferred George of England to his namesake[2] Washington."

The settlements of the Loyalists were established for the most part on the south shore of the island. The lands assigned to them were in various townships, notably, Nos. 16, 17, 19, 26, 32, 50 and 56. Most of the people from Shelburne got settled, after much difficulty, at Bedeque Harbor. The obtaining of the grants was a very slow process; and in order to supply their necessities in the meantime the British Government issued provisions to them, at first for one month, but afterwards during the second month also. Many of the Rhode Island immigrants were, according to a writer of 1821-22, located in King's County.[3] Stuart, in his *Account of Prince Edward Island* speaks of the success of the Loyalist settlers in township No. 26 as proof of "what might have been expected from that description of people, had any considerable number of them been brought to the Island instead of being encouraged and in some measure compelled by the overbearing influence of a few individuals to settle themselves on the barren, foggy shores of the southern coast of Nova Scotia."[4]

By far the greater part of Loyalist history in the island must, of necessity, be taken up with the wrongs and persecutions inflicted on the Loyalist settlers. It is not putting the matter too strongly to say that the proprietors participated in a general defalcation when the settlers began appearing in response to the offers first set forth in the proprietary petition to Lord North. Even Edmund Fanning, when lieutenant governor was implicated, as one of the proprietors, in the trouble which arose over township No. 50.[5] The Loyalist settlers in this township,

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[1] *Prince Edward Island, the Garden of Province of Canada,* p. 18.

[2] Letter of C. Stewart, appointed to muster disbanded troops and Loyalists, dated St. John's Island, 9th August, 1784. See *Muster Rolls of Loyalists and Soldiers*, 1784, Vol. 376.

[3] Warburton, *Prince Edward Island, an Historical Sketch,* p. 30.

[4] John Stewart, *Account of Prince Edward Island in the Gulf of St. Lawrence,* pp. 207-217. See also Interviews appended to reports of committees in the *Journals of the House of Assembly of Prince Edward Island.*

[5] See *Journal of the House of Assembly of Prince Edward Island* for year 1833—report of the committee to whom was referred the Petition of American Loyalists in 1832.

being unable to obtain their grants, resolved to send a remonstrance to the British Government and chose as their representative one of their number who had been known to Lord Cornwallis in the war, hoping thus to obtain redress. This agent was preparing to leave for England, and had made known his intention to Lieutenant-Governor Fanning and the other officers of the provincial government. The effect secured was as prompt as it was significant; within a week afterwards nearly all the Loyalists who had claims in the specified township obtained their grants. It is worth remarking that the Lieutenant-Governor was himself an extensive proprietor in the township in question. In many other cases, however, the difficulty was not so easily arranged; grants were promised, and then refused; Loyalists were allowed to take up their residence on certain lands, being assured that their titles were secure, and after clearing the lands, erecting buildings, planting orchards, and making other improvements, were told that their titles lacked validity, and were forced to move;[1] and many onerous conditions were attached to the holding of the granted lands. In the legislative investigations which were subsequently made, considerable evidence was adduced to prove that the governors themselves had acted in bad faith in the carrying out of the offers made. A soldier who had seen service both in New York and Cape Breton, on presenting letters of recommendation for land to Governor Fanning, was told—according to his account—that the whole island was soon to become King's land, that the only Crown land at present was in the middle of the forest, and he was advised to wait, with the result that he never got the land. Another, a disbanded seaman, let slip the grant which he might have obtained in Halifax in order to come to the island, and though he repeatedly endeavoured to get a grant from the governor, he was always met with some excuse and remained landless. The royal instructions concerning the grants embodied very liberal terms.[2] But, in disobedience to express provisions therein, time limits were set, quit-rents were demanded, and certain improvements were made conditions of holding. Inducements that were held out by the governors led a number of Loyalists to come to the island who never received any fulfilment of these promises. Written deeds were withheld, and the location of the Loyalists changed quite arbitrarily from one place to another. The minutes of Council which contained many of the Loyalist locations, were not entered in the regular Council Book; and the rough minutes when discovered, bore evidences in erasures and different inks of having

[1] See *Journal of the House of Assembly* for 1833—testimony of witnesses appended to the report of the committee to confirm the titles of the Loyalists.

[2] Quoted in report referred to in note 1.

been tampered with.[1] Moreover, we find Governor Patterson taking advantage of the dependent condition of the Loyalists to secure for himself a party in the House of Assembly. These new settlers were dependent on him for the government donations which made the estabment of their settlements possible; in him also was vested the power of locating them on the lands they were to receive—hence they were ready to support any meausre in which he was interested. Fanning, Patterson's successor, later excused himself for withholding a grant on the ground that all the land had been granted by his predecessor.

If Loyalist history in the island is full of wrongs and persecutions, it is also marked by attempts at Loyalist redress renewed from time to time. As early as 1790 the island legislature passed an act empowering the governor to give grants to Loyalists who had not yet received them from the proprietors.[2] The need of this act, as avowed, lay in the fact that the proprietors had failed to fulfil their part of the agreement, and many of the Loyalists had therefore remained unsupplied with lands. This measure was "allowed" by the King in 1793. But its provisions did not redress all grievances, and after the lapse of forty years a petition of the Loyalists led to further action in the matter. A committee of investigation was appointed in the House of Assembly, and made a report containing a review of the Loyalist movement in which the gross injustice of their treatment was shown. A bill to confirm their titles was recommended and evidence was presented in the form of interviews with witnesses.[3] The committee appointed to prepare a bill for the relief of the Loyalists also made an extended report.[4] This report quoted the royal instructions of 1783, pointed out the failure on the part of the proprietors and governors to regard them, and exposed the suppression of Loyalist applications in the Council Minutes. Appended to this report there was likewise a set of interviews with witnesses.

This measure seems to have fallen through, for in 1839 another bill for relief was reported. It did not, however, meet the approval of the Colonial Secretary in England, although his objections were replied to by the committee to whom his despatch had been referred. Another bill passed the House in 1840, but was rejected by the Legislative Council. In the same year the Loyalists sent an address to the Governor General of Canada; and in 1841 a bill for relief was again passed in the

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[1] These Minutes were originally thought to have been lost, but investigation revealed that they had been preserved on loose papers.

[2] *Revised Statutes of Prince Edward Island*, 1790, 30th Geo. III, ch. 5.

[3] *Journal of the House of Assembly of Prince Edward Island* for the year 1833.

[4] *Journal of the House of Assembly of Prince Edward Island*, Thursday, March 28, 1833.

House and rejected by the Council. A committee, also appointed in 1841, to deal with the question of Loyalist relief, gathered together all these bills with the reasons given for their rejection. They showed that the objections of the Colonial Minister, which had not been completely refuted in the report of 1840, were removed by the omission from the bill of 1840 of the objectionable parts of the bill of 1839; that the bill of 1840 did not in fact infringe the rights of either the proprietors or the Crown. They reviewed the reasons given by the Legislative Council for rejecting the bills, namely, that it was similar to that of 1839, and that it amounted to an assumption by the Legislature of the right to dispose of the waste lands of the Crown, and showed that both statements were unfounded. They called attention to the fact that the "anxious desire" professed by the Legislative Council to afford relief to the Loyalists did not facilitate the comprehension by that body of what was the evident intention and meaning of the bill of 1840. They made it clear also that through the objections raised in various quarters on the part of the Crown, governors, and Legislative Councils, all bills for Loyalist relief for forty years had been prevented; and they urged the House not to relinquish a cause which after mature consideration it had declared to be well founded, but that it publish the list of Loyalist claimants along with extracts from certain letters of Lord Liverpool and William Fauknor, and appoint a committee at the next session to investigate how many claimants had been satisfied to the end of securing redress for those who had not.[1]

What was the outcome of this agitation we are unable to say, for the records at our disposal are incomplete; but it should be noted that as late as 1860 a Land Commission was appointed which again reported that the Loyalists had claims on the local government, and recommended that free grants be made to such as could prove that their fathers had been attracted to the island under promises which had never been fulfilled. Thus we see that for three-quarters of a century after the settlement of the Loyalists in Prince Edward Island, their grievances had been periodically urged with vigour and had proved to be an abundant source of agitation and concern to the island authorities.

Concerning the real significance of the Loyalist settlement in Prince Edward Island, it is not easy to generalize. It seems probable that at the end of the year 1784 the American refugees formed from a fifth to a sixth part of the island population, which some fifteen years later amounted only to 4,372. As their habitations were fixed mostly in the southern part of the island, that section, which already had the

[1] Report quoted entire in the *Journal of the House of Assembly of Prince Edward Island*, April 20, 1841.

advantage of proximity to Nova Scotia, received an additional stimulus, and benefited agriculturally, commercially and in other respects. The presence of the Loyalists also made itself felt politically. Governor Patterson was not averse to bidding for the votes of Loyalists and their friends in the lower house of the provincial legislature when some favourite measure was up for enactment. These people were naturally conscious of their obligations to the executive, and were likely to vote as he desired. However, the political influence of this class of settlers seems to have been incidental to the exigencies of the situation.[1] Otherwise, it manifested chiefly, if not altogether, in the recurring attempts to right the wrongs of the Loyalists themselves. As the Loyalist strength, however, was entirely confined to the House of Assembly, remedial legislation could not be secured. The adverse power of the proprietors found its chief defence in the Legislative Council; the proprietors well knew that their titles to disputed lands were only safe while they were in control of that body. As the governors, Patterson and Fanning, were themselves proprietors, they did not escape being charged with sharp practice towards the refugee claimants, although the latter was himself a North Carolina Loyalist. In this connection it may be noted that one of the early chief justices of the island was the son of a Loyalist from Connecticut, Munson Jarvis.[2]

We have some slight indications of the religious adherence of the new settlers. The great majority of them were undoubtedly Episcopalians. But when in 1792 a Methodist revival was held in the island, Nathaniel Wright and his family became converts. They were of the number of Loyalists who had scattered from Shelburne. They remained zealous followers of Methodism, and not only assisted in bringing another minister to the island in 1794, but were active in keeping alive Methodist teachings in the colony. It is probable that Nathaniel Wright who lived at Bedeque—the place of settlement chosen by many of the Loyalists—had associated with him a considerable number of his fellow refugees in the Methodist community which grew up there.

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[1] Stewart, *Account of Prince Edward Island*, pp. 192-4.
[2] Sabine, *The American Loyalists*, p. 384.

VI —*Harrison and Procter.*

The River Raisin.

By LT.-COL. E. A. CRUIKSHANK.

(Read September 28, 1910.)

The capture of Mackinac had decided General Hull to abandon the important but isolated post at Chicago, a measure that had long been contemplated. About the first of August he prepared an order to Captain Heald, the commandant, instructing him to destroy or distribute among the neighbouring Indians all public property that he was unable to remove, to dismantle the fort and join him at Detroit, and sent it to the commanding officer at Fort Wayne to be forwarded by a trusty messenger. At the same time Captain Wm. Wells, the Indian agent at the latter post, was directed to assemble a band of friendly Indians with whom he was to proceed to Chicago and escort the garrison in its retreat. The message to Heald was delivered on August 9th and gave him the first information of the fall of Mackinac. His intention of evacuating the fort was immediately made known to the Indians who rapidly assembled to the number of several hundreds to receive their presents. They encamped on the sand hills overlooking the lake a mile or two away and their general demeanor was orderly and peaceful. The merchandise in the government store and a quantity of provisions were given to them; but the spirits and all spare arms and ammunition were destroyed, greatly to their disappointment. On the 11th Captain Wells arrived at the head of one hundred mounted Indians. Two days later Heald began his march along the sandy beach in the direction of Detroit, with his Indian escort forming an advance and rear-guard. His main body was composed of fifty-four officers and men of the 4th United States Infantry, twelve armed civilians, nine women and eighteen children, several of whom also bore arms. A small train of waggons and pack horses conveyed their baggage and provisions. Two small brass cannon were thrown into the river; but no attempt was made to destroy the fort or neighbouring houses through fear of provoking the Indians. When they rushed forward to ransack the deserted buildings they found to their intense disgust that the powder magazine had been emptied into the well and that a large number of fire-arms had been broken up and barrels of whiskey emptied on the ground. As these were precisely the articles that they most coveted, their indignation knew no bounds. A numerous party started swiftly in pursuit and after running two or three miles at full speed gained a commanding

position on the crest of the sand hills about a hundred yards to the right of the route by which the column must pass. Their actions seemed so menacing to Heald that he rashly ordered his small body of infantry to move against them and expel them at the point of the bayonet. As the Indians showed no disposition to retire the soldiers fired a volley and charged. The Indians gave way in front but closed in upon their flanks and rear, delivering a deliberate and effective fire from the cover of thickets and hollows. In the course of fifteen minutes two-thirds of Heald's men were killed or wounded, his baggage train was captured, and the survivors forced to take refuge upon a mound in the adjacent prairie where they stood desperately at bay. They were not immediately pursued; but all the wounded men who were left behind and most of the women and children captured with the waggons were mercilessly slaughtered. Captain Wells was among the killed but his band of friendly Indians abstained from the contest and finally rode out of sight. Heald was badly wounded and the total destruction of his party could have been accomplished with ease. But instead of renewing the attack, the Indians assembled and held a consultation after which they signalled to him to come forward. Heald gallantly advanced alone and was met by Blackbird, a noted Ottawa chief, accompanied by a half-breed interpreter. After shaking hands Blackbird invited him to surrender promising that the prisoners should be well treated. As further resistance was evidently hopeless, Heald agreed to this proposal with little hesitation, although still doubtful of the Indians' sincerity. Thirty-eight men, of whom twenty-six were regular soldiers, two women and twelve children had already perished. Mrs. Heald and several other persons were suffering from wounds. After being disarmed the prisoners were marched back to the Indian camp where they were apportioned among the different bands. Next day Fort Dearborn was burnt and the Indians dispersed to their respective villages. Heald and his wife were taken to the Ottawa village near the mouth of the River St. Joseph where they were allowed to reside at the house of Benoit, a French Canadian trader. A few days later many of the warriors marched away to besiege Fort Wayne and Heald took advantage of their absence to induce a Canadian to take them in his boat to Mackinac where they were kindly treated by Captain Roberts who supplied their wants and furnished them with a passage in the next vessel sailing for Detroit.[1] The earliest information received by Procter, about the 8th of September, led him to believe that only three persons had escaped death and made him tremble for the fate of the garrison of Fort Wayne, which was described as being closely invested and reduced to the last extremity. Until that moment he had no intimation that an attack upon Chicago

[1] Heald to Eustis, Oct. 23, 1812; A. B. Woodward to Procter, Oct. 8, 1812.

was contemplated nor were the Indians in that quarter considered as coming within the influence of the officers of the British Indian Department.[1] Further inquiry proved that the collision was unpremeditated and that some thirty prisoners were scattered among the Indian villages on the borders of Lake Michigan. Chief Justice Woodward then requested that special messengers should be despatched to ransom the survivors and conduct them to Mackinac or Detroit.[2] Procter promptly replied that the most effectual means in his power would be employed at once "for the speedy release from slavery of these unfortunate individuals and for their restoration to their friends."[3] Elliott and McKee were accordingly directed to make known his wishes to the chiefs and readily secured their promise that the captives should be surrendered.[4] Lieutenant Helm and a few others were soon brought in, but the Indians became greatly angered at the destruction of some of their villages and decided to retain the remainder as hostages for the safety of their own people who had been carried away as prisoners. When Robert Dickson visited Chicago in the following March he ascertained that seventeen soldiers, four women and some children were still prisoners among the neighbouring Indians and took instant measures for their redemption.[5] Eventually most of them were liberated through his influence.

Every available vessel and boat was pressed into service for the transportation of the prisoners taken at Detroit; but with every effort, several weeks elapsed before the last of them were sent away. The regular troops were taken to Fort Erie on their way to Quebec and the Ohio volunteers and drafted militia were paroled and landed at Cleveland. The detachment of the 41st Regiment which had been drawn from the Niagara frontier was sent back without delay to meet the impending attack in that quarter and the militia volunteers from the counties of Lincoln, Norfolk and York returned to their homes, after doing duty as an escort to the prisoners on their way down the lake. Three hundred of the local militia were retained in service, part of whom were employed in the expedition to the River Raisin and Miami Rapids already described, while the remainder were engaged in disarming the Michigan militia, dismantling the batteries at Detroit and removing the guns and military stores to Amherstburg. The executive powers of civil governor of Michigan Territory were assumed by Colonel Procter, who appointed as Secretary for the time being, Augustus B. Woodward,

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[1] Procter to Brock, Sept. 10, 1812.
[2] Woodward to Procter, Oct. 8, 1812.
[3] Procter to Woodward, Oct. 10, 1812.
[4] Procter to Evans, Oct. 28, 1812.
[5] Dickson to Freer, March 16, 1813.

the former Chief Justice. All officers of the American Indian Department were superseded and collectors of customs were appointed. All other civil officers remaining at their posts within the conquered territory were continued in office by special proclamation. Persons having public property in their possession were required to deliver it up to the officers of quartermaster-general's department without delay.

On arriving at Fort Erie, Brock learned that an armistice had been concluded and at once wrote to Procter to suspend the projected expedition against Fort Wayne until further orders.[1] Eight hundred Indians took their departure from Amherstburg within a few days in high dissatisfaction in consequence. The Prophet returned to the Wabash and Tecumseh undertook a long journey to the south in the hope of regaining his health and enlisting the Cherokees and Creeks in the war. Early in September, Procter advanced with a small force to the Miami Rapids where he learned that the enemy's post at Sandusky had been abandoned, and that Chicago had been taken and Fort Wayne closely invested by the "back Indians." Colonel Elliott who had accompanied him on this expedition was disabled by illness from riding on horseback or he would have sent him forward to restrain them; but he was instructed to take all necessary measures for that purpose within his power. On the 10th of September, after his return from Detroit, he received a letter from Brock informing him of the resumption of hostilities and desiring him to send every man and gun he could spare to his assistance on the line of the Niagara. A party of Indians had come in about the same time bringing a prisoner who had been sent out from Fort Wayne to seek assistance from General Harrison.[2] By his account the garrison was reduced to such an extremity that Procter decided to despatch a small body of regulars and militia to assist in the siege and save the lives of the inmates. Some American prisoners to whom his determination was made known seemed much pleased and gave him full credit for his good intentions.[3]

Fortunately, as it happened, some unforeseen events delayed the departure of this expedition for several days. The regular troops at his disposal had been reduced to less than two hundred and fifty of all ranks and arms by the detachment of parties to serve as marines and escorts and he was consequently obliged to call out a hundred additional militiamen besides thirty horsemen to act as despatch riders and maintain his communication with the settlement on the Thames. One hundred and fifty Indians opportunely arrived from Mackinac, which with the Wyandots and other small bands that still remained at Amherst-

[1] Brock to Procter, Aug. 25, 1812.

[2] Letter in Boston Messenger, Dec. 4, 1812. Procter to Brock, Sept. 10, 1812.

[3] Brock to Prevost, Sept. 18, 1812.

burg made up a body of about six hundred warriors. The announcement that the war would be continued put them all in the best humour and they seemed eager for active employment. Twenty artillerymen under Lieut. Troughton with a light howitzer and two small field guns, one hundred and fifty of the 41st Regiment and an equal number of the Essex militia and the whole of the Indians were accordingly detailed to march against Fort Wayne. Brevet Major Muir of the 41st was selected for the command as an officer of tried courage and discretion. Colonel Elliott and Captain Caldwell were placed in charge of the Indians. Forty-seven French Canadians from the River Raisin were engaged to drive a large herd of cattle and a train of pack-horses escorted by the Indians, many of whom were mounted on their own horses, while the artillery and infantry ascended the Miami in boats of light draught as far as they could go. The distance to be travelled exceeded two hundred miles, much of which would undoubtedly be difficult navigation owing to prolonged dry weather. These preparations detained Muir until the 16th of September, when he set sail from Amherstburg. The troops were landed at the foot of the rapids, where the tedious labour began of conveying the artillery and stores across a ten mile portage and of towing the boats up stream. Here they were joined by their supply train and a considerable body of Indians. The water in the river was unusually low and after surmounting the rapids their progress was slow and fatiguing. The Indians persistently lagged behind and gave little assistance of any kind. On the afternoon of September 26th, Muir arrived at the old Delaware town twelve miles above the site of Fort Defiance at the junction of the Au Glaize with the Miami and forty miles below Fort Wayne. Three days had been occupied in moving his boats a distance of only eight miles. The guns were landed and remounted on their carriages with the intention of advancing the remainder of the way by the Indian trail. The main body of the Indians had remained behind at Fort Defiance; but for the first time a few of their scouts had that day been induced to precede the troops a few miles. About sunset this party discovered five white men forming their camp for the night, whom they quietly surrounded and approached, stating that they were hunters on their way home. Ensign Leggett, the officer in command, informed the Indians that his party were scouts for General Winchester's army of five thousand men which had relieved Fort Wayne exactly two weeks before and was then encamped only four miles in their rear, while another body, three thousand strong, was advancing down the Au Glaize with the intention of joining Winchester at Fort Defiance when the whole force would move forward to the rapids. The Indians then declared themselves as enemies and demanded his surrender. Seeing that he was outnumbered and that

resistance was useless Leggett finally consented to accompany them to the British camp on the condition that his men were not disarmed. After proceeding together in that direction until night fell, the Indians became suspicious that their prisoners intended to escape, when they were all ruthlessly shot down and scalped. This took place so near Muir's encampment that the sound of the firing was distinctly heard by the sentries and caused a general alarm.[1] Muir at once sent off a runner with a message to summon the Indians to his support and took up a position on the high ground commanding a ford in the river. At noon next day Elliott came up with six hundred warriors and scouts were sent out to explore the woods in every direction. At nightfall, Split Log, a Wyandot chief of reputation, reported that he had gone entirely around the enemy's camp which was situated about eight miles away and was strongly fortified. He estimated their force at about 2,500 men.[2] Winchester's advance from Fort Wayne had been conducted with great caution in three parallel columns, a few hundred yards apart, with his supply train in the centre and an advance guard of three hundred men preceded by a screen of scouts thrown out a mile or two in front. Moving at a rate of between five and ten miles a day he invariably halted about three o'clock in the afternoon and surrounded his entire camp with a formidable breastwork of logs and brush. When it became dark large fires were built fifty paces outside his lines and smaller ones at the door of each tent.[3]

On the morning of the 27th much dismay was caused by the discovery of the mutilated bodies of Leggett's party and Winchester at once drew in his flanking columns and retired to his camp which he began to strengthen in expectation of an attack.[4]

Muir was already in difficulties from lack of supplies, many cattle having run away from their drivers. He had in consequence only

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[1] Muir to Procter, Sept. 26, 1812; Richardson (Casselman's ed.), pp. 94–5.

[2] Muir to Procter, Sept. 26, 1812; Richardson, p. 95.

Brigade Major Garrard reported the strength of Winchester's brigade, Oct. 31, 1812, as follows:—

Regiments of Allen, Lewis and Scott fit for duty		1,678
'Sick' present		216
" absent . .231.		
		1,894
Winchester had also under his command Simrall's dragoons	300	
Garrard's troop of mounted riflemen.....	70	380
		2,274

[3] Letter in Federal Republican of Georgetown, D.C., Nov. 27, 1812, dated Paris, Ky., Oct. 24.

[4] Tupper to Harrison, Oct. 12, 1812.

sufficient provisions for two days' consumption although his whole force had been put upon short allowance several days before. A party had been sent back to the rapids to procure cattle but had not yet returned. Next morning one hundred and fifty more Indians came up, increasing his force to more than a thousand men but at the same time adding to his embarrassment in providing food. Concluding that the approach of so large a force indicated an immediate intention to advance upon Detroit or Amherstburg, Muir sent off a despatch to warn Procter and boldly determined to attack Winchester on his line of march if he gave him an opportunity. Captain Caldwell and Lieut. Askin went forward to reconnoitre with sixty militia and Indians. They returned after a brisk skirmish in which they lost two men and reported that the enemy's advanced party was already within two miles. The guns were placed in a position to command the approaches to the ford and by which the Americans must cross the river, with the regulars and militia in support; but the Indians positively refused to fight at that place and Muir was obliged to retire to his boats. The guns and stores were embarked and sent away in charge of Lieut. Troughton. Muir then went to the Indian camp where a council of the chiefs was assembled to decide upon their future course. He was soon informed that they had determined to fight in the morning at some advantageous spot. An hour before daylight to his great surprise he received a message from Colonel Elliott stating that their soothsayers had been busy conjuring all night and in consequence the Mackinac and Saginaw Indians were preparing to return home at once. Assuming that he had then no alternative to an immediate retreat, Muir gave orders for his baggage and cattle to be sent off. Shortly afterwards he received a second message from Elliott informing him that the Indians had changed their minds and were determined to fight. On marching his troops to their encampment he found that they were not yet ready to move, but that small parties were going off in every direction. The chief of the Mackinac Indians came to take leave of him saying that as the Indians could not agree among themselves he would take his young men home; but he was willing that those who had horses should remain if they chose, as they could easily escape in case of a defeat. He then went away followed by most of his band. Muir observed to some of the interpreters that the number of Indians that remained seemed very small. Overhearing this a young Huron exclaimed that there would not be half as many by the time they reached the ground they had selected to fight on, which lay in the fork of the river about three miles above Fort Defiance where both their flanks would be protected by branches of the Miami. The movement was begun and Muir rode forward with Elliott to examine this position. On their return a prisoner was brought in who gave his name as

Sergeant McCoy of Scott's regiment of Kentucky volunteers. He had been wandering in the woods for four days without food. On being questioned he described Winchester's force very accurately giving the name and approximate strength of each regiment and estimating the whole to amount to three thousand, of whom four hundred were dragoons or mounted riflemen, accompanied by a six pounder and a train of seventy waggons. They were short of provisions but expected to be joined at Fort Defiance by an equal force advancing down the Au Glaize with provisions for both and four field guns.

By that time Muir had ascertained that not more than 330 Indians had remained and told Elliott that it would be madness to risk an engagement with so small a force, pointing out the danger they ran of being completely surrounded and destroyed by overwhelming numbers. Elliott replied that two of the Indian conjurers had dreamed that they would be successful that day and the warriors were fully determined to fight. Muir bade him tell them that he could not see the smallest prospect of success and must refuse to throw away the lives of his men to no purpose. Roundhead then came to him with an interpreter and urged that they might be allowed at least to justify the prediction of the conjurers by driving back the enemy's advance guard, and then retire through the woods. Muir retorted that the Indians might be able to do this but the regular troops could not exist without supplies. During the day he overtook Troughton who had been obliged to lighten his boats by the sacrifice of some stores. Indian scouts who were sent up the Au Glaize reported that they had heard cannon shots and the sound of bugles in the woods a few miles up that river, which seemed to confirm the report that an army was advancing from that direction.[1] Muir continued his retreat without molestation arriving at the head of the rapids on September 30th, and at Amherstburg on October 2nd. He reported that his men had behaved remarkably well and praised his officers for "their zeal and cheerful compliance with all orders on every occasion." As it afterwards appeared his movement was not wholly fruitless, as it materially delayed Harrison's advance upon Detroit; but the result of the expedition confirmed Procter in the conviction that he must have "an independent regular force to insure the assistance of the Indians." He strongly urged that he should be reinforced by a portion of the 41st regiment without delay. "The Indians will certainly not desert us now," he wrote; "but a respectable force is requisite to give them confidence and render them effective. The Indians hesitated some time whether they should again confide in us. They have their fears that this territory may be again ceded to the

[1] Muir to Procter, Sept. 30, 1812.

Americans and in the event of which I am confident they will look upon us as their betrayers and worst enemies."[1]

He had already received a letter from Brock approving of his movement against Fort Wayne. "But it must be explicitly understood," he added, "that you are not to resort to offensive warfare for purposes of conquest. Your operations are to be confined to measures of defence and security. With this view, if you should have credible information of the assembling of bodies of troops to march against you, it may become necessary to destroy the fort at Sandusky and the road that runs through it from Cleveland to the foot of the rapids. The road from the River Raisin to Detroit is perhaps in too bad a state to offer any aid to the approach of an enemy except in the winter, and if a winter campaign should be contemplated against you it is probable that magazines would be formed in Cleveland and its vicinity, of all of which you will of course inform yourself. In carrying on your operations in your quarter it is of primary importance that the confidence and good will of the Indians should be preserved and that whatsoever can tend to produce a contrary effect should be carefully avoided. I therefore most strongly urge and enjoin you acting on those principles on every occasion that may offer, inculcating them in all those under your influence and enforcing them by your example, whether in your conduct towards the Indians or what may regard them or in your language in speaking to or of them."[2] He was advised never to call out the militia except in cases of urgent need and only in such numbers as might be indispensably required. A reinforcement of regular troops was promised when circumstances would permit.

During Muir's absence the *Queen Charlotte* was directed to make a demonstration in his favour by cruising off the south shore of Lake Erie between Cleveland and Sandusky and Procter began to remove the cattle and other supplies from the eastern settlements in the Michigan territory without much ceremony. He announced his intention of leaving no provisions in that quarter for the enemy's subsistence and that he should be made to pay dearly for every inch of tenable ground.[3] He foresaw that a forward movement would not be long delayed since several undesirable persons who had been permitted to leave Detroit might be relied upon to expose the weakness of his force. The Governor General had indeed recommended the total evacuation of Detroit and the entire territory of Michigan to enable Brock to withdraw a greater number of regular troops to the Niagara frontier, but that capable

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[1] Procter to Brock, Sept. 30, 1812.
[2] Brock to Procter, Sept. 17th.
[3] Procter to Brock, Sept. 30, and Oct. 3, 1812.

commander exercised his discretion to postpone this from motives of both policy and humanity.[1]

"Such a measure would most probably be followed by the total extinction of the population on that side of the river," he wrote, "or the Indians, aware of our weakness, would only think of entering into terms with the enemy. The Indians since the Miami affair in 1793 have been extremely suspicious of our conduct; but the violent wrongs committed by the Americans on their territory have rendered it an act of policy with them to disguise their sentiments. Could they be persuaded that a peace between the belligerents would take place without admitting their claim to an extensive tract of country fraudulently usurped from them and opposing a frontier to the present unbounded views of the Americans, I am satisfied in my own mind that they would immediately compromise with the enemy. I cannot conceive a connexion so likely to lead to more awful consequences.

"If we can maintain ourselves at Niagara and keep the communication to Montreal open, the Americans can only subdue the Indians by craft, which we ought to be prepared to see exerted to the utmost. The enmity of the Indians is now at its height and it will require much management and large bribes to effect a change in their policy; but the moment they are convinced we either want the means to prosecute the war with spirit or are negotiating a separate peace, they will begin to study in what manner they can effectually deceive us."[2]

When the declaration of war became known in Kentucky it received the hearty approval of the great majority of the people and most of the towns and villages were illuminated on the following night as a sign of general rejoicing. As soon as Congress adjourned, Henry Clay, the Speaker of the House of Representatives and recognized leader of the war-party, hurried home and exerted himself with characteristic energy to promote the organization of a volunteer force to support General Hull in the anticipated conquest of Upper Canada. He daily attended musters of militia and frequently stirred public meetings with a torrent of fiery and confident rhetoric. Shortly after his arrival at Lexington he wrote to the Secretary of State that he was actually alarmed by the enthusiasm displayed by the people of his State. Four hundred men had been enlisted for the regular army and the quota of militia detached for six months' service had been more than completed with volunteers.

"Such is the character of our society, however," he added, "that I doubt whether many can be engaged for a longer period than six months. For that term any force whatever which our population may

[1] Prevost to Brock, Sept. 14, 1812.
[2] Brock to Prevost, Sept. 28, 1812.

afford, can be obtained. Engaged in agricultural pursuits, you are well aware that from about this time when the crop is either secured in the barn or laid by in the field until the commencement of spring, there is leisure for any kind of enterpirse."[1]

Two weeks later persistent rumours respecting the precarious situation of Detroit excited grave misgivings.

"Should Hull's army be cut off," he wrote confidentially, "the effect on the public mind would be, especially in this quarter, in the highest degree injurious. Why did he proceed with so inconsiderable a force, was the general inquiry made of me. I maintained it was sufficient. Should he meet with a disaster, the prediction of those who pronounced his army incompetent to the object will be fulfilled, and the Secretary of War, in whom already there unfortunately exists no sort of confidence, cannot shield Mr. Madison from the odium which will attend such an event."[2]

In public he kept up a brave show of confidence and on the very day of Hull's capitulation he addressed three regiments assembled at Georgetown, serenely predicting the speedy capture of Amherstburg and conquest of Upper Canada.[3]

Some time before this, Harrison, the capable and energetic Governor of the Indian Territory, had been invited by Governor Scott to attend a conference on military affairs at Frankfort and his arrival evoked a great demonstration of warlike enthusiasm. Many leading politicians had assembled there to be present at the inauguration of Isaac Shelby, a veteran soldier of the Revolution, as Scott's successor in office. Brigadier General James Winchester of Tennesseee had been designated by the Secretary of War to command the forces then being organized but he had not yet arrived and was by no means popular in Kentucky. Steps were immediately taken to secure his supersession by the "hero of Tippecanoe." At the suggestion of a small caucus of influential politicians, Harrison was accordingly appointed Major-General of the Kentucky militia, thus outranking Winchester. On the day of his appointment, Clay wrote in the highest spirits to solicit the same rank for him in the army of the United States.

"If you will carry your recollections back to the age of the Crusaders and of some of the most distinguished leaders of those expeditions, you will have a picture of the enthusiasm existing in this country for the expedition to Canada and for Harrison as Commander."[4]

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[1] Clay to Monroe, July 29, 1812.
[2] Clay to Monroe, Aug. 12, 1812.
[3] Williams, Two Campaigns in 1812.
[4] Clay to Monroe, Aug. 25, 1812.

The leader thus chosen was only forty years of age, active, robust and masterful. He had been governor of Indiana for a dozen years and knew the frontier and its people thoroughly. He was a most persuasive and voluble speaker and an adept in the arts of gaining and retaining personal popularity. Throughout his first campaign he wore an ordinary hunting shirt and conversed freely with all ranks. His short but fervid speeches from the top of a stump or tail of a waggon went straight to the hearts of his men and never failed to rouse them to renewed efforts. The Cabinet at this time seriously contemplated the appointment to this command of James Monroe, the Secretary of State, who was eager to display his military talents; but when their hand was thus forced by the unexpected action of Clay and his friends they could not well refuse their assent.[1]

One regiment had already begun its march for Vincennes, and Harrison wrote a lengthy letter to the Secretary advocating the formation of a chain of blockhouses along the Illinois River from its mouth to Chicago as a barrier against Indian raids and the concentration of five thousand men at Fort Wayne. But while on the road to Cincinnati on August 26th he learned with dismay that both Detroit and Chicago had fallen and that Fort Wayne was closely invested. The military situation was wholly changed. Next day he crossed the Ohio with the 17th United States Infantry, the 1st and 5th Kentucky Volunteers, the 1st Kentucky riflemen, and a troop of dragoons, making a force of 2,100 men. Three other regiments of infantry volunteers, five troops of dragoons and five hundred mounted infantry were a few days' march in rear.[2] He described these troops as "the best material for forming an army that the world has produced," but qualified this by the statement "that no equal number of men was ever collected who knew so little of military discipline." Nearly the whole of his men were armed with rifles; but he had no sabres for his cavalry and possessed but a single field-gun. He then requested Shelby to call into service an additional body of mounted riflemen for the protection of Indiana and appealed to Meigs to support him with the entire military strength of Ohio.

He assumed control of all military affairs and put his own column in motion for Fort Wayne. At the ford of St. Mary's River he was overtaken by Johnson's regiment of mounted riflemen from Kentucky and a day later by seven hundred horsemen from Ohio, increasing his force to three thousand, of whom thirteen hundred were mounted. In fact every road intersecting his line of march was thronged with

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[1] Colton, Letters of Henry Clay.

[2] Harrison to Eustis, Aug. 28 and 29, 1812.

unsolicited volunteers eager to join him. His movement was conducted with characteristic circumspection and vigilance and difficulties of transport delayed him; but Fort Wayne was relieved without firing a shot on September 12th. Strong columns of mounted men were then sent out in every direction to destroy all Indian villages within sixty miles. Harrison himself accompanied one of these which marched to the forks of the Wabash.[1] These villages were all deserted at their approach and few prisoners were taken. The cabins were burnt and the standing corn was cut and piled in heaps to rot. Graves were ransacked and the bones they held scattered wantonly abroad. Little was accomplished by these raids except the infliction of untold misery upon a number of wretched women and children and the consequent exasperation of the warriors who were forced to seek refuge at Amherstburg or Brownstown.

During their absence Simrall's regiment of Kentucky dragoons and a troop of mounted riflemen arrived in charge of a supply train, adding five hundred men and rendering possible a further advance. But on September 18, General Winchester came up and assumed command much to the disgust of many of the Kentuckians with whom Harrison had become a general favourite, while his successor seemed distant and supercilious. Winchester prepared to move forward to the Miami rapids and Harrison returned to Piqua with the intention of attempting a simultaneous advance with all the mounted troops he could assemble by way of St. Joseph's River to the River Raisin.[2] The infantry regiments of Jennings, Barbee, and Poague, in all about fifteen hundred strong, were directed to move down the Au Glaize in charge of a supply train, clearing the road and building blockhouses to protect the line of communication as they advanced. Winchester wrote confidently to Meigs that he still hoped to winter at Detroit or its immediate vicinity and asked him to push forward two regiments of Ohio Volunteers to join him at the Miami Rapids between the 10th and 15th of October, and a third to keep the road open from Piqua to Fort Defiance. On September 22, he marched from Fort Wayne with about 2,500 men, but seldom advanced more than five miles in a day. Scouting was performed by a small band of Indians led by a half-breed Shawanese chief known as Captain Logan, said to be a nephew of Tecumseh and a company of white spies under Ruddle, a veteran frontiersman.[3] Apprehending an attack from Muir, Winchester crossed over to the right bank of the Miami at a little known ford and fortified his camp. Messages requesting reinforcements and supplies were sent off to Harrison and Meigs.

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[1] Harrison to Meigs, Aug. 28, 1812.
[2] Harrison to Eustis, Sept. 11 and 18, 1812.
[3] Harrison to Meigs, Sept. 22, 1812.

On September 30, he learned that Muir had retreated and moved forward to the site of Fort Defiance where he again formed an entrenched camp and awaited supplies. Nine days had been occupied in covering a distance of less than fifty miles.

On reaching Piqua, on Sept. 24th, Harrison received a letter from the Secretary of War, dated only seven days before, placing him in supreme command of the Northwestern army which, in addition to all the regular troops in the military district, would include the whole of the volunteers and detached militia from Kentucky and three thousand ordered to join him from Pennsylvania and Virginia, making a total force of more than ten thousand men. A train of artillery was being equipped at Pittsburg. With respect to the vital question of supply he was practically given unlimited authority. "Command such means as may be practicable," the Secretary wrote; "exercise your own discretion and act in all cases according to your own judgment." After having secured the frontier against Indian incursions, he was instructed to retake Detroit and advance as far into Upper Canada as he might deem prudent with a view to the permanent conquest of that Province.[1] The Secretary's next letter confirmed and even extended his authority.

"As the difficulty of obtaining supplies, particularly of provisions, through the wilderness, appears to be one of the greatest obstacles you will have to contend with, which difficulty it is well known increases as the season advances, your own judgment will enable you to determine how far it may be practicable to advance and what posts or stations it may be expedient to maintain during the winter. You are already apprised of the solicitude of the government that everything that can be done, shall be done towards recovering the ground lost and extending successful operations into Canada."[2]

The contractor, commissary, and all officers of the quartermaster general's department were made directly subject to his orders to enable him to act with greater freedom and vigour. In three days he had framed a plan of operations by which he hoped to concentrate the greater part of his troops at the Miami Rapids, seventy-two miles from Detroit within a month. Considerations of supply and transport as well as his instructions to protect the frontier settlements, induced him to move in three columns. The right division consisting of 250 cavalry, twenty-eight guns and two brigades of infantry detached from the militia of Pennsylvania and Virginia was to assemble at Wooster, Ohio, and thence advance by way of Upper Sandusky where it would be joined by a

[1] Atherton's Narrative, pp. 7–9.
[2] Eustis to Harrison, Sept. 17, 1812.

brigade of Ohio militia increasing its strength to five thousand men. Twelve hundred Ohio militia assembled at Urbana were directed to move by Hull's road, while the remainder of the Kentucky troops would join Winchester at Fort Defiance by the Au Glaize route along which they were already distributed. Upper Sandusky, Fort McArthur on Hull's road, and St. Mary on the Au Glaize, were selected as advanced bases. The purchase of two millions of rations was ordered at once for delivery at these posts, much of which was contracted for within a week as both cattle and grain were abundant in the frontier settlements of Ohio.[1] He was, however, much concerned over the pressing need of woollen clothing, watch coats and shoes, which could not be so readily procured.

Meigs, a man of exceptional zeal and energy, made every possible exertion to assist him. So successful were his efforts in assembling and equipping the militia of his State that it was estimated that twelve thousand were already under arms.[2] The Indians of Ohio were collected in concentration camps at Sandusky, Zanesville and Waupakoneta, where blockhouses were built for their protection and they were vigilantly guarded.

Shelby in Kentucky was equally diligent in forwarding supplies and reinforcements. Nor had popular zeal in that State at all abated.

"The capitulation of Detroit has produced no despair," Clay wrote, on September 21. "It has on the contrary wakened new enthusiasm and aroused the whole people of this State. Kentucky has at this moment from eight to ten thousand men in the field; it is not practicable to ascertain the precise number. Except our quota of the 100,000 militia, the residue is chiefly of a miscellaneous character who have turned out without pay or supplies of any kind coming with their own arms and subsistence. Parties are daily passing to the theatre of action; last night seventy lay on my farm, and they go on from a solitary individual to companies of ten, fifty and one hundred."

All ranks and classes seemed animated by the same warlike spirit. John Allen, the most eminent lawyer in the State next to Clay, Madison, the State Auditor, and not less than seven Congressmen elect, were already serving under Harrison, two or three of the latter as private soldiers. The course of events, however, would soon demonstrate that these armed mobs were liable to disperse as rapidly as they assembled.

By October 1, Harrison had succeeded in assembling three thousand men in the vicinity of St. Mary. Half of these were mounted and were formed into a brigade under command of Brigadier General Edward

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[1] Eustis to Harrison, Sept. 23, 1812.

[2] Harrison to Eustis, Sept. 27, 1812.

Tupper of Ohio. That day he received an urgent demand from Winchester for reinforcements stating that he had come in contact with the advance of a large British and Indian force, and a letter from Erie reporting that three thousand men had left Amherstburg two weeks before with the design of attacking Fort Wayne. He also learned that Colonel Jennings had halted on his march half way down the Au Glaize and fortified his position. Greatly alarmed for Winchester's safety he determined to proceed to his support with the whole of Tupper's brigade. Riding rapidly forward with a strong escort he reached Winchester's camp near Fort Defiance on the evening of the 2nd. Continued scarcity of provisions had already caused great discontent. During the night Harrison was aroused from sleep by Colonel Allen and other officers who informed him that their men had resolved to return home and that their remonstrances had been answered with insults.[1]

Next morning Tupper's brigade arrived and Harrison promptly addressed the mutineers assuring them that ample supplies would arrive during the day and that they were the advance guard of an army of ten thousand men. His appointment as Commander-in-Chief was welcomed by them with evident satisfaction and loyally accepted by Winchester himself. A reconnaissance down the river for several miles satisfied him that no immediate attack need be feared. A site for an intrenchment, which became known as Fort Winchester, was selected on the left bank of the Au Glaize near its confluence with the Miami, and Winchester was instructed to push forward a force to the deserted settlement at the foot of the rapids, to harvest several hundred acres of corn, which was considered "an object of no little importance to the future movements of the army." He was put in command of the entire left wing including the three regiments of the Kentucky volunteers and a battalion of Ohio militia employed on the road from St. Mary. Harrison then announced his intention of proceeding at once to Wooster to hasten the advance of the right division.[2] The term of enlistment of Johnson's regiment of mounted riflemen having nearly expired, it was allowed to return with him. The remainder of Tupper's brigade, numbering 960 of all ranks, was detailed for the expedition to the rapids taking with them eight days' provisions which nearly exhausted the entire stock of flour in store.[3] But a small party of hostile Indians was still lurking in the woods who killed an unwary ranger on the opposite bank of the Miami before the march began. Many of the horses were grazing when this became known, but as soon

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[1] Duncan McArthur to ———— Sept. 1812.

[2] Atherton, 9–10; Darnell, Journal.

[3] Harrison to Winchester, Oct. 4, 1812.

as they could be caught, there was an immediate stampede in pursuit. Small bands of excited horsemen dashed through the ford in spite of their officers' efforts to detain them, and scoured the woods in every direction. When they returned their horses were too exhausted to proceed on the march that day.[1] Logan's Indian scouts after examining the trail reported that the enemy seemed to be in considerable force and they were sent forward next morning to reconnoitre the river below as far as the little rapids, a distance of fourteen miles. They came upon Muir's track and perceived that he had retired in great haste, forcing his carriages over logs and tearing up small trees by the roots. In their absence, camp rumour had persistently magnified the strength of the enemy and there were symptoms of a panic. Simrall's dragoons had received instructions to return to the frontier settlements to recruit their horses, many of Tupper's men announced their intention of going with them. On October 8th he advanced with the remainder to the Delaware village, twelve miles above the rapids, where he found an abundant supply of sweet corn; but on preparing to continue his march next morning, found that he had only two hundred men. As this number seemed too large for a reconnaissance and too small for an offensive movement he decided to return at once to Urbana by Hull's road, greatly mortified by the conduct of his troops.[2]

The departure of the dragoons reduced Winchester's force to less than 1,800 effectives. They had not drawn full rations for a month. They were sometimes without flour, and generally without salt. Some were barefooted, others without blankets; many had torn their clothing to rags in forcing their way through the woods. None of them was supplied with under garments of any kind. More than two hundred were disabled by sickness. Any further advance before the arrival of supplies seemed decidedly unwise. Winchester therefore contented himself for the present with the construction of a palisaded fortification enclosing about a quarter of an acre of ground with log blockhouses at the angles. Several hours daily were spent in drill. Reconnoitring parties were constantly sent out; but his white scouts seldom ventured to go very far into the woods and little reliance was placed on the reports made by the Indians. A party of men who had strolled off to gather wild plums was surprised and five of them killed. On another occasion a detachment of Garrard's mounted infantry was attacked, losing one man killed and another wounded.[3]

A report of Winchester's advance had reached Amherstburg on October 4th. An officer of the commissariat was then at the River

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[1] Atherton, p. 12.
[2] Tupper to Harrison, Oct. 12, 1812; Atherton, p. 12.
[3] Tupper to Harrison, Oct. 12, 1812.

Raisin engaged in collecting supplies. Procter directed Lieutenant Edward Dewar, of the Quartermaster General's Department, to protect him with a party of militia who went forward in boats. Dewar with Roundhead and fourteen Wyandots rode from Brownstown on the 8th, and learned that a false report of the enemy's movements had been purposely raised by some of the settlers to create an alarm and give them an opportunity of stealing some of the cattle purchased by the commissary. Next day a Pottowatomie chief arrived with his band from the rapids who stated that he had seen a party of Shawanese scouts in the enemy's service at that place the day before and began a conversation with them across the river, but had been driven away by the appearance of American soldiers coming out of the woods. Some of the settlers at the River Raisin, who were armed and mounted, volunteered to accompany Dewar and the Wyandots on a reconnaissance. Arriving at the rapids at dark on the 10th they carefully examined the fords and roads before entering the settlement. Five townships had been surveyed at this place and sixty-seven families resided here before the war. But one house remained which was occupied by a French Canadian family named Beaugrand, all the rest having been burnt by the Indians. Many cattle were running wild in the woods, and there were several large fields of standing corn fully ripe. Sending two trusty scouts along Hull's road, Dewar with Roundhead and two others rode twenty-five miles up the left bank of the river. During the night he encountered a scouting party from a camp of Creeks from Florida who agreed to accompany him to Amherstburg. In the morning he was joined by a war party of Kickapoos carrying the scalp of a horseman whom they had shot within the line of sentries at the American camp. They reported that it was occupied by about eight hundred men who were building blockhouses and were in want of provisions. On his return to the rapids, Dewar found that his men had succeeded in securing only twenty cattle out of ten times that number as they were very wild from having been shot at by the Indians; but it was estimated that eight thousand bushels of corn might be gathered. The settlements at the River Raisin had suffered greatly from the depredations of the Pottowatomies and Delawares whose villages had been destroyed. They had stolen most of the horses, wantonly killed many cattle and hogs and ravaged the fields. Still he reported that three thousand bushels of grain might be obtained. If suitable encouragement was given he believed that many of the people residing there might be induced to remove to Canada and take part in its defence. He recommended that Colonel Elliott with the whole of the Indians then at Amherstburg, numbering some eight hundred warriors, should be

sent to the rapids to subsist themselves as the stock of provisions was very low.[1]

The arrival of an express with news of the victory at Queenston raised the spirits of the Indians and they readily consented to occupy this advanced position and send out parties to annoy the enemy. All of them except the Wyandots had lost their entire crop of corn by American raiding parties and were quite dependent on the commissarat. The corn and cattle at the rapids would be sufficient to maintain them for several weeks during which some portion of these necessary supplies might be secured and brought away. The Indians would have employment, the Americans would be prevented from advancing, the consumption of provisions would be lessened and time gained for the removal of the surplus produce of the Michigan Territory. Little inducement for the enemy to continue his movement would then remain. Ten days elapsed before this plan could be carried into effect. By that time only two days' provisions were left in store. A scouting party returned from the River Huron below Sandusky with a prisoner who stated that the blockhouses there were occupied by five hundred men while as many more were employed in cutting a road forward. This information clearly pointed to a converging movement upon the Miami Rapids. The opportune arrival of a speech from the Six Nations accompanied by a scalp taken at Queenston greatly animated the Indians and on October 30th, Elliott left Amherstburg with 250 Pottowatomies and Delawares embarked in two gun-boats, a small schooner and a number of batteaux, while Roundhead and the Wyandots agreed to ride on from Brownstown and join them at the rapids.[2] Procter complained that the Indian Department, upon which so much depended, lacked an efficient head. Although still capable at times of great exertions, Elliott was more than seventy years of age and in poor health. McKee, next in rank, was brave and influential but had ruined his constitution by habitual intemperance. His regular force was too weak to command respect and repress order among the Indians. Including two companies of the Royal Newfoundland Regiment detailed for marine duty it had never exceeded four hundred effectives.[3] Captain Muir was disabled by illness and there were but six company officers serving with the detachment of the 41st. Firmly convinced that the fate of Upper Canada depended upon the maintenance of his position, Procter earnestly asked for a strong reinforcement. A single regiment, he said, would make him perfectly secure and inspire the Indians with confidence.

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[1] Atherton, p. 10.

[2] Dewar to Colonel Macdonnell, Oct. 19, 1812.

[3] Elliott to Claus, October 28, 1812; Procter to Sheaffe, Oct. 30, 1812.

The armed schooner *Lady Prevost* was instructed to cruise off Sandusky and the River Huron to create an alarm.[1]

Early in November, General Tupper advanced from Urbana to Fort McArthur, where a considerable quantity of supplies had been accumulated, with a strong brigade of Ohio Volunteers and sent Hinkton's company of scouts ahead to reconnoitre by Hull's road. Arriving at the rapids on the afternoon of the 7th, Hinkton found the Indians in possession busily engaged in killing hogs and gathering corn. A white man who was seen in a corn-field stalking a flock of wild turkeys, was stealthily surrounded and taken prisoner before he could give the alarm.[2] He proved to be Interpreter Clark of the British Indian Department. When he was brought to Fort McArthur, Clark was significantly warned that his future treatment would depend on the truth of his statements, and he talked freely. He said that the number of Indians at the rapids, exclusive of women and children, did not exceed 250 and described the weak state of the garrisons of Amherstburg and Detroit. This information decided Tupper to make a dash forward with the object of dispersing the Indians and securing the cattle and corn. The distance was seventy-seven miles which he expected to cover in three days.[3] Every man who was not afraid of fatigue was ordered to draw five days' rations and he began his march on the 10th at the head of 650 well mounted riflemen, taking with him a light field gun. An express was sent to warn Winchester of the proposed movement and invite his co-operation. Finding that the gun impeded his progress it was left behind at a blockhouse fifteen miles in advance of Fort McArthur. The road was very bad and it was the evening of the 15th before Tupper arrived at the ford of the Miami two miles above the settlement. His scouts reported that the Indians were encamped near Beaugrand's house on the opposite side of the river and their boats were moored some distance below. They were drinking and dancing and seemed unaware of his approach. He determined to cross at once, surround their camp in the dark and attack at daybreak. But the river was swollen by recent rains and the current was swift. Very few men succeeded in gaining the opposite bank, several of whom lost their rifles and others had their ammunition spoiled. They were ordered back and the attempt to cross was abandoned. When daylight returned Tupper marched his force into the clearing opposite their camp. The Indians assembled in considerable numbers and began a fire of musketry across the river while several shots were also discharged

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[1] Return of November, 25 1812. Royal Artillery, 30; 41st Regiment, 256 Royal Newfoundland, 117.

[2] Procter to Sheaffe, Oct. 30 and Nov. 9, 1812.

[3] Howe, Historical Collections of Ohio.

from a field-gun. The boats got under way down stream. Observing a body of horsemen riding in the direction of the ford with the apparent intention of threatening his line of retreat, Tupper lost no time in moving off. Some mounted Indians under the personal direction of Colonel Elliott, who was recognized by several Americans, and Split Log, the Wyandot chief, conspicuous on a white horse, crossed the river and harassed his rear guard for several miles. Four stragglers were killed and a number wounded. Hearing nothing from Winchester and finding that his provisions were nearly exhausted, Tupper was compelled to retire at full speed to Fort McArthur where his troops arrived on November 20th, half starved and completely exhausted and disheartened.[1]

During the entire month of October, Winchester had remained quietly in his camp on the Au Glaize, drilling his men and waiting for the arrival of a sufficient quantity of supplies to enable him to advance. From time to time his scouts went out but returned with little information. On October 29th, however, they brought in a prisoner, one William Walker, who had lived among the Indians for thirty years and was married to a Wyandot woman. He represented himself as a deserter from the British service but was suspected of being a spy and little confidence was placed in his statements.[2] The lack of proper food and clothing had caused much suffering and discontent. The number of sick had greatly increased and there were several deaths daily.

On November 2nd, Winchester crossed the Miami and advanced a few miles. He fortified his camp in the usual manner and remained stationary for a week. His scouts then reported the presence of a considerable body of Indians at the rapids. Scarcity of provisions still prevented him from bringing forward the regiments in rear which would have doubled his force, but could be more readily supplied on the line of communication.[3] On November 10th he advanced six miles to a position where there was plenty of timber at hand suitable for the construction of boats or sleds and again entrenched. Next day this movement was reported to Elliott, who became decidedly uneasy as the Wyandots had not yet joined him, and he urged Procter to support him with all the regular troops he could spare and some pieces of artillery.

Tupper's message stating his intention of advancing upon the rapids was not received by Winchester until the 15th, when he at once directed Colonel Lewis to march to his support with 410 picked men. Lewis had advanced eighteen miles when he was overtaken by an express

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[1] Tupper to Meigs, Nov. 9th, 1812.

[2] Tupper to Harrison, Nov. 19, 1812; McAfee, p. 171; Armstrong, I, 63–5.

[3] Atherton, p. 98; Darnell, Journal.

[4] Atherton, 18; Darnell.

with information that Tupper had arrived at the ford but had failed to cross the river. He then sent an officer with an escort through the woods to propose to Tupper a junction of their forces at Roche de Bout, six miles above the rapids. This party returned next morning with the information that they had found Tupper's camp deserted and the bodies of two of his men scalped and stripped of their clothing. Lewis retreated without delay and on his return Winchester began to strengthen his breastworks and to build huts to shelter his men. Scouts were sent out daily who reported that the Indians continued to occupy their position until the end of November, only withdrawing when the supplies at that place were consumed or removed. The sole incident worthy of notice occurred on the 22nd, when Logan and two other Shawanese scouts encountered Interpreter Elliott with a small party of British Indians. Finding themselves outnumbered, Logan and his companions professed to have deserted the American service and asked permission to accompany Elliott to his camp. That officer, who was a son of Colonel Elliott, lately practising law at Amherstburg, seems to have been completely deceived and unwisely allowed them to retain their arms. After proceeding quietly for some distance they suddenly sprang behind trees and opened fire upon Elliott's party, wounding him and two Indians. Their fire was returned and Logan received a mortal wound but escaped to die in the American camp. Elliott's injuries also proved fatal within a day or two.[1] In the latter part of November, the roads were rendered impassable by frequent showers of rain, which, however, were not sufficient to make the Au Glaize navigable for loaded boats. The cattle driven forward for beef became so poor for lack of food that they could scarcely stand up to be slaughtered. Typhus fever continued to rage in Winchester's camp, causing many deaths. When the weather turned cold the health of his men improved and they were allowed to hunt; but scarcely a squirrel or other animal could be found in the woods, although game was usually plentiful.

On his return to St. Mary from Fort Winchester, Harrison found himself obliged to detach a battalion of Ohio militia and a regiment of Kentucky mounted riflemen to the relief of Fort Wayne, which was again threatened by the neighbouring Indians influenced by the Shawnee Prophet, who had re-established his camp upon the Tippecanoe River. He learned at the same time that not only Fort Harrison on the Wabash but distant Fort Madison on the Mississippi near St. Louis had been invested. In compliance with his requisition for troops to protect the frontier of Indiana and Illinois, Shelby had issued a proclamation inviting an unlimited number of mounted volunteers to assemble at

[1] Elliott to Ironside, Nov. 10, 1812; Elliott to St. George, Nov. 11, 1812.

Louisville on September 18th, bringing their own horses, arms, and provisions for thirty days. Four thousand horsemen responded to the call and were organized into a division of three brigades under General Hopkins. Fort Harrison was relieved by him on October 10th, and a few days later he began his march across the open prairie with the intention of destroying the Indian villages on the Wabash and Illinois. His guides lost their way and the troops speedily became dispirited and unruly. The tall dry grass caught fire through their own negligence and threatened them with a sudden and dreadful death. The air was filled with thick clouds of smoke that hid the sun. Forage and water for their horses could scarcely be found. Finally the men positively refused to advance further. Their officers confessed that they had lost all control over them and the whole force returned to Fort Harrison where Hopkins organized a smaller column which moved up the Wabash and destroyed the Prophet's town and two other deserted villages, but lost thirteen men in an ambush.[1]

About the same time Colonel Russell and Governor Edwards with a mixed force of rangers and volunteers, among whom were many genuine border ruffians marched from Vincennes against the villages on Peoria Lake which they destroyed without opposition, tarnishing their success by at least one act of almost incredible barbarity. A party of horsemen, commanded by a certain Captain Judy, encountered an Indian and a squaw on the open prairie. The Indian offered to surrender but Judy replied that he had not come out to take prisoners, and shot him through the body. The Indian began chanting his death-song and shot one of the party. The remainder instantly sprang from their saddles and sheltering themselves behind their horses opened fire upon the hapless pair. The man soon fell pierced by many bullets but the woman singularly enough escaped unhurt. Her life was spared although soon afterwards these wretches killed a starving Indian child who fell into their power.[2] They scalped and mutilated the bodies of the slain and ransacked graves in search of plunder. Such acts naturally converted the existing hostility of the Indians into an almost insatiable passion for revenge. When the British officers attempted to restrain them they indignantly retorted:—"The way they treat our killed and the remains of those that are in their graves to the west make our people mad when they meet the Big Knives. Whenever they get any of our people into their hands they cut them like meat into small pieces."[3]

Another body of seven or eight hundred men composed of the First United States Infantry, a company of rangers, and two regiments of

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[1] Atherton, 19.

[2] Davidson, History of Illinois.

[3] Speech of Blackbird to Claus, July 15, 1813.

mounted volunteers from Illinois and Missouri assembled at Lower Hill near St. Louis and ascended the Illinois to Peoria Lake, the infantry being transported in flat boats protected by bullet-proof wooden shields. A large band of the Sac Nation was compelled to remove to the Missouri under the supervision of Nicholas Boilvin, an able and zealous agent of the American government, who had been instrumental in persuading a deputation of chiefs from the western nations to visit Washington during the summer. The French Canadian village at Peoria was burnt and its inhabitants removed to St. Louis under the pretext that they had supplied and assisted the hostile Indians. As usual all cornfields in the vicinity were remorselessly laid waste.[1]

About the middle of October, Harrison established his headquarters at Franklinton as a central position from which he could supervise and direct the simultaneous advance of all his columns. His experience in Wayne's campaign twenty years before, determined him to employ a train of one hundred ox-teams for the transport of the artillery with his right division as they would thrive on forage found in the forest on which horses would inevitably starve. He now considered these guns as indispensable to his future success. If the fall should be very dry he still hoped to re-occupy Detroit before winter set in, but if there was much rain, he must delay his movement until the Miami River and Lake Erie were sufficiently frozen to provide a passage for his troops. Meanwhile, a position at the rapids would enable him to wage a desultory warfare against the Indians near the southern end of Lake Michigan. Learning that General Van Rensselaer was being strongly reinforced by militia from New York and Pennsylvania, he wrote to that officer strongly urging him to make a diversion in his favour.[2]

But a heavy fall of rain, combined with the information that most of the farms at the River Raisin had been broken up and in consequence little food for his animals could be obtained in that part of Michigan, made him far less sanguine as two loads of forage must accompany each load of provisions. Already the contractors had been dilatory in the delivery of supplies. It was believed that one of them would certainly clear a hundred thousand dollars from a single contract with the State of Ohio, and Harrison vehemently asserted that this man would rather see his army starve than permit his profits to be diminished by five hundred dollars, and he denounced one of the sub-contractors as being "as great a scoundrel as the world can produce."[3] In consequence of their delinquency two regiments near Fort Jennings were already subsisting on the commissary's stores.

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[1] Howard to Eustis, Oct. 13, 1812. Dickson to Freer, March 16 and 22, 1813.
[2] Harrison to Eustis, Oct. 23, 1812.
[3] Harrison to Eustis, Oct. 23, 1812.

He finally decided to make Upper Sandusky his principal base of supply and began to organize a train of two thousand oxen and packhorses for that line of communication. But at the same time he gave orders for the construction of boats and sleds at St. Mary, Fort Jennings, and Fort Winchester, to take advantage of a possible rise of water in the river or an early fall of snow. If absolutely necessary he still affirmed his ability to retake Detroit at any time with a flying column of fifteen hundred or two thousand men without artillery, accompanied only by a few hundred packhorses with flour and a drove of beef cattle.

As soon as the surrender of Detroit had become known to Governor Meigs he had called out two thousand militia for the defence of the north-western frontier of Ohio. As the blockhouse at Lower Sandusky had already been abandoned and destroyed, they were directed to occupy positions at Mansfield and the mouth of the Huron River and erect works of defence. One of their first acts was to make an unprovoked attack upon an Indian village near the former place, which they burnt, after shooting several of its inhabitants. They were employed in building blockhouses and cutting roads through the forest in the direction of Sandusky. This laborious duty soon became distasteful to many of them. About the middle of September General Beall wrote that he almost despaired of obtaining the quota required from his brigade, and that "the unparalleled number of deserters was truly astonishing."[1] Their working parties were occasionally annoyed by Indians, who cut off a few stragglers and carried away a prisoner to Amherstburg about the end of October, from whom Procter secured some important information. The attempt to build a direct road from Mansfield to the Miami was finally abandoned, as it was found that it would be necessary to lay a causeway of logs for a distance of fifteen miles through a continuous swamp. After a personal inspection, Harrison determined to concentrate the whole force, which had then diminished to thirteen hundred effectives, at the Huron River, and set them to work on the road along the lake to Lower Sandusky, which was not re-occupied until the middle of November. About the same time the Pennsylvania brigade, accompanied by twenty-eight guns and a baggage train of a hundred waggons, arrived at Mansfield and began to crawl forward at the rate of four or five miles a day to Upper Sandusky, whither the Virginians were also plodding through the mud from Wooster.

At last Harrison was constrained to acknowledge that it would scarcely be possible for him to advance beyond the Miami during the winter, as he considered it indispensable to accumulate at least one million rations there before moving farther. This would be sufficient

[1] Beall to Meigs, 13 Sept., 1813.

to maintain an army of ten thousand men for a hundred days. The transportation of such a supply would be a task of immense difficulty. He informed the Secretary of War that the country north of the fortieth degree of latitude was "almost a continued swamp to the lake. When the streams run favorable to your course, a small strip of better ground is generally found, but in crossing from one river to another the greater part of the way at this season is covered with water. Such is actually the case between the Sandusky and the Miami Rapids, and from the best information I could acquire whilst I was at Huron, the road over it must be causewayed at least half the way."[1]

Major Hardin, who had lately returned from Fort Winchester, reported that the road between Piqua and that place was so bad that a waggon could not haul its own forage. All hope of employing mounted men must inevitably be abandoned.[2] Rain enough had fallen to render the roads almost impassable without making the rivers navigable. At best he could only hope to make use of water carriage for his left column as far as the Miami Rapids. He began to despair of ultimate success until he could obtain command of Lake Erie, or at least dispute its control.

Shelby was urged to prepare the public for delay by concurrence in a proposal to disband all the State troops except a sufficient number to maintain the frontier posts and furnish escorts for supply trains during the winter. But the Secretary of War flatly refused to agree to such a mortifying admission of failure, coming so close on the heels of those upon the Niagara and the frontier of Lower Canada.

Harrison, therefore, showed no relaxation in his efforts to push forward troops and stores by each of his three lines of advance, moving constantly from post to post with unflagging energy.

The unsatisfactory result of General Hopkins's movement laid open his left flank, and before sending his cavalry into winter quarters he determined to anticipate any attempt upon his line of communications by raiding parties of Indians by striking at the villages on the Mississinewa branch of the Wabash.[3] It was alleged that some of their inhabitants had participated in the attack upon Fort Wayne, but the majority had certainly taken no part in the war so far. The gravest accusation that could be made against them was that they had failed to attend the council at Piqua in the latter part of August, after being warned that their absence would be construed as evidence that they had withdrawn from the protection of the United States. Early in

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[1] Harrison to Eustis. McAfee, 167–8.

[2] McAfee, 177–8.

October several of their chiefs had visited Harrison at Franklinton fully prepared to extenuate or deny the charges against them, but when he declared he had positive proof of their guilt, they threw themselves upon the mercy of the Government and consented that five of their number should remain in his power as hostages until the decision of the President could be ascertained. A white spy had since reported that the war-party among them had quite gained the ascendant, and Harrison feared that these villages would become a rendezvous and base of operations for hostile warriors seeking an opportunity to intercept his trains on their way from St. Mary to the Miami. If they were laid waste and the corn stored up for the winter destroyed, an enemy would be unable to find any means of subsistence nearer than the Pottowatomie villages at the mouth of St. Joseph's river on Lake Michigan.[1]

He detailed for this expedition Simrall's regiment of Kentucky Dragoons, Ball's squadron of the Second United States Light Dragoons, Elliott's company of the 19th United States Infantry, Alexander's volunteer riflemen and Butler's Pittsburg Volunteers, all of whom were mounted and armed with rifles. Lieut-Colonel John B. Campbell, of the 19th Infantry, a zealous young officer, was placed in command. Under pretence of returning to Kentucky for the winter this force was moved from Franklinton to Dayton, where all ranks were supplied with fresh horses. They were required to carry twelve days' provisions and a certain amount of forage, and be provided with guides. From Dayton they marched to Greenville, where the final preparations were completed. The ground was hard frozen and covered with snow. The distance yet to be travelled was about eighty miles. On the evening of the third day, when about twenty miles from their destination, it was determined to march all night and attack the nearest village at daybreak. Their approach was discovered by some mounted Indians, and although they advanced at full speed nearly all the men in the village succeeded in making their escape, leaving about forty women and children behind. In the pursuit several Indians were killed. Three small villages a few miles distant were found entirely deserted. These were at once destroyed, although one of them belonged to the band of a chief named Silver Heels, which Campbell had received special instructions to spare as undoubtedly friendly. Very little corn was found, much to his disappointment, as his horses were already suffering for want of food. So little resistance had been offered that he had lost only two men killed. But his troops were so greatly fatigued that he determined to fortify a position and encamp for the night. Outlying pickets were posted in small outworks built for their protec-

[1] Harrison to Secretary of War, 23 Oct., 1812 and Nov. 15, 1812.

tion. During the night Indians were discovered lurking about, and the camp was placed on the alert two hours before daybreak. While it was yet dark one of the pickets was surprised and driven in with the loss of its commanding officer and several men. This was followed by a general attack on the right flank and rear, during which the assailants directed much of their fire upon the horses, causing indescribable tumult and confusion. As soon as daylight returned they retired, having so roughly handled Campbell's force in the course of an hour that he abandoned his design of advancing against their principal village about twelve miles farther on and decided to return to Greenville at once. He had lost two officers and six men killed and four officers and forty-four men wounded, besides 107 horses killed and many wounded. His departure was hastened by a false report that the redoubtable Tecumseh, with several hundred warriors, was not far distant. Many men were suffering from frost-bites, and there was a danger that their provisions would be exhausted before they could obtain a fresh supply, as their movement must be necessarily slow, on account of the wounded and many dismounted men. An officer was accordingly despatched in haste to request that a reinforcement with supplies should be sent forward to meet them. During the retreat, whenever they encamped they surrounded their position with a strong breastwork, and one-third of the entire force was placed on guard. Several of the wounded died of exposure, and when at length they arrived at Greenville, fully three hundred men were found to be disabled from further duty. Of Gerrard's company, which had marched out with seventy-two effectives, only seven remained fit for service on the last day of December. Simrall's regiment was so much reduced that it was at once disbanded. The expedition had resulted in the destruction of Harrison's cavalry without inflicting any serious loss upon the Indians. He was so greatly disappointed that he undertook a special journey from Lower Sandusky to Chillicothe for the purpose of proposing to Meigs to despatch a body of Ohio troops to destroy the remaining villages. When this plan was rejected, he advised Winchester to abandon his intention of advancing to the rapids and fall back to Fort Jennings.[1] He attempted to conceal his failure by the publication of a general order announcing that Campbell's operations had been attended with complete success.

Yet the paralyzing effect of the mud had so greatly discouraged him that he broadly hinted to the Secretary of War that it might be expedient to defer any further advance until a sufficient naval force could be created to protect the movement of his supplies by the lake.

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[1] Armstrong I, 65–8; McAfee, 177–82; Atherton, 28–9.

This might be done, he said, with a comparatively small expenditure of money. He had nominally ten thousand men under his command; but of these not more than six thousand three hundred were reported fit for duty. With the most heroic efforts he had not succeeded in pushing the heads of his columns beyond Lower Sandusky, Fort Necessity and Fort Winchester. His artillery had arrived at Upper Sandusky on December 10th; but the teams drawing it, which had started in the best condition, were quite worn out. He was appalled at the loss of horses, valued at half a million dollars. Two trips from Fort McArthur to Winchester's camp absolutely destroyed a brigade of pack-horses. The road had become a continuous morass, in which the horses sank to their knees and the waggons to the hubs of their wheels. The drivers were generally the dregs of the frontier settlements, who took little care of either horses or goods. The teams were valued so high that the owners were willing to sacrifice them to obtain compensation. Many waggons were abandoned and their contents lost. No bills of lading were used, nor accounts kept with the teamsters. The loss of public stores was enormous.[1] Nothing could be more disheartening than the "imbecility and inexperience of public agents and the villainy of the contractors" upon whom his army was obliged to rely for their subsistence.[2] Every attempt to make use of the St. Mary and Au Glaize rivers for the conveyance of supplies had failed.

Dr. Eustis, the Secretary of War, had been forced to resign by popular clamor. Monroe, the Secretary of State, undertook to administer the affairs of that department until his successor was appointed. One of his first acts was to require Harrison "to form a clear and distinct plan as to the objects you may deem attainable, and the force necessary for the purpose, and that you communicate the same with precision to this department." He was cautioned at the same time not to promise the inhabitants of Canada anything beyond protection for their lives and property, and advised not to occupy any position which he would be unable to retain permanently.

Before he received this letter, Harrison had actually written to suggest the postponement of further military operations until April and May, by which time a respectable naval force might be created upon Lake Erie. Detroit, he said, would not be tenable unless Amherstburg was also taken. Otherwise he would be compelled to hide his army in the swamps to keep it out of range of the British artillery. Even if both these places were captured, his adversary might still retain Mackinac and St. Joseph's Island as long as the Ottawa route

[1] McAfee, 183–4; Gardinier, Examiner.

[2] Harrison to Secretary of War, 12 Dec., 1812.

remained open, and thus supply the Indians in that quarter. While ships were being built, he proposed to occupy a position at the Miami Rapids with fifteen hundred men, maintain a thousand more in other advanced posts, and accumulate supplies. Contrary to his wishes, Winchester had kept the bulk of his division far advanced and thus immensely increased the difficulty of supplying it. But on December 18th the prospect on the right seemed so encouraging that he wrote from Upper Sandusky to Winchester instructing him to advance to the Miami Rapids and build huts, to give the impression that he intended to winter there, and prepare a large number of sleds for a future forward movement, but giving his troops to understand that they were to be used for bringing forward supplies from the rear. A week later the miscarriage of Campbell's expedition caused him to countermand this order.

The tone of Monroe's letter obviously irritated Harrison, and he wrote a lengthy and vigorous justification of his conduct. As his former letters had contained frequent allusions to the "monstrous expenditure" incident to military operations at that season, he had construed the silence of the late Secretary of War as an intimation that cost was to be disregarded in his efforts to recover the lost territory. A thousand pack-horses were employed in supplying his right column alone. When a barrel of flour was delivered at the advanced posts it had cost the government $120.[1] A brigade of Ohio troops had been employed in road making beyond Sandusky for a month. The brigades from Pennsylvania and Virginia were close behind. The concentration of 4,500 or 5,000 men at the Miami within two or three weeks seemed reasonably certain. A "choice detachment" from these could then be selected for a demonstration against Detroit and an actual attack upon Amherstburg by crossing the river on the ice. He prudently based his estimate of the force necessary for this enterprise not upon the present strength of the British garrison, which was reported to be almost incredibly small, as most of the Indians had dispersed to their villages, but upon the numbers that might be assembled from other quarters in time to oppose him. He knew that troops could be brought forward quickly from the Niagara frontier by the "back route" along the Thames, and he might encounter the same regulars who had fought at Queenston three months before, while he said that a mere whistle would be sufficient to recall the Indian warriors. If his force was weak, "the timid, cautious and wavering among the Canadians and Indians" would be encouraged to take the field against him, and if he was unable to carry sufficient supplies with him, he

[1] Boston Gazette, 8th March, 1813.

would be compelled to make strong detachments to escort his trains. His former experience of Indian warfare had taught him that it would be unsafe to send a detachment either to the front or rear which was not strong enough to repel the enemy's whole force. One third of his troops had already become ineffective from exposure and disease. A fine body of recruits from Ohio and Kentucky, composing the 17th and 19th regiments of United States Infantry had been nearly destroyed through want of proper clothing. A suspension of hostilities might become inevitable, and he reminded the Secretary that General Wayne after an entire summer spent in preparation, had been unable to advance more than seventy miles from the Ohio River, when he went into winter quarters, by Washington's advice.[1]

Having put his right wing in motion, he had returned to Franklinton with the intention of urging forward the centre column, which seemed inert and demoralized since Tupper's return from the Miami. Lack of direct lateral communications seriously imperilled the success of his arrangements.

On December 20 the weather turned so cold that the Miami was frozen, thus putting an end to Winchester's expectations of being able to advance by water. Since the 10th he had been entirely without flour, and his men had been subsisting upon lean beef, fresh pork and hickory roots. His supply of salt had long since been exhausted. Many men were suffering acutely from want of shoes and winter clothing. Probably one hundred had died from disease, and the sight of the sufferings of between three and four hundred sick made the camp "a loathsome place."[2] His effective force had been thus reduced to less than sixteen hundred of all ranks. Two days later a good supply of flour, salt, and woollen clothing arrived. With undaunted resolution Winchester began building sleds and ordered forward the effective men of Jennings' regiment from the posts in rear to enable him to resume his advance. While thus employed he received Harrison's letter of the 18th, which had been brought through the woods from Sandusky by an officer conducted by Indian guides. In a week each company was provided with three sleds which might be drawn by one horse or three men. On December 29, one regiment was sent forward six miles, followed next day by the remainder of the effective men in camp. A despatch was sent to Harrison by the roundabout route of Hull's road, which, owing to stormy weather, did not reach him at Upper Sandusky until January 11th. As some of his sleds were drawn by hand, Winchester's progress was slow, seldom exceeding six miles in a day, and

[1] Harrison to the Secretary of War, 4th and 8th January, 1813; McAfee, 192–9; Dawson, 342.

[2] Darnell, Journal; Atherton; McAfee, 183-4.

a rapid thaw set in, during which most of the snow went away. On January 2 this was succeeded by a heavy fall of snow, which continued for two days and nights. He was then overtaken by Harrison's message countermanding his movement, which he determined to disregard. On January 4 the march was resumed, but, the snow being nearly two feet deep, horses and men rapidly gave out, and he did not reach the deserted settlement at the foot of the rapids until the 10th.[1] Here he fortified a position with a timber breastwork on the left bank of the river, where Hull's road crossed it, and began building huts and storehouses. Again a message was sent to Harrison by way of Fort McArthur, which did not reach Upper Sandusky until he had left that place. The messenger followed him to Lower Sandusky, and ultimately delivered the letter to him at the place he had started from.[2]

The term of enlistment of the Kentucky Volunteers would expire in February, and Harrison had requested Winchester to recruit at least a regiment from among them to serve six months longer, stating his opinion that it would be unwise to employ them in any offensive movement unless he succeeded. He soon ascertained that the hardships and privations of the campaign had so greatly dispirited the majority that little could be expected, and replied accordingly.

Camp equipage and supplies of all kinds were brought up as rapidly as possible, and a large drove of hogs ordered forward from Fort Jennings. A quantity of corn was discovered in the fields, which Winchester ordered his men to gather and use to spare his flour.

On January 11, a scouting party fell in with a few Indians, whom they pursued, and a skirmish followed in which there was some loss on either side. On the evening of the 13th, two French Canadians from the River Raisin came in with a letter from a spy named Day, who had been sent forward to that place. He wrote that a party of Indians had passed through with the information of Winchester's arrival at the Miami and had threatened to return in force and burn the village. The British were preparing to remove all the cattle and provisions of every kind, and suspected persons were being arrested and confined.

A supply of woollen underclothing had opportunely arrived from Kentucky, which made the men comfortable, and they began to regain their spirits, although the weather had again grown very cold. On January 14th, a second messenger arrived from the River Raisin soliciting protection. Winchester wrote to General Perkins, who was in command at Lower Sandusky, stating that he meditated an advance

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[1] McAfee, 200–2; Atherton; Darnell.

[2] McAfee, 202–3.

and asking him to send forward a battalion to his support. On January 15, another French Canadian came with information that two companies of Canadian militia and a body of Indians had arrived at the River Raisin shortly before his departure and announced their intention of removing all the cattle and grain and possibly destroying the village. An Indian scout afterwards brought in a letter from Day, who wrote from Otter Creek, stating that the British force at Frenchtown consisted of forty or fifty militia and perhaps a hundred Indians, who had positive instructions to remove all the inhabitants to Amherstburg with their horses, cattle, carioles, sleds, grain and provisions of all kinds. An immediate advance might secure three thousand barrels of flour and much grain.[1]

Winchester called a council of his principal officers and asked their advice. Colonel Allen at once took the lead and warmly advocated a forward movement in a speech of such force that it carried the other members with him. As they were unanimously in favour of an advance, Winchester concurred cheerfully and ordered Colonel Lewis, as the next senior officer to himself, to march next morning at the head of ten companies completed to fifty-five men each.

He had less than fifteen hundred effective men, all Kentuckians belonging to the 17th United States Infantry; 1st Kentucky, Colonel Scott; the 2nd Kentucky, Colonel Jennings; the 5th Kentucky, Colonel Lewis; and the 1st Kentucky Rifles, Colonel Allen. Most of them were strong, hardy, adventurous young men, accustomed to the use of the rifle from boyhood. In the river towns of the Mississippi a Kentuckian was dreaded far more than an Indian, and the name "Kentuck" had much the same significance as "cow-boy" in later years. They were thoroughly fearless, reckless, lawless fellows, ever ready to quarrel and fight, who boastfully described themselves as "half horse and half alligator, tipped with snapping turtle." Quiet folk were shocked by their drinking bouts, frequently ending in duels or savage fights attended by biting and gouging. Horse racing and rifle shooting were their chief amusements. Twenty years before the legislature had passed an Act making it compulsory on every white male over sixteen years of age to kill a certain number of crows and squirrels every year. Sometimes as many as two thousand squirrels were slaughtered in a single *battue*, all with the rifle. Auction sales or raffles were scarcely known. When a man announced his intention of disposing of his household goods, his neighbours turned out gun in hand. A mark was set up, a price was placed upon an article of furniture, each man paid his entrance money, and the shooting began.[2]

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[1] Winchester Narrative; Armstrong I, 66–7; McAfee, 204; Brown.

[2] McMaster, History of the American People II, 575; Marshall, History of Kentucky; Ramsay, Hist. South Carolina.

These men had been in service since August 16. They had endured much privation with admirable tenacity and acquired a considerable degree of discipline. Their term of enlistment would expire in a month and they were naturally eager to perform some noble action before returning home. Allen had declared that if they failed to advance now, they would be told that "a thousand freemen are unequal to a contest with three hundred savages and slaves."[1]

Lewis began his march early on the 17th, taking with him three days' provisions hauled on sleds. A few hours later Winchester received news which induced him to despatch Colonel Allen with two more companies of fifty-five men each to reinforce him. Lewis advanced twenty miles that day, crossing the bay on the ice to a little settlement on Presqu'Isle. The inhabitants came to meet him with a white flag, stating that the British had retired from Brownstown. Three hours after dark Allen overtook him. During the night a messenger came from Frenchtown with information that the number of Indians there was increasing and that Elliott was expected to march from Amherstburg next morning with many more. Lewis transmitted this to Winchester with a request for further reinforcements, but resumed his march shortly after daybreak in the hope of forestalling Elliott's arrival. He divided his force into four battalions of three companies each, under Colonel Allen, Majors Graves and Madison and Captain Ballard, that commanded by the latter being detailed as an advance guard.

Winchester had remained so long inactive that he had lulled Procter into the belief that he had gone into winter quarters. Tecumseh who was in poor health, had gone southward to rouse the Creeks and Cherokees. The Prophet had returned to the Wabash. The Indians from Saginaw, Mackinac and the borders of Lake Michigan had long since been dismissed to save provisions. The movement of a strong body of Americans up the Illinois in shot-proof boats, with the intention of building a fort near Peoria and ultimately re-occupying Chicago, had been reported. He surmised that their object was to cut off his communication with the most formidable Indians of the west by the establishment of a chain of posts. The chief Mapock, who had been active in the operations against Hull, had assembled a force to oppose them. Repeated applications from the Indians for detachments of regular troops to accompany them on expeditions had been evaded by Procter with considerable difficulty; but when they proposed the organization of a body of rangers for that particular purpose, he readily gave his approval. "A corps of that description," he wrote,

[1] Amrstrong, I, 68.

"would be, I am convinced, of the highest utility, both in restraining and directing the hostility of the Indians to the proper objects of it." It might also prove an efficient substitute for the militia, which had few good officers. He proposed the enlistment at first of a single company as an experiment, and recommended that it should be placed under Colonel William Caldwell, who possessed great influence among the Indians and had commanded a company of Butler's Rangers at the Blue Licks and Sandusky thirty years before.

With the exception of the Wyandots of the River Canard and Brownstown and some Pottowatomies and Miamis, who had been driven in by the destruction of their villages, few Indians remained in the vicinity of Amherstburg.

Procter had directed the construction of two gunboats at Chatham and laid the keel of a ship at the Amherstburg dockyard to ensure his supremacy on Lake Erie Two blockhouses were also projected at important points. But he lacked carpenters and artificers, as well as officers and seamen to man these vessels when they were launched.

On January 13, a party of Indians came in who reported that the enemy had advanced to the foot of the Miami Rapids with a thousand men. Two days before they had encountered their scouts, of whom they had killed two and wounded several, bringing off three captured horses. Procter promptly issued orders for calling out the militia and assembling the Indians. If it became necessary to dislodge the enemy he foresaw that he must employ his whole force.[1]

Two flank companies of the Essex militia, under Major Ebenezer Reynolds, accompanied by a band of Pottowatomies, were dispatched next day to break up the settlement at the River Raisin and remove the inhabitants. To enable him to maintain his position until this could be effected, he took with him a three-pounder mounted on a sled, in charge of Bombardier Kitson, of the Royal Artillery. Not unnaturally these people were very reluctant to leave their homes and sacrifice much of their property, and they bitterly resented the insolent conduct of the Indians, who killed or drove off their cattle with scant ceremony. As the Pottowatomies were constantly going and coming, their numbers fluctuated greatly, sometime rising above a hundred and sometimes falling as low as twenty.

About noon on January 18, Reynolds learned that a large body of men had been seen approaching along the lake a few miles distant, and made every effort to collect the Indians. The river was solidly frozen and presented no obstacle to an attack from the southward. Three hours later the enemy appeared in force in the skirt of the woods and

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[1] Procter to Sheaffe, 13 January, 1813.

deployed into three lines in extended order on a very wide front before crossing the cleared ground, with the evident intention of enveloping his position. The field gun was brought into action, but after firing three rounds with no apparent result, it was seen that a party was crossing the river with the object of cutting off his retreat by the road. Reynolds then gave orders for the removal of the gun and retired from the village, which was occupied by the Americans with the loss of only three men wounded. Some of the inhabitants instantly armed themselves and began firing upon the retreating Indians. The pursuit was continued, with loud shouts, across a ravine and through an orchard and some cleared fields into the woods, which were obstructed with much undergrowth, furnishing excellent cover. Kitson made his escape by the road under cover of the fire of an escort of Indians. On entering the woods the foremost pursuers were soon checked, with material loss. Their eagerness and haste exposed them to the fire of unseen foes, who instantly retired and took up a fresh position, where they reloaded and again awaited their approach until close upon them, when they delivered their fire and retired again.[1] The action continued in this way until dark, when Lewis assembled his men and retired to the village. He found that he had lost twelve killed and forty-five wounded, among the latter being three captains. He acknowledged that he had made a serious mistake in allowing his troops to enter the woods at all.[2]

During the night Reynolds fell back to Brownstown. He reported the loss of one militiaman and three Indians killed, but did not state the number of wounded and missing. The Kentuckians asserted that they had taken twelve scalps besides one Indian and two militia prisoners. The Indians accused them of barbarously hacking to pieces one of their wounded warriors with their knives and tomahawks and of cutting strips of skin from the bodies of the slain to use as razor strops.[3]

Lewis sent off a despatch rider to announce his success and ask for a reinforcement to maintain his position, who travelled with such speed that he reached Winchester's camp before morning. On the 17th Winchester had written to Harrison stating that he was sending forward a force to Frenchtown to secure the flour and grain at that place and desiring support in this movement from the right wing of his army. This letter was despatched to Lower Sandusky. He now wrote again, relating the success of his movement and declaring his

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[1] Atherton, 39–40.

[2] Lewis to Winchester, 20 January, 1813; Procter to Sheaffe; Armstrong ; Atherton, 39–40; Darnell; McAfee.

[3] John Strachan, Letter to Thomas Jefferson; Blackbird to Claus, July 15, 1813. Palmer, Travels.

intention of going forward in person to maintain this advanced position. After instructing Colonel Wells to follow with six companies, numbering about 330 of all ranks, and leaving General Payne in charge of the camp with about three hundred of the least effective men, Winchester rode forward with his staff and arrived at the River Raisin on the night of January 20.

Harrison at Upper Sandusky had not received Winchester's letter of December 30th until January 11th, when he ordered a forward large drove of hogs and held his train of artillery in readiness to march. On the 16th he received a letter from General Perkins, written the day before, enclosing Winchester's letter to him asking a reinforcement of a battalion. The artillery was at once ordered forward by way of the Portage River, with an escort of three hundred infantry, as this road was sixteen miles shorter than that leading through Lower Sandusky. Supply trains were directed to follow by the same route. Harrison himself went next day to Lower Sandusky, riding so hard that the horse of his aide fell dead on their arrival there at nightfall. He learned that Cotgrove's battalion, with a field gun, was under orders to march next morning. The distance to Winchester's camp on the Miami was only thirty-six miles, but the roads were much blocked by snow-drifts. At four o'clock on the morning of the 19th Harrison received Winchester's letter of the 17th. There were still three battalions of Ohio Militia at Sandusky. Two of these were at once ordered to advance by forced marches to the Miami. Harrison and Perkins drove off in a sleigh to overtake Cotgrove. Finding that their progress was very slow, Harrison mounted his servant's horse and rode on alone. Darkness coming on, his horse became nearly mired in a swamp, where the ice gave way under him and he was obliged to dismount and make his way onward on foot. Cotgrove was then ordered to march directly on the River Raisin by crossing Miami Bay on the ice. After a few hours' sleep, Harrison pushed on to the Miami Rapids, where he arrived early on the morning of the 20th. Captain Hart, Inspector General of the district, was sent forward to inform General Winchester of the movement of troops in his rear and instruct him to hold his position at all hazards. Next day he received a letter from Winchester in which that officer said: "Advices from Brownstown and Malden all agree that the enemy is preparing to retake this place. If he effects his purpose he will pay dearly for it." A small reinforcement would make him perfectly secure, he added. The two Ohio battalions from Lower Sandusky arrived that night, and General Payne was directed to march at daybreak with the remainder of the Kentuckians to join Winchester. In no respect could Harrison be justly suspected of any slackness in his efforts to support his lieutenant, whom he had constantly treated more as an associate than as an inferior.

Winchester moved so rapidly that he arrived at the River Raisin on the night of the 20th, and Colonel Wells came up next day with his detachment, bringing tents and other camp equipage. There was little regularity in their encampment. Lewis had allowed his men to select quarters and settle down wherever they pleased. They were greatly elated by their success and seemed to forget that they had an enemy in the world.[1] Quantities of hard cider had been discovered and some men were drunk and quarrelsome. Desiring to escape the tumult created by "this parcel of dirty, noisy freemen," the General took up his quarters at the house of Peter Navarre on the right bank of the river less than three hundred yards in rear. He afterwards stated that had he not been encumbered by so many wounded men, he would have retired to the Miami, but there is nothing in his conduct or correspondence at the time to give colour to this assertion. Wells was instructed to encamp his men on the right of the village and then to select a position to be fortified and occupied by the whole force. This was done; but as some of the troops were tired and all of them excited and unruly, no attempt was made to entrench that day. Patrols were sent out in several directions. One of these reported that they had gone as far as Brownstown without seeing any sign of an enemy. Another had seen two men, whom they suspected to be British officers, ride away from a house two miles up the river. All accounts agreed that the number of regular troops at Amherstburg and Detroit was small, and that there was little danger of an attack. Captain Hart, a brother-in-law of Henry Clay, came in with the information that Harrison had established his headquarters at the camp on the Miami the day before, and that a strong reinforcement was on the march. This was publicly announced and put everybody in high spirits. Colonel Wells was sent back to hasten the movement of supplies; but in a letter to Harrison entrusted to him Winchester expressed no anxiety. Late at night a French Canadian arrived with information that a body of British and Indians three thousand strong was assembling at Brownstown. This report seemed so absurd that it was generally disbelieved by the principal officers, who were regaling "themselves with whiskey and loaf sugar."[2]

Frenchtown was a compactly built village of twenty dwellings, besides barns and outhouses, situated on the left bank of the river and on the right of the road leading to Brownstown, surrounded on three sides by a stout palisade of round logs split in halves and set in the ground, rising to a height of eight feet and sharpened to a point at the top. Blockhouses had been built at the angles during the sum-

[1] Atherton, 40.
[2] Darnell, Journal.

mer and the place put in a position to resist an attack, but Brush had partially destroyed these works before evacuating it in August.[1] The river front was entirely open. All of the buildings were constructed of hewn logs with shingle roofs, and some were clapboarded. With their gardens and orchards they covered a quadrangular space of two hundred by three hundred yards, the longest side being parallel to the river. Lewis's original command had taken up their quarters in these buildings, where they were comfortably housed. The troops brought forward by Colonel Wells, consisting mainly of men of the 17th United States Infantry and the 1st Kentucky Rifle Regiment, occupied the post of honour on the right, outside the enclosure, some being billetted in detached houses and the remainder encamped in tents. Along the river on both sides for several miles there were farm houses, forming in the whole a settlement which had a population of more than twelve hundred persons before the war began. North of the village, at a distance of about one hundred yards, a deep hollow ran parallel to the river, crossing the road to Brownstown nearly at right angles, which, with an isolated farmhouse and orchard, afforded some cover to a force attacking from that direction.

Winchester had with him then three companies of the 17th United States, three companies of the 1st Kentucky militia (Scott's regiment), one company of the 2nd Kentucky militia (Jennings), five companies of the 5th Kentucky militia (Lewis), and six companies of the 1st Kentucky Rifles (Allen), making in all a force of about 975 of all ranks, including the wounded and their medical attendants. Orders had been given to strengthen the position, but little had been done beyond cutting some loopholes in the palisades. A general feeling of security prevailed. As the weather was bitterly cold and the snow lay deep everywhere, no outlying pickets were posted and no patrols were sent out during the night.[2]

Procter learned that Reynolds had been driven from Frenchtown at two o'clock on the morning of the 19th. He quickly decided that there was no time to be lost in attacking the enemy at that place "with all and every description of force" within his reach. Fortunately most of the young men of the Petite Côte, were celebrating Queen Charlotte's birthday at a public hall where they were warned for service in a body. Captain James Askin's company of the 2nd Essex was detailed as the garrison of Detroit, under Major Muir, who was still enfeebled by illness. A corporal's party of the Royal Artillery and the invalids of other regular corps with the least effective men of the militia were assigned for the

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[1] Williams, Two Western Campaigns, 25.

[2] Winchester's Statement; A. B. Woodward to James Monroe. 31 January, 1813.

occupation of the fort at Amhesrtburg, under Lieut-Colonel J. B. Baby. Every man considered fit for field service was marched across the river on the ice to Brownstown, where the Indians were likewise directed to assemble.

By great exertions a force of 578 of all ranks belonging to ten different corps was scraped together. Of these, 366 were regular soldiers or Provincial seamen. Three three-pounders and three small howitzers, mounted on sleds, were manned by squads of the Royal Artillery and seamen and escorted by a company of the Royal Newfoundland Regiment. Four weak companies of the 41st Regiment officered by four subalterns and eight sergeants, formed the backbone of this motley array under command of Captain Joseph Tallon. As inspecting field officer, Lieut-Colonel St. George superintended the movements of the militia, of whom there were eight small companies commanded by Major Reynolds.[1]

There were nearly five hundred Indians, mainly Wyandots and Pottowatomies, directed by nineteen white officers headed by Elliott and Caldwell. A good number of these Indians were armed with muskets and mounted on their own horses. Before dark, Procter advanced twelve miles to Swan Creek, where he bivouacked in the open air. Two hours before dawn the march was resumed, and just as day was breaking the head of the column arrived within gunshot of the village. As the deployment began in the fields on the left of the road the drums in the American camp were heard beating the reveillé. Then three shots were fired by their sentries in rapid succession, one of which struck down a leading grenadier of the 41st. Procter has been strongly censured for not charging at once with his infantry, instead of waiting for his artillery, which actually made little impression upon the enemy's defences and gave them time to recover from their surprise. But their position was not yet precisely ascertained, and it was still so dark that the palisades with little jets of flame darting from the loopholes were at first mistaken for a line of men drawn up in front.[2]

Three guns were placed in position in the orchard near the hollow; the others were moved to the right of the road to enfilade the village from that direction, and were supported by a small party of Indians. The whole of the militia and the great body of Indians made a wide circuit to the left to turn that flank. In this they entirely succeeded, and rushing suddenly from their concealment, with shrill whoops upon the 17th United States Infantry, which was wholly unprotected by

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[1] Staff, 3; Royal Artillery, 23; 10th Battalion Royal Veterans, 4; 41st Regiment, 244; Royal Newfoundland, 61; Marine Department, 28; 1st Essex Militia, 116; 2nd Essex Militia, 96; Commissariat, 1; Field Train, 1; Royal Engineers, 1.

[2] Narrative of Shadrach Byfield, 41st Regiment.

any breastwork, the men of that corps were seized with a panic and began to retire in much disorder. Winchester came up and attempted to rally them behind a fence. Two companies of riflemen sallied from the village to their support, but were soon borne away in the general flight. Lewis and Allen joined Winchester and endeavoured to form the fugitives under the shelter of the river bank, calling upon them to incline to the centre and seek refuge in the enclosure. But the pursuit was keen, and their words were unheeded. The flight was continued across the river and through a narrow farm lane leading past Navarre's house to the main road. Many fell beneath a murderous cross fire or were overtaken by fleet footed runners. Others threw away their arms and ran frantically along the road. They were headed off by mounted Indians and sought concealment in the woods. When overtaken, most of these were ruthlessly shot down. The homeless Pottowatomies slaked their thirst for revenge and spared few. Fifteen men of the 17th United States Infantry, under Lieut. Garrett, threw down their arms in a body, but were all killed, except the officer. Of that regiment, one hundred and twenty were killed and only sixty taken prisoners. The Christianized Wyandots were more merciful. Winchester with his son, a lad of sixteen, and Colonel Lewis, after a pursuit of nearly three miles, surrendered to Roundhead, who stripped the general of his richly laced uniform coat and put it on himself. Among the officers slain were Colonel Allen and Captain Simpson, a member of Congress. A wounded officer and a few men ran down towards the lake and succeeded in concealing themselves until night fell, when they made their way back to the encampment at the Miami. Others shut themselves up in detached houses or barns, where they were surrounded and eventually killed or made prisoners. In storming one of these buildings, Lieut-Colonel St. George received four severe wounds which rendered him incapable of further active service during the war.

Meanwhile, the guns in the orchard were gradually advanced across the hollow until they were within fifty yards of the palisades, without effecting a breach or making much impression. The shells from the howitzers had failed to set fire to the snow-covered houses against which they were directed. The gunners and their escort, clearly silhouetted against the snowy surface of the ground, fell fast under the opposing rifle fire. The only sergeant and one private of the Royal Artillery were killed; Lieut. Troughton and seven rank and file were wounded, Bombardier Kitson, who had behaved so well in the last action, dying of his wounds soon after. One seaman was killed and three officers and thirteen seamen were wounded. Lieut. Rolette received a charge of buckshot in the side, and a musket ball spent its force in the folds of a handkerchief he had wound about his

head to relieve the pain of a severe headache.[1] Midshipman Richardson, a boy of fourteen, lost a leg. The horse and driver of a sled bringing forward ammunition were both shot. The guns were silenced and the most advanced piece abandoned within twenty-five or thirty yards of the palisades. Some American riflemen leaped over the fence to take possession, but were driven back by the fire of the escort. Lieut. Robert Irvine then ran forward alone and, seizing the drag-rope, hauled it to a place of safety, amid a shower of bullets, receiving a severe wound in the foot. Procter witnessed this gallant act and subsequently testified his admiration in a letter of thanks, assuring him that he should lose no opportunity of suitably rewarding him.[2] The men who were still unhurt were so benumbed by the cold that they could scarcely work the guns. The escort had lost one-third of its number. Ensign Thomas Kerr, a gallant boy of eighteen, had fallen mortally wounded in leading an assault on a large barn occupied by the enemy's riflemen, encouraging his men with his last words to push on. Captain Tallon then formed the 41st into column of sections and made a most determined effort to force his way into the villlage. Every rifle that could be brought to bear, not only from the loopholes, but the windows of the houses on either flank, was directed upon them with such effect that within half an hour fifteen privates were killed and Captain Tallon, Lieut. Clemow, three sergeants and ninety-two rank and file were wounded, being nearly one-half of the entire detachment. The attack was then discontinued until the militia and Indians could be re-assembled. Exasperated by the sight of the slaughter of their comrades outside, some of the American riflemen continued to fire upon the wounded whenever they attempted to get away, and were even seen to use their knives and tomahawks upon them. This naturally excited the bitter resentment of the troops watching them from the shelter of the hollow, who became eager to retaliate.[3]

As the firing had nearly ceased, the defenders of the village sallied out and set fire to a barn which had been occupied by a party of Indians. Bread was distributed among them and ammunition served out.

The Indians gradually returned, some of them with bleeding scalps dangling from their saddles, others driving prisoners before them.[4] Among these were General Winchester, Colonel Lewis and other officers, who were conducted to Colonel Procter.

The investment of the village was completed, and a party of Indians

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[1] P. Bender, Old and New Canada.

[2] Troughton to Irvine, 28 January, 1813.

[3] Procter to Sheaffe, 1st February, 1813; John Richardson to Charles Askin, 4th February, 1813; Byfield, Narrative.

[4] Atherton, 47.

getting into the bed of the river and sheltering themselves beneath the bank, began a fire from the rear, which struck down several men. Preparations were in progress to set some of the houses on fire and thus drive out the defenders. Winchester was not unnaturally dispirited and appalled by the slaughter of so many of his men which he had already witnessed, and saw little hope for the remainder, who were completely surrounded. If their position was carried by assault, few could expect to escape death, as the Indians, and indeed the British regular troops and militia, were greatly exasperated. He asked Procter if they would be given an opportunity to surrender, and received the reply that they must decide quickly, as he intended to set the place on fire at once and could then take no responsibility for the conduct of the Indians. But he assured him that if they surrendered at discretion, without further delay, he would make every effort to protect them and the officers would be permitted to retain their swords and private property. Winchester then directed Captain Overton, his aide-de-camp, to go with a flag of truce to the commanding officer of the troops in the village and deliver an order to surrender. Procter himself, with some other officers, accompanied Overton to make sure that no time was lost and there could be no misunderstanding. Major George Madison, afterwards Governor of Kentucky, who was the senior officer, came forward to meet them attended by Brigade Major Garrard. They expressed surprise to learn that General Winchester was a prisoner and seemed reluctant to obey the order to surrender without conditions. Procter insisted that they must consent to this, as all he could promise was protection for their lives and property as far as his power extended. He seems to have given them clearly to understand that the Indians were greatly infuriated and that he was doubtful whether he could restrain them in any event. Madison returned to the village to consult his officers. He found that he had lost about forty in killed and wounded, reducing his effective force to 384 of all ranks. Major Graves, his second in command, Captain Hart and several other officers were among the wounded. The men had but two or three cartridges apiece. They were surrounded by much superior numbers. The buildings they occupied were inflammable. A retreat was impossible, and there was no hope of a reinforcement in time to save them. A decision to surrender was soon arrived at. When this was announced to the men there were the usual disorderly scenes. Cries of rage were uttered and rifles dashed furiously to the ground.[1]

When Madison signified his intention of obeying Winchester's order Procter was unquestionably relieved of much anxiety. More

[1] Procter to Sheaffe, 25th January, 1813; Winchester to Secretary of War, January 26 and February 11, 1813; Atherton, 50–2; McAfee, 213, 216.

than two-fifths of his regular force had already been killed or wounded. A continuation of the contest meant further bloodshed, resulting most probably in the complete extermination of the enemy's force. Some of the Indians had already shown an inclination to kill the wounded and strip the prisoners in the most unequivocal manner. He readily assured Madison that he would endeavour to protect his sick and wounded and prevent pillage; but remarked that his own wounded were numerous and must be removed from the field first. He accordingly advised him to place such of his men as were unable to march to Amherstburg in charge of his surgeons, and a guard would be detailed to remain with them.

The prisoners had scarcely been disarmed when an Indian scout reported that he had discovered the advance guard of an American reinforcement on the road to the Miami only eight or ten miles distant. No time must be lost in sending them away and removing the wounded. He had but a single surgeon and very few sleighs. Every man that was able to walk was accordingly ordered to make the best of his way to the bivouac of the night before at Swan Creek, where a rest camp would be formed.[1]

So little apprehension was felt at this time for the safety of the wounded prisoners that several of them who were slightly hurt and perfectly able to march decided to remain behind, possibly in the hope of regaining their liberty. The entire number of prisoners thus left at Frenchtown was about sixty-four, including five surgeons. Among them were Major Graves, Major Woolfolk, Winchester's secretary, and Captains Hart and Hickman. Captain Matthew Elliott, of the Indian Department, had been a classmate of Hart at Princeton College, and promised to send a sleigh next day to convey him with other wounded officers to Amherstburg. Major Reynolds, with three interpreters, remained with them as a safeguard against straggling Indians. Lieut-Colonel St. George and others whose wounds were severe and the whole of the British dead were left behind for several hours until sleighs could be secured for their removal.[2]

Procter had lost in all twenty-four killed and 158 wounded, being more than two-fifths of his entire white force. Among the wounded were twelve officers.[3] The number of prisoners greatly exceeded that of his effective troops. Captain William Caldwell and Interpreter John Wilson, of the Indian Department, were also wounded; but the loss of the Indians seems to have been inconsiderable, probably not exceeding

[1] Byfield, Narrative; Atherton, 67.
[2] Coffin, 205–6.
[3] See page 60.

four or five warriors killed. Not more than four hundred stands of arms and a small quantity of stores were secured, the remainder having been instantly carried off by the Indians. The first official return of prisoners dated January 25th, showed a total of thirty-three officers, twenty-seven sergeants and 435 rank and file. Winchester's official letter increased the number to thirty-five officers and 487 non-commissioned officers and men, which his return of February 11th still further augmented to thirty-seven officers and 500 N.C.O. and privates. Twenty-two officers and 375 N.C.O. and privates were returned as killed or missing.[1]

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[1] *Staff.*—Wounded, Lieut-Colonel St. George, severely.

Royal Artillery.—Killed, one sergeant, one gunner; wounded, Lieut. Troughton, one corporal, five gunners, one bombardier.

10*th Royal Veteran Battalion.*—Wounded, two privates.

41*st Regiment.*—Killed, fifteen privates; wounded, Captain Tallon, Lieut. Clemow, three sergeants, one corporal, 91 privates.

Royal Newfoundland Regiment.—Killed, one private; wounded, Ensign Kerr, three sergeants, three corporals, thirteen privates.

Marine Department.—Killed, one seaman; wounded, Lieuts. Rolette and Irvine, Midshipman Richardson, one gunner, twelve seamen.

1*st Essex Militia.*—Killed, two privates; wounded, Captain Mills, Lieuts. McCormick and Gordon, two sergeants and seven privates.

2*nd Essex Militia.*—Killed, three privates; wounded, Ensign Gouin and three privates.

Killed and missing:—

17*th United States Infantry.*—One surgeon, two captains, three lieutenants, two ensigns, 112 N.C.O. and privates.

1*st Regiment Kentucky Militia.*—One major, one captain, one surgeon's mate, one ensign, 36 N.C.O. and privates.

1*st Kentucky Rifles.*—One lieutenant-colonel, one surgeon, four captains, one ensign, 154 N.C.O. and privates.

5*th Regiment Kentucky Militia.*—One major, one captain, one lieutenant, 73 N.C.O. and privates.

Prisoners:—

17*th United States Infantry.*—One captain, two lieutenants, three ensigns, 54 N.C.O. and privates.

1*st Kentucky Militia.*—Two captains, one lieutenant, one ensign, 104 N.C.O. and privates, of whom one ensign and five privates were wounded.

1*st Kentucky Rifles.*—One Major, two captains, four ensigns, 133 N.C.O. and privates, of whom two ensigns and six privates were wounded.

5*th Kentucky Militia.*—One Lieut-Colonel, one adjutant, one quartermaster, one surgeon, one surgeon's mate, three captains, one lieutenant, four ensigns, 180 N.C.O. and privates, of whom one sergeant, three corporals and seven privates were wounded.

2*nd Kentucky Militia.*—One captain, twenty privates.

Brigade Staff.—One brigadier-general, one brigade inspector, one aide-de-camp, one lieutenant 17th United States Infantry.

Of those reported killed or missing, twenty-five or thirty, including three officers, made their escape to the Miami. Forty or fifty others were carried off as prisoners by the Indians, most of whom were delivered up or ransomed in the course of six months, through the efforts of the officers of that department. Quite three hundred were killed, and the small number of wounded prisoners sufficiently indicates the merciless character of the pursuit.

The worst was yet to come. During the night a number of Indians intent on plunder stealthily returned to the River Raisin. Major Reynolds and two of the interpreters had been called away and but one remained, who was unfortunately not proficient in their language. The Indians ransacked the village and found a quantity of liquor. Many of them became drunk and began to rob and insult the wounded. The interpreter and surgeons were helpless. Words were succeeded by blows, and finally these wretches killed Captains Hart and Hickman and several privates who were unable to walk and carried off the remainder with the surgeons as prisoners. Several others whose strength failed on the march were instantly butchered. Not more than half the wounded left here eventually escaped death in this manner.[1]

It is, perhaps, not surprising that Procter was personally blamed for this massacre by his enemies, and indeed, he seems to have anticipated censure.

"My opinion of the enemy is not more favorable than it was from what I have seen and heard of them. They were armed with knives and tomahawks, and some of them used them. They fired at the wounded as they lay on the ground, themselves behind enclosures and in buildings. Every art, every means have been employed to prejudice and influence these misguided people against us. There have been some instances, I am sorry to say, of Indian barbarity; but the example was set by the enemy they came to seek. I know we shall be vilified, for the truth is not in them. I have not anything to accuse myself of."[2]

In evidence of this he enclosed an extract of letter written to him from Sandwich on January 29 by General Winchester, in which that officer said:

"You will please to be assured, sir, that I feel a high sense of gratitude for the polite attention shown to myself as well as for the humanity and kindness with which you have caused the prisoners to be treated who fell into your hands on the 22nd instant."[3]

The appearance of these men generally was uncouth and repellant.

[1] Am. State Papers, Military Affairs, I, 367–75; Atherton, 70–5.

[2] Procter to Sheaffe, 1st February, 1813.

[3] Winchester to Procter, 29th January, 1813.

They were haggard and unshaven. Their clothing was tattered and dirty with many months' wear. Numbers of them still wore the grimy linen hunting frocks and trousers they had on when they marched from Kentucky in mid-summer. Blankets were wrapped about their waists to protect them from the cold and kept in place by broad leather belts, in which were suspended huge knives and tomahawks. Their long, tangled locks were covered with shabby slouched hats. Some wore leather stocks with a metal badge representing an eagle picking out the eyes of a lion. The great majority seemed sullen and dejected; but some maintained an appearance of bravado and defiance, one of whom excited peals of laughter from his captors by exclaiming in a tone of amazement, "Well! You have taken the greatest set of gamecocks that ever came from Kentuck!"[1]

There were no buildings at Amherstburg adequate for the accommodation of so many prisoners, and on the night of the 23rd all but the officers were penned in a woodyard exposed to a chilling rain. If they were paroled and sent home by the route they had advanced, the poverty of his means of defence would at once be disclosed, and probably other troops upon the line of communication would be liberated to renew the attack. The Indians proposed that some of them should be offered in exchange for the Wyandots detained at Sandusky; but Procter deemed this scarcely expedient. Yet it was necessary to get rid of them immediately, as he could neither house them, feed them, nor furnish the necessary guards without great difficulty. He accordingly determined to march them overland to Niagara, to be there paroled or forwarded to Quebec. On January 25th they were marched to Sandwich, where the wounded and others declared unfit for the journey were detained and lodged in the Court-house in charge of the sheriff.[2]

Procter's first act on his return was to write to General Sheaffe in the most urgent terms to send him a reinforcement of at least one company of regulars to make good his loss in the action. This was done with such promptitude that the light company of the 41st met the prisoners at Oxford and arrived at Amherstburg on February 7.

Meanwhile he had learned with much alarm that a number of the inhabitants of "that depot of treachery, Detroit," had formed a plot to overpower the militia garrison and make themselves masters of the fort while he was engaged at the River Raisin. The rapidity of his movements had alone prevented the execution of this design and it became known to him soon after his return. A letter from Woodward to Monroe was intercepted, which decided Procter to remove him from

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[1] Atherton, 54; Richardson, 140; Darnell, 72.

[2] Wm. Hands to ———

office as "an artful, designing, ambitious young man" who was endeavouring to "ingratiate himself with his own government and to court popularity." The Territory of Michigan was placed under martial law and one hundred and four of "the more suspicious and turbulent characters", among them Captain Brevoort and William Macomb, whose son was a colonel in the United States army, were ordered to proceed under military escort to Niagara. A few of these were British subjects; but the majority had actually become prisoners of war under the capitulation and had given their parole.[1] A report that Harrison had again advanced to the Miami with an overwhelming force emboldened twenty-nine of these malcontents to meet and pass a series of resolutions protesting against this order as "an unjustifiable and wanton invasion of private rights," and "a flagrant and gross violation of the third article of the capitulation." They declared their intention of maintaining a "strict and exemplary neutrality," adding that if there were any among them "whose conduct and behaviour does not strictly comport with the spirit and meaning of the preceding resolution they ought not to be screened from punishment." Woodward was requested to present these resolutions to Colonel Procter and urge him to revoke the obnoxious order. He took advantage of this opportunity to complain that some of the prisoners and some inhabitants had been killed by the Indians since the action at Frenchtown, and some houses burnt, and to propose a new convention on behalf of the residents of Detroit. He asked that a military force should be stationed there to protect the inhabitants "from slaughter, conflagration and plunder" and that they should be armed and organized for their own defence. All Indians should be prohibited from entering the region extending from the River Aux Ecorces to Grosse Point and from carrying scalps through the town. Procter was requested to name eighteen persons from whom they would choose six as hostages, while they would name eighteen from whom he might select six to act as commissioners "to apprehend all persons who should violate their neutrality or give rise to probable suspicion thereof." This agreement should then be submitted to the American commander for his ratification. Woodward cited the conventions adopted by Montgomery at Montreal and the Marquis de Bouillé at Tobago in support of his proposal. Procter was greatly enraged. He declared that Woodward's letter was "insolent" and that the resolutions were "indecent," and ordered the deportation of the suspects to be put into effect without delay. Woodward was required to name a day to substantiate his charges respecting the murder of prisoners. Many residents of Detroit were British subjects by birth, and Procter now proposed to arm for their own defence all

[1] Procter to Sheaffe, 4th February, 1813; Farmer, History of Detroit.

who were willing to take the oath of allegiance, while an oath of neutrality would be required from "confirmed citizens of the United States." His situation was still extremely precarious, as Harrison had actually advanced to the Miami and might at any time be expected to move upon Amherstburg with more thousands of troops than he had hundreds to oppose them. The Indians and militia might indeed be relied on for support as long as there was some probability of success; but a reverse would dishearten and disperse them. He had already witnessed the powerful effects of hope and fear on the minds of both. His influence over the Indians in particular, largely depended upon their estimate of his strength, and he declared that not less than an entire regiment of regular troops would be necessary to ensure the safety of the military posts and shipping.[1]

He had shown conspicuous energy and decision on all occasions and there seemed little reason to suspect that he would be found wanting in future.

Woodward, who had excellent opportunities of observation and was a keen and by no means a friendly critic, wrote with unrestrained admiration:

"The operations of the British commander are marked with the same minute correctness of judgment in this instance and the same boldness of conception and execution which distinguished in the former instance his illustrious predecessor, General Brock. It is a military movement of equal and in fact of greater splendor."[2]

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[1] Conditions proposed for a convention; Woodward to Procter, 2nd February, 1813; Procter to Sheaffe, 4th February, 1813; Procter to Baynes, 31st January, 1813; Procter to Sheaffe, 2nd February, 1813.

[2] Woodward to Monroe, 31st January, 1813.

VII.—*A List of the Members of the House of Assembly for Upper Canada from* 1792, *to the Union in* 1841.

By WILFRED CAMPBELL, LL.D.

(Read in part 27th May, 1909.)

The following list of the members of the House of Assembly for Upper Canada from the foundation of the Province by Simcoe in 1792, to the Union of the two Canadas in 1841, is, so far as the compiler is aware, the first complete list of the members of that House which has ever been made.

This list has been gathered, not from any previously printed lists of any of the Parliaments, but solely from the manuscript and other Journals of the House, and from other documentary sources, available in the Archives and elsewhere.

As the Journals of the House of Assembly for the years 1794, 1795, 1796, 1797, 1809, the 2nd Session of 1812, 1813, and 1815 are missing, it has been very difficult to secure a correct list of the members of the Parliaments opening during those years. This, however, has been accomplished; though, in one or two cases, there is some doubt as to what particular member represented a certain riding. But throughout the whole of the thirteen Parliaments the names of all the members elected at the general and bye-elections are established.

It would be interesting in connection with such a list, to procure political maps of the Province, showing the birth and gradual growth of the different ridings .

The original division of the Province in 1792 gave sixteen members representing nineteen counties. A new Act was passed in 1800, increasing the representation to nineteen members; and in 1808 another Act increased it to twenty-five.

In 1820 a further Act made a great increase in the representation.

It provided that every county of one thousand souls should have one member, and every county having four thousand souls, two members; also that every town of one thousand souls, where quarter sessions were held, should have one member.

This gave, in the next Parliament, which met on the 31st of January, 1821, forty members, representing twenty-five counties or ridings and two towns.

This Act of 1820, also provided for a member to represent the University and the tract of land containing it, which was formed for that purpose into a separate riding. The member for this special riding was to be elected by the members of the Convocation when the University should be organized and performing its work.

First Parliament, 1792–1796. John Graves Simcoe, Lieut.-Governor; Hon. William Osgoode, Chief Justice; Colonel John Macdonell, Speaker of Assembly. The division of the Province provided for sixteen members. See page 212, Q. 278.

Counties and Ridings.	Representatives.
Glengarry, first riding	Hugh Macdonell (brother to Col. John), petitions for land, as—24 May, 1793.) Appointed on Committee to His Excellency, 18 Sept., 1792. (Journal)
Glengarry, second riding	Colonel John Macdonell, first Speaker of Assembly, mentioned 17 Sept., 1792; takes oath, June 9, 1798. (Journal).
Stormont	Capt. Jeremiah French, on Committee of House, 21 Sept., 1792. Presented petition of some inhabitants of Stormont, 3 Oct., 1792. (Journal).
Dundas	Alexander Campbell, on Committee of House, 21 Sept., 1792. (Journal). On Lord Dorchester's list as "Alexander Campbell, Lieut. Royal Rangers.
Grenville	Ephraim Jones, on Committee 18 Sept., 1792, moves bill *re* wolves, 24 Sept. 1792. (Journal).
Leeds and Frontenac	John White, first Attorney General, see Simcoe's despatch to Dundas, 4 Nov., 1792; also White's petition for land as Attorney General, 20 Oct., 1792. On Committee, 18 Sept., 1792. (Journal). Killed in a duel with John Small, 1801.
Ontario and Addington	Joshua Booth, present 10 June, 1793. (Journal). In Lord Dorchester's list as S. G. Sergeant, residence, Ernestown.
Prince Edward and District of Adolphus	Philip Dorland, of Adolphustown, Quaker, elected on writ bearing date on or about 16 July, 1792; refused oath as a Quaker; seat vacated. His Memorial read to House, 19 Sept., 1792; also decision of House, same date.
	Peter Vanalstine succeeds Dorland, takes seat 2nd Session. Writ returned 31 May, 1793; takes seat 1st June, 1793. (Journal.)
Lennox, Hastings and Northumberland	Hazelton Spencer, in Chair of House, 26 Sept., 1792. (Journal). County Lieutenant for Lennox, 1803. Colonel, Lennox Militia.
Durham, York and first riding of Co. Lincoln	Nathaniel Pettitt, on Committee of House, 24 Sept., 1792. (Journal).
Lincoln, second riding	Benjamin Pawling, present 4 July, 1793. (Journal.)
Lincoln, third riding	Isaac Swayze, on Committee of House, 4 Oct., 1792. (Journal).

Counties and Ridings.	Representatives.
Lincoln, fourth riding, and Norfolk	Parshall Terry (not mentioned as a member in Journals of 1792-1793.) One of signers of a petition of inhabitants of Co. York, as Paschall Terry. Given as member elected for this Riding in Quebec Magazine for Dec., 1792.
Suffolk and Essex	David William Smith, succeeded as Speaker of Assembly. In chair of House, 18 Sept., 1792. (Journal). Mentioned as elected, by Simcoe, in letter of 4 Nov., 1792. Became Acting Surveyor General, retired and went to England to reside, created a Baronet.
Kent	William Macomb, on Committee of House, 4 Oct., 1792. (Journal).
	Francis Baby, on Committee of House, 24 Sept., 1792. (Journal).

Note.—The Journals of the first Parliament for the years 1794, 1795 and 1796 are lost.

Second Parliament, 1797—7th July, 1800, opened at York, 16th May, 1797. Peter Russell administering the Government. John Elmsley, Chief Justice. Hon. David William Smith, Speaker of Assembly, 1797 to 1800. Samuel Street, succeeds as Speaker, 5th June 1800.

Counties and Ridings.	Representatives.
Glengarry, first riding	Captain Richard Wilkinson, absent on call of House, 2nd Session, 9 June, 1798. On Committee of House, 18 June, 1798. (Journal.)
Glengarry, second riding	Colonel John Macdonell, takes oath and seat, 9 June, 1798. (Journal).
Stormont	Robert I. D. Gray, Solicitor General, signed notice of death of member for Addington as member for Stormont, 20 Nov., 1798; took oath as Solicitor General. 18 July, 1796. (Journal).
Dundas	Captain Thomas Fraser, presented a petition, 19 June, 1799. (Journal).
Grenville	Major Edward Jessop, presents William Fairfield as member, 12 June, 1799 (Journal); also a petition, 2 June, 1798.
Leeds and Frontenac	Solomon Jones, M.D., in Chair of the House, 3 July, 1798. (Journal).

Counties and Ridings.	Representatives.
Ontario and Addington	Christopher Robinson (Ensign Queen's Rangers), died, 2 Nov., 1798. See notice of his death as member for Addington, read in House, 12 June, 1799. (Journal).
	William Fairfield succeeds, takes oath and seat, 12 June, 1799. (Journal).
Prince Edward and District of Adolphus	David McGregor Rogers, introduced William Fairfield to House as member for Addington, 12 June, 1799. (Journal).
Lennox, Hastings and Northumberland	Colonel Timothy Thompson, absent on call of House, 9 June, 1798. Signs notice of death of member for Addington, as member for Lennox, 20 Nov., 1798. (Journal).
Durham, York, and first riding of Lincoln	Richard Beasley (Acting Commissary for 2 years—1777-1778), voted on division of House, 4 July, 1798. (Journal).
Lincoln, second riding	Hon. Samuel Street, Speaker, elected 5 June, 1800, voted on a division of House, 4 July, 1798. (Journal).
Lincoln, third riding	Hon. David William Smith, Speaker, 16 May, 1797, to 5 June, 1800. (See Journal, 20 Nov., 1798).
Lincoln, fourth riding and Norfolk	Benjamin Hardison, voted on a division of House, 4 July, 1798, seconded motion regarding Militia Bill, 26 June, 1799.
Suffolk and Essex	John Cornwall, of Colchester voted nay on a division *re* relief to Methodists, 26 June, 1799.
Kent	Captain Thomas Smith. His petition as member for Kent, 12 Aug., 1797; present 2 July, 1800.
	Captain Thomas McKee, takes oath and seat as one of members for Kent, 5 June, 1800; present, 2 July, 1800.

Note.—The Journal of the Second Parliament for the year 1797 is lost.

Third Parliament, 1800—14th May, 1804. Called to meet, 28th May, 1801. Peter Hunter, Lieutenant-Governor. Hon. David William Smith, Speaker during first and second Sessions. Hon. Richard Beasley, Speaker during third and fourth Sessions.

Counties and Ridings.	Representatives.
Glengarry and Prescott.....	Hon. Alexander Macdonell. See return of members elected, Journal, 1801. Sheriff. See Journal, 29 May, 1801, when he introduces his fellow member, Angus MacDonell, introduced to House as one of members for Glengarry, 29 May, 1801.
Stormont and Russell.....	Robert I. D. Gray. See return of members, Journal, 1801.
Dundas.....	Jacob Weager. See return of members, Journal, 1801.
Grenville.....	Samuel Sherwood. See return of members, Journal, 1801.
Leeds.....	William Buell. See return of members, Journal, 1801.
Frontenac.....	John Ferguson. See return of members, Journal, 1801.
Prince Edward.....	Ebenezer Washburn. See return of members, Journal, 1801.
Lennox and Addington	Colonel Timothy Thompson. See return of members, Journal, 1801.
Hastings and Northumberland	David McGregor Rogers. See return of members, Journal, 1801.
Durham, Simcoe and E. R. York.....	Justice Henry Alcock. See return of members, Journal, 1801. Unseated.
	Angus McDonell succeeds, takes seat, 30 July, 1801.
West York, 1st Riding Lincoln and Haldimand.....	Robert Nelles. See return of members, Journal, 1801
	Hon. Richard Beasley. See return of members, Journal, 1801. Speaker during 3rd and 4th Sessions.
Lincoln, 2nd, 3rd and 4th Ridings.....	Ralph Clench. See return of members, Journal, 1801.
	Isaac Swayze. See return of members, Journal, 1801
Norfolk, Oxford and Middlesex	Hon. David William Smith. See return of members, Journal, 1801. Speaker during first and second sessions.
Kent.....	Thomas McCrae. See return of members, Journal, 1801.
Essex.....	Mathew Elliott. See return of members, Journal, 1801.
	Captain Thomas McKee. See return of members, Journal, 1801.

Fourth Parliament, 1804–1808. Opened, 1st February, 1805, Peter Hunter, Lieutenant-Governor, died 21st Aug., 1805. Alexander Grant, President until Francis Gore took over the Administration, 25th August, 1806. Hon. Alexander Macdonell, Speaker.

Counties and Ridings.	Representatives.
Glengarry and Prescott	Alexander Macdonell, Speaker. See return of members, Journal, 1805.
Stormont and Russell	Robert Isaac Dey Gray, first Solicitor General. See return of members, Journal, 1805. Drowned, Oct., 1804.
	D'Arcy Boulton, elected, takes seat, 5 February, 1805. Second Solicitor General.
Dundas	John Crysler. See return of members, Journal, 1805.
Grenville	Samuel Sherwood. See return of members, Journal, 1805.
Leeds	Peter Howard. See return of members, Journal, 1805.
Frontenac	Allan McLean. See return of members, Journal, 1805.
Lennox and Addington	Thomas Dorland. See return of members, Journal, 1805.
Prince Edward	Ebenezer Washburn. See return of members, Journal, 1805.
Hastings and Northumberland	David McGregor Rogers. See return of members, Journal, 1805.
Durham, Simcoe and E. R. York	Angus Macdonell. See return of members, Journal, 1805. Drowned, Oct., 1804; seat declared vacant, 2 February, 1805.
	William Weeks, elected, takes seat, 27 February, 1805. Killed in a duel, 1806.
	Robert Thorpe (Judge), takes seat, 26 January, 1807. Journal, 1807.
West York, 1st Lincoln and Haldimand	Solomon Hill. See return of members, Journal, 1805. Died, 30 Aug., 1807.
	Joseph Wilcocks takes seat, 26 Jan., 1808, succeeds Hill.
	Robert Nellis. See return of members, Journal, 1805.
Wentworth	James Durand, declared elected, 12 May, 1807. Journal, 1807.
Lincoln, 2nd, 3rd and 4th Ridings	Isaac Swayze. See return of members, Journal, 1805.
	Ralfe Clench. See return of members, Journal, 1805.
Norfolk, Oxford and Middlesex	Benajah Mallory. See return of members, Journal, 1805.
Kent	John McGregor. See return of members, Journal, 1805.
Essex	Mathew Elliott. See return of members, Journal, 1805.
	David Cowan. See return of members, Journal, 1805.

Fifth Parliament, 1808–1812. Called to meet 2nd February, 1809. —dissolved 1st May, 1812. Francis Gore, Lieutenant-Governor. General Isaac Brock, administering the Government during the 4th Session. Samuel Street, Speaker.

Counties and Ridings.	Representatives.
Glengarry	Alexander Macdonell, excused from attendance, 10 Feb., 1810. 2nd Session, Journal, 1810.
	Captain Thomas Fraser, informs the House of death of member for Stormont and Russell, 2 February, 1810. (Journal.)
Prescott	Thomas Mears, took oath and seat, 17 February, 1809. See letter, election papers, U.C. MSS. Room, Archives.
Stormont and Russell	John Brownell, returned at General Election, died, Dec., 1809. Journal, 2 February, 1810.
	Abraham Marsh, elected, 18 Sept., 1810; takes seat, 1 February, 1811. (Journal.)
Dundas	Henry Marcle, absent first session, took oath and seat, 1 February, 1810. (Journal.)
Grenville	Stephen Burritt, presents petition from inhabitants of Grenville, 3 February, 1810. (Journal.)
Leeds	Peter Howard, seconds motion on Highways Bill, 5 February, 1810. (Journal.)
Frontenac	Allan McLean, absent on call of House, 3 Feb., 1810. (Journal).
Prince Edward, except Ameliasburgh	James Wilson, unseated, 3 March, 1810.
	John Stinson, elected, takes seat, 1 February, 1811, 2nd Session. (Journal).
Lennox and Addington	John Roblin, unseated, 7 Mar., 1810.
	Willett Casey, took seat, 1 February, 1811, 3rd Session. (Journal).
	Thomas Dorland, voted on division, 5 February, 1810. (Journal).
Hastings and Township of Ameliasburgh	James McNabb, as member of House, took part in election trial, 6 Mar., 1810. (Journal).
Northumberland and Durham	David McGregor Rogers, voted on division, 3rd February, 1810. (Journal).
York, E. R., and Simcoe	Thos. B. Gough, introduces member for W. York, 1 Feb., 1810. (Journal).
York, W. Riding	Richard Beasley, unseated, 1809. See Journal, 7 Mar., 1810.
	John Wilson, elected, takes oath and seat, 2nd Session, 1 Feb., 1810. (Journal).

Counties and Ridings.	Representatives.
Lincoln, 1st Riding and Haldimand	Joseph Wilcocks, introduces a motion, 2 Feb., 1810. (Journal).
	Levi Lewis, votes on division, 2 Feb., 1810. (Journal)
Lincoln, 2nd Riding	David Secord, votes on division, 3 Feb., 1810. (Journal).
Lincoln, 3rd Riding	Hon. Samuel Street, Speaker. See address in reply to Speech, 3 Feb., 1810. (Journal).
Lincoln, 4th Riding	Crowell Willson, of Crowland, motion *re* Schools, 3 Feb., 1810. (Journal).
Oxford and Middlesex	Benejah Mallory, absent 1st Session, took oath and seat, 1 Feb., 1810. (Journal).
Norfolk	Philip Sovereign, votes on motion, 5 Feb., 1810.
Kent	John McGregor, absent on call of House, 5 Feb., 1810. (Journal).
Essex	Mathew Elliott, absent on call of House, 5 Feb., 1810. (Journal).
	J. B. Baby, absent on call of House, 5 Feb., 1810. (Journal).

Note.—The Journal for the first session of the Fifth Parliament, 1809, is lost.

Sixth Parliament, 30th June, 1812—1st June, 1816. Opened 27th July, 1812, in Special Session—adjourned. Aug., 1812. Francis Gore, Lieut.-Governor, on leave. Major-General Isaac Brock, President. Allan McLean, Esq., Speaker. (The following list, with the exception of the references to the Journals, is copied from a list of members returned in 1812, signed, Wm. Jarvis, Sec'y; in Dom. Archives.)

Counties and Ridings.	Representatives.
Glengarry	Alexander McMartin, present 19 Feb'y., 1814. (Journal). John Macdonell, (dead). Now Alexander MacDonell, absent, prisoner with enemy 19 Feb'y., 1814 (Journal).
Prescott	Thomas Mears, present 19 Feb'y, 1814, (Journal).
Stormont and Russell	John Beikie, present 19 Feb'y, 1814. (Journal).
Dundas	John Chrysler, present 19 Feb'y, 1814. (Journal).
Grenville	Gideon Adams, present 19 Feb'y, 1814. (Journal).
Leeds	Levius P. Sherwood, present 19 Feby., 1814. (Journal).
Frontenac	Allan McLean, Speaker, present 19 Feb'y., 1814. (Journal).

Counties and Ridings.	Representatives.
Prince Edward, except Ameliasburgh	John Stinson, present 19 Feb'y, 1814. (Journal).
Lennox and Addington	Benjamin Fairfield, present 19 Feb'y., 1814. (Journal). Timothy Thompson, present 19 Feb'y., 1814. (Journal).
Hastings and Township of Ameliasburgh	James Young, present 19 Feb'y., 1814. (Journal).
Northumberland and Durham	David McGregor Rogers, present 19 Feb'y., 1814. (Journal).
York, E.R., and Simcoe Co.	Thomas Ridout, present 19 Feb'y., 1814. (Journal).
York, W.R., Saltfleet, Ancaster, &c.	John Wilson, absent ill 19 Feb'y., 1814. (Journal). Abraham Markle, (deserted to the enemy) referred to in Address 17 Feb'y., 1814. James Durand, succeeds, present 7 Feb'y., 1816. (Journal).
Lincoln, 1st Riding	Joseph Willcocks, (deserted to the enemy) referred to in Address, 17 Feb'y., 1814. Robert Nelles, succeeds, present, 6 Feb'y., 1816. (Journal).
Lincoln, 2nd Riding	Ralfe Clench, absent, prisoner with the enemy, 19th Feb'y., 1814. (Journal).
Lincoln, 3rd Riding	Thomas Dickson, present 19 Feb'y., 1814. (Journal).
Lincoln, 4th Riding	John Fanning, (dead). Now Isaac Swayze; Swayze present, 19 Feb'y., 1814. (Journal).
Oxford and Middlesex	Mahlon Burwell, present 19 Feb'y., 1814. (Journal).
Norfolk	Robert Nichol, present 19 Feb'y., 1814. (Journal).
Kent	John McGregor, absent, prisoner with the enemy, 19 Feb'y., 1814, takes seat 13 Feb'y., 1816. (Journal).
Essex	Richard Pattinson, present 19 Feb'y., 1814. (Journal). William McCormick, absent, prisoner with the enemy, 19 Feb'y., 1814. (Journal).

Note.—The Journals for the first (Special) Session 1812, and the 2nd Session, 1813, of the sixth Parliament, are lost, having been destroyed by the enemy at the capture of York, 27th, 29th April, 1813.

Seventh Parliament, 1st June, 1816–1820. Opened 4th February, 1817. On the 5th February, 1817, a Bill passed the House, constituting the two new ridings of Halton and Wentworth out of the old double riding of West York, Saltfleet and Ancaster. Francis Gore, Esq., Lieutenant-Governor until August, 1818. Samuel Smith, Administrator, 1817 to 1818. Sir Peregrine Maitland succeeds as Lieutenant-Governor, August 1818, Speaker, Allan McLean.

Counties and Ridings.	Representatives.
Glengarry	Alexander McMartin, gen. election. (Journal).
	John Cameron, gen. election. (Journal).
Prescott	John Macdonell, gen. election. (Journal).
Stormont and Russell	Philip VanKoughnet, gen. election. Journal).
Dundas	John Chrysler, takes seat 10 Mar., 1817. (Journal).
Grenville	Jonas Jones, gen. election. (Journal).
Leeds	Peter Howard, gen. election. (Journal).
Frontenac	Allan McLean, Speaker, gen. election. (Journal).
Prince Edward, except Ameliasburgh	James Cotter, gen. election. (Journal).
Lennox and Addington	Willett Casey, gen. election. (Journal).
	Isaac Fraser, gen. election. (Journal).
Hastings and Townships of Ameliasburgh	J. McNabb, gen. election. (Journal).
Northumberland and Durham	Zaccheus Burnham, gen. election. (Journal).
York, E. Riding	Peter Robinson, gen. election. (Journal).
Lincoln, 1st Riding	Robert Nelles, gen. election. (Journal).
Lincoln, 2nd Riding	Ralfe Clench, votes, 1st on 27 Feb'y., 1817.
Lincoln, 3rd Riding	David Secord, gen. election. (Journal).
Lincoln, 4th Riding	Isaac Swayze, gen. election. (Journal).
Oxford and Middlesex	Mahlon Burwell, gen. election. (Journal).
Norfolk	Robert Nichol, gen. election. (Journal).
Essex	William McCormick, gen. election. (Journal).
	George B. Hall, gen. election. (Journal).
Kent	Joshua Cornwall, took seat 8 Feb'y., 1817.
Wentworth	James Durand, took seat 25 Feb'y., 1817. Attack on House, 1 Mar., 1817. (Journal). Expelled 7 Mar., 1817. New writ, re-elected, takes seat 6 Feb'y., 1818.
Halton	Moses Gamble, takes seat 25 Feb'y., 1817, not qualified; new election, 24 Mar., 1817.
	Richard Hatt, takes seat, 6 Feb'y., 1818. Hatt, died before 21 Feb'y., 1820. New writ ordered, 22 Feb'y., 1820.

Eighth Parliament, 1820–1824. Opened 31st January, 1821. Sir Peregrine Maitland, Lieutenant-Governor, Levius P. Sherwood, Speaker. In 1820 a new Act provided one member for every county of 1,000 souls; two members for those of 4,000 souls, and one member for every town of 1,000 souls where quarter sessions were held.

Counties and Ridings.	Representatives.
Glengarry	Alexander Macdonell, (residence, York), gen. election. (Journal).
	Alexander McMartin, (residence, Cornwall), gen. election. (Journal).
Prescott and Russell	William Hamilton, gen. election, takes seat, votes 5 Feb'y., 1821, declared not elected 24 Mar. 1821. (Journal).
	David Pattie, declared elected, takes seat, 24 Mar., 1821. (Journal). (Residence, Hawkesbury).
Stormont	Archibald McLean, gen. election. (Journal). (Residence, Cornwall).
	Philip VanKoughnet, gen. election, (Journal). (Residence, Cornwall).
Dundas	Peter Shaver, gen. election. (Journal). (Residence, Matilda).
Grenville	Walter F. Gates, gen. election. (Journal). (Residence, Johnstown).
	Jonas Jones, gen. election. (Journal). (Residence, Brockville).
Leeds	Levius P. Sherwood, Speaker, gen. election. (Journal). (Residence, Brockville).
	Charles Jones, gen. election. (Journal). (Residence, Brockville).
Frontenac	Allan McLean, gen. election. (Journal). (Residence, Kingston).
Carleton	William Morris, gen. election, (Residence, Perth).
Kingston (town)	Christopher Alexander Hagerman, Gen. Election. (Residence, Kingston).
Lennox and Addington	Samuel Casey, gen. election. (Journal). (Residence, Adolphustown).
	Daniel Hagerman, gen. election. (Journal). Died, before 2 Oct., 1821. (Journal).
	Barnabas Bidwell, succeeds 2nd session, petition against, 24 Nov., 1821. (Journal).
Prince Edward	James Wilson, gen. election. (Journal). (Residence, Hallowell).
	Paul Peterson, gen. election. (Journal). (Residence, Hallowell).
Hastings	Reuben White, gen. election, (Journal). (Residence, Belleville).
Northumberland	David McGregor Rogers, gen. election. (Journal). (Residence, Haldimand).
	Henry Ruttan, gen. election. (Journal). (Residence, Haldimand).
Durham	Samuel Street Wilmot, gen. election. (Journal). (Residence, Clarke).

Counties and Ridings.	Representatives.
York (town)	John Beverly Robinson, gen. election. (Journal). (Residence, York).
York and Simcoe	Peter Robinson, gen. election. (Journal). (Residence, Newmarket).
	William Wilcocks Baldwin, gen. election (Journal). (Residence, Spadina).
Wentworth	George Hamilton, gen. election, (Journal). (Residence, Hamilton).
	John Willson, gen. election, (Journal). (Residence, Saltfleet)
Halton	James Crooks. gen. election, (Journal). (Residence, Dundas).
	William Chisholm, gen. election, (Journal). (Residence, Nelson).
Lincoln, 1st riding	John Clarke, gen. election, (Journal). (Residence, St. Catharines).
Lincoln 2nd riding	William J. Kerr, gen. election, (Journal). (Residence, Waterford).
Lincoln, 3rd riding	Robert Hamilton, gen. election, (Journal). (Residence, Queenstown).
Lincoln, 4th riding	Robert Randall, gen. election, (Journal). Residence, Queenstown).
Oxford	Thomas Horner, gen. election, (Journal). (Residence, Burford.)
Middlesex	Mahlon Burwell, gen. election, (Journal). (Residence, Port Talbot).
	John Bostwick, took seat, 17 Mar., 1821, (Journal). (Residence, Talbot settlement).
Norfolk	Robt. Nichol, gen. election, (Journal). (Residence, Stamford).
	Francis Legh Walsh, gen. election, (Journal). (Residence, Vittoria).
Essex	Francis Baby, gen. election, (Journal). (Residence, Sandwich).
	William McCormick, gen. election, (Journal). Took seat, 12 Feb'y., 1821, (Journal). (Residence, Amherstburgh).
Kent	James Gordon, gen. election, (Journal). (Residence, Amherstburgh).

Ninth Parliament, 1824–1828. Opened 11th January, 1825. Lieutenant-Governor, Sir Peregrine Maitland, to 5th November, 1828. John Wilson, Speaker.

Counties and Ridings.	Representatives.
Glengarry	Alexander Macdonell, gen. election, (Journal).
	Duncan Cameron, gen. election, (Journal). Election voided, new writ ordered, 12 Mar., 1825. P. 61. (Journal).
Prescott and Russell	Donald Macdonell, gen. election, (Journal).
Stormont	Archibald McLean, gen. election, (Journal).
	Philip VanKoughnet, gen. election. (Journal).
Dundas	John Chrysler, gen. election, (Journal).
Grenville	Jonas Jones, gen. election, (Journal).
	Hamilton Walker, gen. election, (Journal).
Leeds	Charles Jones, gen. election, (Journal).
	David Jones, gen. election, (Journal).
Lanark	William Morris, gen. election, (Journal).
Frontenac	Hugh C. Thomson. gen. election, (Journal).
	James Atkinson, absent on call of House, 28 Nov., 1825. (Journal).
Carleton	Col. Burke, on Committee of House, 28 Nov., 1825. (Journal).
Lennox and Addington	Marshall S. Bidwell, gen. election, (Journal).
	Peter Perry, gen. election, (Journal).
Prince Edward	James Wilson, took seat 15 Jan'y., 1825. (Journal).
	Paul Peterson, gen. election. (Journal).
Hastings	Reuben White, gen. election. (Journal).
	Thomas Coleman, gen. election, (Journal).
Northumberland	Zaccheus Burnham, gen. election, (Journal).
	James Lyons, seat voided, 23 Feb'y., 1825.
	Benjamin Ewing, declared elected. Lyons protests Ewing. Lyons finally declared elected, 28 Mar., 1825. (Journal).
Durham	George Strange Boulton, unseated; new writ ordered, 1 Mar., 1825. 2nd Session.
	Charles Fothergill, succeeded, present 7 Nov., 1825.
York (town)	John Beverley Rohinson, gen. election. (Journal).
Kingston (town)	Cumming, took seat, 15 Jan'y, 1825. (Journal).
York Co., and Simcoe	William Thompson, gen. election. (Journal).
	Ely Playter, gen. election. (Journal). Withdrew from Province, seat declared not vacated, 17 Feb'y., 1827. (Journal).
Wentworth	John Wilson, gen. election. (Journal).
	George Hamilton, gen. election. (Journal).
Halton	Richard Beasley, gen. election, (Journal).
	William Scollick, gen. election. (Journal).
Middlesex	John Rolph, gen. election. (Journal).
	John Mathews, gen. election, tried by Committee of House, 31 Dec., 1825. (Journal.)

Counties and Ridings.	Representatives.
Niagara (town)	Edward McBride, gen. election. (Journal).
Lincoln, 1st riding	John Clark, gen. election. (Journal).
Lincoln, 2nd and 3rd ridings	Bartholomew C. Beardsley, gen. election. (Journal)
	John J. Lefferty, M.D., gen. election. (Journal).
Lincoln, 4th riding	Robert Randall, gen. election. (Journal).
Oxford	Thomas Horner, gen. election. (Journal).
	David Jones, gen. election. (Journal).
	Charles Ingersoll, 2nd Session. (Journal).
Norfolk	Francis L. Walsh, gen. election. (Journal).
	Duncan McCall, gen. election. (Journal).
Essex	Alexander Wilkinson, gen. election. (Journal).
	Francis Baby, gen. election. (Journal). Tied with N. Lyttle. Baby appealed, 17 Jan'y., 1825. (Journal).
Kent	James Gordon, gen. election. (Journal).

Tenth Parliament, 1828–1830. Opened 8th January, 1829. Sir Peregrine Maitland, Lieutenant-Governor, to 5th November, 1828. Election in August, 1828. Sir John Colborne, Lieutenant-Governor from 5th November, 1828. Marshall Spring Bidwell, Speaker.

Counties and Ridings.	Representatives.
Prescott and Russell	Donald Macdonald, gen. election. (Journal).
Glengarry	Alexander Fraser, gen. election. (Journal).
Stormont	Archibald McLean, gen. election. (Journal).
	Ambrose Blacklock, gen. election. (Journal).
Dundas	Peter Shaver, gen. election. (Journal).
	George Brouse, gen. election. (Journal).
Grenville	George Longley, gen. election. (Journal).
	Rufus E. Henderson, gen. election. (Journal).
Leeds	John Kilborn, gen. election. (Journal).
	William Buell, Junior, gen. election. (Journal).
Lanark	William Morris, gen. election. (Journal).
Frontenac	Hugh C. Thompson, gen. election. (Journal).
	Thomas Dalton, gen. election. (Journal).
Kingston	Donald Bethune, gen. election. (Journal).
Carleton	Thomas Radenhurst, gen. election. (Journal).
Lennox and Addington	Marshall Spring Bidwell, gen. election. (Journal).
	Peter Perry, gen. election. (Journal).
Hastings	Joseph N. Lockwood, gen. election. (Journal).
	James H. Samson, gen. election. (Journal).

Counties and Ridings.	Representatives.
Prince Edward	Paul Peterson, gen. election. (Journal).
	James Wilson, gen. election. (Journal).
Northumberland	James Lyons, gen. election. (Journal).
	Benjamin Ewing, gen. election. (Journal).
Durham	John David Smith, gen. election. (Journal).
	Charles Fothergill, presents petition, 19 Jan'y, 1829. (Journal).
York	Jesse Ketchum, gen. election. (Journal).
	William Lyon McKenzie, gen. election. (Journal).
Simcoe	John Cawthra, gen. election. (Journal).
Middlesex	John Mathews, gen. election. (Journal).
	Dr. John Rolph, gen. election. (Journal).
York (town)	John Beverley Robinson, gen. election. (Journal).
Halton	George Rolph, gen. election. (Journal).
	Caleb Hopkins, gen. election. (Journal).
Lincoln, 1st and 2nd ridings	William Terry, gen. election. (Journal).
	William Woodruff, gen. election. (Journal).
Lincoln, 3rd riding	John J. Lefferty. gen. election. (Journal).
Lincoln, 4th riding	Robert Randall, gen. election. (Journal).
Wentworth	John Wilson, gen. election. (Journal).
	George Hamilton, gen. election. (Journal).
Niagara (town)	Robert Dickson, gen. election. (Journal).
Norfolk	Duncan McColl, gen. election. (Journal).
	Dr. William Warren Baldwin, gen. election. (Journal).
Oxford	Thomas Hornor, gen. election. (Journal).
	Finlay Malcolm, gen. election. (Journal).
Essex	John A. Wilkinson, gen. election. (Journal).
	Francis Baby, gen. election. (Journal).
Kent	William Berczy, voted on Division of House, 24 Feb'y, 1829. (Journal).

Eleventh Parliament, 1830–1834. Opened 7th January, 1831. Sir John Colborne, Lieutenant-Governor. Archibald McLean, Speaker.

Counties and Ridings.	Representatives.
Glengarry	Alexander McMartin, gen. election. (Journal).
	Alexander Fraser, gen. election. (Journal).
Prescott and Russell	Donald Macdonald, gen. election. (Journal).
Stormont	Archibald McLean, gen., election. (Journal).
	Philip Van Koughnet, voted on Division of House, 2nd Dec., 1833. Presented petition of Inhabitants of Cornwall, 3 Dec., 1833. (Journal).

Counties and Ridings.	Representatives.
Dundas	Peter Shaver, gen. election. (Journal).
	John Cook, on Committee of House, 3 Dec., 1833. Leave granted to 8 Jan'y, 1834. (Journal).
Grenville	Richard Duncan Fraser, gen. election. (Journal)
	Edward Jessup, gen. election. (Journal). His death mentioned in House, 1 Nov., 1831; writ ordered.
	Hiram Norton, succeeds, takes seat, 21 Dec., 1831. (Journal).
Leeds	William Buell, Junior, gen. election. (Journal).
	Mathew H. Howard, gen. election. (Journal).
Brockville	Henry Jones, gen. election. (Journal).
Carleton	John Bower Lewis, gen. election. (Journal).
	Hamnet Pinney, declared elected 31 Oct., 1832, takes seat 2 Nov., 1832. George Lyon declared elected 16 Jan'y, 1833. Pinney unseated.
Lanark	William Morris, gen. election. (Journal).
	Donald Fraser, declared elected, 31 Oct., 1832, (3rd Session). Unseated, new writ ordered, 30 Nov., 1832.
Frontenac	Hugh Christopher Thompson, gen. election. (Journal).
	John Campbell, presents petition to House of Inhabitants of Loughborough, 15 Nov. 1832. (Journal).
Kingston	Christopher Alexander Hagerman, gen. election. (Journal).
Hastings	Reuben White, gen. election. (Journal).
	James Hunter Samson, gen. election. (Journal).
Lennox and Addington	Peter Perry, gen. election. (Journal).
	Marshall Spring Bidwell, gen. election. (Journal).
Prince Edward	Asa Werden, gen. election, unseated, new writ ordered, re-elected, 11 Mar., 1831, re-introduced to House, 17 Nov., 1831. (Journal).
	John Roblin. gen. election. (Journal).
Northumberland	Archibald Macdonald, gen. election. (Journal).
	James Lyons, absent on call of House, 13 Jan'y, 1834. (Journal).
	John Brown, gen. election. (Journal).
Durham	George Strange Boulton, gen. election. (Journal)
	Jesse Ketchum, gen. election. (Journal).
York Co	William Lyon McKenzie, gen. election. (Journal). Expelled House, 13 Dec., 1831, re-elected, 3 Jan'y, 1832, again expelled, re-elected, 16 Dec., 1833, again expelled, takes oath again, Feb. ,10, 1834, attempts to sit in House, discharged.
	William Botsford Jarvis, gen. election. (Journal).
York, (town)	

Counties and Ridings.	Representatives.
Simcoe	William Benjamin Robinson, gen. election. (Journal).
Middlesex	Mahlon Burwell, gen. election. (Journal).
	Roswell Mount, gen. election. (Journal).
Norfolk	Duncan McColl, gen. election, died before 14 Jan'y, 1833.
	Colin McNeilledge succeeds; took seat, 14 Jan'y, 1833. (Journal).
	William Wilson, gen. election. (Journal).
Oxford	Charles Ingersoll, gen. election, died before 8 Nov., 1832
	Thomas Hornor succeeds; takes seat, 9 Nov., 1832. (Journal).
	Charles Duncombe, gen. election. (Journal).
Essex	William Elliott, gen. election. (Journal).
	Jean Baptiste Macon, gen. election. (Journal).
Wentworth	John Wilson, gen. election. (Journal).
	Allan McNabb, gen. election. (Journal).
Halton	William Chisholm, gen. election. (Journal).
	Absolam Shade, takes seat, 2nd Session, 17 Nov., 1831. (Journal).
Haldimand	John Brant, gen. election, takes seat, but declared not elected, 1 Feb'y, 1831.
	John Warren, declared elected, same date. Warren died before, 7 Nov., 1831.
	William Hamilton Merritt succeeds; takes seat, 7 Nov., 1832. (Journal).
Niagara, (town)	Henry John Boulton, gen. election. (Journal).
Lincoln, 1st riding	John Clark, Chairman of a Committee of the House, 13 Feb'y, 1834. (Journal).
Lincoln, 2nd and 3rd ridings	William Crooks, gen. election. (Journal).
	Bartholomew C. Beardsley, gen. election. (Journal)
Lincoln, 4th riding	Robert Randall, gen. election. (Journal).
Kent	William Berczy. See report for West. Dist., 1828, p. 49. (Journal). On Committee of House, 26 Nov., 1833. (Journal).

Twelfth Parliament, 1834–1836. Opened 16th January, 1835. Sir John Colborne, Lieutenant-Governor. Marshall Spring Bidwell, Speaker.

Counties and Ridings.	Representatives.
Prescott	Alexander Macdonell, gen. election, his death reported to House, 27 Feb'y, 1835. New writ same date. (Journal).
	John Chesser, returned, 2 Apr., 1835. (Journal).
	Charles Waters, gen. election. (Journal).

Counties and Ridings.	Representatives.
Russell	Thomas MacKay, gen. election. (Journal).
Stormont	William Bruce, gen. election. (Journal).
	Donald A. E. Macdonell, gen. election. (Journal).
Glengarry	Donald Macdonell, gen. election. (Journal).
	Alexander Chisholm, gen. election. (Journal).
Dundas	John Cook, gen. election, (Journal).
	Peter Shaver, gen. election. (Journal).
Grenville	Hiram Norton, gen. election. (Journal).
	William B. Wells, gen. election. (Journal).
Leeds	Ogle R. Gowan, gen. election, unseated, 14 Feb'y, 1835, new writ issued.
	William Russell, declared elected, took seat, 12 Apr., 1836. (Journal).
	Robert S. Jameson, gen. election, unseated, 14 Feb'y, 1835, new writ issued.
	Mathew M. Howard, declared elected, 12 Apr., 1836. (Journal).
Carleton	Edward Malloch, gen. election. (Journal).
	John Bower Lewis, gen. election, (Journal).
Lanark	William Morris, gen. election, made a Legislative Councillor, 27 Jan'y, 1836, new writ ordered. (Journal).
	Josias Tayler, gen. election. (Journal).
Frontenac	Jacob Shibley, gen. election. (Journal).
	John Strange, gen. election. (Journal).
Brockville, (town)	David Jones, gen. election, seat contested, 28 Mar., 1835. (Journal). Jones sustained.
Kingston, (town)	Christopher A. Hagerman, gen. election. (Journal).
Cornwall, (town)	Archibald McLean, gen. election. (Journal).
Lennox and Addington	Marshall Spring Bidwell, Speaker. gen. election. (Journal).
	Peter Perry, gen. election. (Journal).
Hastings	Henry W. Yager, gen. election. (Journal).
	James Hunter Samson, died before, 30 Mar., 1836, new writ ordered of that date.
Prince Edward	John P. Roblin, gen. election. (Journal).
	James Wilson, gen. election. (Journal).
Northumberland	Alexander Macdonell, gen. election. (Journal).
	John Gilchrist, gen. election. (Journal).
Durham	George S. Boulton, gen. election. (Journal).
	John Brown, gen. election. (Journal).
Toronto (city)	James E. Small, gen. election, contested, Small, sustained, p. 280. (Journal).
York, 1st riding	David Gibson, gen. election. (Journal).
York, 2nd riding	William Lyon McKenzie, gen. election, (Journal).
York, 3rd riding	Thomas David Morrison, gen. election. (Journal).

Counties and Ridings.	Representatives.
York, 4th riding	John McIntosh, gen. election. (Journal).
Haldimand	William Hamilton Merritt, gen. election. (Journal).
Wentworth	Harmannus Smith, gen. election. (Journal).
	Jacob Rymal, gen. election. (Journal).
Halton	Caleb Hopkins, gen. election. (Journal).
	James Durand, gen. election. (Journal).
Lincoln, 1st riding	Dennis Woolverton, gen. election. (Journal).
Lincoln, 2nd riding	George Rykert, gen. election. (Journal).
Lincoln, 3rd riding	John Johnson Lefferty, declared elected by returning officer, never voted, unseated, 2 Feb'y, 1835. (Journal).
	David Thorburn, declared elected, 2 Feb'y, 1835. (Journal).
Lincoln, 4th riding	Gilbert McMicking, gen. election. (Journal).
Simcoe	William B. Robinson, gen. election. (Journal).
	Samuel Lount, gen. election. (Journal).
Hamilton (town)	Allan Napier MacNab, gen. election. (Journal).
Niagara	Charles Richardson, gen. election. (Journal).
Middlesex	Thomas Parke, gen. election. (Journal).
	Elias Moore, gen. election. (Journal).
Oxford	Charles Duncombe, gen. election. (Journal).
	Robert Alway, gen. election. (Journal).
Norfolk	Francis L. Walsh, gen. election. (Journal).
	David Duncombe, gen. election. (Journal).
Kent	William McCrae, gen. election. (Journal).
	Nathan Cornwall, gen. election. (Journal).
Essex	Francis Caldwell, gen. election. (Journal).
	John A Wilkinson, gen. election. (Journal).

Thirteenth Parliament, 1836–1841. Opened 8th November, 1836. Sir Francis Bond Head, K.H., Lieutenant-Governor to 23rd March, 1838. Sir George Arthur, Lieutenant-Governor, 23rd March, 1838 to February 10th, 1841, when the two Provinces of Upper and Lower Canada were united under one government.

Archibald McLean, Speaker from 9th November, 1836 to 4th March, 1837 (1st session). Allan Napier MacNab, Speaker from 19th June, 1837, to end of 2nd session, when he being on public duty, Henry Ruttan was elected Speaker at opening of the 3rd session, 28th December, 1837, to act during Mr. MacNab's absence. Mr. MacNab, resumed the Chair as Speaker on the 24th January, 1838, and continued as Speaker throughout the remaining sessions of the 13th Parliament, 1838–39 and 1839–40.

Counties and Ridings.	Representatives.
Glengarry	Donald Macdonell, gen. election. (Journal).
	Alexander Chisholm
Stormont	Archibald McLean, (Speaker 1st Session) appointed to Judgeship of King's Bench. (Journal).
	Alexander McLean, succeeds; takes seat, 20 Dec., 1837. (Journal).
	Donald Æneas McDonell, gen. election. (Journal)
Cornwall (town)	George S. Jarvis, gen. election. (Journal).
Dundas	Peter Shaver, gen. election. (Journal).
	John Coues, gen. election. (Journal).
Prescott	John Kearns, gen. election. (Journal).
	Richard Phillips Hotham, gen. election. (Journal).
Russell	Thomas MacKay, gen. election. (Journal).
Carleton	John Bower Lewis, gen. election. (Journal).
	Edward Malloch, gen. election. (Journal).
Lanark	John A. H. Powell, gen. election. (Journal).
	Malcolm Cameron, gen. election. (Journal).
Grenville	Hiram Norton, gen. election, resigned seat, Oct., 1838, goes to U.S. (Journal).
	Melo McCarger, succeeds, 15 Apr., 1839. (Journal).
	William B. Wells, expelled House, left country, new writ, 27 Feb'y, 1838. (Journal).
	Henry Burritt, succeeded, present, 4 Dec., 1839. (Journal).
Leeds	Jonas Jones, gen. election, appointed Registrar, Co. Dundas, new writ, 20 June, 1837. (Journal).
	James Morris, succeeds, takes seat 30 Dec., 1837. (Journal).
	Ogle Robert Gowan, gen. election. (Journal).
Brockville (town)	Henry Sherwood, gen. election. (Journal).
Frontenac	John Marks, gen. election. (Journal).
	James Mathewson, gen. election. (Journal).
Kingston (town)	Christopher Alexander Hagerman, gen, election. (Journal).
Lennox and Addington	John Solomon Cartwright, gen. election. (Journal).
	George Hill Detlor, gen. election. (Journal).
Hastings	Edmund Murney, gen. election. (Journal).
	Anthony Manahan, gen. election. (Journal).
Prince Edward	James Rogers Armstrong, gen. election. (Journal).
	Charles Bockus, gen. election. (Journal).
Northumberland	Alexander Macdonell, gen., election. (Journal).
	Henry Ruttan, gen. election. (Journal).
Durham	George Strange Boulton, gen. election. (Journal).
	George Elliott, gen. election. (Journal).

Counties and Ridings.	Representatives.
York, 1st riding	David Gibson, gen. election, expelled as a rebel, new writ ordered, 15 Jan'y, 1838. (Journal).
	John William Gamble, succeeds, takes seat, 5 Feb'y, 1838. (Journal).
York, 2nd riding	Edward William Thompson, gen. election. (Journal).
York, 3rd riding	Thomas David Morrison, gen. election. Left country, new writ ordered, 28 Mar., 1839. (Journal).
	James E. Small, succeeded, took seat, 29 Apr., 1839.
York, 4th riding	John McIntosh, gen. election. (Journal).
Toronto (city)	William Henry Draper, gen. election. (Journal).
Simcoe	William Benjamin Robinson, gen. election. (Journal).
	Charles Wickens, gen. election. (Journal).
Halton	William Chisholm, gen. election. (Journal).
	Absalom Shade, gen. election. (Journal).
Wentworth	Allan Napier MacNab, gen. election. (Journal).
	Michael Aikman, gen. election. (Journal).
Hamilton	Colin Campbell Ferrie, gen. election. (Journal).
Lincoln, 1st riding	Richard Woodruff, gen. election. (Journal).
Lincoln, 2nd riding	George Rykert, gen. election. (Journal).
Lincoln, 3rd riding	David Thorburn, gen. election. (Journal).
Lincoln, 4th riding	Gilbert McMicking, gen. election. (Journal).
Haldimand	William Hamilton Merritt, gen. election. (Journal).
Niagara (town)	Charles Richardson, gen. election. (Journal).
Middlesex	Thomas Parke, gen. election. (Journal).
	Elias Moore, gen. election. (Journal).
London (town)	Mahlon Burwell, gen. election. (Journal).
Oxford	Robert Alway, gen. election. (Journal).
	Charles Duncombe, fled from Justice as a Rebel, expelled from House, new writ ordered, 20 Jan'y, 1838. (Journal).
	Robert Rollo Hunter, succeeded, took seat, 27 Feb'y, 1839. (Journal).
Norfolk	David Duncombe, gen. election. (Journal).
	Dr. John Rolph, fled from Justice as a Rebel, expelled from House, 20 Jan'y, 1838. New writ ordered. (Journal).
	William Salmon, succeeds; took seat, 27 Feb'y, 1838. (Journal).
Kent	William McCrae, gen. election. (Journal).
	Nathan Cornwall, gen. election. (Journal).
Essex	John Prince, gen. election. (Journal).
	Francis Caldwell, gen. election. (Journal).
Huron	Robert Graham Dunlop, gen. election. (Journal).

Counties and Ridings.	Representatives.
	Members of the House of Assembly, connected with the Rebellion.
Norfolk	Dr. John Rolph, warrant out for, expelled, fled.
Oxford	Charles Duncombe, expelled, fled.
York, 3rd riding	Thomas D. Morrison, arrested, fled, on return tried and acquitted.
Middlesex	Elias Moore, arrested.
Oxford	Robert Alway, arrested.
Grenville	William B. Wells, expelled, left for States.
York, 1st riding	David Gibson, warrant for, expelled, fled.

See Lt. Governor's notice of warrants against members of Assembly, 15 Jan'y, 1838, in Journal of House.

VIII.—*The Epistles on the Romance of the Rose and other Documents in the Debate.*

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(Communicated by the REV. DR. GEORGE BRYCE, and read by title, 28 September, 1910.)

PREFATORY NOTE.

I am indebted for the subject treated in the following pages to suggestions made in a course on the history of the French language at the University of Chicago. I desire therefore first of all to express my sincere gratitude for the encouragement of Professor T. A. Jenkins, whose advice has been of inestimable value in the preparation of the dissertation.

The little work owes much to several writings of M. Arthur Piaget, particularly to his adjustment of the difficult question of the chronology of the letters, and to the essay on Martin Le Franc.

I desire to thank also, for several timely hints and very valuable suggestions, Professors W. A. Nitze, Karl Pietsch, P. S. Allen, and J. W. Thompson of the University of Chicago. I am also indebted to the late Professor John E. Matzke of the Leland Stanford, Jr., University.

I.—INTRODUCTION.

From its first appearance the *Roman de la Rose* enjoyed great vogue. We observe in this connection the glowing tributes of contemporary and succeeding writers, the numerous manuscripts, which compensate for the art of printing not then invented, the translations into English, Dutch, Italian, and other languages. Even the numerous paintings and tapestries of scenes from the romance point to its great popularity. Perhaps the remark of M. A. Coville crystallizes the general opinion:

"Parmi les livres du siècle précédent, un surtout fut lu de tous, admiré des uns, ardemment discuté par les autres, c'est le *Roman de la Rose.* La seconde partie avec sa science pédante, ses allégories, ses artifices, devint une nouvelle Bible, et Jean Clopinel de Meun, l'auteur, passa pour un véritable prophète. On retrouve son influence surtout chez les poètes et les moralistes."[1]

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[1] Lavisse, *Histoire de France,* t. iv, p. 405.

Naturally (and this is also an indirect testimony to the influence of the *Roman de la Rose*) there were those who found matter for serious complaint in the work of Jean de Meung, who in the second part placed the work of Guillaume de Lorris on a basis of profound philosophical import. As we shall see, Gerson, Chancellor of the University of Paris, saw the danger to morals in the average man's reception of a poem which tended to free him from all restraint. Christine de Pisan, too, with a much narrower range of thought, assails with singular energy and with the courage of her convictions a book which contains so many attacks on her sex.

If we analyse critically the influence of the second part of the *Roman de la Rose* we shall see that its fundamental purpose or idea (whether altogether so intended by Jean de Meung or not does not matter) was to disseminate in a popular form the philosophy of the Latin writers. To Jean de Meung must be given credit for the manner of the work, the handling of the material, but for the subject matter he is indebted to Plato, Aristotle, Cicero, Horace, Juvenal, etc., and especially to the *De Consolatione Philosophiæ* of Boethius, the *De Nuptiis* of Theophrastus, the *De Planctu Naturæ* of Alain de Lille, and to the *Ars Amatoria* and *Metamorphoses* of Ovid.[1] As a popular exposition of the favorite doctrines of Latin philosophy, as an encyclopædia of knowledge on almost every subject, good and evil, the nature of government, the Church, society, morals, manners, women, etc., etc., the *Roman de la Rose* was admired by the bourgeois, the average man. At a time when learning was only for the favored few, it is not much wonder that those who had formerly been excluded from the magic pale treasured a work which opened wide for them the portals of mental advancement.

It is this freedom or expression, so novel because so bold in the age in which he lived, that makes him characteristically French; while the objects to which it was directed, the attempt to be encyclopædic, and the constant appeal to a clear and uncompromising reason, lead us to agree (as far as such comparisons will hold) with Gaston Paris that Jean de Meung is the Voltaire of the Middle Ages. In this sense, too, he may be regarded as representing the *Aufklärung* which was logically required to prepare the way for the new and larger enthusiasm of the Renaissance.

About twenty-five years after Jean de Meung finished his masterpiece, another work was written which vehemently supported his attacks on women and marriage. This was the *Lamenta* of Matheolus, translated into French about the middle of the fourteenth century by

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[1] Cf. E. Langlois, *Origines et Sources du Roman de la Rose*, Paris, 1890, p. 130 sqq.

Jean le Fèvre under the title *Les Lamentations de Matheolus.*[1] Matheolus (or Mahieu as he was called in the dialect of his own district) looked at marriage from the standpoint of one who had suffered much from that institution. He was deprived of the privileges of the clerical order because he had married a widow, and failed to find in the latter's society sufficient compensations for this sacrifice. The *Lamenta,* inaccessible to the multitude, as had been indeed the sayings of the great Latin writers before they were put into popular form by Jean de Meung, became very widely read in the French translation made by Jean le Fèvre. It is interesting for us to note as chief sources of Matheolus' work: the *De Nuptiis* of Theophrastus, the *De Planctu Naturæ* of Alain de Lille, the collections of Exempla, and possibly the *Roman de la Rose* itself.

Jean le Fèvre, however, surprised at the success of the *Lamentations* in strengthening the hold of the philosophy of life taught in the *Roman de la Rose,* or feeling that this vivid presentation of the evils of the married state was considerably overdrawn, tried to stem the tide of feeling by writing a refutation of the *Lamentations,* which he called the *Livre de Leesce.*[2] This praiseworthy attempt failed completely, and the book against which it was directed, in spite of the attacks of Christine de Pisan,[3] who saw its real character, became more and more popular.

The influence of the *Roman de la Rose* is evident in the *Roman de Fauvel*[4] (which is likewise composed of two independent parts) particularly in its satires on the different classes of society and in its general pessimistic outlook upon life; and is still more strongly seen in the *Registre* of Gilles li Muisis.[5]

This Benedictine abbot was a great admirer of the famous romance, and traces of the thought contained therein may be plainly seen in his long arraignment of conditions then existing, as compared with the

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[1] Printed several times. Cf. *Le Livre de Matheolus, poème français du XIVe siècle,* par Jean le Fèvre, Brussels, A. Mertens et fils, 1864. M. A. Piaget quotes from the edition of Ol. Arnoullet, Lyons (Bib. Nat. Rés. Y, 4420). For a critical edition of both Latin and French texts cf. A. G. Van Hamel, *Les Lamentations de Matheolus et le Livre de Leesce de Jehan le Fèvre,* Paris, 1892-1905. Cf. also Ch.-V. Langlois, *La Vie en France au moyen-âge d'après quelques moralistes du temps,* Paris 1908, and Ed. Tricotel's analysis in the *Bulletin du Bibliophile* 32e année, 1866, pp. 552 sqq. I have not been able to consult V.-J. Vaillant, *Maistre Mahieu, satirique boulonnais du XIIIe siècle.*

[2] Ed. Michel LeNoir, Paris, 1518 (Bib. Nat. Rés. Y. 4421.)

[3] Cf. *La Cité des Dames,* as yet unpublished.

[4] Called the *Roman de Fauvel et Fortune,* dated 1314. Bib. nat. fr. 571. Published at St. Petersburg, 1888, by A. Bobrinsky and Th. Batiouchkof. Cf. C.-V. Langlois, *op. cit.* p. 277 sqq.

[5] *Poésies de Gilles li Muisis,* ed. Kervyn de Lettenhove, Louvain, 1882. The *Registre* was written probably in 1350.

ætas dorea, which to his old man's fancy had existed when he was a youth.

Eustache Deschamps (1338?–1415) naturally belongs on the side of Jean de Meung (whose disciple he may be said to be)with numerous *ballades* and his long poem against marriage, *Le Miroir de Mariage.*[1] In the works of Deschamps we find the epicureanism combined with genuine democratic feeling that we notice in the work of his master. *Le Miroir de Mariage* is not mentioned here, however, because it had a direct bearing upon our controversy. It seems not to have been known to Christine de Pisan or to her allies. It does nevertheless afford additional evidence of the far-reaching influence of the *Roman de la Rose.*

We remark that up to this point the great popularity of the *Roman de la Rose* had carried everything before it. Its influence upon literature was supreme. It was the masterly work which terminated the middle ages. But there was to be a reaction against its doctrines, and we come now to the first public challenge of the work of Jean de Meung, at the beginning of the fifteenth century.

Christine de Pisan was not the first woman to resent the insinuations against the feminine sex contained in many parts of the *Roman de la Rose*, if we are to believe the rather doubtful legend[2] concerning the ladies of the court who were going to whip the author, but she is certainly the first woman-writer to champion publicly the cause of her sex, insulted, as she believed, by the ungallant Jean de Meung. She is still as interesting to us by her character, her fate, and the influence of her spirit on her time, says Wieland in a little known essay,[3] as she once was to her contemporaries by her personal qualities and her works. In 1399 she wrote her *Epistre au dieu d'Amours*[4] (which for convenience of reference we call document I of the debate) which asks, why is it that women, formerly so esteemed and honored in France, are now attacked and insulted not only by the ignorant and base, but also by the educated, the noble, the priestly classes?

This poem naturally encountered opposition among the partisans of Jean de Meung, but Christine found powerful allies in Jean Gerson,

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[1] Cf. *Oeuvres complètes d'Eustache Deschamps*, pub. by the Marquis de Queux de Saint Hilaire and Gaston Raynaud, Paris, 1878-1903.

[2] The same story is told of Guilhem de Bergedam, a Provençal poet who lived before Jean de Meung. Cf. F. Michel: *Roman de la Rose*, t. I., p. xv-xvi, and M. Méon: *Roman de la Rose*, t. II., p. 230 note.

[3] *Ueber Christine von Pisan und ihre Schriften*, in *Der Teutsche Merkur*, 1781, pp. 200–229.

[4] Ed. M. Roy: *Oeuvres poétiques de Christine de Pisan* (in *Soc. des anc. textes franç.*) t. II., p. 1 sqq.

Chancellor of the University of Paris, Guillaume de Tignonville,[1] Prévot de Paris, and Marshal Boucicault.

The last named, indeed, who had just returned from his successful campaign in the East, founded in 1399 an order of knighthood expressly for the defence of women, called "l'écu verd à la dame blanche."[2]

A little later, February 14, 1400, St. Valentine's day, a number of great lords and poets assembled in the hôtel of the duc de Bourgogne in Paris and founded an extensive organisation called the "Cour Amoureuse,"[3] to honor ladies and cultivate poetry. All classes of society were represented in the six hundred members whose names have come down to us.[4] We are perhaps especially interested in noticing the names of Gontier Col, and his brother Pierre Col, probably the foremost disciples (with Jean de Montreuil) of Jean de Meung.

One year to the day after the formation of the "Cour Amoureuse," Christine de Pisan wrote her *Dit de la Rose*[5] (document II) In this she seems to be conscious (probably from support given her by the "Cour Amoureuse" and by the queen) of having an established position as a defender of her sex.

The controversy seems to have commenced,[6] as was very natural considering the circumstances, with oral discussions between Christine de Pisan, Jean de Montreuil,[7] and a third person, probably Gerson.[8]

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[1] Counsellor and Chamberlain of Charles VI.—then prévôt of the City of Paris, 1401–1408—afterwards président de la chambre des comptes until his death (1414)—widely known on account of his execution of two clerks of the Université, guilty of assassination, whom he had hanged at night by torchlight and left attached to the gibbet for four months, when they were cut down and buried by Pierre des Essars (a creature of the duc de Bourgogne), who thus was able to infringe the commission of full power given Guillaume de Tignonville, June 21, 1401—of noble lineage, wise, a fine orator, and highly esteemed by the king—the translator, before becoming prévot of Paris, of the *Dicta Philosophorum* under the title *Livre des Philosophes.* (Cf. P. Paris, *Manuscrits français*, IV. pp. 92–97, 173.)

[2] Cf. M. Roy, *Oeuvres poétiques de Christine de Pisan* (in the *Sôc. des anc. textes franç.*) t. II., p. IV.

[3] Cf. A. Piaget in *Romania*, XX, pp. 417-454.

[4] Cf. Mss. 5233 and 10469, Bib. nat. fr.

[5] Ed. by F. Heuckenkamp, Halle, 1891, and by M. Roy, *op. cit.* t. II. p. 29 sqq.

[6] Cf. for chronology of the letters A. Piaget in *Etudes romanes dédiées à Gaston Paris*, 1891, pp. 113–120.

[7] Jean de Montreuil (called maistre Jehan Johannes by Christine de Pisan), diplomat and secrétaire du roi, was one of the leading humanists of his time, and numbered among his friends many famous men. Cf. A. Thomas, *De Joannis de Monsterolio vita et operibus*, Paris, 1883, p. 1: "ut Petro de Alliaco, Joanni Gersoni, Nicolao de Clamengiis, sed etiam italicis, ut Colutio Florentino Leonardoque Aretino amicitia conjunctus est." He studied at the University of Paris, though he did not attend lectures there by Gontier Col, whom he elsewhere calls his "praeceptorem." He

[8] Cf. document XI.

Then Jean de Montreuil, wishing to convince Christine and the third person before mentioned of the great value of the tenets of Jean de Meung expounded in the *Roman de la Rose*, wrote, probably in 1401, a treatise in the form of a letter (document III) now lost, which he sent to his two opponents.[1] This correspondence with Gerson (if it be he) is not improbable, as we have several other letters of Jean de Montreuil addressed to him.[2] We subjoin herewith also three undated Latin letters[3] from his pen, which bear on our subject.

Shortly afterward, Christine wrote a letter (document IV) to Jean de Montreuil (whom she calls "maistre Jehan Johannes") refuting his arguments and again assailing the *Roman de la Rose*.

Gontier Col,[4] secrétaire du roi, having heard of this letter of Christine's, sent her, in order to convince her of the unsoundness of her views regarding the poem, "un pou de trésor" (i.e., the work, *Le trésor*

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seems to have abandoned the church, for which he was originally intended, and to have gone into public life. In 1391 we find him secretary to Charles VI. and also to the duc de Bourgogne and the duc d'Orléans. He soon became chanoine de Rouen, and then prévôt de Lille, a title which he liked. He undertook many embassies for the king of France: to England and Scotland, 1394; to Germany and Italy; to Pope Benedict XIII. at Avignon, 1404; to Rome (Jean XXIII.), 1412 (where he learned to know Leonardo Bruni). In 1413 he went as ambassador of the king of France to the duc de Bourgogne. In the civil war he attached himself to the party of Orléans and refused to leave Paris, with the result that it cost him his life in the massacre, June 12, 1418, of the party of the Armagnacs, which effected for a long time a stifling of the first Renaissance.

From this we see that Jean de Montreuil was a man of action, but we know him also as a man of letters. He wrote *De Gestis et factis memorabilibus Francorum*, dedicated to Gerson, certain works in refutation of the claims of Edward III. to the French throne (circ. 1400), and a large number of letters. His latinity was above the average of his time, but he tried to treat Latin like a living language, *i.e.*, as a means of expression for all his ideas.

He was charged with paganism because he inscribed the ten laws of Lycurgus on the portico of his house, and confessed that he preferred them to evangelical principles. This is in the spirit of the real Renaissance, divided between faith and reason. This dilemma, whatever may be said, separates the Middle Ages from the Renaissance, since each age gives a different answer to the question. Jean de Montreuil is already abandoning the ideas of the Middle Ages and recommending those of the Renaissance. Therefore in this way he is an innovator and a precursor of the new time. His attitude in this matter is inseparably connected with that quarrel concerning the *Roman de la Rose* which, while it is the most ancient literary quarrel, is also really a moral and religious quarrel. (Cf. Lavisse, *Histoire de France*, 1908, t. IV. (A. Coville), and A. Thomas, *op. cit.*)

[1] Cf. A. Thomas, *op. cit.*, p. 41–2.

[2] Cf. A. Thomas, *op. cit.*, p. 38.

[3] v. Appendix.

[4] For a brief sketch of the life of Gontier Col, cf. M. Roy, *Oeuvres poétiques de Christine de Pisan*, t. II., pp. V-VI.

de Jean de Meung, ou les sept articles de la foi)[1] together with a request for a copy of her letter to Jean de Montreuil, in order that he might be informed concerning her point of view. This communication (document V) is dated September 13, 1401.

After his request had been promptly acceded to, Gontier Col hastened to write again to Christine (document VI, September 15, 1401). This letter censures Christine sharply for her narrowmindedness regarding Jean de Meung's great work, and rather brusquely calls upon her to retract her statements and sue for pardon.

Shortly afterward the authoress replied to this (in document VII). She now not only refuses to abandon in the slightest degree the position she had taken, but proceeds to adduce other reasons for condemning the poem and to repeat some arguments already brought forward.

Christine went further still. With an impulse born of clever feminine intuition, she assembled the documents of the debate and "la veille de la chandeleur 1401" addressed one copy, with a dedicatory letter (document VIII) to the queen, and the other, also with a letter introducing the subject (document IX), to Guillaume de Tignonville, prévôt of Paris. These two personages already favored her side of the case, and Christine's appeal to Cæsar, as it were, was well calculated to further prejudice public opinion in her favor.

Christine had doubtless been confirmed already in her attitude by the support of Jean Gerson. The latter had written in 1399 a *Sermon contre la luxure,* in one place in which, with all the authority he possessed, he condemned the *Roman de la Rose* to the fire: "Au feu, bonnes gens, au feu!.....C'est le remède meilleur." Gerson's condemnation of the work was based on grounds somewhat different from those of Christine. He saw in it a work subversive of private and public morality. Although a humanist and a friend of humanists, he failed to see the real literary and philosophical merits of Jean de Meung's work, and endeavored to use the great authority of the church to wipe it out of existence. On May 18, 1402, he wrote his *Tractatus contra Romantium de Rosa*[2] which we reprint here (document X). This is cast in an allegorical mould, in the form of a "vision"—if he thought at all that he was borrowing a form of composition established by his opponents, he probably regarded it as fighting the devil with fire—and is a veritable procès-verbal against the romance. He divides his work into eight articles, and writes in a vivid, forceful, and conclusive style.

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[1] Cf. M. Méon, *Roman de la Rose,* t. III., p. 331 sqq.

[2] Cf. also Bib. nat. fr. 1563, fol. 180 a. sqq.

The quarrel seemed to be dying away, political events being presumably responsible,[1] when, four months later, Pierre Col[2] wrote a passionate letter (document XI) refuting both the *Tractatus* of Gerson and the letter of Christine to Jean de Montreuil. He sent copies to Gerson and Christine. With the appearance of Pierre Col the real position of the partisans of Jean de Meung becomes clear for the first time, and it is this part of the controversy which is particularly interesting to us now. Pierre Col undoubtedly recognised the lubricity of parts of the Romance, though he attempted to gloss it over. His share in the debate is virtually an eloquent defence of freedom of thought and liberty of expression, an attitude which links him with the representative writers and thinkers of France. Jean de Meung had dared to be free in thought and speech, and his great disciple ardently champions his right (and inferentially anyone's right) to the liberty in the intellectual and moral world, which France always has allowed more than other nations, and to which one eventful day she was to add political liberty. To him the *Roman de la Rose* was a precious public possession, and he was determined to keep it such.

We reprint herewith the eloquent reply of Gerson: *Responsio ad scripta cujusdam errantis*[3] (document XII) and publish for the first time that of Christine (document XIII) dated October 2, 1402, in which she adds no new arguments, though she reiterates and expands some already put forth, and confesses her weariness of an apparently endless struggle.

The indefatigable Pierre Col apparently did not intend to let the lady have the last word. Unconvinced by either the learned eloquence

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[1] The policy of the duc d'Orléans was opposed to that of the duc de Bourgogne not only in France, but also with regard to the empire as a whole. He took the side of Wenceslas, rival for the crown of the empire of Robert of Bavaria. He used this position to repair his losses in Italy by acquiring possessions and position elsewhere, and succeeded so well that he was able in 1402 to occupy part of Luxembourg. The danger of this new power became so great that in December 1402, the diet of Spires discussed means of minimizing it. (Cf. Lavisse, *Histoire de France*, t. IV., p. 327–8).

Then also the whole of christendom was split in two by the great schism in the church. As if strife in the empire and within France itself were not sufficient, there was added the intrigues of two rival popes. The University of Paris intervened in the struggle, and we can imagine Gerson's activity commencing with his famous address of January 6, 1391.

In the struggle, in which so many differing interests were concerned, we can easily surmise the interest of Christine de Pisan with her whole being directed towards national unity, and of Gontier and Pierre Col with their political and ecclesiastic affiliations.

[2] Pierre Col, brother of Gontier Col, chanoine de Paris et de Tournai. Cf. a letter of Nicolas de Clémanges to Gontier Col in *Nic. de Clém.* ed. Lydius, p. 307, Epist. cx.: "Ad Guntherum Colli, De Germani sui sospitate et reditu ex peregrinatione, gratulatio."

[3] Cf. Anvers edition, 1706, Vol. III, col. 293 sqq.

of Gerson or the feminine appeals of Christine, he concludes the controversy by a reply to Christine's letter (the one dated October 2, 1402), of which only a short fragment has been preserved (document XIV).

This, briefly, is the general course of the debate, which we shall be satisfied to outline, preferring to let the documents speak for themselves rather than to attempt further analysis here.

II.—MANUSCRIPTS.

The first six letters:

IV. Christine's letter to Jean de Montreuil.
V. Gontier Col's first letter to Christine, requesting a copy of IV.
VI. Gontier Col's second letter to Christine.
VII. Christine's reply to VI.
VIII. Dedicatory letter of Christine to Queen Isabelle of Bavaria.
IX. Dedicatory letter of Christine to Guillaume de Tignonville

are contained in mss. A.B.C.D.E. (letter IV also in ms. F). They have been already edited by F. Beck (in 1888) from a comparison of A.D.E. only, but this edition contains a number of serious errors in the text, and of course, as the author says (p. V.), it is not a critical one.

The remaining letters, which have not been printed before, are found in mss. as follows:

XI. Pierre Col's letter to Christine and Gerson. Ms. F.
XIII. Christine's reply to XI. Mss. A.B.F.
XIV. Pierre Col's reply to XIII—a fragment. Ms. F.

A brief summary of the manuscripts follows:

A. Paris, Bib. nat. fr. 835, fol. 87 a; B. London, Brit. Mus. Harl. 4431; C. Brussels, Bib. royale, 9561; D. Paris, Bib. nat. fr. 604, fol. 112 a; E. Paris, Bib. nat. fr. 12779, fol. 26 a; F. Paris, Bib. nat. fr. 1563, fol. 178 a (for IV); fol. 185 b (for XI); fol. 190 b vo. (for XIII).

It has been impossible to determine accurately the date of these manuscripts. They almost certainly belong to the fifteenth century, very probably (with the possible exception of F.) to the first part of that century. They have already been described,[1] with the exception of C (9561 Brussels) and F (1563 Bib. nat.)

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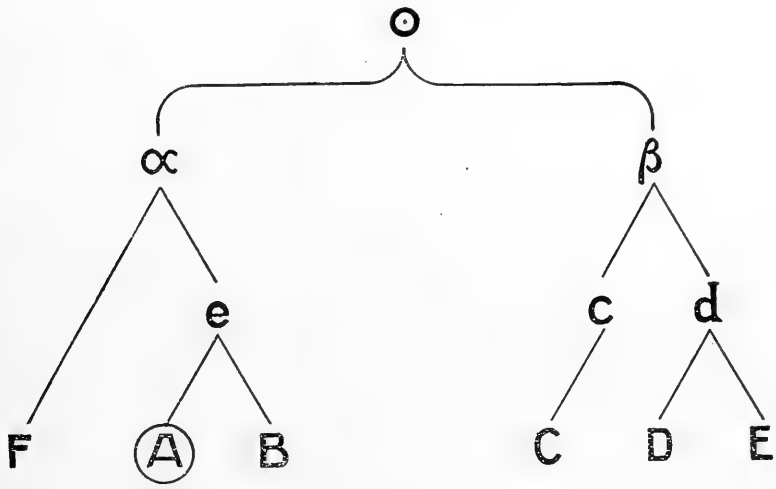
[1] Cf. M. Roy, *Oeuvres Poétiques de Christine de Pisan*, in the *Société des anc. Textes fr.*, 1886, vol. I., pp. V. sqq., and also P. Paris, *Manuscrits franç. de la Bib. du roy*, 1842, vol. V., pp. 72–73, 94–100, 133–81, 399–403.

The filiation of the manuscripts cannot probably be determined with mathematical exactness. From internal evidence in the letters, however, I am able to suggest a genealogical tree which would seem to determine correctly the majority of variants.

In letter XIII, AB form a group as distinguished from F: p. 2, l. 20 a cause de AB puis (?) F; p.5, l. 72 a ceste question. . . . response A aincois que question je. . . . response B a cet demande que tu me disse F; p.8, l.129 tu erres AB tu ti tiens F; p.10, l.165 que le chose peust AB de la chose quelle peust F; p.10, l.166 et plus AB ou pour plus F; p.11, l.173 mie *wanting* F; p.16, l.260 tel AB ce F; p.18, l.295 deffendi B; deffend A descendy F; p.18, l.310 comme AB quant F; p.19, l.324 faire *wanting* F; p.21, l.360 parles a voulenté AB parles et de voulenté F; p.24, l.402 second que *wanting* F; p.25, l.422 dame Eloquence, qui parles de Fol Amoureux dont Meun parle *wanting* F; en voye de perillez A en voye de periller B en peril de perillier F; p.30 l. . . . . les *wanting* F; p.37, l.598 Salomon *wanting* F; p.50, l.795 plus *inserted* F; p.52, l.828 maniere *followed by* ains dit plainement et aluchie toutes pour tos et tos pour toutes F; p.54, l.866 gloses AB choses F; p.59, l.928 celle que elle aimeroit par amours AB maistre Pierre Abalart F; *in subscription* Christine AB Christine de Pizan F; etc.

In letters IV.—IX. there seem to be two groupings, AB (confirming our investigation of the previous paragraph) and CDE. CDE again break up into two smaller groups, C and DE. For letter IV. F is available (though differing greatly from any other manuscript), making four groups, AB, C, DE, and F. As evidence, let us notice: p.5, l.54 lequel dit clerc meu de raison ACDE lequel meu de raison B; p.5, ll.58-59 enuoya a la dicte Christine ycelle A enuoya a la dicte Christine ycellui B enuoya a elle icelle CDE; p.5, l.60 Item comme Christine veu et consideré AB Item comme la dicte veu et consideré CDE; p.8, l.10 de voz ditz fait en reprenant ACF + B (with reprouuant for reprenant) de vos diz faiz si comme il me semble en reprenant D + E (*omits* si); p.11, l.74 reboutee AB deboutee CDE; p.10, l.97 car trop est pire le vice de propre malice que cellui de simple ignorance *wanting* CDEF; p.10, l.105 et querez *wanting* CDE; p.10, l.107 tant ouir de laidures ABF oir tant de laidures CDE; p.13, l.184 ou tollent elles pas A + BF (tolent B ilz F) ne tollent mie CD ou tollent mie E; p.13, l.183 ne *wanting* ABF; p.13, l.189 estat ne pot AB estat n'en pot CDE *wanting* F; p.14, l.206 valables AB vaillans CDEF; p.15, l.234 honte et raison ABF raison et honte CDE; p.21, l.23 ie ne mette en peine d'escripre AB je me mette a escrire CDE; p.23, l.19 l'aucteur AB l'acteur CDE; p.23, l.26 bien soit de toy AB soit bien de toy CDE; etc.

The following diagram, therefore, exhibits the relationship of the manuscripts as nearly as it is possible to determine it with the material which we have:



For the orthography, A, apparently the most reliable manuscript, has been followed, when available; *i.e.*, for letters IV–IX and XIII. F is the only one containing letters XI and XIV. The text has been determined by a comparison of all the manuscripts according to the diagram above, *i.e.* of FAB with CDE. Where there was a deadlock of α and β, what seemed the better according to the context has been selected. When in the last case there was no preference, the reading of α has been arbitrarily chosen. Variant readings will be given as footnotes, as also occasional interesting differences in orthography. I have also modernized the punctuation and paragraphing.

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ROYAL SOCIETY OF CANADA

TRANSACTIONS

SECTION III.

MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES

PAPERS FOR 1910

I.—*Methods of Investigation of Tides and Currents: A review of the general methods adopted in a new field of investigation, by the Tidal Survey of Canada.*

Presidential Address to Section III.

By W. BELL DAWSON, M.A., D.Sc., M. Inst. C.E., F.R.S.C.

(Read 27th September 1910.)

It may be of interest, at the present stage, to review briefly the investigations of the Survey of Tides and Currents, as these are now sufficiently advanced to afford a good general knowledge of the nature of the tides on both coasts of Canada, and to exemplify the methods best adapted to deal with tides so diversified in character and with so little known about them for guidance in their investigation. This review may also be appropriate, as the Royal Society has always shown a real interest in the matter, and has taken notice of the progress of the Survey in its annual reports to Council.

Definite steps to obtain information as to our tides and currents were first taken by the Marine department some 16 or 18 years ago, and the Survey for the purpose was organized as a branch of that department. Although its primary object was to secure practical data for the benefit of navigation, it is interesting to note the directions in which the results have become of indispensable value to other departments in the Government service, as well as to our coast cities, for other than maritime purposes. It may be true that these accessory results have been obtained by extra work, outside the requirements of the Marine department for the interests of trade and commerce; but they serve nevertheless to show how any such investigation which the Government may undertake becomes of far reaching benefit to the country at large.

To make the present review as brief as possible, it is only proposed to outline the work that has been done, sufficiently to explain the general procedure which has proved serviceable in obtaining the best results. The results themselves need not be enlarged upon, as they are already published; and this review may thus serve as an outline with which all the information published may be connected by references. It is hoped that this may also prove of some service to others who may undertake similar investigations in new fields in other parts of the world.

Early Representations, and Commencement made.

The importance of publishing tide tables for Canadian waters and the necessity for tidal observations was discussed as early as 1884. The question was taken up at a meeting of the British Association held in Montreal in that year; and the Montreal Board of Trade were also considering the matter independently. Ship owners and masters of vessels were practically unanimous as to the pressing need for knowledge on the subject of tides and currents; and they united with other bodies in addressing a strong memorial on the subject to the Dominion Government. During the re-survey of the St. Lawrence, in 1887 and 1888, the matter received some attention. Various representations were made and petitions addressed to the Minister of Marine and Fisheries until 1889, in which attention was drawn to the average marine loss of $2,782,000 per annum, as well as 239 lives; a certain proportion of this loss of life and property being undoubtedly due to imperfect knowledge of the currents. It was also urged that if the number of narrow escapes of vessels from disaster or wreck were known, this would add a powerful argument in favour of proceeding with the work forthwith.

A practical commencement was made in the following season of 1890, under the supervision of the Director of the Meteorological Service. By 1893, gauges had been placed at St. John, N.B., Quebec and South-west point, Anticosti; as well as a trial station on the Magdalen islands in the middle of the Gulf of St. Lawrence. The preliminary steps above referred to, and the early attempts made, are fully described in the first Report of Progress (1).

General Methods employed.

At the outset the chief desire of the shipping interests was to obtain information regarding the tidal streams and currents on the leading steamship routes. Many wrecks were attributed to unknown currents, and definite information on the subject was of primary importance. The preliminary information collected served to show that extremely little was known regarding the tides and currents of Canada, beyond the "Establishment" at a certain number of ports, and an approximation to the range of the tide; such data having been determined during the early Admiralty surveys of these coasts. There was also a crude attempt to publish tide tables for Quebec, by a difference of time from London Bridge. Some early tidal observations were found at Halifax in the archives at the Dock yard. The gathering of this fragmentary information, and the beginning of regular observations at a few places in a somewhat tentative way, was all that had been done

up to 1893, when the writer was appointed to organize a survey to carry on the work systematically.

Tides.—Under the circumstances, there was practically a clear field to work upon. The tides themselves were known to be very complex in character, as they ranged from almost nothing in the middle of the Gulf of St. Lawrence to the highest in the world in the Bay of Fundy. The general method adopted from the outset was to establish principal stations at strategic points, to which the harbours in the surrounding regions could be referred. It was the intention from the beginning that the principal stations should be adequately equipped to obtain tidal record which could be reduced by the modern method of Harmonic Analysis. For this purpose it is essential to have continuous record day and night throughout the year. There were thus many practical difficulties to be overcome; such as the heating of the tide gauges in winter by a method devised for the earliest stations, construction problems in the establishment of gauges where no artificial structures existed and the exposure was severe, and the design of an unfailing recording instrument for situations where no repair could be obtained. In such matters little help could be found in anything previously done in other countries.

The two essentials for tidal observations are correct time and some datum or plane of reference from which the height can be measured. At some of the tidal stations the time can be readily ascertained, but at others it has to be specially obtained either by telegraphic signals or by meridian instruments which determine the time directly from the sun. At almost all the tidal stations it has been necessary to originate a datum level for height, and to establish a bench mark. A tide scale is set with reference to this bench mark, to maintain a uniform datum throughout the years of observation. As an open scale becomes useless in the winter season, on account of the accumulation of ice, it was necessary to devise special apparatus which can be enclosed and protected.

With regard to the limits of accuracy, it is sufficient to have the time correct within one minute, as this is as close as individual readings can be taken on the tide diagrams. The limit of accuracy for height is in general 0.01 foot.

The equipment of the tidal stations to secure a continuous record, summer and winter, for harmonic analysis, and to obtain time and height for the observations under conditions of isolation and winter ice, are described in a Paper communicated to the Institution of Civil Engineers of London (2).

Currents.—In the investigation of the currents the advantage of current meters registering electrically was very evident; but at that

date they had only been used in fresh water, and there was much difficulty in making them work satisfactorily at sea. By their use, however, constant observations could be secured day and night, which was essential in dealing with tidal streams which show so much inequality in strength. The velocity of the current was measured at the standard depth of 18 feet (three fathoms). This was adopted to place the meter below the keel of the surveying steamer when lying between wind and weather, and as this depth may be considered to be the average draught of an ocean steamer, it thus represents the actual effect of the current upon a vessel. The appliances used for all the purposes in view are described in the Reports of Progress (3). Special attention was also given to the study of the under-current, as normal conditions often continue below the surface during times of wind disturbance (4). The other observations taken, included the temperature and density of the water, and meteorological data for comparison with the behaviour of the current. The wind record was obtained from an anemometer on board, and the barometric variations were registered by a barograph.

In carrying on the work of the Survey, the surveying vessel was anchored at carefully selected stations, and the vessel itself served as a fixed point from which to determine the direction and velocity of the current. In this way as much information can be obtained in 24 hours of continuous work, as in a week by running measured courses. Interruption from fog is also avoided, as it does not interfere with the continuity of the observations.

Investigation of the Currents.

Gulf of St. Lawrence.—In the first three seasons, 1894, 1895 and 1896, a general investigation of the Gulf of St. Lawrence was made. The relation of the Gulf area to the ocean was ascertained by observations in Cabot strait, between Cape Breton and Newfoundland, and also in Belle Isle strait. Similar observations were carried on at the mouth of the St. Lawrence, north and south of Anticosti, to determine the relation of the St. Lawrence estuary to the Gulf. The temperature and density of the water were taken throughout the Gulf, which proved a valuable means of tracing the general circulation of the water. The results of these investigations have been fully reported in the Reports of Progress, and they are also summarized in a special pamphlet (5).

It will therefore suffice to note, regarding the results, that no currents exceeding one knot were found in the open waters of the Gulf, apart from local straits and passages. This in itself served largely to dispel the supposed dangers to navigation in these waters. Erroneous

theories were also disposed of, such as a constant inward flow through Belle Isle strait, which has undoubtedly led to the occurrence of wrecks.

Pacific Coast.—In dealing with the passes and narrows in British Columbia a different procedure is necessary. The strength of the current is from 8 to 10 knots per hour, and it is impracticable to anchor a vessel for their investigation. Navigation through these passes is only possible at slack water, and vessels have to time their trips accordingly. Several of the most important industries of the province are dependent upon towing, as in the transportation of lumber and coal; and a knowledge of the time of slack water is therefore essential, as the most powerful tugs cannot handle a coal barge, a raft, or a scow-load of freight cars when the current is running.

In these circumstances, the method adopted is to observe the turn of the current from the shore. This has been done for several of the passes where there is any habitation or lighthouse from which observations can be made. Other passes, through which an immense traffic goes, have uninhabited shores. A consequent difficulty is to obtain correct time. It is necessary to place a meridian instrument by which the time can be obtained direct from the sun, or to furnish the observer with a chronometer.

The object in view is to ascertain the time of slack water relatively to the time of the tide as observed simultaneously at some principal station. A basis is thus obtained for the calculation of a slack water table in advance, similar to a tide table. In reducing the observations for this purpose, it was found that the time at which the current turns is not constant with relation to the time of high and low water; but in the difference between the two, there is a variation of a complex character, because of the half tides and other special features in the tidal fluctuation. The annual variation is so large that it is essential to continue the observations throughout the course of the year, to obtain a satisfactory basis for calculation.

When these variations are determined, the time of slack water can be computed in advance from the calculated tide tables. In this way, slack water tables are now published annually for First Narrows at the entrance to Vancouver harbour, Active Pass and Porlier Pass; and good determinations have been obtained also for Seymour Narrows.

Atlantic Coast.—When a vessel and funds were again available for current investigation, the seasons of 1903 and 1906 were given to the steamship routes around the south coast of Newfoundland and to a more systematic investigation of Belle Isle strait. The question of indraught into the large bays on the south coast of Newfoundland was fully examined, because many wrecks were attributed to this

influence. The results for this region and for Belle Isle strait are fully given in pamphlets issued by this Survey (6). In the seasons of 1904 and 1907 the outer part of the Bay of Fundy was examined, chiefly on the lines of the International and Atlantic steamship routes, from St. John N.B. to Cape Sable. As a result, the direction and strength of the current at each hour of the tide, has been published in the form of tables (7). This is the first region of extended area in North America for which detailed information is available, of a similar character to that published for the English channel and the North sea.

The currents in Northumberland strait were investigated in the season of 1908. These proved to be exceedingly complex, owing to tidal interference from its two ends; which occasions a large diurnal inequality in the maximum velocity and in the time of slack water. The strength of the current amounts to three knots in some of the narrower parts. Its general characteristics are explained in a report of progress (8).

The character of our tides and currents, as described in the reports of this Survey, have been extensively republished, especially in Germany; and the reports have also been noticed in British and French magazines, and periodicals in the United States. Some general articles by the writer have also appeared in "Nature" (9).

Wind Disturbance.

When the writer first began these investigations, the general impression derived from books was that the current would always be found to set in the same direction as the wind. But the longer the investigations were carried on, and the greater the care to assign each movement of the water to its true cause, the less residuum there remained to ascribe to the wind, as otherwise unaccounted for.

This impression seems to have gained currency chiefly because of a faulty method of observation, by which the drift of small floating objects was taken to represent the set of the current. The drift of the mere surface or skin of the water cannot be accepted; as the direction of the current should mean its movement at a depth of at least half the draught of an ordinary vessel. The impression may also be due in part to the difficulty of distinguishing leeway from current drift, especially in the old sailing-ship days. It is also noteworthy that in obtaining information from fishermen, only the least observant men speak in a vague way of the current running with the wind. The more intelligent men attribute less to the direct action of the wind, and distinguish the various effects more carefully.

The effects of the wind in disturbing the current, as observed throughout the eight seasons above noted, have been collected and

summarized in a paper contributed to the Royal Society of Canada (10). The effects are classed under the headings of Weak Currents, Constant Currents, and Strong Tidal Streams. The importance of a comparison of the under-current with the surface direction, as an indication of disturbance, is also explained.

Little has yet been done by this Survey in the study of the influence of wind and barometer in modifying the height of the tide. There is more published information on this subject, however, than on the effect of the wind in increasing or retarding the horizontal movement of the water and disturbing the normal conditions which would otherwise prevail. Some attention has been given to the secondary undulations shown by the tide curves, which are apparently related to meteorological conditions; and two papers in which examples are given, and some general characteristics in their mode of occurrence, have been contributed to the Royal Society (11).

It may be well to draw attention, however, to the excellent opportunity for the study of this whole subject which the St. Lawrence estuary affords. It is one of the largest estuaries in the world, with a tide of only four or five feet at its mouth, increasing to nearly 20 feet at its head. A large amount of material is now available for the purpose, as this Survey has now accumulated record from registering tide gauges continuously during 14 years; and with this, there are meteorological observations from ten stations in the area extending from Quebec to Newfoundland, and daily weather charts, which have been fyled from the outset for comparison with the tidal observations themselves.

Tidal Investigations.

The general method adopted for the investigation of the tides, both on the Atlantic and Pacific coasts, has been the same in its general features. Principal tide stations were established at stategic points to serve as reference stations for the harbours in their vicinity. Owing to the clear field which this Survey had before it at the beginning, the choice of principal stations was unhampered; but as practically nothing was known regarding the character of the tides, it was necessary to feel the way carefully to avoid the undue multiplication of principal stations and to extend as far as possible the region referred to each of them.

For a satisfactory reference station the position chosen had to be free from local influences. It thus happens that an important harbour may be entirely unsuitable as a port of reference, because of its situation at the mouth of a river or within an inlet. On the other hand, some isolated island or lighthouse, of no importance whatever on its

own account, may prove eminently satisfactory as a reference station for a number of harbours in its region.

The comparisons with the principal stations are obtained by means of a small type of registering gauge, kept in operation for three or four months at secondary stations in the region. The object of these comparisons is two-fold; to obtain a tidal difference with the principal station, and to ascertain the limits of the region which can be referred to it. If the difference in the time of high and low water proved to be constant, it was accepted as satisfactory. Otherwise, further comparisons were required with other principal stations, or the variation in the difference itself had to be reduced to some law for calculation purposes. A great deal of such trial work can be done, without the expense of additional field work.

The Gulf and River St. Lawrence.—For the main entrance between Cape Breton and Newfoundland, by which the tides of the Atlantic enter the Gulf of St. Lawrence, a tidal station was established at St. Paul island. It was found possible to refer to this station all the harbours on the Gulf coast, in Nova Scotia, Prince Edward island and New Brunswick. The gauge at this station was braced between the rocky cliffs, and it has been very difficult to maintain. It was twice carried away, but it was re-established; as comparisons showed that the nearest harbours on the Cape Breton and Newfoundland coasts were not suitable as reference stations to command this main entrance to the Gulf.

On the Lower St. Lawrence three stations were established; at South-west Point, Anticosti, to command the entrance to the estuary; at Father Point, in the middle of the estuary itself; and at Quebec. An endeavour was made to deduce tide tables for Father Point from Quebec by means of variable differences (12). The variation proved so complex, however, that Father Point was raised to the rank of a principal station. It was also found that all the open estuary of the St. Lawrence, as well as Chaleur bay, could be referred to it with much better advantage than to Quebec. On the other hand, the difference between the Anticosti station and Father Point was so constant that it could be dispensed with as a port of reference. The remaining region, from the Traverse to the head of tide water at Lake St. Peter, is referred to Quebec.

A Paper contributed to the Royal Society explains the character and progress of the tide from the open Atlantic to Quebec. It is illustrated by a set of simultaneous tide curves from the series of stations above referred to (13).

Bay of Fundy.—St. John, N.B. was found satisfactory as a reference station for the whole bay and also for its approaches as far as Cape

Sable. A second station, established at Yarmouth to command the outer part of the bay, was therefore dispensed with; as the difference between the two, in the time of the tide, was found to be quite constant throughout the year as well as during the course of the month. This difference is used to compute the Yarmouth tide tables. The limit between the Bay of Fundy and the Atlantic coast of Nova Scotia, which is referred to Halifax, is sharply defined; as immediately inside of Cape Sable the tide shows distinctly a Bay of Fundy type. The turn of the tidal streams throughout this region is also referred very satisfactorily to St. John.

The Bore.—The opportunity was taken in 1898 to make an examination of the bore on the Petitcodiac river at Moncton. The rate of rise of the water after the bore passed was reduced to the form of a profile of the water surface, which served to throw light on the nature of this tidal feature. A description and diagrams given in one of the reports of progress is republished in "Nature" (14).

Summary.—With the discontinuance of the stations above referred to, after a sufficient time to serve their purpose, and the establishment of an additional station at Charlottetown because of the complexity of the tide in Northumberland strait, there come to be six principal stations in Eastern Canada, for which tide tables are calculated directly by harmonic analysis. The regions commanded by these stations have now been sufficiently well defined to make it certain that all the harbours of Eastern Canada can be referred to them by tidal differences; and the stations serve also for reference in the investigation of the currents. The extent of the various regions is described briefly in the tide tables, in which the tidal differences throughout each region are given.

Pacific Coast.—On this coast, tidal information was in a very unsatisfactory position. The harbours of British Columbia were referred to ports of reference in the United States, situated in Puget sound or on the open coast. These were necessarily unsuitable owing to the difference in the character or type of the tide. A tidal station was established by the Public Works department as early as 1895 in the middle of the Strait of Georgia. It was situated at Sand Heads, off the mouth of the Fraser river. The record obtained, although much broken, was brought into shape for harmonic analysis. This station proved eminently suitable as a port of reference for the harbours throughout the Strait of Georgia; and by 1901 tide tables for it were published by this Survey. This proved a great boon, as the tide of that Strait presents special features which make it impossible to deduct its time from ports of reference in other regions. A summary of the early results, up to 1902, is given in one of the reports of progress.

These results were based partly on tidal information obtained during the Admiralty surveys and partly on observations arranged for by correspondence, before the Pacific coast was visited (15).

In 1905, several stations were established along the coast; and on reducing the results, it was found possible to divide the whole coast into three regions; namely, the West coast of Vancouver island, the region of the Strait of Georgia, and the Northern coast from Vancouver island northward. Principal stations are maintained in each of these regions; in Clayoquot sound, at Sand Heads, and at Port Simpson. The cities on the coast are quite unsuitable as ports of reference; but tide gauges are maintained at Victoria, Vancouver and Prince Rupert, and tide tables are specially calculated for these harbours, on account of their intrinsic importance.

As a rule, the tide on the Pacific coast is strongly influenced by the declination of the moon, and it is also subject to an annual variation with the change in the declination of the sun. On the open coast the spring and neap tides are quite distinguishable, notwithstanding the other inequalities. In the Strait of Georgia the diurnal inequality becomes so large as to dominate every other feature of the tide. Next in importance is an annual variation, as the influence of the sun is very great relatively to the lunar effect. The turn of the current in the Passes is similarly affected, as the relation between the time of slack water and the tide shows a marked annual variation. To obtain good comparisons, it is thus desirable to have a full year of simultaneous observations. If this is not possible, at least six months are necessary; or else the comparisons with the reference station must be made about the time of the Equinox.

Variable Tidal Differences.—The use of variable tidal differences is very valuable in extending as far as possible the region that can be referred to each of the principal stations, and thus avoiding the need for an additional reference station. As a rule, the variation is so largely in some one period, that all others can be neglected; but even if there are two periods involved, their laws of variation can be determined for calculation purposes.

On the Pacific coast generally, the annual variation in the tidal difference, as already explained, is the only one necessary to take into account. For, in most cases, the diurnal inequality is so much the same, both at the principal and secondary station, that it does not cause variation in the difference.

In the Strait of Georgia, where high water and the half tides are so nearly at the same level, it is only the difference for lower low water that is affected by variation. For example, on the Fraser river, from Sand Heads at its mouth to New Westminster, the difference in time

for lower low water is an inverse function of the height to which low water falls. This would not justify a principal station at New Westminster; as the variation can be ascertained for calculation purposes, and the tidal differences for high water and the half tides are constant. A similar distinction is required in the case of lower low water, in calculating slack water in First Narrows from the reference station at Sand Heads.

On the Lower St. Lawrence, between Father Point and Quebec, the variation is also very large in the difference of time for low water. It was not possible to bring the variation into any direct relation to the height of the tide. It was found to be chiefly in the period of the synodic month with the moon's phases, but requiring a large outstanding correction in relation with the moon's distance. The tides for Father Point were calculated by this double series of variables in the early years, before the harmonic constants were determined there.

In comparing the Miramichi region with St. Paul island, on the opposite sides of the Gulf of St. Lawrence, there is apparently a reversal in the diurnal inequality. This is of such a character that if the tide is followed in its actual progress, the difference in time is not constant, but varies so widely as to be practically valueless. Nevertheless, the tides at Miramichi can be deduced from St. Paul island by a constant difference, provided that it is taken as earlier, or for the preceding tide, as this reverses the alternation to which the diurnal inequality gives rise.

After entering the Gulf of St. Lawrence through Cabot strait, the tide changes its character during its progress towards Northumberland strait; and on reaching that strait, the diurnal inequality has developed to such a degree that the tide is practically under the control of the moon's declination. There are times when the difference in range between the two tides of the day is as great as the difference between springs and neaps. It is possible, however, to refer this strait to St. Paul island by means of two series of variable differences, for high and low water respectively; both series varying in accordance with the declination of the moon and alternating with its upper and lower transits. The tide tables for Pictou, in the middle of the strait, are calculated from St. Paul island by means of these differences, and the variation in the moon's declination during the 19-year cycle is also allowed for. The tides for Charlottetown are then computed from Pictou by means of differences by which allowance is next made for a variation in the period of the synodic month. On account of this double variation, Charlottetown has now been equipped as a principal station.

These will suffice as examples of variable tidal differences, as

utilized in this Survey to avoid the multiplication of the principal tidal stations. This method is fully explained, with tabulated examples, in a Paper on the subject contributed to the Royal Astronomical Society of Canada (16).

Tide Levels and Bench Marks.

As there is no general system of levels as yet throughout Canada, it has usually been necessary to establish a local Bench Mark and to originate a datum plane for the tidal observations. Wherever a plane of reference had already been established, it was made use of; but it is only in two harbours in Eastern Canada that Bench Marks exist to which the Admiralty low water datum is referred; namely, Quebec and Halifax. At St. John, N.B. all such marks were destroyed in the great fire of 1877, and although much trouble was taken to re-establish the datum of the harbour chart, the result was only approximate (17). At the head of the Bay of Fundy, a good datum was established by the engineers of the Baie Verte canal; and simultaneous observations in Northumberland strait connect this with the open sea level. To this datum the exceptional tides at the head of the bay are referred. An interesting result for mean sea level at the head of the Bay of Fundy has been deduced from these observations (18).

Bench Marks have almost always been established both at the principal and secondary stations, even when tidal observations have only been continued for a few months. These are valuable at present for local reference, and will be more so in future, when they are connected together by some general system of levels. The Bench Marks thus established along the St. Lawrence and throughout the Maritime Provinces, are described in a Paper communicated to the Canadian Society of Civil Engineers (19). The extreme levels of high and low water in the various harbours are there given; as well as the tide levels at the head of the Bay of Fundy, which are valuable for the security of the extensive hay lands in that region, known as dyked marshes.

The value of mean sea level at Quebec had long been desired by engineers; and accurate local data have now become available there, from tidal observations during eight complete years. The relation with Atlantic mean sea level at New York was accordingly worked out from connections recently made by geodetic surveys and canal levels, and from revised determinations made in the United States. The result is given in a Note communicated to the Canadian Society of Civil Engineers, the data on which the result is based being carefully explained (20).

In British Columbia the levels were in an unsatisfactory condition, especially at Victoria. In that harbour it was found that a new datum

had been adopted for each new purpose as it arose. The datum for city works had been altered more than once. The Royal Engineers and the Public Works department had independent levels of their own. Another datum was used for the harbour chart, and so on. When the tidal observations were begun, much trouble was taken by the writer to correlate these various levels and to adopt a satisfactory plane of reference for the future. For this purpose, instrumental levels were carried to Esquimalt, as some datum planes were better defined there than at Victoria. The relation between all existing planes of reference was eventually determined and brought into relation with the tidal observations.

The results for Victoria, Vancouver and other cities and towns of British Columbia, are given in a Paper, prepared by the writer, which was published by the Marine department, entitled "Tide Levels and Datum Planes on the Pacific Coast" (21). This paper contains a complete list of the Bench Marks which define datum planes in the cities, and also those which define the low water datum of the charts at all points along the coast where Admiralty surveys have been made.

Importance of Bench Marks.—The importance of establishing Bench Marks in connection with tidal observations is very evident, as it is only from these observations that data for many purposes can be obtained. The extreme levels of high and low water are important for wharf construction and docks, and also for sewerage and other city works. They are also essential for dredging operations in the deepening of harbours and channels. The value of mean sea level is very accurately determined by the continuous observations required for harmonic analysis; and where there is a Bench Mark for reference, the level is permanently fixed. This determination in our principal harbours affords a basis for geodetic levelling; and it is also utilized by the Public Works department, the Interior department and the Geological Survey, as well as for our principal canals. Such determinations of mean sea level afford the only means by which an alteration in the level of the continents relatively to the ocean can be detected. In several regions such gradual changes are taking place, and they have a practical bearing on the depth of harbours and channels. In such ways as these, the levels as determined by the Tidal Survey have an extended value; and they will become increasingly useful for reference in the future as the country develops and a wider accuracy is required.

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II.—*On the Thermal Expansion of Rock at High Temperatures.*

By N. E. WHEELER, B.S.

(Communicated by Dr. H. T. Barnes, and read 27th September 1910.)

At the request of Dean Frank D. Adams, F.R.S., some experiments were carried out during the autumn of 1909 by Dr. H. L. Bronson and Mr. G. St. G. Sproule to determine the relative expansion of a certain nickel-steel alloy, and of granite and diabase up to a comparatively high temperature. The apparatus then used was designed by Dr. Barnes and Dr. Stansfield, and the preliminary results obtained were such as to make a further study of the various rocks desirable. Accordingly it was suggested to the writer, by Dr. Barnes, that careful measurements be made to determine the behaviour of various rocks as regards their expansion up to a temperature of 1000°C.

As will appear from the following historical account, the previous experiments have for the most part been conducted at comparatively low temperatures. In fact, little work upon rocks where the temperature range was large, say from 20° to 1000° C., has up to this time been published. While it may be true that from an economic point of view the investigation of the thermal expansion of rock at ordinary temperatures is more important, yet it would seem that the thermal expansion at the higher temperatures and the effects thereby produced are, both economically and geologically, of no small importance.

The geological importance of the thermal expansion of rocks is emphasized by a work published in 1886 by T. Mellard Reade, C.E., F.G.S., F.R.I.B.A., Past President of the Liverpool Geological Society, on "The Origin of Mountain Ranges." Reade sets forth the idea of the "competency of expansion by heat to produce all the phenomena of mountain structure." He gives a general review of the geological evidence which goes to establish the theory that mountain upheaval is associated with previous sedimentation over the given area,—this sedimentation producing in turn a rise of the isogeotherms in the earth's crust, with the result that the thermal expansion of the rock causes an upward movement. In this way, Reade maintains, ridges at least equalling in height any known mountain systems might be formed.

Reade's method of determining the coefficients of expansion of various rocks was to measure with vernier calipers the length, and to determine the temperature of bars of stone about 15 inches long, both before and after heating them in an ordinary oven, either with or without a sand bath, but always on a board. Corrections were made to allow for the cooling of the stone after removal from the oven and for the

necessary heating of the calipers, and the mean of several readings was taken as the final result. Though Reade neglected to state for just what range of temperature his determination was made, the range, as in most of the earlier experiments, was probably not very great, as the specimens of rock were placed on wood. The coefficients of expansion according to Reade are per degree Fahrenheit, and are as follows:

"Sandstones..... $\frac{1}{178,825}$
Marbles..... $\frac{1}{184,797}$
Slates..... $\frac{1}{193,827}$
Granites..... $\frac{1}{203,322}$

"Mean of the whole $\frac{1}{190,192} = 2.77$ feet per mile for every 100° Fahr."

Reade gives results obtained by A. J. Adie[1] as follows:

"The mean coefficient of the thirteen determinations of the expansion of stone is $\frac{1}{207,009}$; but if we omit the last coefficient, viz; that of the Black Marble from Galway, (which is probably an error, being so much less than those of the other marbles, and also of my own determination of the expansion of Irish Black Marble), the mean coefficient will be $\frac{1}{190,522}$, showing a remarkable agreement with my own results.

"In Mr. Adie's experiments he used longer bars of stone, namely, 23 inches long and from ½ to 1 inch square, and heated them with a steam jacket, using much more complicated apparatus than mine."

Reade also refers to the experiments conducted by W. H. C. Bartlett by order of Col. Totten[2], in 1832, the object of which was to ascertain the cause of the fissuring of the joints of coping-stones at Fort Adams, Newport Harbor, the conclusion reached being that the fractures were due to ordinary changes of temperature.

"These experiments were made with three bars of the several stones mentioned, measuring 94 inches long (nearly). The measuring instrument was a pine rod with copper elbows, fitted with a graduated wedge for measuring. The variations of temperature ranging through 100° were those due to the atmosphere, which affected both the measuring rod and the stone, the actual expansion being calculated from the differences of expansion." The results are given as follows:

"Granite..... 000004825 = $\frac{1}{207,253}$
Marble..... 000005668 = $\frac{1}{176,429}$
Sandstone..... 000009532 = $\frac{1}{104,909}$
Mean..... $\frac{1}{162,863}$

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[1] Trans. Royal Soc. Edin. Vol. XIII., p. 366.
[2] Amer. Journ. of Science, 1st series, Vol. XXII., p. 136.

A work which appeared soon after that of Reade was the "Preliminary Notes on the Coefficients of Thermal Expansion of Certain Rocks" by Professor William Hallock,[1] who treated the subject from a "scientific or an economic point of view" for ordinary ranges " of temperature. The first method described is that of finding the cubical expansion by the displacement or pycnometer method. An iron box was constructed with a cover which could be screwed on, the specimen being placed in it and the surrounding space being filled with mercury. The necessary calibrations were made. "Then knowing the coefficient of the mercury and iron, and the volume of the stone, iron and mercury, and the apparent coefficient of the stone and mercury in the iron, a simple calculation gives the coefficient of the stone alone. The linear coefficient is practically one-third the cubical." It was found that the mercury penetrated porous stones. "There seemed also a source of error arising from the difference of 'fit' of the mercury to the stone at high and low temperatures," *i.e.*, the mercury seemed to fit into the uneven cavities on the surface of the stone more perfectly when hot.

These considerations led to the abandonment of this method, and the comparator method, involving the use of micrometer microscopes, was adopted. The specimens were heated in a water bath, the extremes of temperature being about 20° and 100° C. Hallock estimates that his results should be within about 0.1%. Chemical analyses of the specimens were also made. The results obtained were as follows:

Standard Brass Bar.	0.00001866
A Slate from near Hydeville, Vt.	0.00000881
A marble from Rutland, Vt.	0.00000659
" " " Rutland, Vt.	0.00000661
" " " Knoxville, Tenn.	0.00000495
" " " " "	0.00000525
" " " "Keowa", from Georgia	0.00000348
" " " " " "	0.00000309
" " " "Cresle," from Georgia.	0.0000110
" " " "Cherokee" " " . .	0.00000740
" " " " " " . .	0.00000786
" " " " " " . .	0.00000855

The duplicate values are for different pieces of the same stone.

Hallock notes that the marble samples upon which he was at work, "being heated for the first time to 100°C. and allowed to cool, did not contract to their original length, and the next two or three heatings resulted in continued but ever diminishing increments of length at

[1] U. S. Geol. Survey Bull. 78, pp. 109–118.

ordinary temperatures; finally a permanent condition was reached, but not until the bar [which seems to have been 3 ft. in length] was 0.2 to 0.3 mm. longer at ordinary temperatures than originally. The length at 100° C. was practically constant from the first."

In an article on "The Physical, Chemical and Economic Properties of Building Stones" by Geroge P. Merrill, published in 1898[1], there is a further discussion of this permanent expansion which takes place when rocks are heated. After referring to the economic and geological importance of the fact that the tenacity of stone is weakened through expansion, he goes on to say:

"Within recent years, some good work in this line has been done under the direction of the Ordnance Department of the U. S. Army. The method of testing has consisted in placing carefully measured bars of stone in baths of cold water (32° F.), hot water (212° F.), and back to cold water once more. It was noted that in none of the samples tested did the stone quite regain its first dimensions on cooling, but showed a slight 'permanent swelling'. Since this can only mean that the particles composing the stone have separated though ever so slightly, it is an important matter as it necessitates a weakening, which is shown by actual pressure tests." The mean of the results obtained of the permanent swelling occurring in stone bars of a gauged length of 20 inches is, for granites, .0040 inch; for marbles, .0090 inch; for limestone, .0070 inch; and for sandstones, .0047 inch. "The average result showed that the stones from the water baths lost in strength on an average 34.9 per cent, the granites, after passing through the hot and cold water tests, possessing but 83.7 per cent. of their original strength; the marbles, 46.2 per cent; the limestones, 58.8 per cent; and the standstones, 66.9 per cent."

"The amount of expansion of rocks," according to Dana in his Manual of Geology, "is mostly between 1 and 10 millionths for 1° F. and 1 millionth corresponds to 1.2 thousandths of an inch for 100 feet." After quoting results of Totten and Adie, he adds, "Pfaff found for the expansion between the ordinary temperature and red heat (about 1750° F.) of granite [one inch in length] from the Fichtelgebirge, 0.0168; for porphry from the Tyrol, 0.0127; and for basalt of Auvergne, 0.0120."

A short investigation was conducted at McGill in the Autumn of 1909, by Dr. H. L. Bronson and Mr. G. St. G. Sproule under the direction of Dr. H. T. Barnes and Dr. A. Stansfield, for the purpose of determining the relative thermal coefficients of expansion of certain rocks and of a certain nickel-steel alloy, which was required in connection with some

[1] Maryland Geological Survey, Vol. 2, pp. 47–123.

experiments on rocks made by Dr. F. D. Adams of the Department of Geology and Mineralogy. The method used was similar to that described below in connection with the present investigation. Two heatings were made. First a granite cylinder about 20 cm. in length was heated within a hollow cylinder of the nickel-steel. The expansion of both cylinders was measured with micrometer microscopes. The average coefficient of expansion, as obtained for the granite was 0.0000106, and for the nickel, 0.0000099 per degree centigrade, for a temperature range of 17° to 782° C. A similar experiment was made with diabase in place of the granite, the temperature range being 18° to 793° C., the coefficient of expansion obtained for the diabase being 0.0000107, and for the nickel-steel, 0.0000102. Unfortunately a trial heating of the granite was made before any systematic readings were taken. This would affect to some extent, the results obtained for the granite. The permanent elongation for this second heating of the granite was given as 0.272 mm.; that for the heating of the diabase as 0.29 mm.

For the present investigation the apparatus and method used in the preliminary work just mentioned, were somewhat improved, and were found to be quite satisfactory. A cylinder of rock about 20 cms. long and 2.4 cms. in diameter was placed inside a specially constructed electric furnace with a nickel heating coil. The specimen was carefully protected from the air without by a thick packing of asbestos, in order that its temperature might be practically uniform throughout. The temperatures were got by the use of a platinum and platinum-rhodium thermo-electric couple, connected to a potentiometer bridge designed by Dr. Tory. The thermo-couple and bridge were first calibrated for water at 15.2° C., for steam, for sulphur vapor and for the freezing points of aluminum and silver, and a curve was drawn through these points on a large scale, so that degrees of temperature which were plotted against the potentiometer bridge readings as well as the bridge readings themselves, were represented by millimetre spaces on a large sheet of squared paper. Thus it was possible, having obtained the balance point on the bridge, to read the temperature directly from the curve with a good degree of accuracy. The temperatures (except in the case of the marble) were read at intervals of about 100° to 200° C. up to approximately 1000° C. By means of two micrometer microscopes placed in front of mica covered openings in the furnace, it was possible to observe the ends of the stone cylinder, and thus determine the amount of its expansion between the different temperatures observed. When a reading was to be taken, sufficient resistance was introduced into the heating circuit to render the temperature nearly stationary, or only slowly rising,—a 110 volt direct current being sent through a resistance which was varied from about 4.5 to 20 ohms.

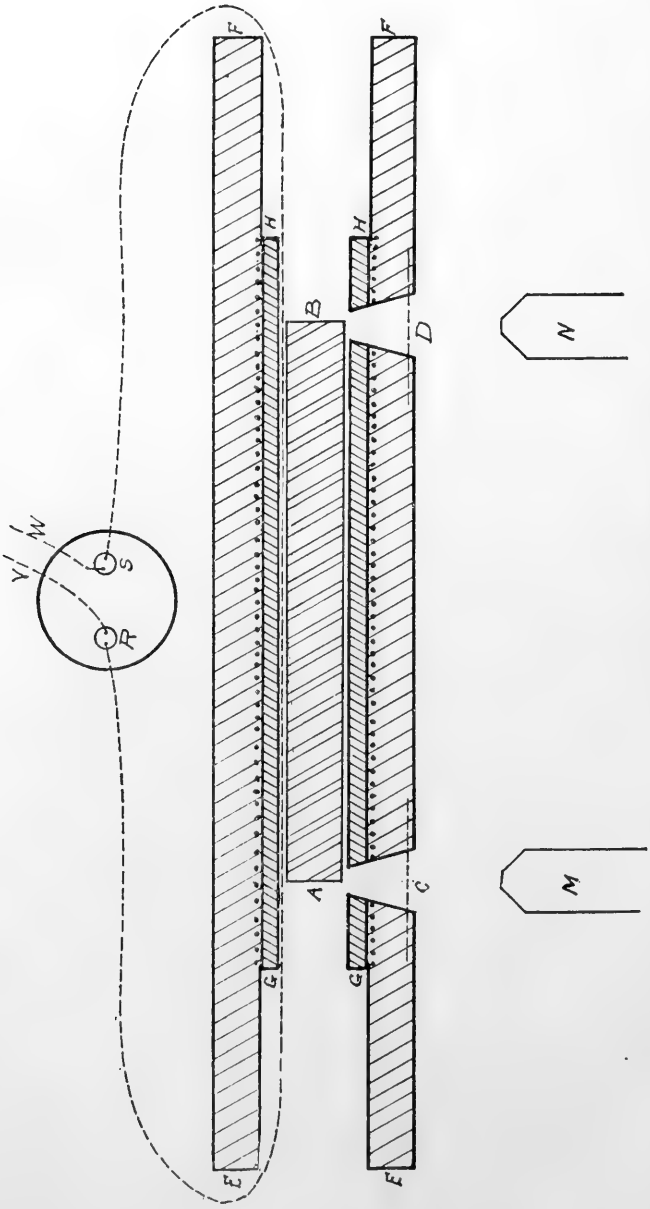

FIG. I. DIAGRAM OF FURNACE USED.

The furnace (See Figure I.) consisted of a hollow cylinder G H of the special nickel steel, the thermal expansion of which had been compared with that of the granite and diabase. This cylinder, within which was placed the stone A B to be tested, was about 27.5 cms. long and slightly larger in inside diameter than the cylinders of stone used. In one side of the nickel steel cylinder, at short distances from the ends, openings were made about 20 cms. apart, to make possible the focusing of the two micrometer microscopes M & N on the ends of the specimen of rock being examined. A hand-feed arc lamp placed between the microscopes was used to illuminate the ends of the stone cylinder. To insulate the heating coil (See dots. Fig. I.), which was of nickel wire of about 1.37 ohms total resistance, from the metal cylinder, the latter was covered with thin sheet asbestos, upon which the nickel wire was wound spirally, together with a coarse asbestos string, serving to insulate one turn of the spiral from the next. This heating coil extended about 3 cms. beyond the ends of the cylinder of rock placed within. Mica coverings C & D were placed over the openings at the ends of the stone and the furnace was wound with several layers of sheet asbestos E F, so that with the stone at 1000° C. the outside would not become very hot. For the present work the furnace was lengthened by winding with more sheet asbestos to make possible packing with asbestos wool for a greater distance from the ends of the stone.

The hot junction of the thermo-couple was placed within the nickle steel cylinder of the furnace, usually near the middle of a groove along one side of the cylinder of stone, and insulated from the stone by means of a thin strip of mica and from the metal cylinder of the furnace by means of a strip of sheet asbestos. The cold ends passed into mercury at the bottom of two test tubes R & S suspended in a jar of melting ice to keep them at a uniform temperature of 0° C. From the mercury contained in the test tubes, copper leads V & W consisting of ordinary electric lighting twin wire, perhaps 50 ft. in length (to make it possible to perform the sulphur-vapour calibration in a hood at some distance from the potentiometer) led to the proper terminals of the potentiometer.

The potentiometer bridge used (See Fig. II) consists of a hard rubber cylinder A B about 3½ inches in diameter on which is cut spiral groove of about one centimeter pitch running the whole length of the cylinder. The cylinder is divided into 30 equal divisions for each turn of the groove, making about 1300 equal divisions in all. The contact piece P is so attached that it moves along directly over the bridge wire as the cylinder is turned. The whole is attached permanently to a base-board. Immediately behind the cylinder is a resistance box made of 41 coils, 1 of 300 ohms, 10 of 100 ohms, 10 of 10 ohms, 10 of 1 ohm,

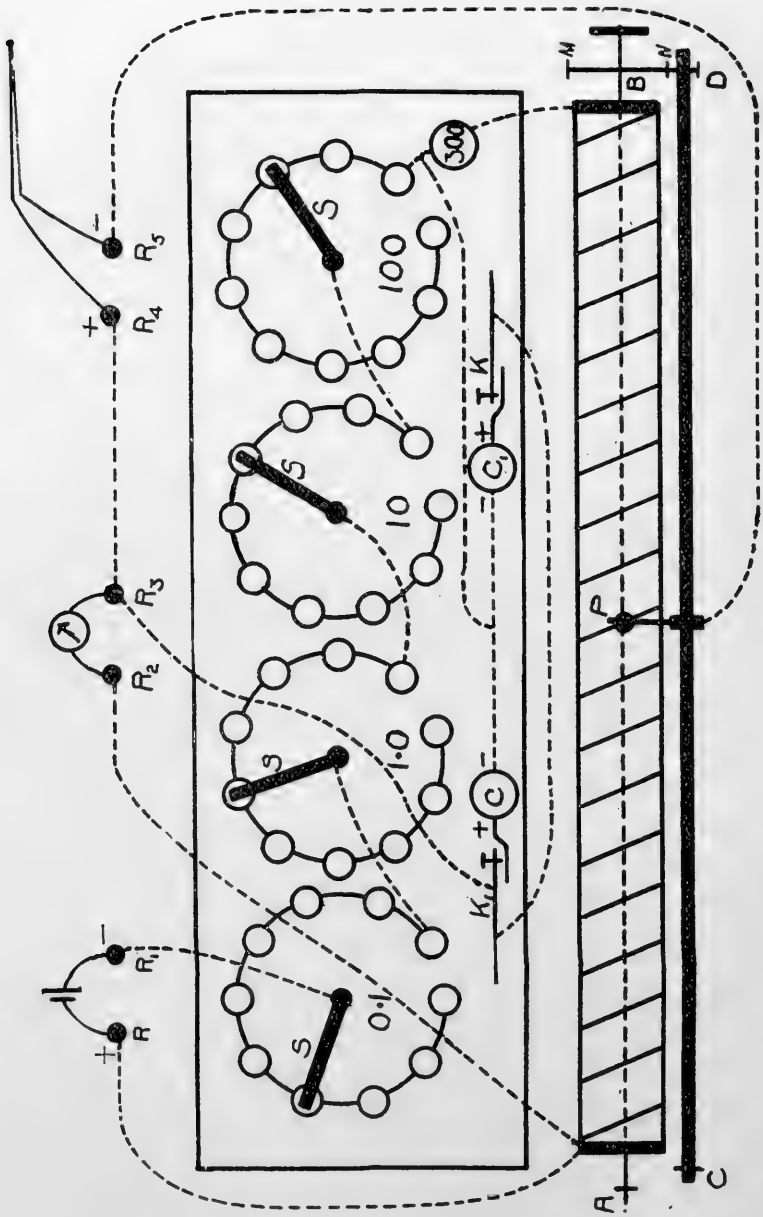

FIG. II. DIAGRAM OF FACTORY POTENTIOMETER.

and 10 of 1–10th ohm. The ends of the bridge wire are soldered to German silver bands going around the ends of the cylinder and contact is made with these by means of German silver springs attached to the base-board.

The connections are evident from the diagram. The 300 ohm coil will be seen to form part of the bridge wire. In place of C & C^1, which were originally cadmium cells, two Weston cells, furnished by Mr. A. N. Shaw of the Physics department were substituted as the standard of the E.M.F. The object of having two cells was simply that one might serve as a check on the other. The terminals R and R^1 were connected to a storage battery of which the E.M.F. remains practically constant for some little time, after balancing against the Weston cells by means of varying the amount of resistance in the circuit.

R^2 and R^3 were connected to a galvonometer sensitive to less than a tenth of a bridge division; and R^4 and R^5, to the long leads going to the thermo-junction.

After the apparatus had been assembled, the calibration of the thermo-junction in connection with the Tory bridge was undertaken.

The following table is a summary of the results of the various determinations which were made:—

Point Determined.	Divisions on Bridge Wire.	Temperature.
Sulphur	185.3	443.4°C
Steam	29.3	100.0
Sulphur	186.5	444.6
Water at 15.2°C	2.3	15.2
Silver	444.0	962.0
Aluminum	272. (approx.)	657.0
Aluminum	274.6	657.0
Silver	445.4	962.0
Sulphur	178.0	445.8

In all these determinations, the thermo-junction was kept inside a porcelain tube. Considerable difficulty was experienced in the determination of the sulphur point, it being practically certain that the sulphur vapour was superheated at first, as the sulphur point apparatus used is of the deep iron-cylinder form and it has been found that with this form of apparatus the vapour is very likely to be superheated. It seems possible that 178 bridge divisions even is a little too high. The metals were heated in a gas furnace until melted. Then the flame

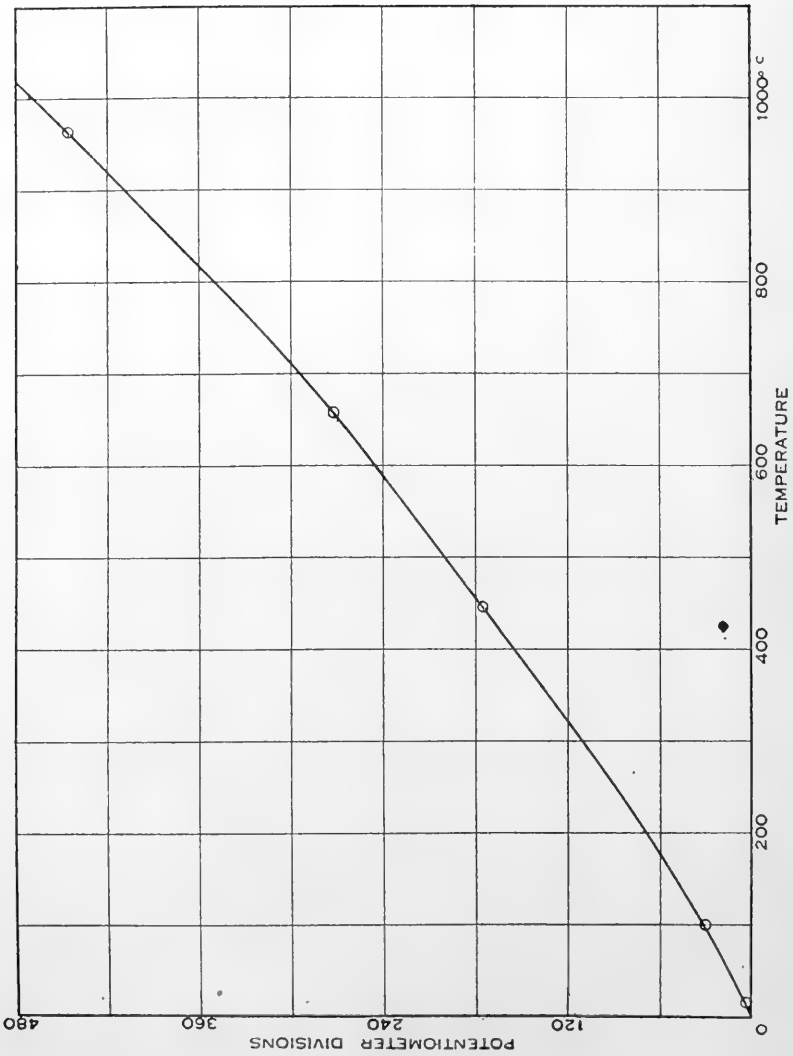

FIG. III CALIBRATION CURVE

was extinguished and the freezing point of the metal taken, the molten metal being stirred with the porcelain tube containing the hot junction, which stirring tends to prevent supercooling. The following results were taken as the most reliable for plotting the temperature curve for getting the temperature directly from the bridge readings, and a curve was drawn through the points by means of a flexible spline. (See also Figure III.)

Bridge Divisions.	Temperature.
2.3	15.2° C
29.3	100.0
178.0	445.8
274.6	657.
445.4	962.

After a few preliminary readings on a cylinder of diabase which had previously been heated, readings on a fresh olivine diabase from near Sudbury, Canada, were begun. A description and photographs of this diabase are given in "An Investigation into the Elastic Constants of Rocks, More Especially with Reference to Cubic Compressibility" by Dr. Adams and Dr. Coker (published by the Carnegie Institution of Washington, D.C.) pp. 57–60. It is a "very typical fresh olivine diabase." It is described as being rather coarse in grain but finer than any of the granites described in the above mentioned work, with the exception of the granite from Westerly, R.I., U.S.A. "The rock is perfectly massive and possesses a typical 'ophitic' or 'diabase' structure."

The length of the cylinder before heating, measured with a pair of vernier calipers, at a room temperature of 18.3° C. was found to be 19.831 cms.

For the calibration of the micrometer microscopes, the approximate mean of several calibrations, which had been obtained by demonstrators in the Elementary Physics Laboratory of the Macdonald Physics Building, were taken; Microscope No. 1 being taken as 9.750 turns to 1 mm. and No. 3 as 11.760 turns to 1 mm.

The diabase cylinder was heated six times to about 1000° C., readings being taken at intervals during the heating and also during the cooling. The table of both the readings and the results will be given for the first heating and cooling as illustrative of the method of procedure; then simply the results of the other five heatings will be given. In columns one and two, the numbers given in parentheses are not micrometer microscope readings, but are the differences of the preceding and the

following microscope readings divided by the calibration constants of the microscopes, *i.e.*, the change in position of the end of the stone cylinder in millimetres.

RECORD OF FIRST HEATING OF DIABASE CYLINDER.

Reading of Microscope No. 1.	Reading of Microscope No. 3.	Bridge Reading	Temp. as read from Curve.	Expansions.	Total Expansion.
0.631	0.132	.....	18°C.	.....	.....
(–.0179mm.)	(.1562mm.)	.....	.....	.1383 mm.	
0.805	–2.297	37.9	123	.....	.138
(.0018)	(.1544)	.....	.....	.1562	
0.787	–4.484	76.8	219	.....	.294
(.0799)	(.0596)	.....	.....	.1395	
0.008	–5.784	104.3	282.5	.....	.434
(.1086)	(.2275)	.....	.....	.3361	
–2.949	–7.108	159.2	405	.....	.770
(.1268)	(.2444)	.....	.....	.3712	
–3.713	–10.236	209.1	514	.....	1.141
(.3302)	(.3564)	.....	.....	.6866	
–6.492	–14.043	253.3	611.5	.....	1.827
(.3289)	(.3221)	.....	.....	.6510	
–9.285	–18.261	302.2	713	.....	2.478
(.0664)	(.1850)	.....	.....	.2514	
–10.638	–20.084	358.5	816	.....	2.729
(–.0110)	(.1768)	.....	.....	.1658	
–10.745	–22.005	417.6 (?)	917	.....	2.896
(–.0634)	(.2173)	.....	.....	.1539	
–9.362	–25.448	470.2	1000	.....	3.050
(–.1497)	(.0000)	.....	.....	–.1497	
–8.822	–25.448	402.	891	.....	2.900
(–.1298)	(.0238)	.....	.....	–.1060	
–6.087	–25.168	345.8	793.5	.....	2.794
(–.1314)	(–.0227)	.....	.....	–.1541	
–5.368	–25.435	295.8	700.5	.....	2.640
(–.1072)	(–.0442)	.....	.....	–.1514	
–4.412	–25.954	254.5	614	.....	2.488

The next day as well as the day after that, when it had come to room temperature of 18.5° C, the total expansion was recorded as 1.3785 mm.

Results of Second Heating.		Results of Third Heating.		Results of Fourth Heating.	
Temperature.	Total Expansion.	Temperature.	Total Expansion.	Temperature.	Total Expansion.
19.5°C.	1.379 mm.	25°C.	1.650 mm.	19°C.	1.917 mm.
115.5(?)	1.518	150	1.762	116	2.002
246	1.662	253.5	1.897	258	2.177
306.5	1.820	374	2.071	371	2.332
382.5	1.960	504	2.293	515.5	2.539
506.5	2.122	609.5	2.545	609.5	2.738
584.5	2.335	726	2.822	734	2.960
717	2.729	816	2.928	812.5	3.129
802	2.845	911.5	3.023	869	3.188
953.5	3.080	995	3.177	443.5	2.504
1026.5	3.340	1053	3.316	364.5	2.389
942	3.120	905	3.085	77	2.030
868	3.004	756	2.896	.....	.....
771	2.905	655	2.796	.....	.....
671	2.810	328	2.188	.....	.....
590	2.577	244.5	2.093	.....	.....
20 (approx.)	1.650	205	2.037	.....	.....
.....	.....	126.5	1.969	.....	.....
.....	.....	19.4	1.910	.....	.....

Results of Fifth Heating.		Results of Sixth Heating.	
Temperature.	Total Expansion.	Temperature.	Total Expansion.
77°C.	2.030 mm.	18°C.	2.103 mm.
218	2.176	149	2.222
375.5	2.408	310	2.436
523	2.627	461	2.651
635	2.894	551.5	2.783
736.5	3.131	694	3.143
835.5	3.247	759.5	3.221
952.5	3.404	861	3.333
978	3.444	1004	3.542
793	3.155	864	3.314
649	2.991	764.5	3.190
419	2.536	585.5	2.886
384	2.482	19	2.175
19	2.087		

For a graphical representation of the results recorded in the above tables see Figure IV. (In Figure IV., as also in Figure V., the crosses indicate points taken after cooling.)

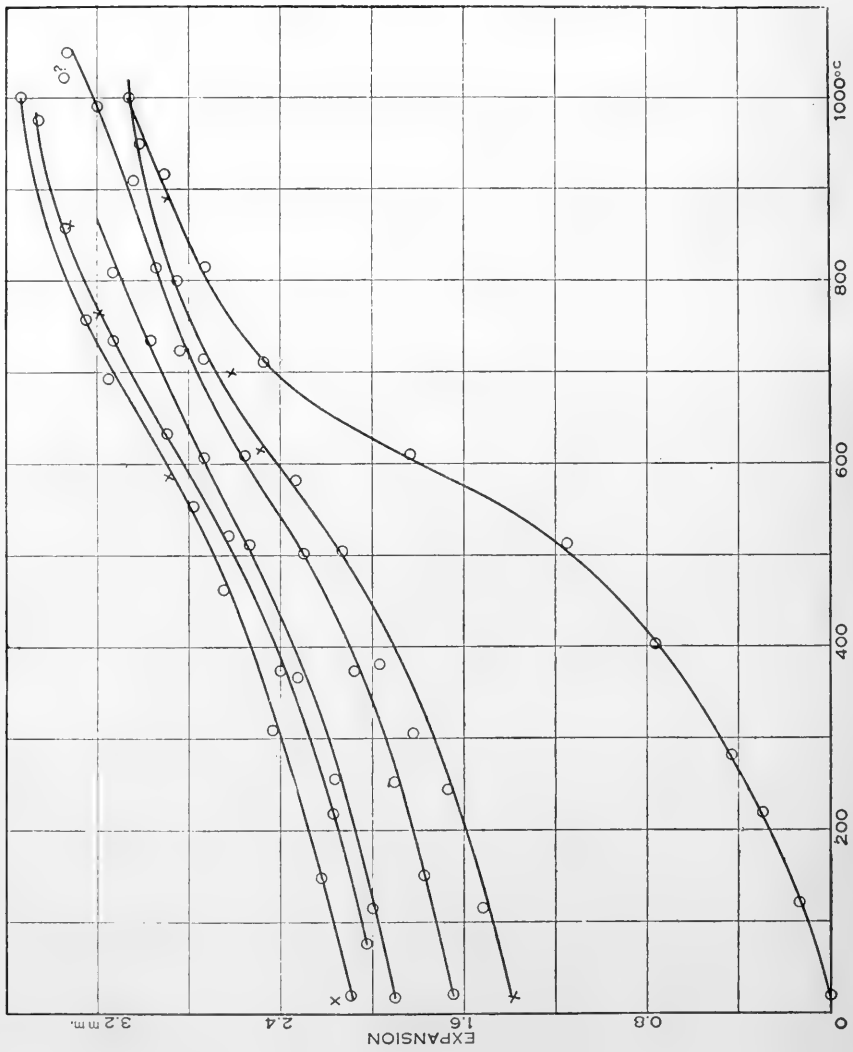

FIG. IV EXPANSION OF DIABASE

In some cases, as will be seen from the foregoing tables, there seemed to be a very slight change in the length of the diabase cylinder in the few days that elapsed between two sets of observations. However, it seems possible that this may have been due to some experimental error, especially as the changes are quite small.

The length of the cylinder after the six heatings was measured with the vernier calipers (Feb. 1, 1910) and was found to be 20.048 cms. This gives a permanent expansion of .217 cms. over the original length of 19.831 cms., which agrees very well with the value obtained from the micrometer microscope readings, *i.e.*, .2175 cms.

The next rock to be examined was a specimen of granite from Westerly, R.I., U.S.A., described in the work by Dr. Adams and Dr. Coker as a "fresh, very fine grained, massive, pale, pink granite," "composed essentially of biotite, microcline, orthoclase and quartz."

As the method of procedure was identical with that for the diabase, only the results obtained are given. Its length, at a temperature of 19° C, as found by the vernier calipers, was 19.833 cms. before heating. The granite was likewise subjected to six sucessive heatings with results as follows (See also Figure V.):

Results of First Heating.		Results of Second Heating.		Results of Third Heating.	
Temperature.	Total Expansion.	Temperature.	Total Expansion.	Temperature	Total Expansion.
19°C.	0 mm.	19°C.	4.029 mm.	19°C.	4.419 mm.
172.5	.261	190.5	4.220	202.5	4.646
371	.960	335.5	4.384	439.5	4.914
468	1.475	480	4.601	604.5	5.208
592	2.440	664	5.074	751	5.525
708	3.439	804.5	5.283	.....	5.700
819	4.442	874	5.392	997.5	5.985
936.5	4.843	984	5.639	1037	6.156
1021.5	5.418	1037	5.858	861.5	5.610
915.5	5.139	885	5.389	670.5	5.291
785	4.920	581	4.915	475.5	5.034
632	4.748	18	4.419	18	4.638
415	4.306	.....	.....	.....	
291	4.221	.....	.....	.....	
19	4.029	....	.....	.....	

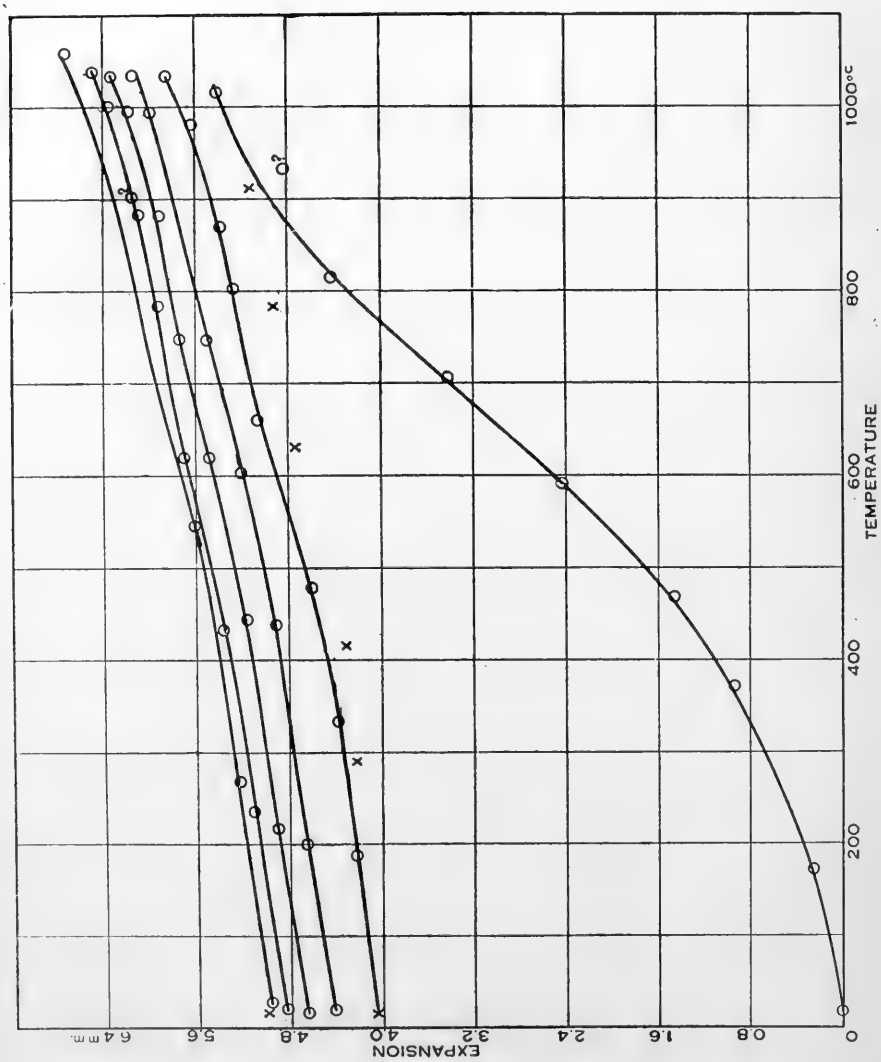

FIG. V EXPANSION OF GRANITE

Results of Fourth Heating.		Results of Fifth Heating.		Results of Sixth Heating.	
Temperature.	Total Expansion.	Temperature.	Total Expansion.	Temperature.	Total Expansion.
20°C.	4.638 mm.	24°C.	4.819 mm.	30°C.	4.951 mm.
219	4.907	238	5.101	270	5.233
446.5	5.155	434	5.351	551	5.618
622.5	5.497	643	5.711	903	6.140
751	5.742	788	5.948	1070	6.740
885	5.919	886.5	6.098	19	5.025
998	6.191	1003.5	6.362	.....	
1037	6.350	1040	6.496	.....	
897.5	5.915	820	5.845	.....	
607.5	5.387	24	4.951	.....	
297.5	5.044	.....	.....	.....	
24	4.819	.....	.....	.....	

The granite cylinder became very brittle during the heatings and the permanent expansion was so large that it fitted rather tightly in the furnace after cooling. It was broken in removing it, so that no satisfactory measurement of its length was obtained with the vernier calipers after the heatings.

A part of the granite cylinder was given to Dr. Adams to see if anything could be learned concerning the nature of what took place during the heatings and coolings, through an attempt to make a thin section which could be examined microscopically. The author quotes his remarks concerning it as follows:

"After the completion of the experiment the column of rock was more brittle than it had formerly been, and showed a tendency along portions of the sharp edges to disintegrate slightly. Otherwise, however, it seemed to be tolerably hard and compact.

"In cutting it open, however, for the purpose of making thin sections, the rock could be seen to be apparently firm and more or less compact around the outer portion of the column, while in the inner portion it was found to be quite pulverulent, so much so that the grains could be shaken out, being quite separate from one another.

"It would seem that the proximity of the heated surface of the tube had produced some effect in the way of sintering of the grains on the outer surface of the column, while within the unequal expansions

and contractions of the different grains had served to rend them apart. This has an important bearing upon the fact that the co-efficient of expansion of the column as a whole changed in the later heatings as compared with the first heating."

The third and last rock to be examined was a specimen of white marble from Carrara, Italy. A description of this rock is also to be found in the article by Dr. Adams and Dr. Coker already referred to, pp. 26–27. It is a "white very fine grained saccharoidal marble. Under the microscope it is seen to consist of a mosaic of calcite grains. In this mosaic, some grains are larger than others, but there is no great difference in their relative sizes and the average grain of the rock is uniform throughout. The average diameter of calcite crystals closely approximates 0.2 mm. The grains come against one another along sharp and usually straight lines. There is no trace of foliation in the rock, nor is there any trace of flattening or elongation of the grains in any one direction. The rock is perfectly massive."

The method employed was identical with that in the case of the diabase and granite, except that in the present case the heating was not carried above about 500° C., as the marble would be decomposed at the higher temperatures. The specimen was roughly cylindrical and its length, as measured with the vernier calipers before heating, was found to be 19.925 cms. at room temperature.

The results obtained during the six heatings are given in the following tables (See also Figure VI.)

Results of First Heating.		Results of Second Heating.		Results of Third Heating.	
Temperature.	Total Expansion.	Temperature.	Total Expansion.	Temperature.	Total Expansion.
22°C.	0 mm.	18°C.	.732 mm.	16°C.	.897 mm.
162	.221	128	.788	146	.959
273	.667	199.5	.861	358	1.499
338	.976	340	1.309	430	1.716
387	1.234	414.5	1.530	463	1.852
448	1.611	455.5	1.711	19	.952
19.5	.732	464	1.810	.....	
.....	.....	16	.897	.....	

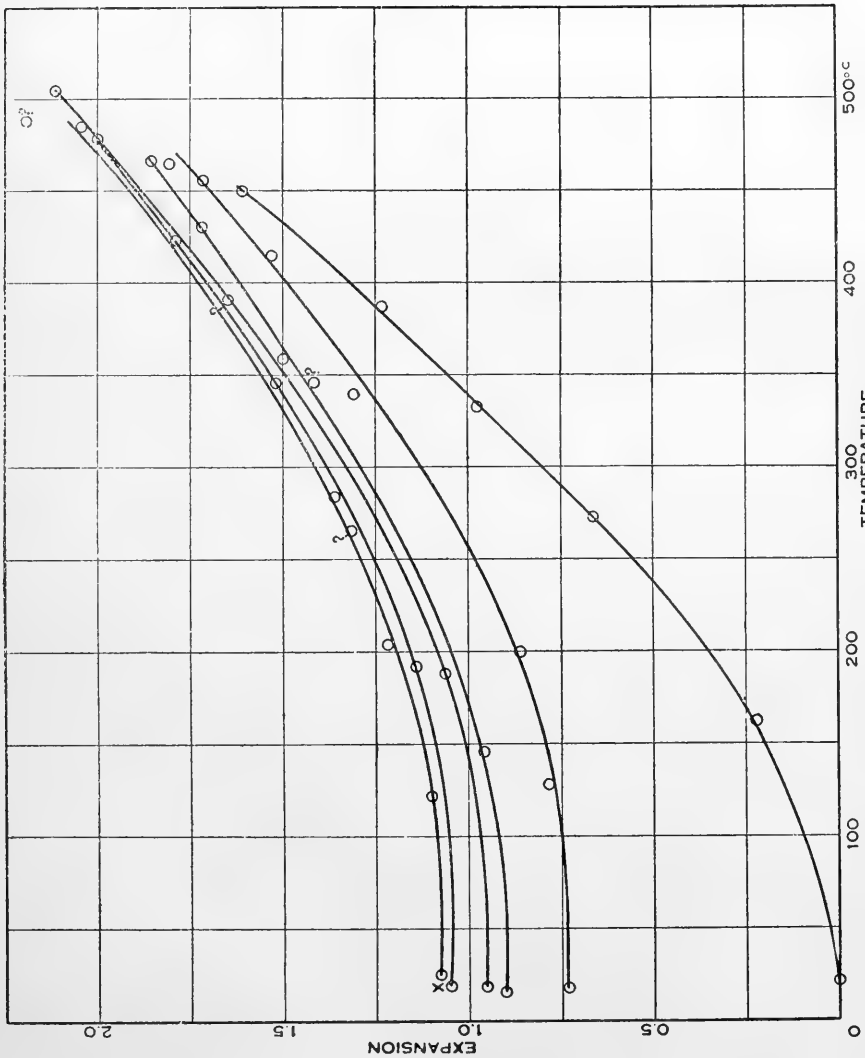

FIG. VI EXPANSION OF MARBLE

Results of Fourth Heating.		Results of Fifth Heating.		Results of Sixth Heating.	
Temperature.	Total Expansion.	Temperature.	Total Expansion.	Temperature.	Total Expansion.
19°C.	.952 mm.	18°C.	1.048 mm.	25°C.	1.074 mm.
188	1.063	179	1.143	122	1.099
346.5	1.414	266	1.317	204	1.221
504.5	2.119	346.5	1.519	284	1.359
18	1.048	423.5	1.785	377	1.650
.....	.....	478	1.998	484	2.047
.....	.....	25	1.074	487.5	2.129
.....	.....	.....	.....	18	1.095

After the six heatings of the marble, the length obtained with the vernier calipers was 20.029 cms., indicating a permanent elongation of 0.104 cms., which is in good agreement with the value given in the above table, or 0.1095 cms., considering the fact that the ends of the marble were not very nicely finished.

The results of two sets of readings on the nickel-steel cylinder of the furnace are also given here, as being of interest in indicating the relative expansion of this alloy and the rocks examined, and especially the general accuracy of the work with the rocks.

The composition of this nickel-steel was given by Dr. Adams as being approximately as follows:

"Carbon	.30
Manganese	.74
Silicon	.162
Phosphorus	.035
Sulphur	.038
Nickel	4.740
Iron	"

The readings on the nickel-steel were taken on two marks at a distance apart of 20.09 cms. as measured with a metre scale. The determination was made with a cylinder of stone within the furnace and the thermo-junction arranged as before, and the following results were obtained (See also Figure VII, in which the circles represent the points taken during one heating, and the crosses the points during the other heating.)

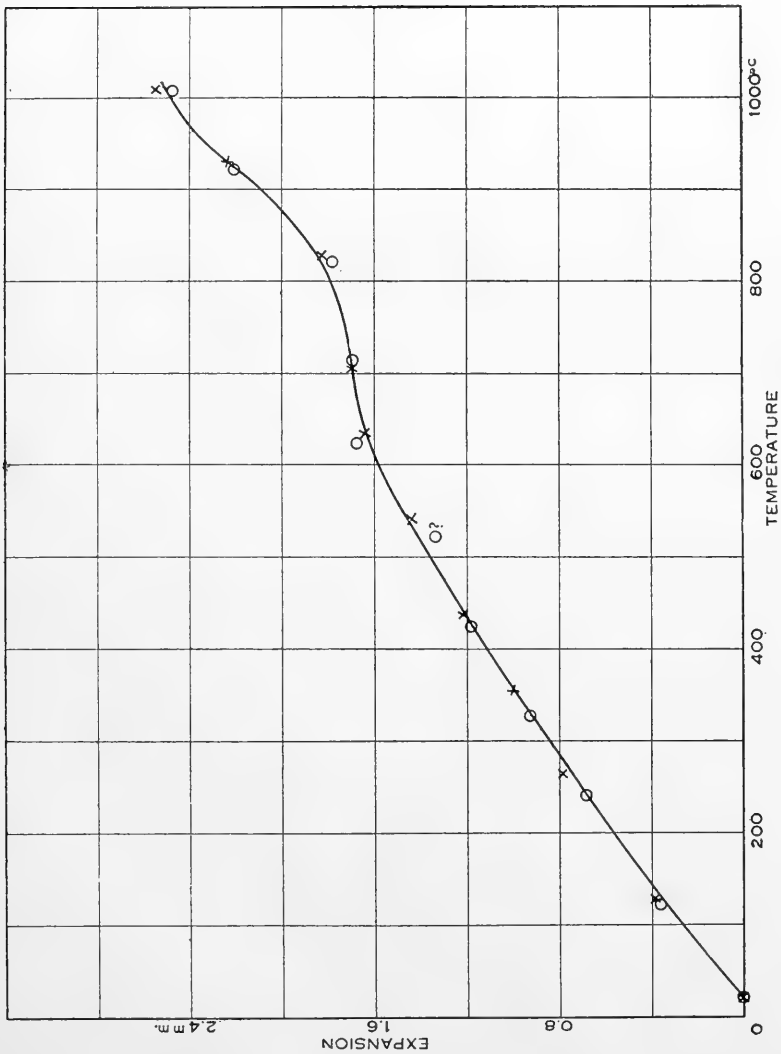

FIG. VII EXPANSION OF NICKEL-STEEL

Results of One Heating of Nickel-Steel Cylinder.		Results of a Second Heating of Nickel—Steel Cylinder.	
Temperature.	Total Expansion.	Temperature.	Total Expansion.
22°C.	.0 mm.	22°C.	.0 mm.
120	.3612	128	.3678
239	.6966	263.5	.7789
327.5	.9259	353	1.0034
424.5	1.1962	437	1.2019
523	1.3394 (?)	542	1.4359
624.5	1.6909	635	1.6468
717	1.7070	710	1.7062
822	1.7833	829	1.8328
922.5	2.2104	933	2.2217
1010	2.4830	1009.5	2.5502
859.5	1.7650	34.5	.2302
736.5	1.2979	.....	
706	1.2116	.....	
416	1.1290	.....	
22	.1675	.....	

It will be seen that much more is shown in this way concerning the real character of the thermal expansion than in investigations similar to that preliminary to this work, where simply two widely separated temperatures were taken and the average coefficient of expansion between these limits calculated. For instance, in the case of the diabase, it happens that between 20° C. and any temperature up to about 550° C. the coefficient of expansion is greater for the nickel-steel cylinder than for the initial heating of the diabase, while the reverse is true between 20° C. and any temperature between about 550° C. and 1000° C.

In the case of the rocks examined, there was no marked tendency of the permanent expansion to become less in the course of a few days or weeks. For example, the diabase cylinder, which measured 20.048 cms. on February 1, measured 20.050 cms. in length on February 9, or practically the same within the limits of accuracy of such measurements with the vernier calipers used. The effect on this permanent expansion of cooling specimens of the diabase and granite to the temperature of liquid air was also tried. The diabase cylinder which had been subjected to the six heatings above mentioned, was kept in liquid air for about thirty minutes. Afterwards it was measured at 20° C., and its length found to be 20.053 cms. or practically the same as before the cooling to

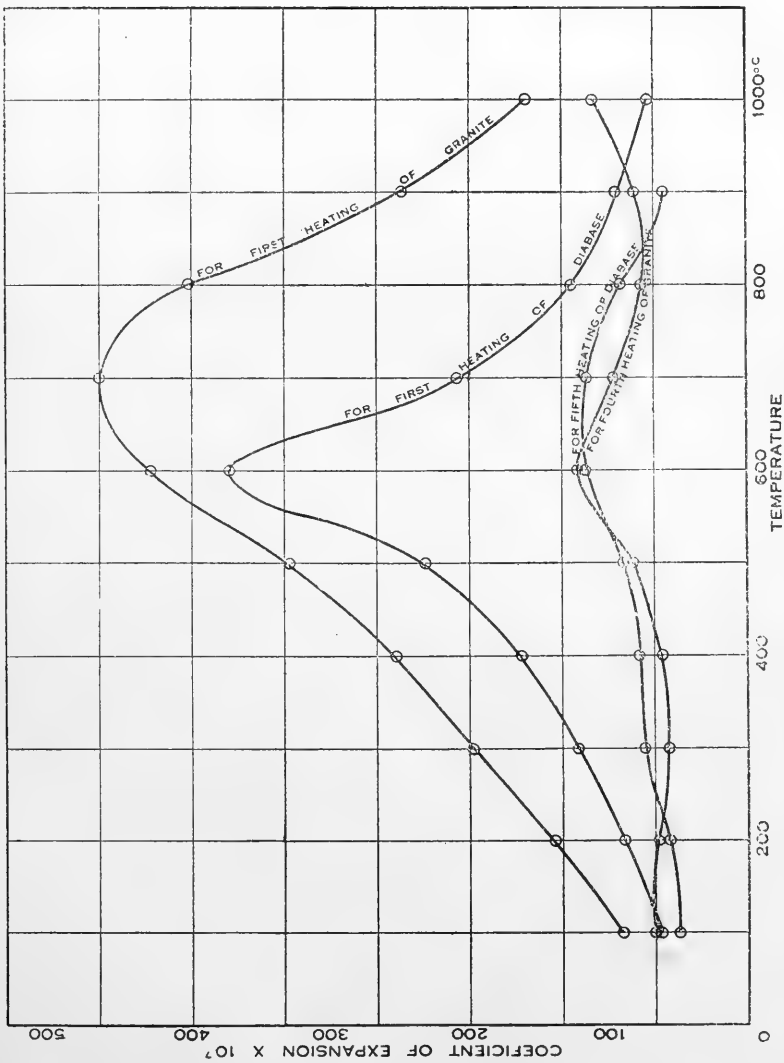

FIG. VIII COEFICIENT OF EXPANSION FOR GRANITE AND DIABASE

−182° C. The effect on the granite seemed to be exactly similar. The cylinders were placed in a copper trough but little longer than the specimens themselves, and the bubbling of the liquid air as it was boiling next to the ends of the trough interfered with focusing micrometer microscopes on the ends of the rock, so, unfortunately, no satisfactory measurement of the coefficient of expansion between −182° and 0° C. was obtained.

In the following tables (See also Figure VIII.) are given the approximate values of the coefficient of expansion per degree Centigrade at intervals of 100° C. These values were calculated from the slopes of expansion curves of Figures IV., V, and VI., at the various points considered. They are given for the initial heating and also for one of the later heatings.

Coefficient of Expansion for Diabase.			Coefficient of Expansion for Granite		Coefficient of Expansion for Marble.	
Temperature.	First Heating.	Fifth Heating.	First Heating.	Fourth Heating.	First Heating.	Fifth Heating.
100°C.	62.7×10^{-7}	48.7×10^{-7}	90.7×10^{-7}	66.3×10^{-7}	82.3×10^{-7}	28.3×10^{-7}
200	89.8	55.7	139.6	63.4	181	92.3
300	123.4	73.9	198.7	56.1	239	127.3
400	163	77.6	253.8	62.2	276	179.2
500	233	88.4	331.7	82.3	.....	
600	374	116.8	430	122.6	.....	
700	210	115.6	467	96.2	.....	
800	126.6	91.2	402	75.2	.....	
900	94.2	59.8	249.7	80.8	.....	
1000	71.8	.....	159.4	110.8	.....	

At this point it is interesting to compare the above results for low temperatures with those previously published. Those given by Reade are, for granites $\frac{1}{203,322}$ per degree Fahrenheit and for marbles, $\frac{1}{184,797}$, which gives for granite 88.53×10^{-7}, and for marbles 97.40×10^{-7} per degree Centigrade. The results of the experiments under the direction of Col. Totten, above referred to, are equivalent to 86.85×10^{-7} for granite, and to 102.02×10^{-7} for marble, per degree Centigrade. For the more accurate results obtained by Hallock in experiments upon several specimens of marble, between about 20° and 100° C. see reference above. It will be seen that the results obtained by the author for the lower temperatures are of the same order as those previously obtained.

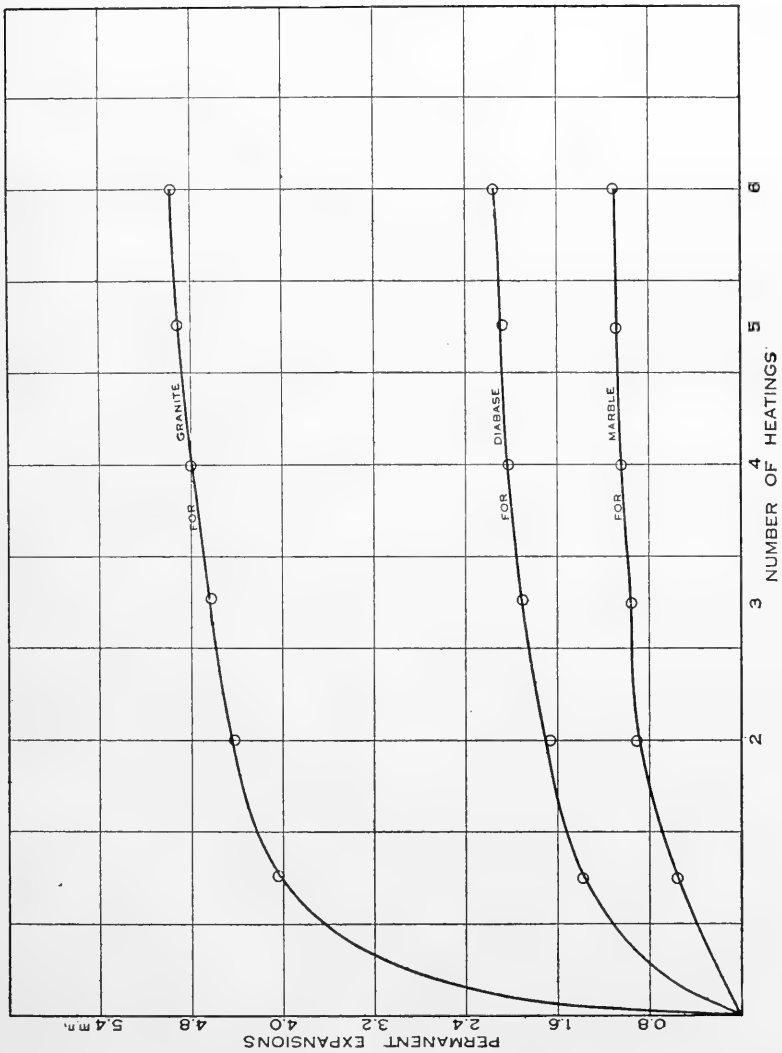
PERMANENT EXPANSIONS
0.8
1.6
2.4
3.2
4.0
4.8
5.4 m.m.
NUMBER OF HEATINGS
2
3
4
5
6
GRANITE
FOR
DIABASE
FOR
MARBLE
FOR

FIG. IX

It should of course be remembered that we are comparing the actual coefficient of expansion at 100° C. with the average coefficient of expansion over a more or less wide range up to about 100° C.

It seems reasonable to suppose that the more rapid increase in length of the diabase and granite between 350° and 800° C. may be due to the different coefficients of expansion of the various crystals composing the rock, those having a greater coefficient tending to stretch other parts of the rock, until finally at about 350° C. the elastic limit of those parts being exceeded, the elongation becomes much more rapid.

In the same way it would seem that the permanent expansion with its consequent weakening of the rock might be explained. As the particles of the rock which have a smaller coefficient of expansion are torn apart by others having a greater expansion, more or less of a rearrangement of the loosened particles would naturally follow, so that on cooling, instead of completely resuming their original position, they would tend to tear apart the crystals having the greater expansion coefficients. This would cause both a weakening of the rock and a permanent elongation.

In Figure IX., the permanent expansions have been plotted against the number of heatings to show the tendency of the rocks to approach a permanent state. It will be recalled that Hallock noted that the permanent expansion of the marble samples upon which he was working on "being heated for the first time to 100° C. and allowed to cool did not contract to their original length, and the next two or three heatings resulted in continued, but ever diminishing increments of length at ordinary temperatures." . It will be seen that a similar result is obtained on heating to a much higher temperature.

In conclusion the author desires to express his thanks to Dr. Barnes and Dr. Adams for much help during the progress of the work.

III.—*The Variation of Water Vapour Lines in the Solar Spectrum.*

By N. R. GILLIS, M.Sc., Lecturer in Physics,
McGill University, Montreal.

Communicated by DR. H. T. BARNES.

(Read Sept. 28th, 1910.)

HISTORICAL.

As early as 1833 certain lines and bands of the sun's spectrum were found to vary with the proximity of the sun to the horizon[1]. These consisted of a large group near the D line, the lines A, B and C, which were greatly widened, and other lines which were developed between A and B and between C and D. The source of these lines was suggested to be the absorptive action of the earth's atmosphere.

A very extensive study of the variation of such lines was carried out by Brewster and Gladstone[2]. A map showing the lines studied is appended, together with smaller maps of selected portions of the spectrum.

These observations were verified by the eminent French physicist Janssen.[3] He was able by means of the greater dispersive power of his spectroscope to render these bands into lines. By noting the difference in intensity of the lines at various altitudes, he showed that the agency by which the alteration was produced was the absorption of the atmosphere. He observed the absorption spectrum of water vapour[4] and found that the bands therein corresponded with those of the solar spectrum that increased in blackness as the sun approached the horizon. He also mapped the spectrum of the sun between C and D, as it appeared at noon and near sunset; by a comparison of these, the water vapour lines could be detected, viz., they consisted of all lines in the second spectrum which were not found in the first. In this manner the lines were concluded to occupy the region near C, that in the neighbourhood of D and a region almost midway between these two.

Cornu[5] carried out a very careful investigation upon the lines that are due to atmospheric absorption. He succeeded in distinguish-

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[1] Sir D. Brewster: Phil. Mag. (3), 8, 384.
[2] Phil. Trans., 150, 149 (1861).
[3] Annales de Chimie et de Physique (4), 23, 274–300 (1871).
[4] Annales de Chimie et de Physique (4), 24, 215–217 (1871).
[5] Annales de Chimie et de Physique (6), 7, 1–102 (1886).

ing the solar lines from those due to the absorbing influence of the earth's atmosphere. This was accomplished by an application of the principle that the spectral lines of the light which is emitted by a source in relative or absolute motion are displaced. The general experimental arrangement consisted in causing the two extremities of the solar diameter to fall rhythmically upon the slit of the spectroscope. Thus it was found that the solar lines were displaced, while the telluric lines remained fixed.

A large number of lines of atmospheric origin was found near D and also near A, B and the band called K in Augström's map was determined. Those that were considered to be due to water vapour are indicated specially.

Important work upon the variation of the water vapour lines was conducted by C. S. Cook.[1] Observations were made upon the hygrometric state of the atmosphere and upon the intensity of a line near the D lines as seen when the spectroscope was pointed to different azimuths. These were carried out at different stations, one at the foot, and the other at the summit, of a mountain, the difference in altitude being three thousand feet. The results showed a marked similarity between the curves representing the humidity gradient and the difference in the intensity of the lines at the bottom and top of the mountain.

A very important paper by Theodor Arendt[2] details work done by him upon the variation of the aqueous vapour lines. His method of comparison was the "Step-by-step" Method. Numerous curves are given to show the changes in the intensity, the humidity of the atmosphere, the temperature and the barometric pressure.

The general result is that the rainband is not trustworthy as a guide to the weather.

Apparatus and Method of Observation.

For several years records have been made by Professors McLeod and Barnes of the difference of temperature between the base and summit of Mount Royal. They have shown that, under conditions not yet understood, the temperature differences show considerable variation over extended periods. The present work was undertaken at the suggestion of Professor Barnes, to see how far variations in the water vapour lines were connected with the changes in the temperature gradient in the lower atmosphere.

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[1] Science, 2, 488 (1883).
American Journal of Science and Arts, 39, 258 (1890).

[2] Beitrage zur Physik der freien Atmosphare, Zweiter Band, 4 Heft, 135 (1907).

The experimental arrangements were as follows:—

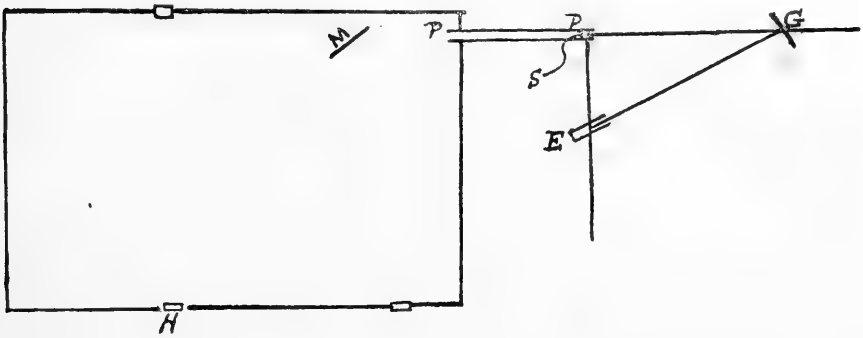


FIG. 1.

Sunlight was reflected from a heliostat H to a mirror M, both of which stood in a room by themselves. Thence the light passed through a pipe PP and slit S to a grating G, and was then reflected to the eye-piece E. The grating stood in a room which could be completely darkened, and, moreover, in order to shut out all extraneous light, the arm GE and the grating were covered with black cloth.

The usual adjustments having been made, the original intention was to take observations by a photographic method, a camera being mounted at E instead of the eye-piece. However, this was abandoned in favour of a modification of C. S. Cook's method. The eye-piece was

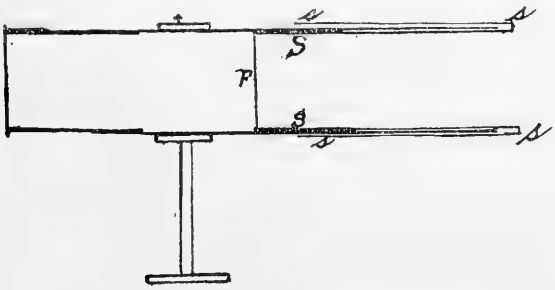


FIG. 2.

provided with a sleeve S carrying a single silk fibre F. This was moved in and out by means of metallic springs SS that bent over a millimeter scale attached to the outside surface of the tube. When the fibre is placed near the focus, one very dark line is seen in the approximately monochromatic light from the grating; however, when it is gradually moved away, two dark lines of less intensity appear. These are the diffraction bands, which are caused by the passage of

the light about the fibre. The intensity of these bands can be varied at will from total blackness to disappearance by increasing the distance of the fibre from the focus. This change of distance can be read off on the scale, and constitutes an arbitrary scale of intensity.

From a consideration of the aqueous vapour lines in Rowland's tables, it was decided to use the portion in the neighbourhood of the D lines, as the vapour lines there are very pronounced. The important ones whose wave lengths are 5901.682 and 5919.860 were at last selected.

Specimen observations upon the intensity are plotted in the accompanying curves. The variations in 5901.682 are represented in the left-hand curves, those in 5919.860 in the right-hand ones. The abscissæ are devoted to the hours of the day at which the readings were taken, while the ordinates are the readings on the millimeter scale. Each ordinate is the mean of four observations at one time.

Conclusions.

1. This method of measuring the intensity of the lines is capable of considerable accuracy. When the spectrum is ordinarily bright the greatest and least readings at any one time differ by less than two millimetres; however, in order to obtain the best results, the eye and also the fibre must be kept as steady as possible, and all extraneous light should be eliminated. A further precaution is necessary, viz., a specific portion of one diffraction band should be chosen to compare with an adjacent portion of the line; otherwise the possible lack of perpendicularity in the fibre will prove a source of error. If these precautions are taken, a difference of about one millimetre may be found in the readings.

2. An inspection of the curves shows that the intensity varies considerably throughout the day and also from day to day. Especially intense are they before storms. This fact is made clear by the observations on January 20th. Although the day was fine, the lines were about the darkest in the whole winter's observations. The same statement would be true of their number, for one or two lines in the band of Angström's map were observed, which have not since appeared. Usually one sees in the spectrum given by the grating that is used three lines between the D lines, but on days when the lines are very intense as many as seven may be detected and many new lines appear on both sides. The phenomena detailed above were followed by a severe sleet storm.

3. Generally the noon readings are less than the morning or evening; however, exceptions are noted on February 12th and March

3rd. In each case a storm ensued. It is possible that the water vapour area was situated at such a height and in such a direction that the sunlight did not traverse it until noon.

4. It will be seen that the curves representing the intensity and the temperature follow the same general course. Thus far the observations indicate that the intensity is mainly a function of the temperature and the humidity, but it is hoped to continue the work for some time in order to see how far the accumulation of masses of aqueous vapour in the atmosphere may differ from time to time, during corresponding seasons of the year.

NOTE: March 6th, 1911, by H. T. B. Owing to ill health Mr. Gillis was obliged to abandon this work. The observations gave promise of interesting results, and it is hoped others may be induced to follow the variation of the water vapour lines by Cook's method.

IV.—*The Chinook in Southern Alberta and Temperature Inversions at Sulphur Mountain, Banff.*

By R. F. STUPART.

(Read September 27, 1910.)

A study of some of the remarkable characteristics of the climatic conditions of Alberta has led to an investigation of the phenomena of the Chinook wind and of the inversions of temperature which are found to be not infrequent in the higher levels of the Rocky Mountains. For this investigation daily observations for the six years 1904–9, at the following stations, have been considered: *Outer Coast*, Port Simpson, Rivers Inlet, Quatsino, Clayoquot and Bamfield. *The Island*, Victoria. *Lower Mainland*, New Westminster, Agassiz, Ladner's Landing. *Interior Plateau*, Kamloops, Okanagan. *Mountains*, Revelstoke, Glacier House, Golden, Barkerville, Banff and Sulphur Mountain. *Prairies*, Calgary and Edmonton.

The first and most obvious conclusion is that the Alberta chinook is a strong southwest or west wind which blows between the coast and Alberta when a well-marked area of low barometric pressure is passing eastward across the more northern part of the Province, and with these conditions a heavy general precipitation occurs on the outer coast line and also in a more spasmodic manner on the western slopes of the Mountain ranges of the Interior. The Chinook is not pronounced unless the barometric gradient be steep enough for strong winds. It is found that the temperature of the winter chinook in Southern Alberta is approximately equal to the temperature on the outer coast of British Columbia and may exceed 50. The conditions which precede and accompany the Chinook all tend to confirm the theory, that the fohn results from the retardation, due to the condensation of moisture, in the rate of cooling of the air ascending the western slopes of the mountains and subsequent warming at the ordinary adiabatic rate in the descent of the eastern slopes. Observation does not shew that a change to higher temperature on the Alberta prairies is indicated much in advance by a change occurring on Sulphur Mountain, while on the other hand cold waves setting in from the north are usually well marked on the plains before any change occurs at high levels.

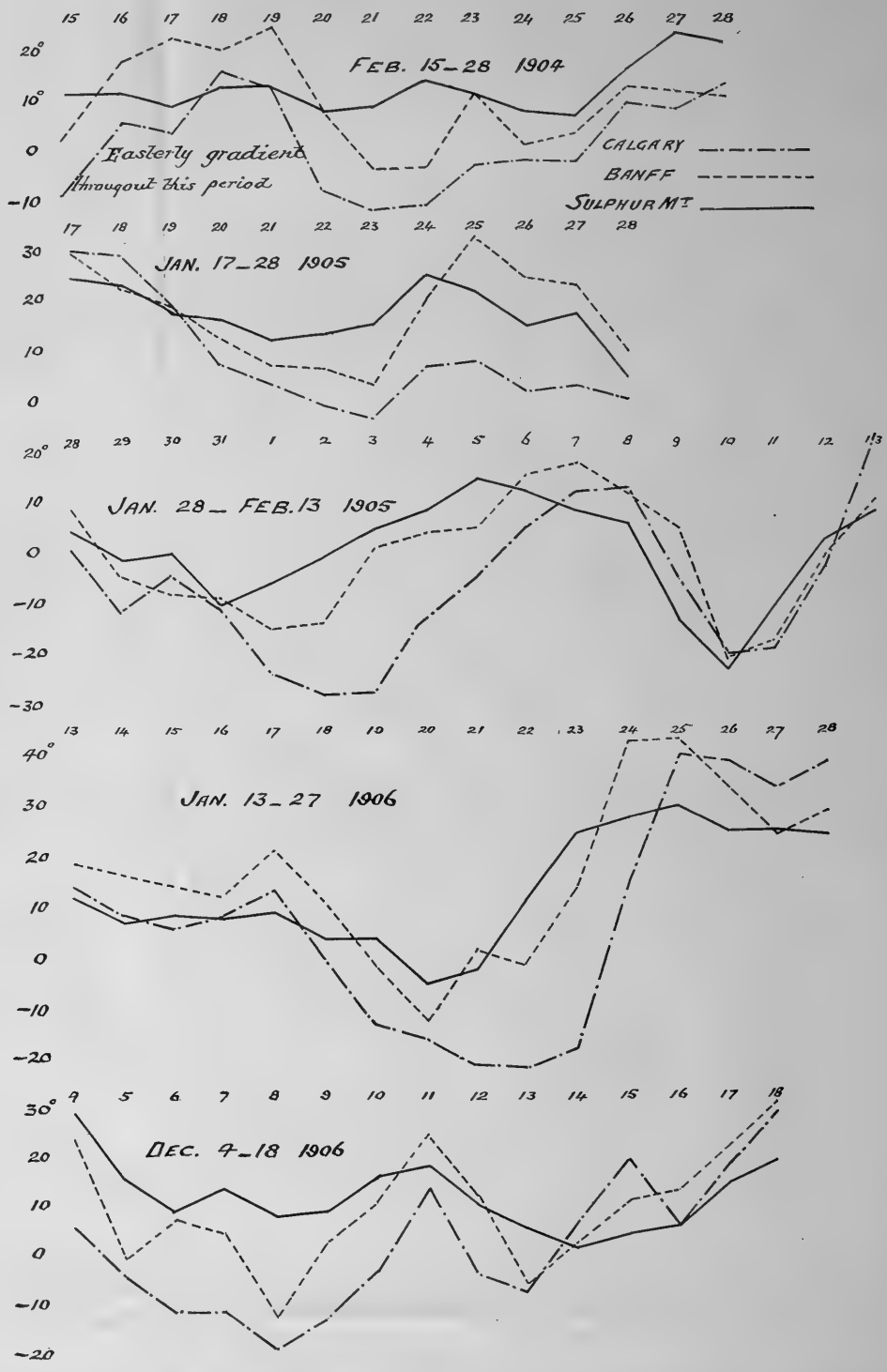
Accompanying tables and diagrams shew that the averge mean temperature of a term of years is in every month of the year higher at Banff and at Calgary than on the top of Sulphur Mountain and that the mean daily range of temperature at Calgary is approximately double what it is on the Mountain. It is a most interesting fact, however, that in abnormally cold winter months on the plains, the mean tem-

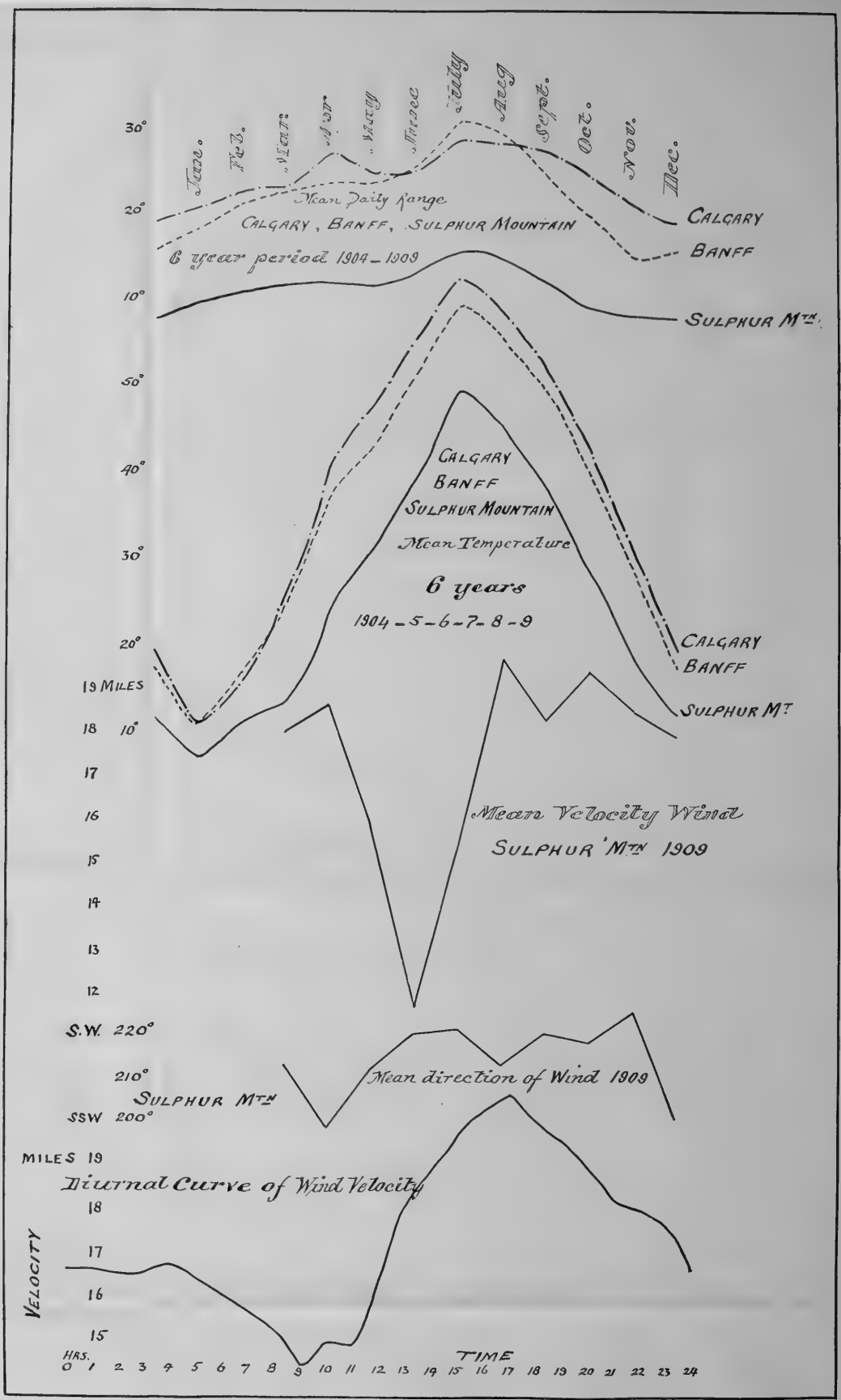
perature on the Mountain top is actually higher than at Calgary, while in seasons, when the Chinook is persistent, the mean temperature at Calgary is very decidedly higher than at Banff and on Sulphur Mountain.

TABLE I.—SHEWING THIS MEAN MONTHLY TEMPERATURE AT CALGARY, BANFF AND SULPHUR MOUNTAIN DURING THE YEARS 1904-9.

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1904													
Calgary.	17.6	—1.1	13.3	43.0	48.0	54.3	61.0	56.6	51.0	43.7	35.5	20.3	36.9
Banff.	17.7	6.2	15.7	39.8	44.5	50.7	59.3	55.3	49.4	42.9	35.9	19.8	36.4
Sulphur M't. . . .	10.6	4.5	6.6	29.8	32.2	40.8	51.1	47.8	38.7	31.0	24.9	12.6	27.6
1905													
Calgary.	10.0	14.4	36.0	39.5	47.4	52.9	61.2	59.9	51.5	37.4	33.7	24.6	39.0
Banff.	11.8	15.8	33.8	37.9	43.7	49.7	58.4	56.8	48.9	32.6	30.2	22.4	36.8
Sulphur M't. . . .	10.1	12.1	23.2	26.4	30.9	36.7	46.7	46.6	36.5	19.7	20.3	15.2	27.0
1906													
Calgary.	16.0	24.3	25.4	45.5	46.4	56.0	64.2	60.0	51.4	44.4	26.9	11.6	39.3
Banff.	18.6	23.0	24.3	42.4	44.1	51.2	62.8	55.6	49.3	40.7	22.7	15.4	37.5
Sulphur M't. . . .	12.3	14.7	13.0	30.7	31.0	39.1	52.9	45.2	37.8	28.5	15.0	13.2	27.8
1907													
Calgary.	—6.3	21.0	22.1	34.6	44.2	55.0	60.3	55.0	48.9	48.0	34.5	23.6	36.7
Banff.	—4.3	21.4	22.3	33.0	42.8	51.1	56.6	51 8	46.9	44.6	31.0	20.0	34.8
Sulphur M't. . . .	—4.4	7.0	10.4	18.4	28.1	38.2	46.3	39.2	34.6	35.8	19.9	11.5	23.8
1908													
Calgary.	25.8	22.3	22.0	43.2	50.0	55.2	63.7	57.8	53.3	40.4	33.3	21.2	40.7
Banff.	19.4	17.5	22.0	38.2	45.6	51.6	59.5	55.7	49.7	36.4	30.0	16.1	36.8
Sulphur M't. . . .	9.3	7.6	8.8	23.4	31.4	38.4	49.4	44.8	38.0	26.6	20.2	10.7	25.7
1909													
Calgary.	3.6	11.8	30.7	32.6	46.5	56.8	61.4	59.0	55.2	40.6	19.6	13.9	36.0
Banff.	1.9	15.5	27.6	29.0	43.4	52.3	57.1	54.5	50.9	38.9	20.4	10.0	32.6
Sulphur M't. . . .	4.3	8.2	17.9	16.9	30.9	40.4	47.0	46.1	41.5	27.1	13.7	8.0	25.1
Mean													
Calgary.	11.1	15.4	24.9	39.7	45.2	55.0	62.0	58.0	51.9	42.4	30.6	19.2	37.9
Banff.	10.9	16.6	24.3	36.7	42.2	51.1	59.0	55.0	49.2	39.4	28.4	17.3	35.8
Sulphur M't. . . .	7.0	9.0	13.3	24.3	30.7	38.9	48.9	44.9	37.9	28.1	19.0	11 9	26.2
Daily Range													
Calgary.	20.5	22.4	22.9	26.9	24.5	25.3	28.5	28.2	27.3	24.2	20.8	19.0	24.3
Banff.	18.2	20.9	22.5	22.9	22.8	25.0	30.6	29.1	24.1	19.3	14.3	15.4	22.1
Sulphur M't. . . .	9.5	10.8	11.4	11.8	11.1	13.1	15.3	14.2	11.8	9.0	8.0	7.3	11.1

Diagrams Shewing Temperature Inversions on Sulphur Mountain




Jan.
Feb.
Mar.
Apr.
May
June
July
Aug
Sept.
Oct.
Nov.
Dec.
30°
20°
10°
Mean Daily Range
CALGARY, BANFF, SULPHUR MOUNTAIN
6 year period 1904 - 1909
CALGARY
BANFF
SULPHUR MTN.
50°
40°
30°
20°
10°
CALGARY
BANFF
SULPHUR MTN
Mean Temperature
6 years
1904 - 5 - 6 - 7 - 8 - 9
CALGARY
BANFF
SULPHUR MT
19 MILES
18
17
16
15
14
13
12
Mean Velocity Wind
SULPHUR MTN 1909
S.W. 220°
210°
SSW 200°
SULPHUR MTN
Mean direction of Wind 1909
MILES 19
Diurnal Curve of Wind Velocity
18
17
16
15
VELOCITY
HRS.
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
TIME

V.—*On the amount of Radium and Radium Emanation present in the water and gases of the Caledonia Springs, near Ottawa.*

By A. S. EVE, M.A., D.Sc., McGill University.

(Read 27th September 1910.)

It has been proved by Strutt, Joly, Eve and McIntosh, and others, that soils and rocks usually contain minute quantities of radium. The amount of radium present is variable, but determinations of specimens from many parts of the earth's surface give a mean value of about 1.4×10^{-12} gram of radium per gram of rock, that is, about one part in a billion (10^{12}).

Underground waters percolating through rocks dissolve some of the radium and, therefore, hold some radium in solution. The presence of the water also facilitates the escape of radium emanation from the soil to the air. Surface waters and river waters contain radium to a less extent than underground waters.

The water and gases from the Caledonia Springs have been thoroughly analysed by Dr. Ruttan, of McGill University. The principal salts present in the waters are sodium and magnesium chlorides and calcium and magnesium carbonates. The gases freely liberated at the Springs are mainly methane (63 per cent) and nitrogen (33 per cent). The remaining 4 per cent are mainly hydrogen, carbon monoxide, carbon dioxide, ethane; there is also a trace of helium.

Not far from the springs is a large peat bog, and it appears that the water soaking through the peat is powerful with reagents, to the action of which the greater part of the chemical properties may with much probability be assigned.

The writer has recently made an investigation of the amount of radium present in samples of the water taken by him from the wells, and of the amount of radium emanation present in the gases spontaneously liberated at some of the springs. It appears desirable to place these results on record. The following is a list of the springs.

In front of the Caledonia Springs Hotel,

(1) The Gas Spring,
(2) The Sulphur Spring,
(3) The Saline Spring. (The water from this is carbonated and sold as the well-known Magi Water.)

Across the railway is

(4) The Artesian Sulphur Spring, which supplies the baths of the Hotel.

Two miles away from the Hotel is

(5) The Duncan Spring.

The amount of radium present is given in terms of billionths (10^{-12}) gram of radium per litre of water.

(1) Gas Spring	15
(2) Sulphur Spring	15
(3) Saline Spring	14
(4) Artesian Sulphur Spring	10
(5) Duncan Spring	18

Compare

Sea water, North Atlantic	0.9
River St. Lawrence	0.25
" " in flood, turbid	1.1
Laurentian Spring Water	4

The amount of radium emanation in the gases liberated at the springs was measured in terms of the number of billionths (10^{-12}) of a gram of radium required to produce the amount of emanation present per litre of the gas.

Thus the amount of radium stated below, multiplied by 10^{-12}, is in radioactive equilibrium with the radium emanation in a litre of the gas.

Gas Spring	620
Duncan Spring	420
Saline Spring	210
Atmospheric Air (Montreal, Cambridge, etc.)	0.1

The value for the Saline Spring is an underestimate, for the gas was unavoidably collected in the bottling house, and may have been mixed with air.

The gases, therefore, contain about four to six thousand times as much radium emanation as atmospheric air.

It may be of interest to compare these results with those for the two springs which are, so far as at present known, the most powerful as regards the contents of radium and its emanation.

The water from the Quelle am Schweizergang at Joachimsthal is about 7,000 times as radioactive as the Caledonia Springs. The gases from the pool near Clepsytra Geyser, in the Lower Geyser Basin of the Yellowstone National Park, contain about 700 times as much radium emanation as the gases from the Caledonia Springs. Further information on this point may be obtained from Bulletin 395 of the United States Geological Survey, which is a report by Moore and Schlundt on the "Thermal Waters of Yellowstone National Park."

VI.—*The Nitrogen Compounds in Rain and Snow.*

By FRANK T. SHUTT, M.A., F.I.C.

Chemist, Dominion Experimental Farms.

(Read September 27th, 1910.)

The analysis of the rain and snow, with a view of determining their nitrogen compounds, was first undertaken in the laboratories of the Dominion Experimental Farms, Ottawa, during the latter part of the winter 1906–07, and has been continued uninterruptedly since that time. From the results of this investigation, two papers have already been presented to this society: The Fertilizing Value of Snow (read May, 1907), and the Nitrogen Compounds in Rain and Snow (read May, 1908). The present paper is a report of progress, and will place on record the data obtained for the two years ending February 28th, 1910. For convenience of discussion, the results of each year will be considered separately.

YEAR ENDING FEBRUARY 28TH, 1909.

In the following table are given the monthly precipitations, the average amounts of nitrogen present as free ammonia, albuminoid ammonia and nitrates and nitrites, and the pounds of nitrogen furnished per acre.

RAIN AND SNOW AT OTTAWA FOR THE YEAR ENDING FEBRUARY 28, 1909.

Month and Year	Precipitation in Inches			Nitrogen				Pounds of Nitrogen per Acre
	Rain	Snow	Total as Inches of Rain	In Free Ammonia	In Albuminoid Ammonia	In Nitrates and Nitrites	Total	
				p.p.m.	p.p.m.	p.p.m.	p.p.m.	
March 1908	2.24	13.25	3.57	.262	.029	.183	.474	.383
April "	1.34	4.00	1.74	.702	.056	.374	1.132	.446
May "	5.46	...	5.46	.492	.058	.174	.724	.903
June "	1.31	...	1.31	.288	.052	.194	.534	.159
July "	2.77	...	2.77	.453	.052	.114	.619	.450
August "	1.72	...	1.72	.638	.061	.208	.907	.354
September "	1.00	...	1.00	4.839	.716	.897	6.452	1.462
October "	2.28	...	2.28	3.531	.171	.551	4.253	2.197
November "	1.48	10.00	2.48	1.337	.129	.171	1.637	.920
December "	.21	41.75	4.39	.267	.063	.148	.478	.476
January 1909	2.46	11.00	3.56	.266	.124	.129	.519	.420
February "	.72	16.25	2.35	.212	.043	.109	.364	.194
Total for 12mo.	22.99	96.25	32.63	...	...	...	...	8.364

The chemical data for each month were averaged and from the figures so obtained the total monthly amounts of nitrogen in the various compounds, per acre, calculated.

The total amount of nitrogen furnished during the year, 8.364 lbs., per acre, is practically twice that of the preceding twelve months, viz. 4,323 lbs. It is more than probable that the amount is abnormally high. Following a severe drought, extensive bush fires raged for many weeks during the autumn over large areas in Ontario, Quebec and northern New York State. In these fires many hundreds of acres of forest were destroyed, and the atmosphere in the neighbourhood of Ottawa was, as a consequence, heavily charged with smoke. Quite frequently for days together the smoke was so dense at Ottawa that it was difficult to see clearly for many yards. The rain falling during this period—chiefly September and October—was exceptionally rich in nitrogen compounds, and to this fact we may attribute the phenomenally high results obtained for the year.

Average Nitrogen Content of Rain and Snow—Amount of Nitrogen, per acre, as Free and Albuminoid Ammonia and as Nitrates and Nitrites

			Nitrogen								
			Parts per Million				Percent. of Total			Per Acre	
	No. of Samples Analysed	Precipitation in Inches	In Free Ammonia	In Albuminoid Ammonia	In Nitrates and Nitrites	Total	In Free Ammonia	In Albuminoid Ammonia	In Nitrates and Nitrites	As Free & Albuminoid Ammonia	As Nitrates and Nitrites
										Lbs.	Lbs.
Rain	64	22.99	1.276	.149	.278	1.703	75	9	16	6.324	1.204
Snow	25	96.25	.277	.050	.141	.468	59	11	30	.585	.251

Certain interesting data are set forth in this table. First, we may refer to the very considerable difference in the nitrogen content of the rain and snow. Previous work had shown that rain was the richer in nitrogen, but owing to the smoke laden atmosphere of the autumn months, just referred to, this difference, principally in the free ammonia, was greater than had been noted heretofore. Practically 90 per cent of the whole nitrogen was furnished by the rain, as against 75 per cent in the preceding year.

The nitrogen content of the snow is very similar to that of the previous winter, but as the snowfall was considerably lighter (96 inches,

as compared with 133 inches), the total amount of nitrogen so furnished was less than in 1907–08.

Considering the distribution of the nitrogen compounds, it will be observed that of the total nitrogen furnished per acre, 82.6 per cent, or 6.909 lbs., occurred as free and organic ammonia, and 17.4 per cent, or 1.455 lbs., as nitrates and nitrites. Corresponding percentages for the preceding year were 74 and 26.

Year Ending February 28th, 1910.

The data for the third year's work in this investigation are given in the following table, the determinations and calculations, being those made in the two previous years and already referred to and explained.

Rain and Snow at Ottawa, for the Year Ending February 28, 1910.

Month and year	Precipitation in Inches			Nitrogen				Pounds of Nitrogen per Acre
	Rain	Snow	Total as Inches of Rain	In Free Ammonia	In Albuminoid Ammonia	In Nitrates and Nitrites	Total	
				p.p.m.	p.p.m.	p.p.m.	p.p.m.	
March 1909	1.38	24.00	3.78	.301	.107	.177	.585	.501
April "	2.96	7.50	3.71	.245	.457	.585	1.287	1.082
May "	5.84	...	5.84	.507	.102	.300	.909	1.203
June "	2.52	...	2.52	.494	.127	.366	.987	.564
July "	4.69	...	4.69	.374	.072	.198	.644	.684
August "	3.11	...	3.11	.490	.103	.209	.802	.565
September "	2.81	...	2.81	.397	.101	.301	.799	.508
October "	1.11	...	1.11	.973	.091	.065	1.129	.284
November "	2.93	2.50	3.18	.332	.122	.548	1.002	.722
December "	...	15.00	1.50	.175	.070	.053	.298	.101
January 1910	1.36	9.50	2.31	.307	.108	.112	.527	.276
February "	.08	22.25	2.30	.335	.108	.284	.727	.379
Total for 12mo.	28.79	80.75	36.86	...	...	...	...	6.869

The total precipitation was 36.86 inches, 4.23 inches more than for the year ending February 28, 1909, and approximately 2 inches above the average for the past nineteen years. Of this precipitation, 28.69 inches fell as rain and 8.07 inches as snow. The rainfall being somewhat higher, and the snowfall considerably lower than usual, the proportion of the total fall as rain during the year was above the average. There was no season of drought, and the precipitation was very fairly evenly distributed throughout the year.

The total amount of nitrogen furnished per acre is practically mid-way between the amounts for the two previous years, as will be seen from the following tabulated statement.

	Rain in Inches	Snow in Inches	Total precipitation in Inches	Pounds of Nitrogen per Acre
Year ending February 28, 1908....	24.05	133.0	37.35	4.323
" " " 1909....	22.99	96.25	32.63	8.634
" " " 1910....	28.79	80.75	36.87	6.869
Average for 19 years	25.52	92.56	34.78	

The disturbing factors characterizing the summer of 1908—extensive bush fires and high winds during periods of drought—were absent, and consequently the data of the past year represent more nearly the amounts of the nitrogen compounds normally furnished by the rain and snow in this district.

Considering the total amount of nitrogen per acre, we find that 4.46 lbs., or 65 per cent., was furnished as free and organic ammonia; 2.41 lbs., or 35 per cent., as nitrates and nitrites.

Average Nitrogen Content of Rain and Snow—Amount of Nitrogen, per acre, as Free and Albuminoid Ammonia and as Nitrates and Nitrites.

			Nitrogen								
			Parts per Million				Percent. of Total			Per Acre	
	No. of Samples analysed	Precipitation in Inches	In Free Ammonia	In Albuminoid Ammonia	In Nitrates and Nitrites	Total	In Free Ammonia	In Albuminoid Ammonia	In Nitrates and Nitrites	As Free & Albuminoid Ammonia	As Nitrates and Nitrites
										Lbs.	Lbs.
Rain	75	28.79	.429	.148	.319	.894	48	17	35	3.79	2.04
Snow	36	80.75	.269	.097	.203	.569	47	17	36	.67	.37

The rain, it will be observed, supplied 5.83 lbs. of nitrogen, approximately 85 per cent of the whole; the snow, 1.04 lbs., or about 15 per cent.

Evidence of the greater richness of the rain in nitrogen compounds —especially in free ammonia—is again to be noted, though the difference between the rain and snow is this regard is not so marked as in the year 1908–09, the unusual or abnormal character of which has been pointed out.

The averages of the year show that in both rain and snow the proportion of nitrogen as free ammonia is largest, and that as albuminoid ammonia the smallest—a result agreeing with the findings of the two previous years.

A rather remarkable fact is brought out by taking the averages for the season, namely, that the percentages of the total nitrogen present in the three forms are the same for both rain and snow.

VII.—*On a Variation in the Intensity of the Penetrating Radiation at the Earth's Surface Observed during the Passage of Halley's Comet.*

By ARTHUR THOMSON, M.A.

(Communicated by Professor McLENNAN and read Sept. 28, 1910.)

Since the discovery in 1902 of the penetrating radiation which exists at the surface of the earth, a number of investigators have attempted to ascertain whether this radiation had its origin in the rocks and soil of the earth or in the atmosphere of the latter, or whether it had its origin in one or more of the extra terrestrial bodies such as the sun or the moon.

A number of investigators including Borgmann,[1] Mach and Rimmer,[2] Wood and Campbell,[3] McKeon,[4] Strong,[5] Pacini,[6] and Wulf,[7] found in their various localities daily variations in the intensity of this radiation, and were able from their results to point to regular daily periods of maximum and minimum intensity. Further, an examination of the results of these investigators shews that the variation in the intensity of the radiation covers an exceedingly wide range.

In some cases variations of 10% from the normal intensity were observed, but in the majority of cases variations very much greater than this amount were commonly noted.

From a closer examination of the various results recorded, however, it does not appear that it is possible to establish any connection between the times of maxima and minima intensities obtained in different localities and as a consequence one is forced to the conclusion that the variations observed by the different observers were due to local causes and not to any influences arising from the proximity of the sun or any of the other celestial bodies.

The results obtained by Prof. McLennan and his students at Toronto, when investigating this penetrating radiation, have been quite different from those obtained elsewhere, in that they failed to shew the marked variations observed by others. In particular C. S. Wright, who made a number of observations at Toronto was not able to find any appreciable regular variation in the intensity of the penetrating radia-

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[1] Borgmann, Sc. Abs., 1905, No. 1580.
[2] Mach and Rimmer, Phys. Zeit., 7 pp. 617, Sept. 15, 1906.
[3] Phil. Mag., Feb. 1907.
[4] Phys. Rev., 1907.
[5] Phys. Rev., July 1908.
[6] Rend. Acc. Lincei, 18, 123-129, 1909.
[7] Phys. Zeit., 10, 1909, 152-157.

tion, and the variations which he did observe did not exceed 3% of the observed normal intensity, of the radiation.

These observations were confirmed later by G. A. Cline and the conclusion was drawn by both these investigators that the soil contributed by far the greater proportion of the penetrating radiation present at the earth's surface at Toronto, and that any portion which might be contributed by the earth's atmosphere or by the sun was negligible in comparison with that arising from the soil.

The view that the soil was the chief source of the radiation was corroborated later by the discovery of Prof. McLennan and C. S. Wright that the intensity of the radiation was very much less over the surface of Lake Ontario than over the surface of the land adjoining the waters of the lake.

This diminution in the intensity of the radiation over lake waters was also observed later by Gockel,[1] at Vierwaldstattersee, in Switzerland.

From these experiments it seems then that there is no doubt about the soil and rocks of the earth being the chief source of the radiation. It appears too that the atmosphere of the earth contributes but a small proportion, if any, of the radiation. There is moreover, but little, if any, evidence to shew that any part of it has its origin in either the sun or the moon.

Although it is clear from the evidence adduced above that it is not possible to ascribe an appreciable proportion of the pentrating radiation as ordinarily observed to a celestial origin, it seemed possible that the intensity of the radiation might be increased by the passage near to the earth of a body possessing the constitution and characteristics of Halley's Comet. At the suggestion of Prof. McLennan the writer, therefore, undertook to make a series of observations on the intensity of the radiation extending over a number of days during the period when the comet and its tail was predicted to be in closest proximity to the earth.

To make the observations an ionisation vessel, of about 30,000 ccs capacity, similar to that used by C. S. Wright, and later by G. A. Cline, was installed on the roof of the Physical Laboratory, and readings on the conductivity of the air in the vessel were taken with a sensitive quadrant electrometer situated in a room directly below the point where the ionisation vessel was installed.

In setting up the apparatus the most extreme care was taken to see that all insulating parts were clean and dry, that the receiver itself was hermetically sealed and that all electrical connections were effectively and thoroughly screened.

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[1] Gockel, Phys. Zeit., Nov. 10, 1909, p. 846.

The observations were begun on the morning of May 18th, and were continued without interruption until noon on May 21st. The results of these observations expressed as the number of ions made per cubic centimetre per second in the ionisation chamber are represented by a curve shewn in Fig. 1. From the numbers given it will be seen that while the normal ionisation was about 30 ions per cc. per second two rather remarkable increases were noted in the observed ionisations. One of these occurred on May 19th, beginning at 1 o'clock p.m., and lasting until about 4 o'clock p.m., and the other on May 21st, commencing at about half past nine in the morning and continuing for a period of about one hour and a half. On these two occasions it will be seen that the ionisation rose to about 100 and 130 ions per cc. per second respectively.

Whether these unusual increases in the ionisation were due to the presence of the comet or not, it appears to the writer impossible to decide. A. Wigand[1] in a paper on observations made at Halle from May 17 to May 20, records decided diminutions in the earth's horizontal magnetic field during the early hours of May 19 and again from 7.30 to 11.30 a.m., of the same day. He also records a marked increase in the electrical conductivity of the atmospheric air between the hours of five and nine o'clock on the morning of May 19 and at the same time an anomalous depression in the potential gradient. Wigand concludes from his observations that these magnetic and electrical disturbances were in all probability connected with the passage of the comet.

The disturbances noted by Wigand it will be seen took place on May 19th at 11 a.m., *i.e.*, about 12 hours before the one at Toronto occurred. The phenomena observed by him were the electrical "dissipation" and the potential gradient, while that investigated by the writer was the ionisation in the gas within an hermetically closed metallic vessel. It is possible to conceive that three such phenomena could be related but in the present case it is difficult to see any connection between the two sets of disturbances noted and still more difficult to establish a connection between them and the passage of the comet.

To the writer there appears to be four possible explanations of the disturbance noted by him. It could in the first place be caused by bringing radioactive bodies into the neighbourhood of the ionising chamber. It might also be produced by temporary faulty instrumental conditions or adjustments. Then again the disturbance might be the result of some intense temporary solar activity or finally it might be due to the passage of the comet. The first explanation can be easily dismissed for no radioactive bodies were brought near at any time while

[1] Wigand, Ber der Deut. Phys. Ges. Heft 13, p. 511, 1910.

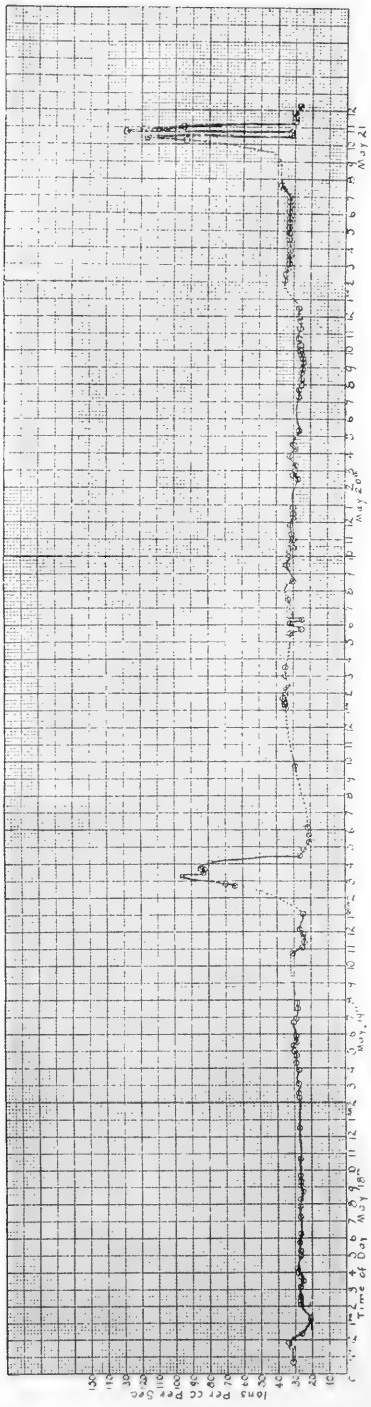
Ions Per cc Per Sec
Time of Day
May 18th
May 19th
May 20th
May 21st

Fig. 1.

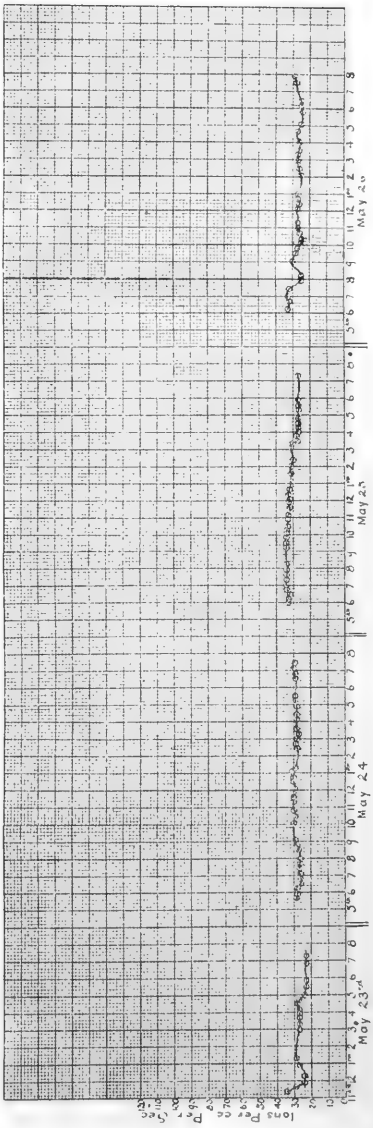
Ions Per cc Per Sec
May 23rd
May 24
May 25
May 26

Fig. 2.

the observations were being taken. In regard to the second explanation it may be stated that extreme care was taken to perfect the conditions of measurement. Even after the measurements were finished the whole instrumental outfit was again closely scrutinised but a rigid examination failed to reveal any faulty adjustment.

The writer is therefore inclined to the view that the disturbance was not due to faulty conditions of experiment or to faulty adjustments.

With the object of corroborating this view observations were again made for periods of about twelve hours on May 23, 24, 25 and 26. The results of these are illustrated by a curve in Fig. II. These observations it will be seen failed to shew anything abnormal. The ionisation varied between narrow limits and the observations were practically of the same character as those made by Wright and Cline on previous occasions.

If the disturbances noted were due to faulty adjustments or to some cause associated with the sun's activity one would expect a repetition of the disturbance. None such occurred, however, during any of the four later periods of observation, and this absence of a repetition would go to confirm the view that the disturbance was not due to any defect in the measuring apparatus.

The absence of a repetition on the four days mentioned, however, would not entirely exclude solar activity as a cause of the disturbance. To establish this point it would be necessary to make a more extended series of observations.

All the readings recorded in the present paper were taken visually but the strain of making measurements in this manner over long continued periods of time is too great for visual observation to be practicable and the writer therefore hopes to continue, at an early date, the observations with self recording apparatus with a view to seeing whether solar activity is ever really accompanied by such terrestrial disturbances as those noted or not.

This information would be useful in deciding between solar activity and the comet's influence as the cause of the disturbance.

In conclusion the writer wishes to acknowledge his indebtedness to Professor McLennan for suggestions during the investigation, and for his kindness in scrutinising the installation of the apparatus and also to Mr. W. T. Kennedy for his kind assistance in taking some of the readings.

VIII.—*On the Influence of Acids and Salts on the Amount of Emanation liberated from a Solution of Radium.*

By A. S. EVE AND D. MCINTOSH.

(Read 28th September 1910.)

In making determinations of the amount of radium in solutions, it is necessary to ascertain, by blank tests, whether the acids and other substances employed are themselves free from radium. Thus Joly has found HC1 to contain so much radium as to necessitate redistillation.

The writers, during some investigations, found that a barium chloride solution was radioactive, and have, therefore, examined some salts of barium, reported to be chemically pure.

These were dissolved in distilled water and the radium contents tested by the amount of emanation expelled on boiling. The results are given in terms of billionths (10^{-12}) gram of radium per gram of the salt named:—

Barium Chloride	2.84
Barium Hydroxide	0.11
Barium Nitrate	0.36

Thus it is clear that these substances contain about as much radium as specimens of rocks or soils from the earth's surface. The radium is probably separated from witherite with the barium in the process of extraction.

Great care is necessary in the case of measurements of minute quantities of radium, in the event of chemical treatment with a barium salt. For example, a solution of barium chloride was found to contain 500 times as much radium as sea water.

In some cases the writers found that the emanation freed by prolonged boiling was less than that known to be actually present. Some experiments were, therefore, made to test this important point.

Three cubic centimetres of a standard solution of radium bromide were taken and added to 1,320 cm^3 of distilled water. After shaking, the solution was divided equally between six new clean flasks, so that each contained $0 \cdot 78 \times 10^{-9}$ grams of radium and a trace of HC1 from the standard solution. Two of these flasks were kept as blanks, whilst to the other four were added respectively, 1 drop H_2SO_4; 10 cm^3 H_2SO_4; 10 cm^3 $BaC1_2$ (10%), and 1 cm^3 H_2SO_4; $1 \cdot 4$ grams $BaSO_4$.

The solutions were sealed for a month and then tested in the usual way by collecting the emanation and introducing it into an electroscope. The results obtained were almost identical, whether the solu-

tions were boiled vigorously for 8 minutes or for 20 minutes. After deducting the small natural leak of the electroscope, the results expressed in divisions per minute were as follows:—

No.		Divisions per min.	Per cent.
1	Blank	4.38	100
2	Blank	4.37	100
3	1 drop H_2SO_4	4.15	95
4	10 cm^3 H_2SO_4	4.22	96
5	10 cm^3 $BaCl_2$ (10%)		
	1 cm^3 H_2SO_4	0.58	13
6	1.4 gram barite	1.17	27

It will be seen that while the addition of H_2SO_4 reduced the amount of radium emanation liberated by only 4 or 5 per cent., the 1.4 grams of Ba SO_4 reduced the yield to one quarter of the amount present, and the barium chloride and sulphuric acid together permitted but one-eighth of the radium emanation to escape. These results are very remarkable when it is remembered that the amount of radium bromide present was only 7.8×10^{-10} grams. They appear to indicate that the precipitated barium sulphate in the fifth flask occluded the radium and thus checked the escape of the emanation.

In the sixth sample the low determination of the emanation appears to show that the barium is more soluble than the radium.

The writers propose to carry out further experiments in order to elucidate these peculiar reactions as far as possible.

IX.—*On the Radium Contents of Specimens from a deep boring at Beachville, Ontario.*

By A. S. EVE AND D. MCINTOSH.

(Read 28th September 1910.)

In the investigation of the amount of radium in soils and rocks, we have found only a few measurements for a vertical section of the earth.

The following results from a deep boring at Beachville may, therefore, be placed on record.

The materials were obtained through the courtesy of Mr. W. R. Brock, Director of the Canadian Geological Survey, to whom we wish to express our thanks.

Treatment: 15 grams of the specimen ground to pass through a 100-mesh sieve were mixed with 50 grams sodium potassium carbonate and fused. The mass was powdered and leached out with small quantities of water until the filtered washing failed to affect litmus paper. The mineral was thus divided into two parts, which we have designated the "soluble" and the "insoluble," the former containing the sulphate, and the latter the barium and, consequently, the greater part of the radium. The two portions were acidified with hydrochloric acid, evaporated to dryness and "baked"—this operation being several times repeated to render the silica insoluble. The acid solutions were filtered and the silica removed with hydrofluoric acid. Any insoluble material remaining was fused again and finally brought into solution.

The amount of radium is expressed in terms of billionths (10^{-12}) gram of radium per gram of rock.

Depth in feet	General Character	Insoluble	Soluble	Total
30	Limestone	0.73	0.074	0.80
420	Limestone and Clay	0.98	0.074	1.05
870	Sand	0.22	0.28	0.50
1,170	Limestone	0.49	0.11	0.60
1,620	Limestone and Sand	1.10	0.32	1.42
2,040	Clay	1.30	0.30	1.60
2,400	Limestone	0.71	0.23	0.94
2,580	Limestone	0.99	0.23	1.22
	Means	0.81	0.20	1.02

It will be seen: (1) that the insoluble portion contained about four times as much radium as the soluble; (2) that there is no definite relation between depth and quantity of radium; (3) that the mean value agrees well with determinations by Strutt and by the writers.

It is remarkable that radium should be distributed with so little variation in the sedimentary rocks, the values ranging only from 3 to 0.3, whilst the mean value for a number of specimens from different localities is approximately 1 for sedimentary, and 2 for igneous rocks.

X.—*Electric Potential and Conductivity of the Air at Winter Harbour, Melville Island. Lat. N.* 74° 47′, *Long. W.* 110° 48′.

By W. E. W. JACKSON, M.A.

(Communicated by R. F. Stupart and read September 28, 1910.)

The instruments used in these experiments were made available for the Canadian Government expedition to the Artic in 1908-9 through the courtesy of the Director of the Department of Terrestrial Magnetism of the Carnegie Institution at Washington, D.C. They included an Exner Electroscope No. 981 and Elster and Geitel's field Collector for observations on atmospheric electricity and the Gerdien conductivity apparatus for conductivity experiments.

Observations were carried on simultaneously for the measurement of the potential of the Atmosphere and the conductivity of the air whenever conditions would permit, and a considerable series of values were obtained. For the measurement of potential an Elster and Geitel flame collector was used, which was connected by insulated wire to an Exner aluminium leaf electroscope. Insulating supports of various heights were available, and the height of the collector was adjusted to keep the potential within the range of the electroscope. For the measurement of specific conductivity of the air, the instrument used was that devised by Dr. Gerdien, and consists of a cylindrical tube about 20 cms. in diameter, in the centre of the lower side of which is a side tube connecting with a aluminium leaf electroscope. The inner electrode consists of a thin brass tube with hemispherical ends about 1.4 cms. in diameter, placed in the axis of the large cylinder and connected with the electroscope. In the rear part of the tube is a fan driven by hand by means of a worm gear, which draws a current of air through the tube. A charge of electricity placed on the inner electrode is then dispersed by the ions of opposite sign, which are drawn through the tube, and the reduction in potential on the electrode, as indicated by the electroscope, is a measure of the dispersion.

Dr. Gerdien[1] has shown, both theoretically and practically, that great variations may be made in the rate of flow of air through the tube without affecting the value of the specific conductivity. During the experiments here noted, however, uniform rotation of the fans was

[1] Terrestrial Magnetism, Vol. X., No. 2.

employed for a period of five minutes for each charge, and for this period and instrument the specific conductivity is given by the formulæ—

$$\lambda = (\log Va - \log Vb) \times 16 \times 10^{-4}$$

where Va and Vb are the potentials at beginning and end of the 5-minute period, and 16×10^{-4} is a constant for the instrument for a 5-minute exposure.

The observations were made as follows:—

1. Leakage Test.—Put a charge on the inner cylinder; close the ends of large cylinder to exclude air currents; read time and deflection of leaves; let stand 15 or 20 minutes, and again read.

2. Earth the inner cylinder; put on a +ve charge of from 150 to 225 volts; let stand about a minute, read position of leaves on an even minute, and at once start rotating the fan. The fan is rotated at a rate of about 80 revolutions per minute. After five minutes' uniform rotation, read the position of the leaves again; earth the inner cylinder, put on a negative charge, and repeat alternately with $+^{ve}$ and $-^{ve}$ charges.

The computation of conductivity is carried out as indicated in table 1, and of electrical potential in table 2.

CONDUCTIVITY OBSERVATIONS.—Gerdien Apparatus No. 1.

Station, Winter Harbour. Date, June 21, 1909.

Time	Sign	Scale Left	Scale Right	Div.	V	Log V	Diff.	$\lambda \times 10^4$	Remarks.
h. m.									
16 23	+	19.0	16.0	35.0	..	..	..	..	Leakage
43	..	19.0	15.8	34.8	..	..	..	..	Test.
17 3	+	17.0	15.0	32.0	233	2.367	..	..	Bar. 30.16
8	..	13.0	11.2	24.2	177	.248	0.119	1.90	Temp. 39
13	−	15.0	13.0	28.0	207	.316	..	..	Hum. 94
18	..	11.2	9.6	20.8	152	.182	0.134	2.14	Wind calm
23	+	16.0	14.0	30.0	222	.346	..	..	Sky blue
28	..	15.0	13.0	28.0	207	.316	0.030	0.48	
33	−	18.5	15.5	34.0	241	.382	..	..	Watch No. 54
38	..	15.0	12.0	27.0	200	.301	0.081	1.30	fast 2h. 15m. on L.M.T.
43	+	15.0	12.6	27.6	204	.310	..	..	
48	..	12.7	11.5	24.2	178	.250	0.060	0.96	
53	−	14.0	14.5	28.5	211	.324	..	..	
58	..	9.0	10.0	19.0	138	.140	0.184	2.94	

POTENTIAL OBSERVATIONS.

Station, Winter Harbour. Date, June 21, 1909.

Time	L	R	Div.	V	H	V per metre	Sign	Remarks.
h. m.								
16 41	6.2	6.0	12.2	106	1.42	75	+	
52	4.2	4.2	8.4	71	..	50	..	Bar. 30.16
17 2	6.0	5.8	11.8	103	..	73	..	Temp. 39
11	7.0	6.9	13.9	120	..	85	..	Hum. 94
18	6.3	6.3	12.6	110	..	78	..	Wind calm
22	6.6	6.6	13.2	114	..	80	..	Sky blue
28	7.0	7.0	14.0	121	..	85	..	
33	7.4	7.1	14.5	125	..	88	..	
38	7.0	6.8	13.8	119	..	84	..	
43	7.2	7.0	14.2	123	..	87	..	
48	6.8	6.6	13.4	116	..	82	..	
53	6.5	6.5	13.0	113	..	80	..	
18 3	10.0	9.0	19.0	161	..	113	..	
8	14.0	13.0	27.0	208	..	146	..	
13	13.0	12.0	25.0	199	..	140	..	
18	15.0	13.2	28.2	212	..	150	..	
23	10.5	9.5	20.0	168	..	118	..	
28	11.5	10.5	22.0	182	..	128	..	A few cirrus clouds.
33	12.0	11.0	23.0	188	..	132	..	

The relative humidity during the whole series of observations was between 90 and 100, and consequently no variation in potential or conductivity due to humidity could be determined from the experiments.

The accompanying table gives the mean value of specific conductivity for potentials of given value.

POTENTIAL.	$\lambda \times 10^4$
50 to 75 volts per m	3.11
75 to 100 " "	3.00
100 to 125 " "	2.99
125 to 150 " "	2.16
150 and over " "	2.04

A very marked decrease in conductivity is here indicated when the potential rises above 125 volts per metre.

At no time was a negative potential observed and only on a couple of occasions did the potential fall to zero.

On October 7th, 1908, with temperature ranging between zero and 7 above, and accompanied by a light S.E. breeze and with the air full of snow particles, a potential of over 800 volts per metre was recorded for a period of two hours from 10.30 a.m. to 12.30 p.m.

During the winter months, owing to the extreme cold, great difficulty was experienced in keeping the electroscope insulated and also in keeping the flame of the collector burning, and as a result, very few records were obtained.

In the months of May and June records were obtained simultaneously with the two instruments whenever conditions would permit, and these records cover observations on each hour of the 24, from which the following empirical formulæ have been deduced by the method of Fourier series.

1. For potential gradient—

$$y = 95.5 - 14.7 \cos \theta + 12.5 \cos 2\theta + 5.8 \cos 3\theta + \ldots.$$
$$+ 0.5 \sin \theta - 4.4 \sin 2\theta - 5.6 \sin 3\theta + \ldots.$$

where y is the potential expressed in volts per metre

and θ is time expressed in degrees at rate of 1 hour to 15 degrees, and beginning at 0 hours, midnight.

2. For conductivity of the air—

$$y = 2.818 + .154 \cos \theta - .031 \cos 2\theta - .072 \cos 3\theta + \ldots.$$
$$+ .363 \sin \theta - .547 \sin 2\theta + .144 \sin 3\theta + \ldots.$$

where $y = \lambda \times 10^4$

and θ is time expressed in degrees at rate of 1 hour to 15 degrees, and beginning at 0 hours, midnight.

An abstract of the simultaneous observations is given in table 3, in which q is the ratio of positive to negative dispersion.

ATMOSPHERIC ELECTRICITY AND CONDUCTIVITY OF THE AIR

Winter Harbour, 1909.

Date 1909	L.M.T.	q	V per metre +	Cond. $\lambda \times 10^4$ of + ve	Cond. $\lambda \times 10^4$ of − ve	Mean	Rel. Hum.	Bar.
	h. m.							
May 11	10 49	.86	88.7	2.53	2.94	2.74	96	30.40
	11 6	.65	88.7	2.03	3.14	2.58		
June 21	14 55	.89	75.3	1.90	2.14	2.02	94	30.16
	15 15	.37	84.2	0.48	1.30	0.89	..	
	15 35	.33	84.5	0.96	2.94	1.95	..	
	15 55	.34	137.2	0.88	2.62	1.75	..	
	16 15	.51	131.0	1.33	2.61	1.97	..	
	35	.73	113.2	1.86	2.56	2.21	..	
	55	.73	106.2	2.11	2.91	2.51	..	
	17 15	.74	117.0	2.24	3.02	2.63	..	
	35	.68	110.8	2.21	3.25	2.73	100	30 17
	55	.84	92.8	2.80	3.33	3.06	..	
	18 15	1.00	105.2	2.62	2.62	2.62	..	
	35	.52	87.2	1.66	3.22	2.45	..	
	55	.85	78.2	2.75	3.25	3.00	..	
	19 15	.83	73.5	2.90	3.50	3.20	..	
	35	.80	59.5	2.85	3.55	3.20	..	
	55	.85	60.5	2.96	3.47	3.22	..	
	20 35	.81	81.0	3.12	3.86	3.49	..	
	55	.78	72.0	3.10	3.98	3.54	..	
	21 15	.83	66.0	3.12	3.76	3.44	..	
	35	.83	68.0	3.26	3.92	3.59	..	
	55	.86	67.2	3.26	3.79	3.52	94	
June 22	20 15	1.05	56.2	2.66	2.54	2.60	89	30 26
	35	.93	56.0	3.17	3.42	3.30	..	
	55	1.01	55.2	2.99	2.96	2.98	..	
	21 15	.79	57.5	2.50	3.17	2.84	..	
	35	.81	50.5	2.56	3.17	2.86	..	
June 23	2 5	.87	85.8	2.96	3.42	3.19	..	30 25
	25	.59	78.5	2.00	3.41	2.70	..	
	45	.89	69.0	2.94	3.30	3.12	..	
	3 5	.84	77.8	2.82	3.34	3.08	..	
	25	.87	69.0	2.93	3.38	3.16	..	
	45	.89	88.2	2.82	3.18	3.00	..	
	4 5	.75	72.8	2.61	3.47	3.04	85	
June 24	1 56	.60	89.7	1.98	3.30	2.64	..	30 23
	2 16	.53	93.5	1.71	3.23	2.47	..	
	36	.68	84.0	2.30	3.36	2.83	..	
	3 1	.39	78.8	1.34	3.47	2.40	..	
	26	.78	74.2	2.27	2.91	2.59	..	
	46	.87	101.8	2.59	2.96	2.78	..	

ATMOSPHERIC ELECTRICITY AND CONDUCTIVITY OF THE AIR

Winter Harbour, 1909.

Date 1909	L.M.T.	q	V per Metre +	Cond. λ x 10⁴ of + ve	Cond. λ x 10⁴ of − ve	Mean	Rel. Hum.	Bar.
	h. m.							
June 24	4 6	.53	72.2	1.82	3.46	2.64	..	
	26	.89	77.5	3.20	3.57	3.38	..	
	46	.80	90.8	3.14	3.94	3.54	..	
	5 6	.72	93.0	2.96	4.11	3.54	..	
	26	.85	91.0	3.55	4.18	3.86	78	30 23
	46	.95	83.0	3.58	3.78	3.68	..	
	6 6	.90	88.0	3.44	3.81	3.62	..	
	26	.69	114.8	2.42	3.52	2.97	..	
	46	.79	95.5	2.58	3.28	2.93	..	
	7 6	.74	105.0	2.26	3.04	2.65	..	
	26	.51	124.5	1.76	3.46	2.61	..	
	46	.84	98.5	3.30	3.95	3.62	..	
	8 6	.89	107.2	3.54	3.97	3.76	..	
	26	.89	105.5	3.38	3.79	3.58	..	
	46	.93	87.8	3.25	3.49	3.37	..	
	9 6	.97	....	3.02	3.10	3.06	..	
	26	.92	....	3.63	3.71	3.67	..	
	46	.95	104.0	3.74	3.92	3.83	..	
	10 6	.92	99.0	3.87	4.22	4.04	..	
	26	.88	99.5	3.68	4.16	3.97	..	
	46	.89	104.0	3.79	4.26	4.02	..	
	11 6	.87	114.5	3.58	4.13	3.86	93	
June 25	10 26	.79	117.5	2.45	3.12	2.78	..	30 23
	46	.65	139.5	2.02	3.12	2.57	..	
	11 6	.87	148.2	2.59	2.99	2.79	..	
	26	.89	128.8	2.38	2.66	2.52	..	
	46	.51	140.0	1.06	2.08	1.57	..	
	12 6	.60	133.0	1.31	2.19	1.75	..	30 24
	26	.48	116.0	1.52	3.14	2.33	..	
	46	.87	139.3	2.08	2.38	2.23	..	
	13 36	.54	176.8	1.26	2.35	1.80	..	
	56	.65	138.5	1.74	2.66	2.20	..	
	14 16	.64	142.8	1.65	2.56	2.10	..	
	36	.66	161.0	1.50	2.27	1.88	..	
	56	.59	144.2	1.70	2.88	2.29	..	
	16	.79	194.5	2.02	2.56	2.29	..	
	36	.99	182.8	1.95	1.97	1.96	..	
	56	.55	192.0	1.62	2.96	2.29	..	30 25

XI.—*Probable Errors of Radial Velocity Determination.*

By J. S. PLASKETT, B.A.

(Read 28th September, 1910.)

The magnitude of the probable errors attending the spectrographic determination of stellar radial velocities has always been with me a question of much interest and considerable work[1] along the line of the dependence of probable error upon the width of the slit employed has already been accomplished. It is proposed in this paper to give a general discussion of the probable errors of radial velocities as affected by changes in the dispersion of the instrument, and in the type of stellar spectrum observed.

It may not be amiss to point out that in measuring stellar spectra, as in practically all scientific measurements, we have two classes of errors to deal with or guard against: first the accidental errors of setting upon the lines of the spectra due partly to imperfect definition, and partly to the unavoidable differences in successive settings which are always present even with the most careful observers; second the systematic errors, due in this case generally to instrumental conditions, which give rise to spurious relative displacements of star and comparison lines. Among such conditions may be cited flexure or change of temperature of the spectrograph, non-uniform illumination of the collimator, prisms, and camera by the star or spark light, faulty focal adjustments of collimator or camera objectives, and so on. The former can be readily evaluated from the measures of the plates themselves, but no evidence of the latter appears in such measurements, and its magnitude can only be determined from the comparison of a number of plates of the same star. In the latter case, however, the errors so obtained will not be entirely systematic but will be affected by the accidental errors present in the measured velocities. In the discussion to follow, relative measures of the accidental errors are given by the probable errors of single lines or regions on a plate, while for the systematic effect the probable error of a single plate, obtained by the discussion of several plates of the same star, is probably the best that can be done although, as stated above, such result has also included in it the effect of the accidental errors.

In considering the effect of change of dispersion, one would naturally expect to find the actual linear errors of the same magnitude for all dispersions and, as errors are always expressed in velocity values, the

[1] Astrophysical Journal XXVIII, 259 and Trans. Roy. Soc. Can. 1909, p. 209.

probable errors in kilometres per second would hence be inversely proportional to the linear dispersion. That is to say, as we have at the Dominion Observatory three different dispersions 10.1, 20.2, and 33.4 tenth-metres per millimetre at H_γ, practically as 3, 1-1/2, and 1, we should expect to find the probable errors in kilometres per second inversely proportional to these latter numbers or as 1, 2, and 3.

Most of the radial velocities at the Dominion Observatory have been obtained from spectra made with the lowest dispersion, a single prism spectrograph, on spectroscopic binary stars of early type in which the spectral lines have generally been broad and diffuse. The probable errors of the velocity determinations of single plates have been consequently high, so high as to lead to the belief that the relation above expressed was not the true one, but that the probable errors increased more rapidly than the dispersion diminished.

It seemed therefore worth while to make a definite test of the matter especially as, although considerable data as to the probable errors of high dispersion star spectrographs are available, there is so far as I know not much published information in regard to the probable errors of one prism instruments. In order to avoid, so far as possible, any effect due to diffuseness of the spectral lines, it was decided to use spectra of the solar type for the comparison. Further, to eliminate difficulties of identification of wave lengths in the blends of lines always present in low dispersion second type spectra, it was essential to measure the plates by the spectro-comparator, an instrument in which the actual displacement of the star lines due to velocity is compared with those in a standard plate of the sun whose velocity is known. By this method no knowledge of wave length is necessary and errors due to the loss of purity inherent with small dispersion can not effect the measurements.

The brightest solar type star, Arcturus, was selected as a test object for the obvious reason that only short exposures would be necessary. To produce spectra of Arcturus, of good quality for measurement, exposures are necessary of about ten minutes with the three prism long focus spectrograph designated as III L, 10.1 tenth-metres per mm., four to five minutes with the three prism short focus designated as III R, 20.2 tenth-metres per mm., and one and a half minutes with the single prism spectrograph designated as I, 33.4 tenth-metres per mm. at H_γ, and consequently the plates required may be quickly made. Fortunately when this investigation was begun we had already obtained nearly thirty plates with III L for another purpose and only plates with III R and I were required. Eleven were made with III R and about fifty with I.

Of these plates 24 of III L., 11 of III R and 38 of I were measured by myself on the spectro-comparator and from these measures the

results to be discussed were derived. In order to clearly explain how the probable errors were obtained it is necessary to briefly describe the comparator and the method of measurement. In the first place a standard spectrum of the sun is obtained by the same spectrograph and this plate has impressed upon it, on each side of the sun spectrum, a strip of the same comparison as in the star spectrum. This standard sun spectrum and the star spectrum are viewed by a special double objective, single ocular microscope, with a Lummer-Brodhun cube in the ocular, which serves to superpose the two spectra so that a narrow strip of star spectrum is seen between and touching two strips of sun spectrum, while on each side a narrow strip of the star comparison lies between and touching strips of sun comparison. The standard sun spectrum is moved by a micrometer screw until the corresponding lines of the star and sun spectra are in exact coïncidence and then again moved until the comparison lines of the two spectra are coïncident. The difference in the micrometer readings evidently gives us the displacement, due to radial velocity, of the star lines with respect to the sun lines, which on multiplication by a constant gives, after adding with the proper sign the known velocity of the sun, the velocity of the star with reference to the observer.

The coïncidences are made at a number of chosen regions, marked by dots on the sun spectrum, which correspond, in a sense, to the lines in an early type spectrum, on which the cross wire is set. The accidental errors can thus evidently be determined from the probable error of the determination of the points of coïncidence in these regions. After the spectra have been measured with the red end to the right for example, they are reversed on the comparator and the same regions remeasured. The differences of displacement, corrected for a systematic effect due to reversal, are evidently wholly due to accidental errors of setting, and from these the probable error of a region is readily obtained in the well known way, giving a measure of the purely accidental error.

In addition to the purely accidental errors of setting are others also of an accidental character due to irregular arrangement of the silver grains or distortion of the film, to the forming of the coïncidences to one side or other of the dot or centre of the region and consequent incorrect value of the velocity constant by which the displacement is multiplied, and to numerous other causes. A measure of the total accidental error is evidently obtained by computing the velocities separately for the mean of the two measures red right, and red left of each region, by obtaining the residuals from the mean velocity of the plate, and the probable error in the usual way. This probable error should be and is, as is seen below, somewhat greater than the purely accidental error of setting.

The systematic errors due to instrumental peculiarities can only be obtained from the discussion of plates of the same star in sufficiently large numbers to ensure that the systematic displacements for this particular spectrograph become accidental in character. It is possible however that there may be slight constant systematic differences in the values given by different spectrographs. We have in the three dispersions plates to the number of 24, 11, and 38, and, by treating the residuals from the mean velocities, we can obtain the probable error of a single plate in which, although as before stated we have the accidental errors of measurement included, we get a good relative idea of the systematic errors, and which certainly gives us an accurate idea as to the total error involved which in the ultimate analysis is what we wish to know.

The following tables contain a summary of the measures in the three dispersions.

SPECTROGRAPH III L. 10.1 T.M. PER MM.

Plate No.	No. of Regions.	Velocity.	Probable Errors of Single Regions.			Residual.
			Errors of Setting		Total Accidental Errors Km.	
			Rev.	Km.		
1426	11	−5.74	± 0.0015	± 0.59	± 0.82	0.23
1455	11	4.97	.0008	.32	.59	.54
1456	16	5.64	.0009	.35	.52	.13
1514	12	5.91	.0017	.66	.93	.40
1515	13	5.78	.0008	.31	.57	.27
1529	10	6.14	.0010	.41	.65	.63
1585	13	5.59	.0020	.78	.71	.08
1586	10	5.94	.0012	.49	.61	.43
1588	11	6.93	.0013	.53	.62	1.42
1595	12	4.14	.0009	.37	.53	1.37
1596	13	5.43	.0010	.39	.69	0.08
1597	13	6.12	.0011	.43	.66	.71
1606	12	5.42	.0009	.37	.61	.09
1615	12	6.24	.0011	.42	.74	.73
1616	12	6.86	.0009	.37	.76	1.35
1619	16	5.14	.0011	.40	.32	0.37
1620	14	5.80	.0011	.43	.64	.29
1622	15	4.58	.0015	.57	.61	.93
1635	14	3.97	.0014	.53	.48	1.54
1645	16	5.00	.0015	.54	.64	0.51
1662	12	4.98	.0011	.45	.72	.53
1671	16	6.10	.0009	.32	.61	.59
1672	14	5.18	.0013	.51	.45	.33
1709	15	4.62	.0009	.35	.74	.89
Means.	13	−5.57	± 0.00117	± 0.453	± 0.628	

Average Probable Error of Setting Single Region = ±0.45 km.
" " Total Accidental Error Single Region = ±0.63 "
" " " " " Single Plate = ±0.17 "
Total Probable Error (Accid'l. + System, c) " " = ±0.50 "

SPECTROGRAPH III R. 20.2 T.M. PER MM.

Plate No.	No. of Regions.	Velocity.	Probable Errors of Single Regions.			Residual.
			Errors of Setting.		Total Accidental Errors Km.	
			Rev.	Km.		
3288	10	-6.64	± 0.0011	± 0.80	± 1.22	2.09
3289	9	4.94	.0009	.67	1.04	0.39
3290	9	5.58	.0009	.67	0.83	1.03
3291	10	4.83	.0013	.95	1.18	0.28
3311	11	3.27	.0011	.78	1.02	1.28
3312	10	4.16	.0013	.95	0.64	0.39
3313	10	3.47	.0013	.95	1.25	1.08
3314	10	5.78	.0010	.73	0.87	1.23
3315	10	3.33	.0006	.44	1.11	1.22
3316	10	4.52	.0008	.58	0.88	0.03
3317	10	3.54	.0012	.88	0.99	1.01
Means.	10	-4.55	± 0.00105	± 0.75	± 1.00	

Average Probable Error of setting Single Region = ±0.75 km.
" " Total Accidental Error Single Region = ±1.00 "
" " " " " Single Plate = ±0.32 "
Total Probable Error (Accid'l. + System, c) " " = ±0.75 "

SPECTROGRAPH I 33.5 T.M. PER MM.

Plate No.	No. of Regions.	Velocity.	Probable Errors of Single Regions. Errors of Setting. Rev.	Km.	Total Accidental Errors Km.	Residual.
3126	6	−6.14	± 0.0019	± 2.25	± 2.49	0.13
3127	8	7.87	.0009	1.02	1.25	1.86
3128	9	5.49	.0007	0.78	1.37	0.52
3129	7	6.58	.0016	1.86	1.02	1.57
3130	7	5.42	.0012	1.39	1.11	0.59
3146	8	8.54	.0008	0.90	1.57	2.53
3147 a	9	6.42	.0014	1.57	1.89	0.41
3147 b	9	5.49	.0011	1.23	1.39	0.52
3147 c	9	5.43	.0008	0.90	1.30	0.58
3148 a	11	7.56	.0007	0.76	1.52	1.55
3148 b	11	6.84	.0010	1.08	1.21	0.83
3148 c	11	6.19	.0006	0.65	1.80	0.18
3149 a	9	5.49	.0008	0.90	1.83	0.52
3149 b	9	4.44	.0011	1.23	1.31	1.57
3149 c	9	4.87	.0012	1.34	1.79	1.14
3150 a	9	4.44	.0007	0.78	1.25	1.57
3150 b	9	4.44	.0011	1.23	1.87	1.57
3150 c	9	5.99	.0007	0.78	1.45	0.02
3238 b	9	5.51	.0008	0.90	1.16	0.50
3238 c	9	6.20	.0009	1.01	1.61	0.19
3239 a	9	5.58	.0009	1.01	1.00	0.43
3239 b	9	5.64	.0008	0.90	1.68	0.37
3239 c	9	5.64	.0005	0.56	1.15	0.37
3240 a	9	4.34	.0012	1.34	1.35	1.67
3240 b	9	5.08	.0010	1.12	0.93	0.93
3240 c	9	5.51	.0012	1.34	1.79	0.50
3272 a	9	6.21	.0011	1.23	0.91	0.20
3272 b	9	6.98	.0008	0.90	1.64	0.97
3272 c	9	5.96	.0006	0.67	1.17	0.05
3273 a	9	6.83	0.0011	1.23	1.63	0.82
3273 b	9	7.76	.0011	1.23	1.39	1.75
3273 c	9	5.22	.0010	1.12	1.80	0.79
3274 a	9	5.22	.0009	1.01	1.06	0.79
3274 b	9	6.83	.0008	0.90	1.45	0.82
3274 c	9	6.15	.0011	1.23	0.86	0.14
3275 a	9	5.90	.0013	1.46	1.36	0.21
3280 c	9	8.07	.0009	1.01	1.71	2.06
3281 c	9	4.23	.0005	0.56	0.69	1.78
Means.	8.84	−6.01	± 0.00097	± 1.09	± 1.41	

Average Probable Error of Setting Single Region = ±1.09 km.
" " Total Accidental Error Single Region = ±1.41 "
" " " " " Single Plate = ±0.47 "
Total Probable Error (Accid'l.+System, c) " " = ±0.70 "

Collecting in the following table the final values we obtain the relative errors for the three dispersions.

SUMMARY OF PROBABLE ERRORS.

Spectrograph.	Disp'n. t.m. per mm.	No. of Plates.	Mean Velocity.	Errors of Single Region.		Errors of Single Plates.		
				Errors of Setting.	Total Accid'l Errors.	Total Errors Accid'l and Syst.	Accid'l.	Syst.
III L	10.1	24	−5.51	± 0.45	± 0.63	± 0.50	± 0.17	± 0.47
III R	20.2	11	−4.55	0.75	1.00	0.75	0.32	0.68
I	33.5	38	−6.01	1.09	1.41	0.70	0.47	0.52

We have in the first column the spectrograph employed; in the second the dispersion in tenth-metres per millimetre at H_γ; in the third the number of plates measured, and in the fourth the mean velocity of these plates.

The fifth column contains the average probable error of the estimation of the coïncidences in a single region, while the sixth contains the average total accidental error as obtained from the final kilometre values of the displacement for each region.

Under the heading of "Errors of Single Plates" we have in the seventh column the total error obtained from the mean velocities of all the plates, and in the eighth the accidental error obtained by dividing the total accidental error of a single region by the square root of the number of regions, while the ninth column is obtained from the two preceding columns by taking the square root of the difference of their squares.

It is difficult to account for the results obtained, especially in the errors of single plates for, as before stated, one would expect the kilometre values of the probable errors to be inversely proportional to the linear dispersion. This is approximately true so far as the errors of single regions are concerned and the discrepancy can be satisfactorily explained by the greater ease and accuracy in the determination of coïncidences in the single prism spectrograph owing to the decidedly smaller curvature of the spectral lines. But when we come to the total errors of a single plate as determined from the measured velocities of the plates, we find the errors instead of being in the ratio of 1, 2, and 3 as we should expect are as 1, 1–1/2, and 1–1/2 approximately.

So far as III L and III R are concerned it must be remembered that, although the linear dispersions are as 1 to 2 the angular dispersions and the resolving powers are equal and the decrease of the ratio

from 1: 2 to 1: 1–1/2 can thus be accounted for. In the single prism spectrograph, however, the linear dispersion, angular dispersion, resolving power, and purity of spectrum are practically only one third of those of III L, and the errors should be three times as great. Instead of that the total error of a plate, which is of course the most important quantity to be determined, is only 40 per cent. greater with the lower dispersion and an examination of the last two columns shows that the systematic (due to changing instrumental factors) part of this error is nearly the same in III L and I, while the accidental part is nearly in proportion to the dispersions.

This would seem to indicate either that the single prism spectrograph is less likely to give systematic displacements of the spectrum lines than III L or that the kilometre rather than the linear value of the systematic displacements remains constant. So far as the first supposition is concerned, although the single prism instrument[1] is undoubtedly less affected by flexure than III L and is probably better controlled and regulated as regards temperature, these two factors will not have much influence in the short exposure required on Arcturus. There is no ground for supposing on the other hand that kilometre rather than linear values of the systematic displacement should remain constant except in the case of displacements due to temperature changes in the prisms.

A partial explanation of the relative superiority of the low dispersion instrument is that it may be due to the fact that the three prism plates were mostly made on different dates and at varying hour angles though never far from the meridian, while the one prism plates were made in four groups only, the plates being obtained consecutively and probably under similar conditions in each of the groups.

In any case it seems to be evident that radial velocity determinations of second type stars may be made with low dispersion instruments with an accuracy not much less than that obtainable with the high dispersion instruments at present in use. This fact, if considered established by the present investigation, is one of much importance as it admits the carrying of the spectrographic survey of the heavens to stars more than a magnitude fainter than those at present available.

It may be of interest to compare the values of the probable errors of a region and plate in the solar type star Arcturus with those obtained, in my investigations on the effect of slit width[2] of the probable errors of an average line and of a single plate in the case of the early type star

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[1] Journal R.A.S.C., III., p. 287.

[2] Astrophysical Journal XXVIII, 259 and Trans. Royal Society of Canada 1909, p. 209.

β Orionis. I will in this case take the mean of the values obtained for the three slit widths 0.025, 0.038, and 0.051 mm. thus using 18 plates with III L, 30 plates with III R, and 30 plates with I.

PROBABLE ERRORS.

Spectrograph.		Line of Average Weight.	Single Plate.
III L.	10.1	±2.20	±1.17
III R.	20.2	±2.47	±1.53
I	33.5	±3.18	±2.16

These results are, relatively to one another, in substantial agreement with those obtained in the present investigation though not quite so favorable to the low dispersion. There seems hence to be no reasonable doubt that the accuracy of radial velocity determinations does not by any means proportionately diminish with decrease of dispersion.

It is evident therefore that the high probable errors of single observations obtained in our work on spectroscopic binary orbits must be due, not to the small dispersion employed giving results relatively less accurate than those obtained with high dispersion instruments, but to the character of the lines in the spectra with the resultant high errors of measurement. In many cases also they are probably due to abnormal conditions in the orbit causing deviations from velocity curves due to simple elliptic motion, thus giving higher residuals.

I have tabulated on following page the probable error of an average observation of the velocity of the brighter stars of spectroscopic binary systems as determined here and at the Allegheny and Lick Observatories and it will be noticed at once that the accuracy very rapidly diminishes as the spectrum lines become broader, and with orbits containing abnormal secondary or other effects. The slightly lower values obtained at Allegheny for the probable errors are likely due to the fact that many of their spectra were made on the fine grained Seed 23 instead of the coarser grained Seed 27 plate used at Ottawa.

PROBABLE ERRORS OF SINGLE OBSERVATIONS.

Star.	Spectral type.	Probable Error Average Plate.	Dispersion.	Observatory.	Remarks.
γ Camelop	A 2 F.....	± 2.4	One Prism. ..	Ottawa....	Lines good.
α Draconis. . . .	VII a.	3.4	" ...	"	" "
θ Aquilæ.	VII a.....	4.0	" ...	"	Changing elements.
B.D.—1°1004	B 3 A. . ..	5.2	" ...	"	Broad Lines.
α Coronæ.	VIII a b. ..	5.4	" ...	"	Lines broad and asymm'l.
ϕ Persei	L.	6.1	" ...	"	Abnormal secondary effect.
ϵ Herculis.	VII a.	6.4	" ...	"	Abnormal secondary effect.
c Orionis.	B, I b.	6.8	" ...	"	Lines diffuse and asymmetric.
ψ Orionis.	B, I b.	6.8	" ...	"	Lines very broad.
τ Tauri.	B, I b.	10.8	" ...	"	Lines very broad.
β Orionis	VI c	2.0	Three Prism.	"	Lines good.
		3.2	One Prism . .	"	Lines good.
η Virginis.	VIII a	2.4	Three Prism.	"	Lines fair.
η Bootis.	XIV a ...	0.50	" .	"	Numerous well defined.
π^4 Orionis	IV a	1.7	One Prism. ..	Allegheny	Lines very good.
ζ Lyræ.....	A I a 2.....	2.0	" ...	" .	Lines well defined.
α Androm	VIII P. ...	2.5	" ...	" .	Lines good.
β Aurigæ.	VIII a. ...	3.2	" ...	" .	Lines sharp and narrow.
θ Aquilæ.....	VII a.	3.4	" ...	" .	Lines fair.
δ Libræ.	VII a.	4.7	" ...	" .	Ill defined lines.
α Coronæ.	VIII a b. ..	4.9	" ...	" .	Broad lines.
2 Lacertæ.	A I b.	5.3	" ...	" .	Fair lines.
μ Herculis	A I b.	8.0	" ...	" .	Broad lines.
α Virginis.	III b.....	9.9	" ...	" .	Very broad and diffuse.
η Pegasi.	XIV a. . . .	0.47	Three Prism.	Lick.	Good Lines.
α Aurigæ.	XIV a. . . .	0.50	" .	"	"
λ Androm.	XV a.	0.50	" .	"	"
β Herculis	XV a.	0.52	" .	"	"
ι Pegasi.	XII a	0.56	" .	"	"
α_2 Gem' m.	VIII a. ...	0.64	" .	"	"
α_1 Gem' m.	VIII a. ...	0.79	" .	"	"
ω Draconis. . . .	F 5 G	0.75	" .	"	Diffuse Lines.
θ Draconis. . . .	XIII a. . . .	0.87	" .	"	"
R.T.Aurigæ. .	G.....	0.82	" .	"	"
η Aquilæ.	XIV a c. ..	0.85	" .	"	"
W Sagittarii.. . .	F 5 G.....	0.90	One Prism. ..	"	Fair Lines.
X "	F 8 G	1.80	" ...	"	"
Y "	G.....	2.10	" ...	"	"

None of the orbits determined with low dispersion at Ottawa and Allegheny are of stars with solar type spectra so that no measure can be thus obtained of the relative accuracy of this dispersion. Three solar type binaries observed at the Lick Observatory with a single prism spectrograph show fairly accurate results especially W Sagittarii with a plate error of ± 0.90 km. and which if three or four discrepant observations are omitted reduces to ± 0.55 km. This is of the same order as the probable error of a single prism plate of Arcturus as determined here (± 0.70 km.)

The probable errors of single observations of binary and constant velocity solar type stars with three prism dispersion both at Lick and Ottawa seem to be very close to half a kilometre and in cases where it is greater it is apparently due to the poorer quality of the spectra for measurement. Three cases in which the probable error of a plate is less than half a kilometre are known to me. At Ottawa a series of 11 plates of β Geminorum gave a probable error of ± 0.40 km. per second and when observations are limited to certain hour angles and special precautions taken as at Bonn by Kustner in determination of solar parallax where 16 plates of Arcturus gave a probable error of a single plate ± 0.22 km., and at the Royal Observatory Cape of Good Hope where 22 plates of β Geminorum gave a probable error of ± 0.34 and 55 plates of α Bootis of ± 0.42 km. There is no doubt, though no values have been published, that the work at the Lick and Yerkes Observatories on solar type constant velocity stars is equally accurate.

It seems to me therefore that we may safely draw the following conclusions from the preceding discussion:—

I.—The accuracy of determination of the radial velocity of stars of solar type by means of spectrographs of different dispersions is not, as would be expected, inversely proportional to the dispersion but in the cases under discussion only a small increase of probable error, 40 per cent., takes place when the dispersion is divided by three. As the relative exposures required are as about five to one it is evident that stars more than a magnitude and a half fainter become available.

II.—The probable error very rapidly increases with the increase in diffuseness of the lines in early type stars varying in low dispersion spectrographs from about ± 2 to ± 11 km. per second. Experience in work with these stars has convinced me that the whole of this error is not due to the accidental error of pointing but that in many cases some physical cause in the stars' atmosphere is responsible for a considerable part of the discrepancy.

III.—The result of this and other investigations shows that the probable error of a single ordinary observation of a good second type star

with the usual three prism dispersion is in the neighborhood of 0.5 km. per second. When greater than this it indicates a spectrum with poorer lines and when less that special precautions and limitations were adopted in the making and measurement of the spectra. It is also shown that the probable error of determination with a thoroughly stable one prism instrument of one third the dispersion is for solar type spectra measured on the spectra comparator about ± 0.70 km. per second and for spectra of earlier type varies from about ± 2 to ± 11 km. per second.

IV.—Generally speaking the major part of the errors in solar type stars are due to systematic displacements of the lines as a whole owing to flexure, temperature changes, imperfect adjustments of the optical parts, faulty guiding or other causes. The accidental errors of pointing are responsible generally for only one third or less of the total error. In the case of early type stars the systematic displacements due to instrumental conditions will probably be approximately the same while the errors of pointing are correspondingly increased.

XII.—*Mathematical Instruction in France.*

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(Presented by Dr. E. Deville and read in abstract, 28 September, 1910.)

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APPENDICES.

For Later Publication.

Introductory.

As the result of remarkable progress during the past fifteen years, a vigorous American School of Mathematics, of which the German School may well be considered the parent, has been developing. Many years must elapse before the offspring may exercise the authority and influence made felt by such masters as Gauss, Riemann, Steiner, Weierstrass and Klein. But meanwhile the process of evolution is proceeding in thorough fashion. In preparing for higher mathematical education, America has recognized the fundamental importance of the secondary; organization, discussion, and criticism of home methods as well as study of those of foreign countries, have been widespread in recent years. But here, again, the preponderance of discussion in book and periodical is of German methods. The series of reports of the Carnegie Foundation for the Advancement of Teaching is doing considerable to spread accurate information of a more general character.

Yet in spite of the predominance of German influence in the discussion, I have become convinced, after several months of observation, that just as much might be beneficially acquired by the study of mathematics and methods of mathematical training in France, as in any other country. Has not this country produced Chasles, Monge, Poncelet, Cauchy, LaPlace, Hermite? What city beside Paris has to-day such a large number of mathematicians of the first order? There are Poincaré, Darboux, Goursat, Picard, Painlevé, Appell, Jordan, Humbert, Borel, Tannery, to mention only a few. What other country gives such a course of mathematical training as is provided in the *Classes de Mathématiques Spéciales* of the French Lycées? Where else is the extraordinarily high standard of the *agrégation* demanded of higher teachers in the secondary schools?

Nevertheless when leaving Harvard some ten years ago with a view to further mathematical study in Europe, and although more or less familiar with such classic treatises as those of Darboux, Picard, Tannery, Appell and Goursat, I scarcely even considered France, as a possible place of location. The professors at Harvard who had studied abroad had been trained in Germany and were thoroughly imbued with German methods and ideals. The same was doubtless true of at least ninety-five per cent of the mathematical professors in the larger American colleges, and the same may be said to-day—Why this neglect of France?

For one thing the American student usually looks forward to getting a doctor's degree in one or two years, while the idea is certainly prevalent among us that if the French degree of doctor were at all available for the foreigner, he could only expect to get it at the age of forty-five or fifty, and after writing some monumental or epoch-making treatise. Such ignorance is without doubt due in part to the excessive

difficulty of getting any reliable information about French as compared with German universities. Even when the inquirer is in Paris the difficulty does not wholly disappear.

It would seem then, that a service may be rendered to students and university professors who have in prospect a sojourn in Europe for mathematical study, if I should present a general view of the situation in France, along with fuller details on topics which must be of especial interest to every mathematician.

The plan of the paper is indicated by the table of contents.

General Remarks—Educational System and Primary Instruction.

To more thoroughly understand the methods and ends of mathematical instruction in France it will be well to introduce here some brief general remarks.

For educational purposes France is divided geographically into *arrondissements*. The assemblage of government schools (primary, secondary and superior) in each arrondissement, forms an *académie* over which a *recteur* presides. We thus have the 16 académies of Aix-Marseilles, Besançon, Bordeaux, Caen, Chambéry, Clermont, Dijon, Grenoble, Lille, Lyons, Montpellier, Nancy, Paris, Poitiers, Rennes, Toulouse, as well as a seventeenth at Algiers. With the exception of Chambéry these names correspond to the seats of the French universities, which have from two to four faculties (law, science, letters, medicine) each, the faculties of science and letters together corresponding to the German *philosophische Facultät*. In the académie first named above, the faculties of law and letters are at Aix and the faculties of science and medicine at Marseilles.

The assemblage of académies forms the *Université de France*, at the head of which is the Minister of Public Instruction, who is *ex officio* the "Recteur de l'Académie de Paris et Grand Maître de l'Université de Paris." For the Académie de Paris there is a vice-recteur, whose duties are the same as those of the recteurs of other académies. Although nominally lower in rank than the heads of académies in the provinces, he is in reality, the most powerful official in the educational system. The position of the Minister of Public Instruction being so insecure by reason of changing governments, continuity of scheme is assured by three lieutenants who have charge respectively of the primary, secondary and superior education. They in turn have an army of inspectors who report on the work and capabilities of the recteurs and their académies as far as primary and secondary instruction is concerned.

This suffices at present to indicate the remarkably centralized and unique character of the French educational system. It is theoretically possible for the most radical changes in any part of public instruction to be immediately brought about by a stroke of the pen on the part of the Minister of Public Instruction.

In the recuperation of the French nation during the past 40 years, gigantic strides have been made in all departments of education; scores of handsome and spacious new buildings have been erected, new chairs have been endowed, new laboratories established and equipped—while in connection with special schools all over the country, scholarships and prizes call forth and reward the best effort of the nation's youth. Forty years ago the state spent 32 million francs for education. The 1909 budget of the Minister of Public Instruction and Fine Arts called for 293 millions—nearly two-thirds of this amount being allotted to *Primary Instruction.*

Primary and superior instruction are free in France and over five million children are now annually in attendance at the public primary schools. Broadly speaking there are three classes of these schools which give strictly elementary education:—

A.—*Ecoles Maternelles.* A sort of kindergarten for children of both sexes from 2 to 5 or 6 years old.

B.—*Ecoles Primaires Elémentaires* for pupils 7 to 13 years of age. The course is divided as follows:—

		Age
Section Enfantine		5 or 6-7
Cours Élémentaire	Ière Année	7–8
	IIe "	8–9
Cours Moyen	Ière "	9–10
	IIe "	10–11
Cours Supérieur	Ière "	11–12
	IIe "	12–13

On completion of the cours moyen the pupil receives a *certificat d'études primaires élémentaires.* This certificate or its equivalent is required of every child in France. A very small proportion of those receiving it take up further work in the cours supérieur, in the lycées or in

C.—*Ecoles Primaires Supérieures.* These are for children of the labouring class who do not aspire to a classical education, but who

wish to prepare themselves for industrial, commercial or agricultural careers.

In what follows it will be supposed that the discussion is limited to the education of boys.

Elementary Mathematical Instruction.

The Lycées.

The present system of secondary education in France dates from the great reform of 1902 and is carried on for the most part in *Lycées* and *Collèges communaux* which are to be found in nearly all cities. Because of their pre-eminence we shall consider the former only, which are under control of the state. Here the boys, who come from families in comfortable circumstances, may enter as *élèves* at the age of five or six years and be led along in their studies till they receive the *Baccalauréat* at the age of 16 or 17. Many lycées have still more advanced courses to prepare for entrance into such schools as the École Normale Supérieure, École Polytechnique, École Centrale, École Navale, École de Saint Cyr, etc. The pupils at the lycées are of four kinds: 1st.—*Externes*, those who come to the lycées for classes but board and lodge outside; 2nd.—*Internes* or *pensionnaires*, élèves who live entirely in the establishment; 3rd.—*Demi-pensionnaires* who usually reside at a distance but take their mid-day meal at the lycée; 4th.—*Externes surveillés*, that is externes who work out their lessons under the eye of the *préparateur* in the *salle d'étude* of the lycée. In the whole of France rather less than one third of the lycée pupils are internes. At lycée Louis le Grand, Paris, in 1907, 275 of the 909 élèves were internes; on the other hand at the Saint Louis, which is quite near, there were 504 internes out of a registration of 854.

The expenses of the pupil vary greatly with the class and the lycée in which he happens to be. The following table exhibits the range of cost (in francs per year), for some of the principal cities of the provinces and for the better lycées of Paris.

	Bordeaux, Lyons, Marseilles, Toulouse.	Paris.
Externes	70–450	90–700
Externes Surveillés	110–540	130–790
Demi-pensionnaires	370–850	500–1200
Pensionnaires	700–1200	900–1700

The lower price in each case is for the classe enfantine, the higher for the special classes open to *bacheliers*.

Instruction in fully equipped lycées may be divided into four sections:—I, Primary; II, Premier Cycle; III, Second Cycle; IV, *Classes de Mathématiques Spéciales.*

I.—*Primary.* The classes in this section are named as follows:—

		Age from
Classes Enfantine	Onzième	5
Preparatory Division	Dixième	6
	Neuvième	7
Elementary Division	Huitième	8
	Septième	9

In a general way this course corresponds to that which leads to the *certificat d'études primaires élémentaires,* but while the latter was designed as a more or less complete unit in itself, the former is laid out on broader lines and has in view further studies which the boy will follow up. According to the *plans d'études,* it would seem as if one essential difference were introduced by instruction in a modern language in the neuvième, huitième and septième. In reality, however, the modern language classes are so conducted in the sixième of the Premier Cycle that both kinds of students are taught together.

II.—*Premier Cycle* (*sixième-troisième*). This cycle of four years constitutes an advanced course for students who have finished their primary studies, and is the first part of secondary education proper. It offers a choice between two lines of study, the one characterised by instruction in Latin with or without Greek, the other in which no dead language is taught. The former is selected by the parent who wishes to prepare his boy for the department of letters in the École Normale Supérieure or for the career of classical professor, lawyer or doctor. The latter is likely to be chosen for the boy who is particularly interested in science or who has a commercial career in view.

III.—*Second Cycle.* This leads, normally, to the *Baccalauréat,* at the end of three years' study, in one of four different sections. The student of Latin and Greek in the quatrième and troisième has passed into the "Latin-Grec" section, the student of modern languages into the "Science-Langues vivantes" section, while this section as well as those of "Latin-Langues vivantes" and "Latin-Science" have been filled by students who have studied Latin (but not Greek), during the four years of the Premier Cycle. The scheme will be clearer in tabular form.

	Pupils who learn Latin, with or without Greek.			Pupils who learn no dead language	Age from
PREMIER CYCLE.	Sixième A (Latin).			Sixième B	10
	Cinquième A (Latin).			Cinquième B	11
4 years	Quatrième A (Latin Greek)	Quatrième (Latin)		Quatrième B	12
	Troisième A (Latin Greek)	Troisième (Latin)		Troisième B	13
				Pupils who give up the study of Latin. ↓	
	LATIN-GREC.	LATIN-LANGUES	LATIN-SCIENCES	SCIENCES-LANGUES	
SECOND CYCLE	Second A	Second B	Second C	Second D	14
	Première A	Première B	Première C	Première D	15
3 years	PhilosophieA	Philosophie B	MathématiquesA	Mathématiques D	16

Let us now observe a little more closely just what is involved in this display, in the matter of studies and demands made upon the élève. As an important examination which we shall presently describe comes at the end of the *Première,* our present analysis will not pass beyond this grade. Here is the programme for a week.

		French.	Latin.	Greek.	Modern Languages.	History and Geography.	Natural Science.	Physics and Chemistry.	Moral Philosophy.	Book-keeping.	Drawing.	Geometrical Drawing.	Arithmetic.	Arithmetic and Geometry.	Algebra and Geometry.	Writing.	Total No. Hours.
VI.	A.	3	7	..	5	3	1	..	..	..	2	..	2	..	..	..	23
	B.	5	..	..	5	3	2	..	..	..	2	1	3	..	..	1	22
V.	A.	3	7	..	5	3	1	..	..	..	2	..	2	..	..	..	23
	B.	5	..	..	5	3	2	..	..	..	2	1	..	3	..	1	22
IV.	A.	3	6	3*	5	3	1	..	1	..	2	..	..	2	..	..	23
	B.	5	..	..	5	3	..	2	1	1	2	1	..	3	..	..	23
III.	A.	4	6	3*	5	3	..	..	1	..	2	..	..	3	..	..	24
	B.	5	..	..	5	3	1	2	1	1	2	1	..	..	4	..	25

		French.	Latin.	Greek.	Modern Languages.	Ancient History.	Modern History.	Geography.	Physics and Chemistry.	Practical Exs. in Science.	Geology.	Supplementary Exs. in Latin.	Drawing.	Geometrical Drawing.	Algebra and Geometry.	Geometry, Descriptive Geometry, Trig., Algebra.	Total No. Hours.
	A.	4	4	5	2	2	2	1	..	..	**	..	2	..	2	....	24
	B.	4	4	..	7	2	2	1	..	..	**	..	2	..	2	....	24
	C.	4	4	..	2	..	2	1	3	2	**	..	2	2	5	....	27
	D.	4	..	..	7	..	2	1	3	2	**	..	2	2	5	....	28
	A.	4	3	5	2	2	2	1	..	..	..	2	2†	..	2	....	23
	B.	4	3	..	7	2	2	1	..	..	..	..	2†	..	2	....	21
	C.	4	3	..	2	..	2	1	3	2	..	..	2	2	3	2	26
	D.	4	..	..	7	..	2	1	3	2	..	..	2	2	3	2	28

* Those who select Greek are exempted from 2 hours in modern languages and one in drawing.

** 12 lectures of 1 hour.
† Optional.

There are several features of this scheme (we shall refer to four), which are particularly interesting.

1.—The prominence given to the study of French throughout.

2.—That all élèves at the age of 10 or 11 commence the study of modern languages (English, German, Italian, Spanish, Russian, or, in Algiers, Arabic), and continue it during six years at least, before matriculating into schools of university grade. Not only do they get glimpses of the best things in the literature of the language, but also learn to speak the language with considerable freedom and remarkable correctness in pronunciation. How many university graduates with us get a training which leads to this result? The direct method is employed and no word of French is ever spoken in the advanced classes. The majority of the élèves choose German, as this is required of all candidates for entrance into such military schools as the École Polytechnique and École de St. Cyr. On the other hand there is an increasing number taking up the study of English which is required for the École Navale.

3.—The small number of hours devoted to mathematics in the Premier Cycle, in II, A, B, and in I, A, B, of the Second. Yet there can be little doubt that the situation might be summed up in even stronger terms than in the recent report of the trustees of the Carnegie Foundation, when comparing the methods of American and German schools: "... lack of efficient teaching is one of the most expensive national weaknesses, and that the inefficiency of our school system is in great measure due to this lack is evident. For example, mathematics is a subject which has been a standard study in our schools from the beginning. Students who pass through our high schools and enter college spend in the nine years corresponding to the period covered by the German *gymnasium*, seventy-five per cent. more of time of instruction on mathematics and yet receive a training vastly inferior to that of the *gymnasium*." Practically all the *professeurs titulaires* in the French lycées, even those in charge of the very elementary classes, are *agrégés* in the subjects which they instruct. Just what this means in mathematics we shall explain later, but suffice it to remark here that even the demands made upon those who wish to become *gymnasien* professors are nothing like as severe.

Another feature of mathematical instruction which is particularly interesting to us is, that from the troisième on, that is, from the time the boy is 13 or 14 years old, instruction is given entirely by lecture. Indeed, even in classes before the troisième when a text book is generally in the hands of the élève, he is required to take notes "pour préciser" the various topics. By such methods, searching questioning and frequent "tests," on the part of the professor, and rigid inspection, kindly expressed praise or cutting public reprimand on the part of the *proviseur* (director of the lycée), there is no possibility of learning parrot-fashion, as is so prevalent in our schools—no room for the shirker or the boy who

does not try his best; reasoning powers and independence of thought must be constantly exercised. The élèves are encouraged to consult the various text-books to be found in all the lycée libraries and for those less bright this may be almost a necessity from time to time; but on personal inspection in different lycées I found the note books of élèves of 14 or 15 alike remarkable for their neatness and completeness. The habits thus gained in the lycée stand in good stead when the student reaches the university. The rapidity of the lecturer and the complexity of his theme seem to make little difference, for at the close of the hour the whole is in the note books as neat as copper-plate. There is surely a lesson to be learned here for improving our secondary and superior education.

4.—The large number of hours in class recitation which may not at first appear very imposing. But we cannot fail to be astonished that 8 hours per day (in class and in preparation of lessons) may be demanded from élèves in the premier cycle, and $10\frac{1}{2}$ in summer, 10 in winter from those in the second cycle. The law further explicitly states that there is no limit to the number of hours which may be demanded of the élèves in the *Classe de Mathématiques Spéciales*. When we later come to look more closely at their programme we shall not be surprised, but nevertheless wonder, how these undoubtedly happy and healthy young men of 17 or 18 have survived the treatment. In more advanced lycée courses as well as at the universities I was also impressed with the almost appalling intensity and seriousness of the auditors—the strife is too strenuous, the competition too keen, to admit of a moment's levity or wandering thought. But when the lesson is over, every care is instantly banished and the national gaiety is once more in evidence.

To return to our table. We remark that the two groups of élèves who elect sciences on entering the Second Cycle have the same number of hours per week in mathematics—indeed the courses are identical. To give greater definiteness to our ideas as to their general attainments let us consider the programme of studies for Première D, when the boy is 15 or 16 years old.

French.—Lectures and questions on the principal French writers of the nineteenth century. Study of selections from prose writers and poets, from moralists, orators, politicians, scientists and historians of the sixteenth, seventeenth, eighteenth and nineteenth centuries.

History.—Political history of Europe in the eighteenth century. Detailed history of France at the close of the eighteenth century.

Geography.—Detailed study of France, its geological constitution, its climatology, physiography, topography, economic and military organization; its colonies, etc.

Physics.—Optics, electricity.

Chemistry.—Of the carbon compounds.

German.—Selections from the dramatic poetry of Schiller, Goethe, Kleist and Grillparzer. Extracts from the prose works of Wieland, Goethe, Schiller, Auerbach, Freytag, Scheffel, etc.

English.—Shakespeare's Julius Caesar and Macbeth, extracts from Milton, Addison, Goldsmith, Wordsworth, Byron, Coleridge, Dickens, Macaulay, Eliot, Tennyson and Thackeray.

Algebra.—Equations and trinomials of the second degree. Calculation of the derivatives of simple functions; study of their variation and graphic representation; study of rectilinear motion by means of the theory of derivatives; velocity and acceleration; uniformly changing motion.

Geometry.—Solid.

Descriptive Geometry.—Elements.

Trigonometry.—Plane, including the use of four or five place logarithim tables, the solution of triangles and trignometric equations.

In passing it may be worth noting that the Latin course for Première A, B, C, includes the study of selections from Cicero's letters and orations, from Livy, Seneca, Tacitus, Lucretius, Virgil and from Horace's Satires and Epodes. The Greek course for Première A, considers extracts from Xenophon's Memorabilia, from Plato, Demosthenes, Homer, Æschylus, Sophocles, Euripides, Aristophanes, etc.

The Baccalauréat.

Having finished the Première, the élève presents himself for examination under conditions which once more emphasise the unity of the French educational system. This is the examination for the first part of the state degree known as the *Baccalauréat.*

A peculiar feature of this examination is that it is not held in the lycées but at the university of the académie to which the particular lycée belongs.[1] As various civil and practically all government positions, except those in post and telegraph offices are only open to *bacheliers*, the state introduces into the body of examiners some who are wholly independent of the lycées. These examiners are the professors in the universities.

Since our future mathematicians are to come from Première C and D we shall give a few particulars concerning their examination. All examinations for the baccalauréat are held in July and October—at the ending of one school year and the beginning of the next. The

[1] As there is no university at Chambéry, the candidate presents himself before a faculty of either Lyons or Grenoble.

examiners of the candidates from Première C are six in number, three of whom are university professors and three professors from the lycées or collèges; for Première D there are but two university professors in addition to three from the lycées. The examinations in all sections are both written and oral. Here is the scheme of examination which practically covers what the élève has studied in earlier years.

Première C (Latin-Sciences).—*Written.* 1st, a French composition (3 hours); (the candidate has a choice of three subjects); 2nd, a Latin translation (3 hours); 3rd, an examination in Mathematics and Physics (4 hours). *Oral.* (about three quarters of an hour). 1st, explanation of a Latin text; 2nd, explanation of a French text; 3rd, examination in a modern language—questions and answers being necessarily in this language. Questions in—4th, History; 5th, Geography; 6th, Mathematics; 7th, Physics; 8th, Chemistry.

Première D (Sciences-Langues Vivantes).—*Written.* 1st, a French composition (3 hours); 2nd, a composition in a modern language (3 hours); 3rd, examination in Mathematics and Physics (4 hours). *Oral* (about three-quarters of an hour). 1st, explanation of a French text; 2nd, two tests in modern languages, one of which must be either English or German. Questions in—3rd, History; 4th, Geography; 5th, Mathematics; 6th, Physics; 7th, Chemistry.

On registering at the secretary's office and paying the fifty francs necessary for the above examinations the student has the option of depositing his *livret scolaire* which contained a full record of his work in the lycée for two or three years previously. If the pupil thus shows a good record but fails to get the necessary fifty per cent on his written paper he is nevertheless admitted to the oral. Otherwise no élève who has not passed the written examination can present himself for the oral. On the other hand if he has passed the written examination, but failed at the oral, he may try another oral examination (within a year), without repeating the written part.

The searching character of the tests prepares us for a large number of failures. Here is the record for 1909.

	Number of Candidates		Number Admitted to Oral		Number Passed		Percentage Passed	
	July.	Oct.	July.	Oct.	July.	Oct.	July.	Oct.
Latin-Grec	2506	1262	1423	759	1097	537	44	42
Latin-Langues Vivantes	3147	1683	1605	930	1293	708	41	42
Latin-Science	2717	1247	1619	729	1350	570	49	46
Science-Langues Vivantes	4088	1860	2110	915	1741	731	42	39
Philosophie	5824	2639	3764	1911	3144	1572	54	59
Mathématiques	3163	1128	1995	790	1762	642	56	57

We observe that less than fifty per cent. of the pupils get through on the first examination[1] while a similar percentage of the remainder fail and are required to return to the Première once more or to wait for another year.[2] Those who have been successful return to the lycée to prepare for the second part of the baccalauréat. A choice of two courses (which may be slightly varied), is open to them, the one *Philosophie A* or *B*, the other, *Mathématiques A* or *B*. We shall only refer to the latter which has been supplied with pupils from the Première C and D. There they had 26 and 28 recitation hours per week. This has now been increased to $27\frac{1}{2}$ and $28\frac{1}{2}$. There has been an increase in the number of hours devoted to mathematics, physics and chemistry, but a reduction in the amount of study of modern languages. Latin no longer enters. The programme for Mathématiques A is in outline as follows:—

Philosophy (3 hours).—I. Elements of Scientific Philosophy: introduction, science, method of mathematical sciences, method of the sciences of nature, method of moral and social sciences. II. Elements of moral and social philosophy.

History and Geography ($3\frac{1}{2}$ hours). *Modern Languages* (2 hours). *Physics and Chemistry* (5 hours). *Natural Science* (2 hours). *Practical Exercises in Science* (2 hours). *Drawing* (2 hours). *Hygiene* (12 lectures of 1 hour).

Mathematics. (8 hours):

Arithmetic.—Properties of integers; fractions; decimals; square roots; greatest common divisors; theory of errors; etc.

Algebra.—Positive and negative numbers, quadratic equations (without the theory of imaginaries), progressions, logarithms, interest and annuities, graphs—derivatives of a sum, product, quotient, square root of a function, of sin x, cos x, tan x, cot x. Application to the study of the variation and the maxima and minima, of some simple functions, in particular functions of the form

$$\frac{ax^2+bx+c}{a^1x^2+b^1x+c^1}\ ;\quad x^3+px+q$$

when the coefficients have numerical values—Derivative of the area of a curve regarded as function of the abcissa (the notion of area is assumed).[3]

Trigonometry.—Circular functions, solution of triangles, applications of trigonometry to various questions relative to land surveying.

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[1] For some it may have been the third or fourth trial.

[2] There are certain exceptional cases which I shall not consider.

[3] The following note is attached to the résumé in the official programme, "Le professeur laissera de côté toutes les questions subtiles que soulève une exposition rigoureuse de la théorie des dérivées; il aura surtout en vue les applications et ne craindra pas de faire appel à l'intuition."

Geometry.—Translation, rotation, symmetry, homology and similitude, solids, areas, volumes, poles and polars, inversion, stereographic projection, vectors, central projections, etc.

Conics.—Ellipse, hyperbola, parabola, plane sections of a cone or cylinder of revolution, etc.

Descriptive Geometry.—Rabatments—application to distances and angles—projection of a circle—sphere, cone, cylinder, planes, sections, shadows.—application to topographical maps, etc.

Kinematics.—Units of length and time. Rectilinear and curvilinear motion. Translation and rotation of a solid body. Geometric study of the helix, etc.

Dynamics and Statics.—Dynamics of a particle, forces applied to a solid body, simple machines in a state of repose and movement, etc.

Cosmography.—Celestial sphere, earth, sun, moon, planets, comets, stars—Co-ordinate Systems, Kepler's and Newton's laws, etc.

One of the most striking things in this scheme, as compared with American method, is to find arithmetic taught in the last year of the lycée course. Note too, that from the Cinquième on, it has been taken up in connection with instruction in geometry and algebra. Indeed, this method of constantly showing the interdependence or interrelation of the various mathematical subjects was one of the interesting and vaulable characteristics of French education as I observed it. For example, I happened to be present in a classroom when the theory and evaluation of repeating decimals was under discussion. After all the processes had been explained, problems which led similarly to the consideration of infinite series and limits were taken up. By suggestive questioning a pupil found the area under an arc of a semi-cubical parabola and the position of the centre of gravity of a spherical cap. With us it is not till the graduate school of the university that the boy is taught the true inwardness of such processes as long division and extraction of roots; but in France, arithmetic is taught as a science and the élève leaving the lycée has a comprehending and comprehensive grasp of all he has studied.

The increasing general interest in practical education is reflected in the French method of teaching geometry with frequent illustration involving discussion of the form or relation between the parts of objects met with in every day life. Rather curiously, the method employed in at least some German *gymnasien*, of demanding that a pupil demonstrate even the more complicated propositions of geometry without any reference to a figure on a blackboard, does not seem to obtain in France. Curiously, because there can be no doubt of the fine exercise of mental concentration required of the members of the class who first build up in imagination the construction as indicated by one of their number and

afterwards follow or criticize his proof; moreover the average French boy could certainly soon become an expert in such mental gymnastics. We remark that most of the mathematical subjects mentioned above are more or less foreign to our secondary education. Instruction in geometrical conics (*courbes usuelles*), is infrequently given by us, even in universities. Again, the ordinary mathematical student who goes up for his doctor's degree in America may have the vaguest idea of what is even meant by Descriptive Geometery. True, it is a regular course for our training of the engineer; but not, unfortunately, of the mathematician. On the other hand the French mathematical student has had at least four years of Descriptive Geometry, two of them before receiving his baccalauréat. The subject is required for admission into many government schools.

We note that the idea of a derivative is familiar to the lycéen during the last two years of his course. Why we so generally shut out the introduction of such an idea into our first courses in analytical geometry and theory of equations is, to me, a mystery. Finally, I would remark that the classes in Mathématiques A last two hours, with the exception of five minutes for recreation at the end of the first hour. The professor thus has sufficient time to amplify and impress his instruction.

At the close of the last year of the Second Cycle, the élève takes the examination for the second part of the baccalauréat. The same general conditions prevail as for the first part. Under no conditions whatever can an élève try the second part till he has passed the first. The jury of four contains two university professors. The written examinations in mathematics, physics and philosophy are each three hours long; the oral covers what has been studied the year previously. If successful, a dipolma now called the *baccalauréat de l'enseignement secondaire*, is granted to the élève by the Minister of Public Instruction. The élève thus becomes a *bachelier*. The diplomas in all four sections are of the same scholastic value. The charge made for diploma and examination is 90 francs. By reference to the foregoing statistical table, it will be noticed that more than forty per cent. of the candidates failed to pass at each of the examinations in 1909.

Because of the similarity of title used in the different countries, the Frenchman does not generally understand what the title Bachelor of Arts implies nor is it easy to make any concise statement in explanation. Little exaggeration can be made, however, in placing the bachelier on a plane of scholastic equality with the Sophomore who has finished his year at one of the best American universities. Certain it is that the bachelier in Latin-Grec has done as much of the dead languages, philosophy and history as is required in the whole pass course of the ordinary

Canadian university. The same may be remarked of the bachelier of Latin-Sciences in modern languages and Latin. When it is further remembered that it is possible for the average Canadian boy to get his B.A. with small effort one inclines to place the baccalauréat, with its rigorous and impartial tests, even higher. No guessing of possible questions and "cramming" for the same, so common in America, can qualify a youth to pass an examination in France.

Another thought which the examinations for the baccalauréat suggest, is the superiority in one respect of Canadian education over that in the United States where a great source of weakness would be removed by the adoption of our plan, under which the examinations for promotion from one grade to the next are conducted by the supervisor of education, not by the teacher. The pressure brought to bear upon teachers to promote ill-prepared pupils is thereby eliminated and this pressure is a fruitful source of demoralization in American public schools.

Finally, does not the French system, as worked out by a great body of educationists, suggest both the kind and method of a much needed reform in our university requirements for the B.A. degree? A large number of bacheliers, as we have seen, have studied no dead language. They may proceed to the Universities and after a time be made doctors in mathematics or natural science without being required to study any dead language. Why may not the same obtain with us? What advantages can be claimed for the study of dead languages, as taught by us, which may not be equally claimed for modern languages? The Harvard authorities apparently see none, as they have not required any dead language after matriculation, for many years past.

The Classes de Mathématiques Spéciales.

IV.—If the bachelier who is proficient in mathematics be not turned aside by circumstances or inclination, to immediately seek a career in civil or government employment, he most probably proceeds to prepare himself for the highly special and exacting examination necessary for entrance into one of the great schools of the government. The method of this preparation exhibits a very peculiar feature of the French system. Whereas with us, or with the German, the boy who has finished his regular course in the secondary school goes directly to some department of a university for his next instruction, the bachelier, who has a perfect right to follow the same course, returns to his old lycée (or enrolls himself at one of the great Paris lycées, such as Saint Louis, Louis le Grand or Henri IV), to enter the *Classe de Mathématiques Spéciales préparatoire* which leads up to the *Classe de Mathématiques Spéciales*. The latter is exactly adapted to prepare students for the École Normale Supérieure, the École Polytechnique and the *bourses de*

licence. Only a small proportion of the lycées (34 out of the 115), have this *Classe*; but with the exception of Aix they are to be found in all university towns. On the other hand, yet other lycées have classes which prepare specially for the less exacting mathematical entrance examinations of the École Centrale, École de Saint Cyr, École Navale, etc. But the number of élèves who on first starting out deliberately try to pass examinations for these schools is small, in proportion to the number who eventually reach them after repeated but vain effort to get into the École Polytechnique or the École Normale Supérieure. Just what makes these two schools famous and peculiarly attractive will appear in a later section. It has been noticed that when the élève has won his baccalauréat he may immediately matriculate into a university, and although it might be possible for him to keep pace with the courses, in mathematics, at least, it would be a matter of excessive difficulty. There is then in reality, between the baccalauréat and the first courses of the universities, a distinct break, bridged only by the *Classes de Mathématiques Spéciales*.

The élèves who enter the *préparatoire* section of this class are, generally,[1] bacheliers leaving the classes de Mathématiques; in very rare instances, there are those who come from the classe de Philosophie. Natural science, history and geography, philosophy—indeed practically every study except those necessary for the end in view, have been dropped and from this time on to the agrégation and doctorat all energies are bent in the direction of intense specialization. This is the most pronounced characteristic of French education to-day. In mathematics, instruction now occupies 12 instead of 8 hours. New points of view, new topics and broader general principles are developed in algebra and analysis, trigonometry, analytical geometry and mechanics. Physics and chemistry are taught during six hours instead of five. Add to these, German, 2 hours; French literature, one hour; descriptive geometry, 4 hours; drawing, 4 hours. After one year of this preparatory training the élève passes into the remarkable Classe de Mathématiques Spéciales.[1]

Eight years of strenuous training have made this class possible for the young man of 17 or 18 years of age, who is confronted with no less than 34 hours of class and laboratory work per week and no limit as to the number of hours expected in preparing for the classes!

When first I looked over the programme it seemed a well nigh impossible performance for one year. Surely no other country can show anything to compare with it. Although it would be of interest to

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[1] Pupils who are not bacheliers, but who are preparing to enter the École Centrale, are also admitted into this class.

reproduce the programme in full, to do so would take up a disproportionate space in a sketch of this kind. Moreover, many parts of it are given in Appendix A in connection with the agrégation examination requirements. I shall, therefore, merely touch on a few of the points of interest. The number of hours per week are distributed as follows:—Mathematics, 15; physics, 7 (2 in laboratory); chemistry, 2; descriptive geometry, 4; drawing, 4; German, 2; French,1. The scope of the mathematical work may be judged from some books which were prepared with the needs of such a class especially in view.

B. Niewenglowski, Cours d'algèbre, I, 382 p.; II, 508 p.; Supplement—*G. Papelier* Précis de géométrie analytique, 696 p.—*Girod* Trigonométrie, 495 p.—*P. Appell* Cours de mécanique, 650 p.—*X. Antomari* Cours de géométrie descriptive, 619 p.

If anything, this list underestimates the work actually covered by those who finally go out from the class. Tannery's Leçons d'algèbre et d'analyse (I, 423 p., II, 636 p.), might well replace Niewenglowski's work while Niewenglowski's Cours de géométrie analytique (1, 483 p.; II, 292 p.; III, 569 p.), represents the standard almost as nearly as Papelier's volume. Another treatise on mechanics widely used is that of Humbert and Antomari.[1]

When we further realize that the books in this list, which represents the work for only one of a half dozen courses, are covered by the professor in about six months—the last three months of the year are given over to drill in review and detail—we begin to get some conception of what the *Classe de Mathématiques Spéciales* really stands for. In his instruction the professor is officially "recommended" " de ne pas charger les cours, de faire grand usage de livres, de ne pas abuser des théories générales, de n'exposer aucune théorie sans en faire de nombreuses applications poussées jusqu'au bout, de commencer habituellement par les cas les plus simples, les plus faciles à comprendre, pour s'élever ensuite aux théorèmes généraux. Parmi les applications d'une théorie mathématique, il conviendra de préférer celles qui se présentent en physique, celles que les jeunes gens rencontreront plus tard dans le cours de leurs études soit théoriques, soit pratiques; c'est ainsi que, dans la construction des courbes, il conviendra de choisir comme exemples des courbes qui se présentent en physique et en mécanique, comme les courbes de Van der Waals, le cycloïde, la chaînette, etc., que, dans la théorie des enveloppes, il conviendra de prendre comme exemples les enveloppes qui se rencontrent dans la théorie des engrenages cylindriques, et ainsi de suite. Les élèves devront être

[1] Further details about these various volumes, as well as of many others, may be found in Appendix D.

interrogés en classe, exercés aux calculs numériques, habitués à raisonner directement sur les cas particuliers et non à appliquer des formules. En résumé, on devra développer leur jugement et leur initiative, non leur mémoire."

In France, as everywhere else, the success of the system depends much on the personality of the professor. A Paris lycée instructor who had a genius for getting hold of his boys has recently died. No less than 35 of his pupils were admitted to the École Polytechnique in a single year. The ordinary professor has to be content with a half or a third of this number. But the success of a class is, by happy arrangement, not left to depend wholly upon a single man. Take, for example, lycée Saint Louis, which is the greatest preparatory school in France for the École Normale Supérieure and the École Polytechnique. There are four Classes de Mathématiques Spéciales and for all the members of these classes, conferences, interrogations and individual examination are organized. These exercises, which complete the daily instruction, are conducted by one of the professors in the lycée itself, or by one of those from the Collège de France, the Sorbonne, the École Polytechnique, the École Normale, from other lycées or from the collèges. Incapables are thus speedily weeded out. Of perhaps greater value than the solidity of the training got in this way is the fact that the interest of the élève is sustained.

Just a word about the calculus course. This is practically equivalent to the first course in the best American universities. The integration of differential equations of the first order in the cases where (1) the variables separate immediately, (2) the equation is linear, as well as of linear differential equations of the second order, constant coefficients, (*a*) without second member, (*b*) when the second member is a polynomial or a sum of exponentials of the form Ae^{ax}—, is taken up.

With the end of the year the élève has his first experience of a *concours*. Previously he has found that it was necessary only to make a certain percentage in order to mount to the next stage in his scholastic career; but now it is quite different. In 1908, 1,078 pupils tried for admission into the École Polytechnique, but only 200, or 19.5 per cent., were received; for the department of science in the École Normale Supérieure, 22 out of 274, or 8 per cent., succeeded. In each case the number was fixed in advance by the Government according to the capacity of the school; the fortunate ones were those who stood highest in the examinations, written and oral. In the case of the École Polytechnique, the written examinations were held in all the lycées which had a Classe de Mathématiques Spéciales. The 387 candidates declared *admissible* were then examined orally at Paris, and from them the 200 were chosen. Similarly for the École Normale, the

written examinations are conducted at the seats of the various academies and the oral at Paris. Since 1904 the concours passed by the École Normalians has been that for the *bourses de licence*, open to candidates of at least 18 years of age and not more than 24. Certain dispensations in the matter of age are sometimes granted. The value of the bourse, for the section of science, is from 600–1,200 francs a year and is intended to help the student to prepare for the licence and other examinations required of prospective professors in the lycées and universities. The candidates leading the list in the concours are sent to the École Normale Supérieure for from three to four years. It is necessary for the six or seven other *boursiers* to prepare for future examinations at the various universities of the provinces. Their bourses last regularly for two, and exceptionally for three, years.

But to return to our élèves of the Classe de Mathématiques Spéciales. At the end of the first year, when 18 years old, they usually present themselves for the concours of both the bourse de licence and the École Polytechnique, the examinations in the former being more strenuous and searching. Only from 2 to 5 per cent. succeed on the first trial. The others then go back to the lycée and take another year in the Classe de Mathématiques Spéciales. Many points not fully understood before are now clear, and at the end of the second year from 25 to 28 per cent. are successful. The persevering again return to their *Classe* and try yet a third time (the last permitted for the bourse de licence); but it is a matter of record that less than one-half of those who enter the Classe de Mathématiques Spéciales succeed even with this trial. This is usually the last trial possible for entry into the École Polytechnique, as the young man who has passed the age of 21 on the first of January preceding the concours may not present himself. The remainder of the students either seek for entrance into government schools with less severe admission requirements, and thus give up their aspirations to become mathematicians, or else continue their studies at the Sorbonne. The candidate who heads the list in each of these concours has his name widely published. In the case of the bourse de licence he is called the *cacique*, and he very frequently tops also the École Polytechnique list.

If the work of the Classe de Mathématiques Spéciales is so enormously difficult that only 2 to 5 per cent of its members can, at the end of one year, meet the standard of requirements of the examinations for which it prepares, why is not the instruction spread over two? Since nearly all the mathematical savants who now shed lustre on France's fair fame have passed from this remarkable class on the first trial, there can be no doubt that the answer to this question may be found in the fact that the government ever seeks her servants among the *élite* of the nation's intellectuals.

Higher Mathematical Instruction.

L'enseignement supérieur is carried on in universities, great scientific establishments and special schools. We shall consider in particular, the mathematical instruction as given at the Sorbonne, the École Normale Supérieure, the École Polytechnique and the Collège de France.

The Sorbonne.

The *Université de Paris* consists of the *facultiés de droit, de médecine, des sciences, des lettres.* (Faculties of Catholic and Protestant theology were suppressed in the years 1885 and 1906 respectively.) The faculties of science and letters have their offices, lecture rooms, laboratories and special libraries in a building now called the *Sorbonne.* This building contains also the headquarters of the officers of the Académie de Paris and of the university administration, the museums, the main university library, the École Pratique des Hautes Études, the École des Chartres and the great amphitheatre capable of seating 3,500 persons and adorned with a large allegorical painting, "the masterpiece of Puvis de Chavannes and one of the finest decorative works of our time."

The present Sorbonne, completed less than a decade ago, is an immense and magnificent edifice, erected to replace the old Sorbonne (the outlines of which may be seen in the courtyard), dating from the time of Richelieu. To make room for the newer building, the older was (in 1885) torn down, with the exception of the chapel, which picturesquely nestles in the midst of the new structure. The name Sorbonne harks from the time of the confessor of St. Louis, Robert de Sorbon, who in the thirteenth century founded a sort of hostel for the reception of poor students of theology and their teachers. This soon acquired a high reputation as the centre of scholastic theology, and the name came to be applied to the faculty itself, which continued to exercise great influence on French catholicism down through the centuries. It was suppressed, along with some twenty other universities, during the Revolution. But under Napoleon, in 1808, the Sorbonne was re-established as the seat of the monster *Université de France*, which embraced all the universities, secondary schools, etc., in the country. The details of this organization did not prove acceptable, and in 1896 the arrangement explained in the early part of this paper came into effect.

Judged by the number of students, the Université de Paris is the largest university in the world. In January last, 17,512 students had registered. Nearly half of these were law students, while of the remainder, 1,845 were pursuing work in one or more of the twenty-three

departments of the faculty of science.[1] The instructors in French universities are of six classes. The *chaires magistrales* are held by *professeurs titulaires*; no less than eleven of these at the Sorbonne, are in the departments of mathematics. Then there are *professeurs adjoints* (of whom there may not be a number greater than one third of the chaires magistrales), *chargés de cours*, *maîtres de conférences*, *chargés de conférences* and *maîtres de conférences adjoints*. Just what scholastic status or state recognition is implied in these titles I shall consider later; but it may be remarked here that all *professeurs*, although theoretically appointed only till the age when the law requires them to be pensioned off, are in reality appointed for life. Those at the Sorbonne, at least, are known the world over, because of their eminence in research and exposition. Here are the names of the *chaires*, of the incumbents and of the courses offered during the past year:—

1°—Géométrie supérieure ..... Darboux.
I Semester.—30 lectures of 1 hour. "Theory of triply orthogonal systems." Largely as in the new edition of Darboux's work on this subject and as in selected parts of his Théorie des Surfaces.

2°—Analyse supérieure et algèbre supérieure ..... Picard.
II Semester.—30 lectures of 1 hour. "Determination of integrals of partial differential equations of the second order with various conditions as to limits."

3°—Calcul differentiel et calcul intégral ..... Goursat.
I and II Semesters.—60 lectures of 70 minutes. This course is practically that given in Goursat's Cours d'Analyse Mathématiques, Tomes I-II, new edition.

4°—Applications de l'analyse à la géométrie ..... Raffy
I Semester.—30 lectures of 75 minutes. This course is a slight expansion of Raffy's book on the subject.

5°—Théorie des fonctions ..... Borel
I Semester.—15 lectures of 1 hour. The announced subject of this course was "Definite Integrals and some of their Applications," but the treatment was more of series.

6°—Astronomie mathématique et mécanique céleste ..... Poincaré.
I Semester.—30 lectures of 1 hour. "Movement of the Celestial Bodies about their centre of Gravity."

7°—Astronomie physique ..... Andoyer.
II Semester.—30 lectures.

8°—Physique mathématique et calcul de probabilités ... Boussinesq.
I Semester.—30 lectures of 1 hour. "Mechanical Theory of Light."
II Semester.—30 lectures of 1 hour. "Reflection and refraction of a pencil of light at the limit common to two homogeneous media."

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[1] The total number of students at all the universities in France, in January 1910, was 41,044 as compared with 52,456 in Germany.

9°—Mécanique physique et expérimentale.....Koenigs.
I and II Semesters.—60 lectures of 1 hour. "Moteurs thermiques."
I Semester.—12 lectures of 1 hour. Theoretical Kinematics.

10°—Mécanique rationnelle[1].....[1]Painlevé.
I and II Semesters.—60 lectures of 1½ hours. The lectures in this course practically cover Appell's Traité de Mécanique rationnelle, Tomes I-III.

11°—Mathématiques générales[1].....[1]Appell.
I and II Semesters.—45 lectures of 1 hour. This course is essentially that given in Appell's Éléments d'analyse mathématique.

Physique générale is demanded of all advanced mathematical students. I add the subjects taught.

12°
Physique.....Bouty.
I Semester.—30 lectures of 1 hour. Thermodynamics and Electrolysis. Blondelet's text is an equivalent.
Physique.....[2]Pellat (Leduc).
I Semester.—15 lectures of 1 hour. "Electrostatics, Ohm's law, Electrodynamics, etc." This course covers Pellat's text.
Physique.....Lippmann.
II Semester.—30 conferences of 1 hour. "Gravity, Capillarity, Acoustics, Optics."

Beside these courses, which are open to the public without even the formality of registration, there are certain *conférences et travaux pratiques* —"cours fermés"—for those regularly matriculated. As far as we are interested in them they are:—

13°—Géométrie supérieure ..... Cartan
I Semester.—15 conferences of 1 hour.

14°—Calcul differentiel et intégral, et ses applications géométriques .....Raffy.
I and II Semesters.—60 conferences of 70 minutes.

15°—Astronomie physique : travaux pratiques ..... Andoyer.
II Semester.—30 conferences.

16°—Mécanique physique et expérimentale: travaux pratiques. Koenigs.
I and II Semesters.—30 conferences.

17°—Mécanique physique: principes de la statique graphigne et de la résistance des materiaux.....Servant.
I and II Semesters.—30 conferences of 1 hour.

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[1] Appell is professor of mécanique rationnelle, and Painlevé of mathématiques générale, but for this year at-least they have exchanged the subjects demanded by their chairs. A possible explanation may be found in the fact that Appell has a remarkable gift of clear exposition of elementary subjects.

[2] Pellat died early in the year and Leduc (professeur adjoint) was temporarily given charge of his course.

18°—Mécanique rationnelle ..... Cartan.
I and II Semesters.—60 conferences of 1 hour.

19° { Algèbre ..... Blutel.
I Semester.—30 lectures of 1 hour.
Exercices de mathématiques générales ..... Garnier
I Semester.—20 conferences of 1 hour.
Travaux pratiques de mathématiques générales ..... Cartan.
II Semester.—15 conferences of 1 hour.

20°—Physique générale ..... Leduc.
I and II Semesters.—45 conferences of 1 hour.

Cartan is a maître de conférence, and Blutel (professor of mathematics at lycée Saint Louis), Garnier (collaborator on the French edition of the *Encyklopädie der Math. Wissenschaften*), and Servant, are chargés de conférences. Unlike the organization at the Collège de France and in German universities where no examinations enter to disturb the serene atmosphere, one of the chief functions of French universities is to provide means for preparing students for two state examinations, the licence and the agrégation. These examinations (but especially the agrégation), demand that exceedingly comprehensive instruction shall each year be given in a large number of special subjects. To this end most of the professors devote themselves. As a consequence there is a great sameness in the courses offered at the different universities from year to year and Lyons is about the only one outside of Paris which attempts to do more than meet the state requirements.[1] At the Sorbonne there is little annual variation in two-thirds of the main courses; these are 3°, 4°, 7°, 8°, 9°, 10°, 11°, 12°. An outgrowth of them is a remarkable series of elegant treatises. But Borel, Darboux, Picard and Poincaré make frequent changes in the subjects on which they lecture. We remark, that no professor gives more than one course (two lectures per week), except in the four cases of those who direct conferences and travaux pratiques; also that Darboux, Picard, Poincaré, Andoyer, Bouty, Lippmann, only lecture during one semester.[2] The maîtres de conférences or chargés de conférences do not give new courses and treat of subjects in which they are especially informed as do the *Privat-docenten* in German universities. But their instruction, as well as that of all others who direct cours fermés, is supplementary to the work of those holding the chaires magistrales. Thus 13° supplements Darboux's course—14° supplements 3° and 4°—15° and 7° go together—so also 16°, 17° and 9°—18° and 10°—19° and 11°—20° and

[1] Compare Appendix B.

[2] Most of Borel's work is at the École Normale Supérieure, which is part of the Université de Paris.

12°. Although there is nothing in the mathematical departments of the universities of France which exactly corresponds to the German *Seminar*,[1] the method of conducting the conferences at travaux pratiques is, I believe, a French specialty. We also find it used in the lycées at the École Normale Supérieure, at the École Polytechnique, etc. Each week the instructor gives out exercises which the students solve and hand in; these are returned with written comment and correction. The hour is employed by calling some student to the board and leading him by means of suggestive questioning to work out, generally in great detail, a piece of analysis or a problem or a theorem—either arising from, or nearly related to, the main course. The manner in which this is carried through, with its exacting demands as to form in statement and black board presentation, is in the highest degree instructive.

The above list does not display all the mathematical courses offered at the Sorbonne this year. Cartan had a special problem course for candidates for the agrégation and Bachelier, gave a *cours libre* of 20 lectures on the calculus of probabilities and its application to financial operations. The number of cours libres varies from year to year.[2]

The Licence.

When a student has finished any one of the groups of studies such as (3°, 4°, 14°) or (10°, 18°), he may pass an examination and receive a *certificat d'études supérieures*. With the third *certificat* is given the diploma *licence ès science*. The choice of subjects is not necessarily limited to those given above but may be selected (at the Sorbonne) from a list of 23[3] which includes general chemistry, zoology, geology, etc. If, however, the student expects to teach in the secondary schools his choice is greatly limited. The mathematician must have *certificats* in calcul différentiel et intégral, in mécanique rationnelle and in physique générale, or a third certificat in mathematics, excepting (11°, 19°). The physicist must have certificats in physique générale (12°, 20°), in chémie générale and in minéralogie or mathématiques générales (11°, 19°), or another subject of mathematical or physical science. The natural scientist must have certificats in zoology or general physiology, in botany and in geology. The examination for certificats may be taken twice in a year, in July or in November. It consists of three parts, *épreuve écrite*, *épreuve pratique*, *épreuve orale*.

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[1] Other subjects *are* treated in *Seminar* style at the École des Hautes Études which is an off-shoot of the Collège de France.

[2] In July, 1910, the University of Paris accepted the offer of M. Albert Kahn to bear the expense, for a period of five years, of a course on "The Theory of Numbers."

[3] This number varies with the university; at Dijon it is 12.

The first two are written examinations of about four hours each. Theoretical considerations abound in the *écrite* while numerical calculation is characteristic of the *pratique*. The oral lasts for 15–20 minutes and is held before the jury of those professors who have the whole examination in charge. It is necessary to get fifty per cent to pass. The first certificat and examinations cost 35 francs, the second and third 30 francs each and the licence diploma 40 francs.

The Diplôme d'Etudes Supérieures de Mathématiques.

This diploma which was instituted by a decree of 1904 has not yet been awarded to any one, although its equivalent, 4 certificats (one chosen at option), is required of all candidates for the agrégation. It may be considered as a little doctarate. The conditions leading to the diploma are twofold:—

(*a*) That a suitable *travail* be written on a subject agreed upon by the faculty.

(*b*) That satisfactory answers be given to questions on the *travail* and on topics given three months in advance and relating to the same part of mathematics. The *travail* may consist either of original researches, or of the partial or total exposition, of a memoir or of a higher mathematical course. In the latter case by "exposition" is meant either a simplified résumé of the memoir or of the course, or the detailed development, where the result or method that the author or professor presents has only been outlined.

The Agrégation des Sciences Mathématiques.

This examination, unlike that for the baccalauréat and licence, is a concours as in the case for entrance into the École Normale Supérieure and the École Polytechnique. The number who become agrégés each year is fixed in advance by the Minister of Public Instruction according to the needs of the lycées in the country. This number in recent years has generally been 14, but in 1897 as few as seven were chosen. The smallest number of competitors since 1885 was 54, in 1907; in 1909 there were 81; the largest number was in 1893, when there were 134 young men eager for 13 places.[1] The candidate for this examination must have four *certificats*; those in *calcul différentiel et intégral, mécanique rationnelle, physique générale* and a fourth chosen at pleasure among the remaining mathematical subjects. As an equivalent of the fourth certificate a *diplôme d'études supérieures de mathématiques* may be presented. The subject of the fourth certificate at Paris is usually Picard's Analyse Supérieure et Algèbre Supérieure (2°) or Darboux's Géométrie Supérieure

[1] Compare the analytical table of Appendix A.

(1°, 13° and an épure). Poincaré's course is chosen less frequently and at present Borel's course may not be selected independently of others. It is usually four years after leaving the *Classe de Mathématiques Spéciales* that the young mathematician first presents himself for the agrégation, *i.e.*, when he is about 21 years of age. In this interval he has probably spent a year in military service, worked off the examinations for the first and third of the above mentioned certificates during the second year, for the second and fourth during the third, while the fourth year was spent in general review, study of teaching methods or other special direct preparation for the agrégation. This examination, which is unique in its difficulty and exactions, is organized for selecting the most efficient young men in the country, to take charge of the mathematical classes in the lycées. It consists of *épreuves préparatoires* and *épreuves définitives*. The former are four written examinations, each of seven consecutive hours in length! The first two of these are on subjects chosen from the programme of the lycées in *mathématiques élémentaires* and *mathématiques spéciales*. The last two, based on the work of the candidates in the universities, are a *composition sur l'analyse et ses applications géométriques* and a *composition de mécanique rationnelle*. These épreuves are held at the seats of the various académies of France. Those who have reached a sufficiently high standard are declared *admissible*. Their number is usually a little less than twice the possible number to be finally received. In 1909 it was 27, but in 1905, 20; while in 1887 there were only 15, from which 13 were selected. They must present themselves at the Sorbonne for the *épreuves définitives*. These consist of two written examinations and two *leçons*. The written tests are an *épreuve de géométrie descriptive*, and a *calcul numérique*. Their duration is fixed by the jury, but it is usually four hours for each. The *leçons*, which are supposed to be such as a professor might give (during $\frac{3}{4}$–1 hour) in a lycée, are on subjects from (a) *mathématiques spéciales*, (b) the programmes of the classes, *Secondes*, *Première*, C, D, and *Mathématiques* A, B. The subjects are drawn by lot, and for each lesson the candidate has four hours to think over what he is going to say. No help from any book or other source is permitted. The unfortunate who has little to say is speedily adjourned. As a salve for disappointment and as encouragement to try again, he receives 300 francs a year for three years because he had won a place among those admitted to the second examination.

The names in the list of agrégés are published in order of merit, and those who head the list are likely to get the better positions. Many of the instructors at the Sorbonne were first agrégés. Appell, Picard and Goursat were successively first agrégés, 1876–78; Cartan and Borel 1891–92; Andoyer in 1884. Painlevé was, however, a ninth agrégé;

Blutel a fourth, and Garnier a second. There have been very exceptional cases (in 1885, 1886, 1895), when an agrégé was still in his twenty-first year, but the average age for the past twenty-five years is a little less than 26. There are also those who do not reach the goal of their ambition till after they are 40, and have tried perhaps ten or a dozen times. The difference between the salary of those lycée professors who are agrégés and of those who are not has been emphasized still more by the law just passed, which gives the former an annual bonus of 500 francs.

If the agrégé wishes to become a professor in a university he must pass the examination for the doctorate, but only a very small proportion of the agrégés take this step—during the period 1885–1904, 20 per cent. If, however, he wishes to teach in a lycée he may demand such a position as his right. Among the candidates who are *admissible* but not received are generally selected *professeurs chargés de cours* (or others in positions of inferiority in the lycée), who, however, after 20 years of service may be named *professeurs-titulaires* and be the academic equals of their luckier comrades of years before.

Other details concerning the agrégation, such as the programme for the concours of 1910, the examination papers for the concours of 1909, are given in Appendix A.

The Doctorat.

What is the relative value of the French and German mathematical doctorate? What the relative difficulty of obtaining it? are questions which the average American post-graduate student who is seeking to decide between France and Germany for further study is sure to ask. Small as is the proportion of students in a German university who present themselves for this degree, the number in France is far smaller. In the two years 1906–08 Germany made 87 doctors in mathematics, while France, with but 20 per cent. fewer students, created only 13.[1] This difference in numbers is doubtless principally due to the fact that the end in view in France is entirely different. The Frenchman usually goes up for his doctorate with the expectation of drawing wide attention to his thèse. The step is also necessary for everyone who aspires to be appointed a professor in a university—unless, perchance, he has become a member of the Institut without having the degree. All except three of the French universities offer the degree of doctorate in mathematics, but only eleven of them have ever conferred it. Again, of the 331 degrees which have been conferred by the existing universities, 296 have been granted by the Université de Paris. This is, of course, very different from the results in

[1] There is of course no degree of Doctor of Philosophy in France. The equivalent is explained later.

Germany, where Berlin university turns out a very small fraction of the doctors in any one year—during 1906–08, less than 4 per cent. There is also one other great difference between French and German universities, although the examinations for *licenciés* rather than those for doctors must be chosen to emphasize the point sufficiently. The difficulty of obtaining those degrees common to most French universities is much the same, and although Paris is the principal degree-conferring centre, it is well established that there have been years when it was more difficult to obtain the licence, in some departments, at certain universities of the provinces than at the Université de Paris. That the personality of the professor should play an important role in determining the standard of excellence demanded is only natural; but as it is the ambition of every professor in the provinces to make his department important and to ultimately arrive at Paris, one can be very sure that no one university in France will ever sink to the level of at least two German universities, where, on account of lax demands in study and thesis, even train conductors call out "Twenty minutes wait to get your doctor."

But if such representative universities as Berlin, Göttingen, Munich be selected in Germany and compared with that at Paris, two questions suggest themselves: (1) Does the average doctor's thesis (which in both countries is the essential performance on the part of the candidate for the degree) indicate a higher standard of excellence in one country than the other? (2) Admitting this to be the case, are the minimum requirements in this country as low as the general requirements in the other? By actual study of the theses, I am convinced that the answer to the first question is decidedly in favour of Paris. One could easily cite a number of French thèses which were notable and extensive contributions to mathematical progress, but it is only necessary to refer the reader to the complete list of the thèses, which is given in Appendix C. Before answering the second question, I shall explain more fully the nature of the French doctorate, the general conditions under which it is available for the Frenchman and the possible modifications of those conditions in the case of foreign candidates.

There are two doctor's degrees open to the mathematical student in France: the first, *doctorat ès sciences mathématiques*, conferred by the State (doctorat d'état), the second conferred by the universities —for the Sorbonne, *doctorat de l'Université de Paris*. Only one American, a woman, has won the former degree, which was created in 1810, and only one American has also obtained the latter, which was organized as recently as 1898. In both cases the thèse is the principal requirement, and judging by the eight for which the doctorat de l'Université de Paris has been granted, the standard in this respect

is about as high as for the doctorat de l'état. It is in the matter of further requirement that the doctorat d'état is more difficult. For this degree there is no possible way of avoiding the various examinations which lead up to the licence ès science with mention of the certificats: 1st, calcul différentiel et intégral; 2nd, mécanique rationnelle, and 3rd, at the choice of the candidate. For the doctorat de l'Université[1] only two certificats are required, and, in the case of foreigners, very great latitude is permitted the faculty in accepting equivalents for these certificats, in view of work done elsewhere. In both cases only one year of residence is required. We can, then, now answer the second question, proposed above, in the affirmative for the doctorat de l'Université, and in the negative for the doctorat d'état.

The analytical table given in Appendix C clears up misconception as to the age of the French mathematical doctor. During the past 25 years, the average age has been 30, but a large number "sustained" their thèses between the ages of 23 and 25. The youngest doctor was Joseph Louis François Bertrand, aged 17, created in 1839; the oldest, in 1882, aged 55.

Only a small proportion of the agrégés ever become doctors,[2] and in but one case (1894) has a doctor become an agrégé. Which title calls for the greater ability in the getting?[3] The two things are so entirely different, it is perhaps difficult to understand why some say the doctorate ranks the higher. The musician with great technical talent only, may be allowed to have equal ability with the performer less gifted in this direction but endowed with strong temperament—power of perception and interpretation which draws aside the veil for the ordinary observer and discloses formerly hidden heights, beyond. Yet it is the latter who particularly appeals to us. So while the technical skill of the agrégé is admired, and the state gives him certain rights denied the doctor, it is only the latter who, on showing power of disclosing the truths waiting for discovery from the foundations of the worlds, has the opportunity to direct the nation's youth in the great universities of the country. So much the more sought after the man who combines in himself to a high degree both talents, the gift of brilliant exposition and the genius for discovery.

The general procedure toward the doctorate is the same for

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[1] According to a decree of 1906 the insignia of the docteurs de l'université de Paris is, "Epitoge à trois rangs d'hermine, avec les couleurs de Paris (bleu et rouge) dans le sens longitudinal."

[2] *Cf.* Appendix A.

[3] The agrégé in Law and Medicine stands much higher than the doctor in these Departments.

both kinds. A thèse worked out under general supervision of a professor is formally approved by a committee of three professors named by the *doyen*. Birth certificate, diploma as licencié, 148 printed copies of the thèse and 145 francs, are deposited with university officials, and the day fixed for appearing before the committee to publicly answer such general questions on the thèse or other topic which the benevolent ingenuity of the examiners may propound. Compared with those in some other departments of the university, the examinations of the mathematician is a very informal affair. It rarely occupies more than three-quarters of an hour. The candidate is immediately told whether he has got the *note* "honorable" or "très honorable," is congratulated and dismissed. The amount of help which the candidate for the doctorate receives from the professor is much less in France than in Germany. In fact he rarely approaches the professor except when he gets his subject or is reporting progress. It is expected of the Frenchman that the thèse represent his own work and thought. The doctor who has presented a remarkable thèse and passed a brilliant examination may have the full cost of examination and diploma remitted. A similar rule applies to bacheliers.

The École Normale Supérieure.

This great institution is a part of the Université de Paris and its object is to mould the future professors of the secondary schools and universities of France by appropriately supplementing the instruction they receive at the Sorbonne and the Collège de France. There are about 165 pupils, in the departments of science and letters, and practically all are internes. We have already remarked that the élèves in the department of science are the pick of the boursiers de licence. In 1909, 22 out of 270 candidates were thus selected and slightly more than one half devoted themselves to mathematics. All decided to live as internes although it was optional for anyone to attend the École as externe—when the amount of the bourse, 1,200 francs, would have been paid to him. Most of the pupils were 20 years old, had obtained the bourse on second trial and had passed one of the two years military service obligatory for every Frenchman by the *loi de deux ans* of 1905.

The course for mathematicians is three years, and is arranged as follows. During the first year the élèves go to the Sorbonne to hear Goursat's course in calculus and differential equations (3°) and Raffy's applications of analysis to geometry (4°). Instead, however, of following Raffy's conference (14°), which goes to complete the regular university student's training for the *certificat, calcul différentiel et intégral*, they are drilled by Borel and Tannery for three hours per week at the École Normale. They also take physique générale with Bouty, Lipmann

and Leduc (12°, 20°), and at the end of the year pass the examinations for the *certificats* in these two subjects. In the second year they take up mécanique rationnelle with Painlevé (10°) at the Sorbonne, and with Hadamard in conference at the École. They also "assist" at such a course as Darboux's and Cartan's in géométrie supérieure (1°, 13°), pass the examinations and receive two more certificats. During the third year the élèves follow their own inclination in the selection of courses at the Sorbonne or Collège de France, while they are well grounded at the École, in descriptive geometry by Roubaudi, and in pedagogy, of algebra and analysis by Tannery, of geometry by Borel. Nearly all those of the first and second year also follow Picard's course (2°), at the Sorbonne, and those of the third year that of Borel (15°).

The drill in conferences ($1\frac{1}{2}$ hours each), at the École Normale is unequalled. In addition to the good points of those at the Sorbonne, we here find in much smaller classes a great degree of intimacy between students and professor, and a freedom of question and discussion. When, then, at the end of the third year these élite in intellect present themselves in the terrific competition of the agrégation, we are not surprised that they give a good account of themselves. Some do not succeed at the first trial or for ten, or twelve years afterwards, but 60 per cent. of the 300 agrégés named during the last 25 years were École Normalians; in 1890 there were only 4 out of 12, but of the 96 competitors in 1898, the 8 chosen were from this famous school.[1]

But as the whole end and aim of the École Normale are not only to prepare its élèves for the agrégation and hence for professorships in the lycées, but also to prepare them as university professors, we find many who have been encouraged to take up certain fields of research and who have made good progress toward a thèse for doctorate. Not only this, but from those who have succeeded in the agrégation, are chosen *agrégé préparateurs* who are taken back to the École for still another two years (sometimes three), while they prepare finally for their doctorate with all the attendant advantages, of the counsels from their former masters, and of the great library collections of the city. The *agrégé-préparateur de mathématiques* is officially *chargé de la bibliothèque* of the school.

The life in the École is singularly pleasant and inspiring. Here alone of all the institutions we have considered do we find among the élèves anything approaching the comradeship, so characteristic of the student relations in American colleges. Nor in after years are friendships and interests thus formed easily changed, as the *Association Amicale des Anciens Elèves* serves as a strong bond of sympathy and

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[1] *Cf.* Appendix A.

a constant means of intercourse. The fine old building, its studious atmosphere, three to five years of friendly rivalry with almost equally brilliant companions, daily intercourse with the professors, could hardly fail to have developed a young man's latent talents or to have inspired him to his best effort. Rarely does one find in France a professor such as Tannery[1] who is so generally beloved and respected by his élèves past and present.

All the great privileges of the École are occasionally open to foreigners either as internes or externes. It is now however, somewhat difficult to make arrangements to enter as interne because of the increasing demands made on limited space by the needs of the state. The charge of 1,200 francs per year made for pension complete is exactly the value of the bourse which France gives to students of her own nationality and which she expects to be refunded if after leaving the École, the élève decides not to take up the career of a teacher in her schools. All élèves are assured positions in lycées—those who have become agrégés, as professeurs titulaires, the others as professeurs chargés de cours.

The École Polytechnique.

This École founded by Monge at the close of the Revolution and the most popular of the great schools of France, is under the direct control of the minister of war and not of the minister of public instruction. Its pupils are recruited from the most diverse orders of society solely because of merit determined by concours on leaving the Classe de Mathématiques Spéciales. Its object is to prepare them as military and naval engineers, artillery officers, civil engineers in government employ, telegraphists and officials of the government tobacco manufactories. All élèves are internes. The cost of the *pension* is about 1,100 francs per year, of the *trousseau*, 600-700 francs, but there are an unlimited number of bursaries covering both pension and trousseau so that no poor boy of brilliant attainment is shut out.

As to the past of the school, until the latter part of the nineteenth century it was famous not only by reason of the great engineers it produced but also for its distinguished mathematicians. Poinsot, Poisson, Cauchey, Poncelet, Chasles, Lamé, Leverrier, Bertrand, Duhamel, Liouville, A. Serrett, Laguerre, Halphen, Hermite, Poincaré, not to mention a host of others, were all trained here. But now, the demands made on the engineer are so great, the élèves are only given the merest glimpses of the vistas which open up in modern mathematics.

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[1] Tannery occupies one of the 12 chaires magistrales in mathematics at the Université de Paris, and as *sous-directeur* of the école normale supérieure is *directeur des études scientifiques.* [*Later note added in the proof:* Tannery died November 11, 1910, and Borel was appointed to his position.]

From being perhaps the leading school of the time with regard to its output of brilliant mathematicians it has, then, sunk to a position of wholly inconsiderable importance in this respect. Yet each year four times as many talented young mathematicians try to get in here as into the École Normale Supérieure. The number of those who enter the École Polytechnique because of failure to get into the École Normale is not perhaps very large; nevertheless there are certainly some among them who would have made good mathematicians but who do not make good engineers. They form, however, an insignificant fraction in comparison with the hundreds of graduates who by original choice have succeeded to the brilliant careers open to them.

The course at the École Polytechnique is two years and mathematics is taught each year. As at the Sorbonne, but in less effective manner, the instruction is a combination of lecture and conference. Jordan and G. Humbert are the professors but they are assisted by several *interrogateurs* or *répétiteurs* as at Lycée Saint Louis. Humbert's Cours d'Analyse (2 vols.), gives an idea of the course in *analysis* (2 years); then there are also *mechanics and machines* (2 years); *descriptive geometry* (first year); *astronomy, geodesy* (second year); *physics,* acoustics and optics (first year); *physics,* thermo-dynamics, electricity and magnetism (second year); etc.

The Collège de France.

This, the highest institution of learning in France, was founded by Frances I, in the sixteenth century. It does not form part of the Académie de Paris, but is under the direct control of the minister of public instruction. No fee or form of matriculation is necessary to attend the lectures, no examinations are held and no degrees are conferred. It is not necessary for its professors to hold any degree or to have passed any specific examination. A man who holds only the degree of bachelier, although not qualified to teach in secondary schools may, if otherwise competent, be appointed professor here. Successive vacancies are filled by the minister of public instruction who chooses between the names of two candidates who have been recommended by the body of professors occupying the 45 chairs. The professors have absolutely no obligations apart from the delivery of lectures, and in some cases, those with untroubled consciences have more or less evaded this requirement. Such abuse of privilege led this year to a law requiring each professor to give 40 lectures, distributed somewhat symmetrically over the two semesters. The purpose of the Collège de France is to advance learning. Within the limits of their chairs, the professors are absolutely free to treat any part of their subjects, no matter how limited or how minute, provided that they go to the bottom of it.

The chairs and foundation which have interest for us are the following:—

Mécanique analytique et mécanique céleste—"Theory of elastic plates." ..... Hadamard.

Mathématiques—"Transformation and multiplication of complexes in elliptic functions." .....(Jordan) G. Humbert.

Physique générale et mathématique—"Elasticity of solids and fluids." .....Brillouin.

Physique générale at expérimentale—"General phenomena of electricity and magnetism." .....Langevin.

Cours complémentaire—"Hyperelliptic surfaces of the fourth degree." .....Traynard.

This last course was established by a foundation of Mlle. Peccot who wished to be the means of encouraging young mathematicians. The instructor must be a doctor of less than 30 years of age and he may not lecture for more than five years.

Jordan has not lectured for several years and his duties have been performed by the *suppléant* Humbert. We have here another peculiarity of this institution. Jordan continues to draw two-thirds of his salary while Humbert is remunerated with the remaining one-third.

The courses usually represent personal researches of the lecturers and are well attended, particularly by élèves of the École Normale Supérieure.

Concluding Remarks on Mathematical Instruction.

Unless I have greatly failed in my presentation, one thing which may be readily inferred from what has gone before is, that no idea could be more mistaken than the one so prevalent among us, that the French are light-hearted, frivolous and at best superficial. Their struggle for existence is severe and the competition is terribly keen. As far as the mathematician is concerned and his training is by no means exceptional, we have found that from the time the élève leaves the Première, that is when he was 15 years old, onward, he undergoes most exacting examination at almost every turn. The successive stages in his studies are very largely marked out for him and care is constantly exercised to see that he make no false step and that he be properly prepared to pass his examinations. The Université de Paris has appeared to be a great institution, "wonderfully organized, to turn out a certain amount of a certain product, of a certain degree of excellence, with the least possible loss of time and energy." The strenuous directness of method and of achievement in this system cannot help but impress us.

Such are the standards set for those, who have prepared themselves as lycée professors, who direct the boy's education from the time he is ten years old. How woefully low are our standards in comparison! Remark too, that after a boy is 6 years old he is taught by men only.

We are also struck with the breadth of the future mathematician's training. Although it is true that after the age of 16, the humanities are set aside, yet physics, descriptive geometry, pure mathematics, applied mathematics, all continue to occupy positions of importance. I have indicated how, by peculiar method of instruction, all these subjects are welded into a homogeneous whole, how that although knowledge of wide range of fact is fundamental, it is the thorough grasp of broad principles and the powers of ready application of those principles to the most diverse kind of problems, that is made essential. German influence has given us a great respect for fact, but the French, if opportunity were given, would soon convince us that a fact, as a fact, had little of interest, except in so far as it might be contributary to the upbuilding of some system. To the Frenchman learning is not an accomplishment, but "an honourable and arduous profession with all its trials, all its heart-burning competitions, all its pitiless disdain of weakness, all its stimulating rewards." This partly explains the severity of the examinations. Every boy of remarkable intellect, be he rich or poor, has the chance to have his talents developed to the utmost. From the time he is 11 or 12 years old till he is ready to step into a position in a university, bursaries constantly reward his accomplishment. If in time he become professor in a provincial university, his effort is in no whit relaxed; he looks forward to being promoted to Paris. With this advancement accomplished, his intellectual activity does not cease by any means, for he now hopes some day to be numbered among the few members of the Académie des Sciences of the Institut. Great as are the rewards and recognition of merit here, there is still greater for him who, as Poincaré, is pre-eminent, namely, to be numbered among the "immortals" of the Académie Française of the Institut. Men of such calibre and brilliance and unremitting intensity of application and purpose, are the professors at the Collège de France and Université de Paris.

Nothing in French universities takes the place of undergraduate life in England and America; nor would we willingly attempt to adopt their system, though it would certainly silence the frequent criticism of our ordinary B.A. course, namely, that it is, to say the least, a poor training for the future man of business; the student has few obligations to meet, no real obstacles to overcome; if the professors make the courses difficult, he either rises in protest or seeks a college with

easier requirements. We prefer to retain the genial, sympathetic relations between the student and professor, to encourage the emotional and sentimental life of the students with one another.

We may, however, still learn from France the advantages of intimate relation, in standards and scheme, of secondary and higher education. How much of the first year in American universities is wasted by getting freshmen into form, in teaching them how to work and how to think for themselves! The French university professors are in constant intercourse with the lycées, are the examiners of all their graduates, are the authors of many of the text-books employed. The mathematical training and equipment of the average writer of secondary texts in France is of far higher order than that of the average American author.[1]

Teaching of Mathematics as a Profession in France.

We have now seen how the mathematician is trained in France. It remains to discuss the nature of the inducements which are offered to young men to prepare themselves for giving mathematical instruction, and to see whether the inducements offered are sufficient to attract the best talent of the nation.

The agrégés are those specially prepared by the State for the positions as *professeurs titulaires* in the lycées. Although this title is not conferred regularly till the agrégé has completed his twenty-fifth year, those who are younger receive temporary appointment. The salaries vary according to the *classe* of the professor. At Paris the lowest salary is 6,000 francs per year, and the highest, 9,500. In this range seven *classes* are represented; six, each differing from the one before by 500 francs, and the *hors classe*, for which the salary is 9,500 francs. Promotion from one class to another takes place by selection and by seniority. From the sixth (the lowest classe) to the third, the number of those who can be advanced each year by selection is equal to the number which can be advanced by seniority. In the second and first classes two advancements may be made by selection to one by seniority. In choosing those for the *hors classe*, selection alone is taken into account. The promotions are made at the end of each calendar year, and take place so that there are always 20 per cent. of them in the sixth class, 18 in the fifth, 18 in the fourth, 16 in the third, 14 in the second, and 14 in the first. This arrangement is obviously a happy one, both by way of recognition of the merits of the unusually successful teacher, as well as those of him whose service is rather characterized by faithfulness.

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[1] Compare Appendix D.

In addition to the *professeurs titulaires* there are *professeurs chargé de cours*, who are usually selected from those École Normalians and those *admissible* to the agrégation, who fail to become agrégés. After 20 years of service they may become professeurs titulaires and receive the salaries we have indicated above. The government has, however, this year passed a law which gives the higher reward to the agrégé. It is to the effect that 500 francs per year shall be added to the regular salary of every agrégé. The real range of salaries mentioned above is then 6,500–10,000; in the provinces this reduces to 4,700–6,700. For the professeurs chargé de cours, the salaries at Paris vary from 4,500 to 6,000 francs; in the provinces, from 3,200 to 5,200. In the Premier Cycle the professors have 12 hours of teaching per week, in the second cycle and the Classe de Mathématiques Spéciales, 14–15 hours. Except for correcting exercises and filling out reports the professors have absolutely no obligations outside of class hours. They do not live in the lycées. The superintendence of the study of the élèves is carried on by *répétiteurs*, the more advanced of whom receive at Paris 2,600–4,600 francs for 36 hours service per week.

Only a very small percentage of the agrégés are also doctors,[1] but these few, as well as the more promising of those who are doctors only, usually prefer to seek some of the minor positions in connection with the universities. *Maîtres de conférences adjoints* are selected from among the doctors. *Chargés de conférences* and *maîtres de conférences* are sought for (1) among agrégés, (2) among doctors, but only the latter may receive an appointment for more than one year. A chargé de conférences at Paris receives 5,000–7,000 francs a year[2] for 2–3 hours per week of service. Even this amount is sufficient to enable a man to live well; but when, in addition, the incumbent is professeur agrégé in a Paris lycée (as in two cases at the Université de Paris at present), his income may exceed the regular salary of a university professor. For a good man there are also other sources of income from acting as *suppléant*, *examinateur* or *interrogateur*.

From the chargés de cours or maîtres de conférences, who are at least 30 years of age, who are doctors, who have seen at least two years of service in a school of higher education, and who are distinguished for their services—are appointed the *professeurs adjoints* of the universities. They receive from 6,000–10,000 francs at Paris and 4,500–6,000 francs in the provinces. The salary of *professeurs titulaires* is 12,000–15,000 francs at Paris and 6,000 or 8,000 to 12,000

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[1] Compare Appendices A, C.

[2] According to a decree of June 25, 1910, chargés de cours complémentaires and maîtres de conférences in the provinces, were thence forth to be of four classes, and to receive 4,500-6,000 francs annually.

in the provinces.[1] In recent appointment of professors, selection has been almost exclusively made from those who are both agrégés and doctors. That in exceptional cases the latter only is necessary was illustrated by a recent appointment to Poitiers,[2] but it is quite unlikely that any professor will ever be promoted to Paris who has not passed both examinations. As exceptional, note that any member of the Institut may be appointed professor at a university after six months of service in an establishment of higher education. The professorship of highest honour in the gift of the nation is at the Collège de France. Although the salary here is only 10,000 francs, the duties consist simply in delivering 40 lectures of one hour each. In the universities the professor is expected, in general, to give but one course of lectures, *viz.*, that which is called for by his chair. These lectures are delivered twice a week and last from an hour to an hour and a half each. If the course continue through the whole year, about 60 lectures are given; but we have already remarked that such men as Poincaré, Picard, Darboux, give only half this number. Remember, too, that many courses (practically all in the provinces) are repeated year after year with little change, that the professors are never called upon to arrange hours for conference with members of the class or to correct students' exercises.

One decidedly disagreeable duty does, however, fall to their lot. This is their obligation in the matter of various examinations. The figures given in an earlier section (p. 99) show how formidable this may be in the case of the baccalauréat alone, for the examiners as a whole. At the present time, however, only about one half the work is done by the university professor; and although his time is more or less broken into from June 27 to August 10, and November 1–8, the whole number of hours actually given up to the work by a single individual, in connection with both the baccalauréat and *certificats*, does not exceed 55. The whole number of hours which the professor gives to the State is, then, 85–145 per year. With such insignificant breaks in leisure for research we can no longer wonder at the great productivity of many French mathematical professors. The attractiveness of their positions is still

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[1] Until the recent increase in the salaries of the university instructors in Germany, 70 per cent. of the full professors received less than 15,000 francs. On the other hand there were three who received over 50,000 francs; and in any large German faculty some full professors will generally be found who receive for teaching an income from two to five times as large as some of his colleagues. These larger incomes are due to special allowances from the government, to extra university perquisites and to fees from the large body of students attracted by superior reputation. As distinguished from the rest of the world, in this connection, Germany pays an unusual amount for unusual merit.

[2] Compare Appendix B.

further enhanced by other sources of income. Nearly all those at the Sorbonne are members of the Académie des Sciences of the Institut de France. As such they receive 1,500 francs annually. Since Poincaré is also member of the Académie Française, this amount is presumably doubled. Darboux, as secrétaire perpétuel, receives 6,000 francs. Painlevé, also a member of the Institut, has been elected a member of the Chamber of Deputies, which will bring him in another 15,000 francs a year.

To such professorships the rising young mathematician may aspire; but as there are only fifty chairs in the whole country, the openings are few and the progress toward them slow.

We cannot help but contrast the conditions of the American professor, with at least 10–12 hours of lecturing per week, in several departments of mathematics, not to speak of the demands made on his time in correcting exercises and examination papers, and in administrative work. Yet with all this burden, he is expected not only to keep abreast of the times in his subject, but also to advance knowledge by his own researches.

The American Mathematical Student in Paris.

Many of the attractive features of mathematical study in Paris have been already set forth in the foregoing pages, but I wish here to briefly indicate a few others, as well as to give some special information which may be helpful to the American student.

No one can be wholly insensible to the charm of Paris herself, to the artisticity lavishly displayed by her people in sweeping shaded boulevard, towering monument, imposing building, gorgeous decoration, garden and embowered statuary, far-reaching park. From the time of Cæsar and Roman occupation of the Cité, historic associations have multiplied, and now they cluster about every quarter. Galleries, churches, palaces, Versailles, Saint Cloud, Chantilly, Fontainebleau, illumine and vivify in thrilling fashion the printed accounts of happenings of history. To the sympathetic student of the genius of the people, their customs, their language, their habits of thought—French literature is vested with new dignity and charm and grace and subtle meaning. Preëminent on the stage, strongly influential in the worlds of art, among the foremost in all forms of scholarship—the potentialities of fair France are great, both to educate and to refine.

But to benefit by such influences, as well as by the courses of instruction, which run, for the most part, through the whole year, the American student should plan to stay in Paris at least a year. It would also be well for him to come as early in June as possible. At this time there is no opportunity for attending university lectures,

since the second semester closes about the middle of June; but he can look over the ground, get acquainted and prepare generally for the following autumn. The student who does not have friends in Paris should go to the *Bureau des renseignements* at the Sorbonne, where he will find some one who can speak English and give information as to pensions, the various institutions of higher education, etc. Another helpful bureau is the *Comité de patronage des étudiants étrangers.* There are a large number of students' associations, but probably the only one which it will be found worth while to join is the *Association générale des étudiants de Paris.* This association has recently moved into a handsome stone building used for over three centuries as lecture hall for the faculty of medicine. Here may be found reading room, library, fencing room, lounge rooms, etc. Members receive great reductions on tickets for nearly all the theatres and in purchasing books and other supplies. There are numerous social gatherings which professors and alumni occasionally join.

Paris is apt to be uncomfortably warm during the summer months, and unless the student is proficient in both speaking and writing the French language, he will probably wish to seek out more enjoyable quarters to carry on his studies. These may be found at such university towns as Grenoble or Geneva, both beautifully situated, but especially the latter, with endless possibilities in Alpine excursion. In each, excellent summer courses, at small cost, are given specially for foreigners. That at Grenoble lasts from July 1st to October 31st. It would be well, however, to return to Paris a little before this latter date, so as to settle the question of lodging somewhat before the beginning of the scholastic year.

To get the most out of a sojourn in Paris, the American naturally wishes, if possible, to get into a private family where he may enter, to the full, into the spirit of the life and language of the people. This is, however, a matter of much greater difficulty than in Germany, where many are so ready to welcome the stranger to hearth and home. In the case of the French the *foyer* is much more exclusive, and unless mutual friends have intervened, a seat there is almost an impossibility. The next best thing is to be in a small pension, where good French, but no English, is spoken. It is a matter of ever-increasing difficulty to find such a place. The charges near the Sorbonne vary from 150 to 250 francs per month; for 180 francs one may be excellently served. A third method, not less expensive, is to rent a furnished room and dine at a restaurant. A room may be procured for 30 to 65 francs per month. But restaurant cooking and poor French frequently heard are undesirable features of this plan. It sometimes happens, however, that meals alone (that is lunch and dinner) may be arranged for at a good

pension for 100–150 francs per month. Pensions on the other side of the Luxembourg from the Sorbonne are usually the cheaper. As some of the courses which the American will likely want to follow at both the École Normale Supérieure and the Sorbonne commence at half-past eight in the morning, it will be well not to live too far away. All necessary expenses of the student who spends the year in Paris, with summers elsewhere, ought not to exceed 750 dollars.

At the Université de Paris the year commences about November 4th and, in contrast to German methods, the lectures start immediately. The student will find the opening addresses of the vice-recteur and doyens, delivered in the great amphitheatre a day or two after the semester has begun, of interest. Matriculation is a very informal, though tiresome, affair. A college diploma and a certified French translation of birth certificate should be taken to the Secretary's office. It is with an air of considerable scepticism that the Frenchman receives the statement that birth certificates are the exceptional possession of the average Canadian or American. The difficulty, in the case of the Canadian, is very easily solved on applying to the Canadian Commissioner, rue de Rome, and doubtless like courtesy awaits the American at the bureau of his Consul General. A passport is not necessary in France, as in Germany. The fee of 30 francs gives the student all rights of library, lecture and conference, for the whole year. To follow the classes at the École Normale it is only necessary to go through the formality of applying for permission to the Vice-recteur of the Université de Paris. The letter received in reply should be presented to M. Tannery, who will most cordially counsel and assist the newcomer. The courses at the Collège de France commence about December 3. The general holidays—one week before and one week after New Year's day, two weeks similarly arranged with reference to Easter—are the same as at the Université de Paris. There is no break between the first and the second semester, which begins March 1. All lectures are freely open to the public.

Just what courses of those offered in these three institutions will particularly appeal to the American student must naturally be both a matter of taste and of previous study. I have given the details of the courses in earlier pages. Appell, Goursat and Picard are especially noted for the elegance and clarity of their presentation. But, except from a pedagogical standpoint, Appell does not, at present, give anything of interest to the American student; while the first half of Goursat's course will be found more or less of a review of earlier work. The courses of Darboux, Poincaré and Painlevé are of a more advanced nature and largely attended. Such conferences as those of Raffy[1] and

[1] Raffy died since I wrote the above; his death occurred June 9, 1910.

Cartan at the Sorbonne, of Tannery, Borel and Hadamard at the École Normale Supérieure, should on no account be neglected. The training and grounding they give is simply invaluable.

If the interests of the student wander into other fields, the opportunity for profit is just as great as in the department of mathematics. There are the chairs in the Faculté des Sciences, such as physics, chemistry, biology, not to mention those held by other world renowned savants in literature, history, philosophy, etc., of the Faculté des Lettres. Any matriculated student in the Faculté des Sciences may have his name inscribed in this Faculté without further charge. The lectures of Reinach, Michel, etc., at the École du Louvre are open to all and are of especial appeal to those interested in the various phases of art. Indeed, as soon as one leaves special for general study, the riches of intellectual treat on every hand lead to embarrassment of choice.

The book treasures and collections available for the student in Paris are unequalled by any other city in the world. Chiefly by cooperation of the *Société Mathématique de France*, the Sorbonne possesses a remarkably complete collection of mathematical periodicals. The officials of the library are exceedingly helpful and most generous to the earnest student; not only do they grant admission to the periodical section, but, occasionally, the privilege of exploring the general stacks as well. Since the catalogue is poor, this facility for the searcher is of inestimable value. The librarian is always ready to purchase any standard work which is not in the library and which the student specially needs. The Bibliothèque Nationale[1] contains nearly all mathematical periodicals lacking at the Sorbonne, a tolerably complete set of French mathematical publications, as well as a representative collection of those of other countries. When the need arises of consulting older mathematical works, this library or the Bibliothèque Mazarine is pretty sure to be able to supply the want. The Bibliothèque Sainte Geneviève has, among others, a good collection of elementary mathematical books.

Finally, under what conditions may an American mathematical student in Paris proceed to the doctorate? The general question has been fully considered in earlier pages, and only a few observations remain to be made here. We have remarked that two degrees are available, the *doctorat d'état* and the *doctorat de l'Université de Paris*. In both cases the candidate must receive permission from the minister of public instruction to present a university diploma as an *Equivalence de Scolarité* of the baccalauréat. In both cases the Thèse (which has

[1] A card of admission will be granted on presenting a letter from either the Canadian Commissioner or the American Consul General.

always been written in French) is the principal thing required after the student has received the necessary *certificats*. Although the Frenchman works his out independently, the American student will not derive less cordial help or suggestion from a French than, under similar circumstances, from a German professor. He will find, however, that this cordiality is very unlikely to expand in the former case, as in the latter it is almost sure to do, to an invitation to be a guest in the home. The question of *certificats*, with their exacting examinations, makes the doctorat d'état decidedly the more difficult. There is, however, no reason why a student who has the ability to get his doctorate in Germany in two years may not get the doctorat de l'Université de Paris in the same time. Indeed, if he be well equipped, have a thèse well under way before coming to France, and is prepared to "scorn delights and live laborious days," this doctorate is a possibility in one year. But since to 'those who know' no other doctor's degree in mathematics has quite as high a standard as the *doctorat d'état*, why does not some Canadian aspire to be the first in the British Empire to win it? Or why does not some young man from the United States feel spurred to show his equality with one of his countrywomen?

Authorities.

For the study of primary and secondary education for boys, three publications are essential:

Organisation pédagogique et plan d'études des écoles primaires élémentaires.

Plan d'études et programmes d'enseignement des écoles primaires supérieures de garçons.

Plans d'études et programme d'enseignement dans les lycées et collèges de garçons.

All departments of education are dealt with by the invaluable *Bulletin* [hebdomadaire] *administratif du ministre de l'instruction publique*, 1850– and *Annuaire de l'instruction publique et des beaux-arts*. The budgets may be found in the *Journal Officiel*, and statistics of various kinds in the *Annuaire Statistique* of the *Ministère du travail et de la prévoyance sociale direction du travail.*

Of unofficial publications which I have sometimes found useful are:

Le Nouveau Baccalauréat de l'enseignement secondaire; guide du candidat.

Programmes des certificats d'études supérieures.

L'Université de Paris et les établissements Parisiens d'enseignement supérieur. Livret de l'étudiant, published by the *Bureau des renseignements* at the Sorbonne.

Annuaire de la jeunesse, of H. Vuibert.

Other authorities are indicated in Appendix C.

Interesting comment may be found in Klein's *Vorträge über den mathematischen Unterricht an den höheren Schulen* (1907), and in Klein's *Elementar Mathematik vom höheren Standpunkte aus—Teil II: Geometrie* (1909. Pp. 456–77: "Unterricht in Frankreich").

It is with great pleasure that I have also to acknowledge my indebtedness to a very large number of friends, acquaintances and officials in the Sorbonne, the École Normale Supérieure, the École Polytechnique, in the lycées and in the different departments of the ministère de l'instruction publique. The invariable courtesy and obliging readiness to place all possible material at my disposal, which my innumerable inquiries called forth, constitute a very pleasant memory, among the many, of a delightful year.

Paris, May 2, 1910.

[After my paper had been written, I saw, by chance, a reprint of an interesting article, with the same title as this, published by Professor Pierpont about ten years ago, in the *Bulletin of the American Mathematical Society.* It suggested several improvements (in connection with questions of form and fuller development) which were then made in my paper. Concerning recent literature reference may be given to: "France as a Field for American Students" by S. Newcomb (*Forum,* xxiii., 320-326, May 1897. French translation, *Revue Internationale de l'Enseignement,* xxxiv., 20-27, July 1897. *Cf.* also *Nation,* lxiii., 400-01, Nov. 26, 1896) — The chapter on "The Universities" in B. Wendell's "The France of To-day" (second edition, 1908)—"Life at the Sorbonne" by H. Jones (*Nation,* xci., 576-7, Dec. 15, 1910).]

APPENDIX A.

Agrégation des Sciences Mathématiques.

As there are no mathematical examinations in any other country to compare in difficulty with those to which the candidate for a French *agrégation* is required to submit, it has seemed to me that it would be a matter of interest if fuller details of what is involved were set forth. I therefore subjoin:

I. The programme for the *concours* of 1910 (announced 9–11 months in advance). The examinations will be on topics selected from this programme.

II. The examination papers for 1909. The four written examinations, it will be observed, occurred on consecutive days. The first paper may seem short for the time allowed (seven hours); but not when the enormously high standard in presentation and detail is taken into consideration.

III. A Table giving certain data respecting the *agrégés* named during the last twenty-five years, which show that the impressions prevailing as to the age of the *agrégé*, the number of *Normaliens* who become *agrégés*, and the number of *agrégés* who became doctors are quite erroneous.

PART I.

PROGRAMME FOR THE *CONCOURS* OF 1910.

I.—General Programme in Analysis and Mechanics.

Since the programmes for the *certificats d'études supérieures* vary among the different universities, the jury indicate in the programme below the minimum of general knowledge which is supposed acquired by the candidates in differential calculus, integral calculus and mechanics.

The subjects of the "compositions" in differential calculus, integral calculus and mechanics will be chosen from Nos., 1°, 2°, 3°, 4°, 5°, 7°, 8°, 9°, 14° and 15° of this programme; their scope will not exceed the standard set by the subjects of problems proposed for the corresponding *certificats* for the *Licence*.

Differential Calculus and Integral Calculus.

1°. *Fundamental Operations of Differential and Integral Calculus:* Derivatives and differentials; simple integrals, curvilinear integrals, integrals of total differentials, double and triple integrals.

2°. *Applications of the Differential Calculus:* Study of functions of a real variable (formula of Taylor, maxima and minima, functional determinants, implicit functions); Calculation of derivatives and differentials; change of variables.—Order of contact and *genre* of an area.

3°. *Applications of the Integral Calculus:* Process of integration. Length of an arc of a curve, plane and gauche areas, volumes. Differentiation and change of variables under the sign $\iint \ldots\ldots$ Study of the integral $\int_a^b f(x)\,dx$ when one of the limits or the function becomes infinite. Formula of Green.—Study of functions represented by certain series. —Properties of power series.

4°. *Elements of infinitesimal Geometry:* "Infinitesimal properties" of plane and gauche curves (curve envelopes, curvature, torsion). Infinitesimal properties of the surfaces; surface envelopes, summary of the results on the transformations of contact; developable surfaces, ruled surfaces, Meusnier's theorem; principal sections.—Conjugate lines, lines of curvature, asymptotic lines in any curvilinear co-ordinates.

5°. *Elementary Functions of a Complex Variable:* Simple algebraic functions; circular and logarithmic functions.

6°. *Theory of Analytic Functions:* Properties of the integral $\int f(z)\,dz$. Series of Taylor and of Laurent. Poles, essentially singular points, residues.—Reduction of the hyperelliptic integrals.

7°. *Differential Equations of the first order:* General solutions, particular solutions, singular solutions.—Simple types of integrable equations. Integrating factor.—Theorem of Briot and Bouquet on the existence of the solutions in the cases where the known functions are analytic.

8°. *Differential Equations and Systems of Equations of any order:* General solution, particular solutions, first solutions.—Simple types of integrable Equations. Linear Equations.

9°. *Integration of linear partial differential equations of the first order.*

10°. *Integration of differential equations (partial or total) of the first order.*

Mechanics.

11°. *Statics:* Composition of forces applied at a point.—Attraction of a spherical homogeneous shell at an exterior or interior point. Elementary properties of the potential.—Reduction of forces applied to a solid body.—Conditions of equilibrium of a solid body. Applications to simple machines.—Funicular polygon. Suspension bridges. Catenary.—Principal of virtual work.

12°. *Kinematics:* Velocity, acceleration.—Movement of a plane figure in its plane. Representation of the movement by the rolling of a moving curve on a fixed curve.—Movement of a solid body about a fixed point. Representation of the movement by the rolling of a

moving cone on a fixed cone.—Movement of a solid body in space. Helicoidal movement.—Relative movements. Theorem of Coriolis.

13°. *Dynamics of a Particle:*—Work. General Theorems.—First integrals of the equations of the motion.—Application to the motions of the planets.—Movement of a point on a curve or on a surface. Pendulum in a vacuum and in a resisting medium. Conical Pendulum. Geodetic Lines.

14°. *Geometry of Masses:* Centres of gravity. Moments of Inertia.

15°. *Dynamics of Systems:* General Theorems. First Integrals.—Energy, Stability of Equilibrium.—Movement of a solid body about a fixed axis. Pressure supported by the axis. Compound Pendulum.—Movement of a solid body about a fixed point.—General movement of a solid body.—Law of friction and slipping.—Application of the principle of *vis viva* to machines.—D'Alembert's Principle.—Lagrange's Equations. —Relative motion.—Percussions.

16°. *Canonical Equations:* Theorem of Jacobi.

17°. *Hydrostatics:* Equilibrium of a fluid mass. "Surfaces de niveau." Pressure on a side plane. Archimedes' principle. Equilibrium of floating bodies.

18°. *Hydrodynamics:* General equations of the movement of a fluid mass. Bernoulli's Theorem. Torricelli's Theorem.

Lessons.

Parts of the programmes from which are drawn the subjects of the lessons.

1.—Mathématiques Spéciales.

Series: Series of positive terms; character of convergence or divergence drawn from the study of the expressions:

$$\frac{U_{n+1}}{U_n}, \sqrt{U_n}, n^p U_n.$$

Absolutely converging series. Convergence of series, with terms alternately positive and negative, of which the general term decreases constantly in absolute value and tends towards zero. Numerical examples.

General Properties of Algebraic Equations: Number of roots of an Equation. Relations between the coefficients and the roots. Every rational and symmetric function of the roots may be expressed rationally as a function of the coefficients.—Elimination of one unknown between two equations by means of symmetric functions.—Condition that an equation has equal roots. Study of the commensurable roots.—Des-

cartes' Theorem.—Complex numbers. De Moivre's Theorem. Trignometric resolution of the binomial equation.

Functions: Function of a real variable, graphic representation, continuity.—Definition and continuity of the exponential function and of the logarithmic function. Limit of $(1 + \frac{1}{m})^m$ when m increases indefinitely in absolute value.—Derivative of a function; slope of the curve represented. Derivative of a sum, of a product, of a quotient, of an integral power; of a function of a function. Derivative of a^x and of log x. — Use of logarithm tables and of the slide rule. —Rolle's Theorem, law of finite increments, graphic representation.—Functions of several independent variables, partial derivatives. Law of finite increments. Derivative of a compound function. Derivative of an implicit function (admitting the existence of this derivative). —Employment of the derivative for the study of the variation of a function; maxima and minima. Primitive functions of a given function, their representation by the area of a curve.

Functions defined by a power series with real coefficients. Interval of Convergence: Addition and multiplication. In the interior of the interval of convergence one obtains the derivative or the primitive functions of the function, on taking the series of derivatives or of the primitive functions (functions which pass to the extremities of the interval are not considered).—Examples:—developments in series of $\frac{1}{1-x}$, $\frac{1}{1+x^2}$, arctan x, log (1—x), log $\frac{1-x}{1+x}$. Exponential series. Binomial series. The equations $y^1 = y$, and $y^1 (1 + x) = my$ serve to determine the sum of two series.—Development into series of a^x, of arcsin x.

Curves whose equation is soluble or insoluble with regard to one of the co-ordinates: Tracing. Equation of the tangent at a point; sub-tangent. Normal, sub-normal. Concavity, convexity, points of inflexion. Asymptotes. Application to simple examples and in particular to the conics and to those curves of which the equation is of the second degree with respect to one of its co-ordinates.

Curves defined by the expression of the co-ordinates of one of their points as function of a prameter: Tracing. Numerical examples. The curves of the second order and those of the third order with a double point are unicursal.

Curves defined by an implicit equation: Equation of the tangent and of the normal at a point. Tangents at the origin in the case where the origin is a simple point or a double point. Discussion of the asymptotes in the case of numerical examples of curves of the second and of the third order.

Curvature. Envelopes. Developables.

Polar Co-ordinates: Their transformation into line co-ordinates. Equation of a right line.—Construction of curves; tangents, asymptotes

Applications (confined to the case when the equation is solved with respect to a radius vector). Case of the conics.

Gauche Curves: Tangent. Osculating plane. Curvature. Applications to the circular helix.

Study of surfaces of the second degree with reduced equation: Condition of the contact of a plane with the surface. Simple problems relative to tangent planes. Normals. Properties of conjugate diameters. Theorems of Apollonius for the ellipsoid and the hyperboloids. Circular sections. Rectilinear generatrices. The surfaces of the second order are unicursal.

Dynamics.

1. *Free Material Point:* Principle of inertia. Definition of force and mass.[1] Relation between the mass and the weight. Invariability of the mass. Fundamental units. Derived units. Movement of a point under the action of a force, constant in magnitude and direction or under the action of a force issuing from a fixed centre: 1° proportional to the distance; 2° in the ratio inversely as the square of the distance.—Composition of forces applied at a material point.[2]—Work of a force, work of the resultant of several forces, work of a force for a resulting displacement. Theory of living force. Surfaces de niveau. Fields and lines of force. Kinetic energy and potential energy of a particle placed in a field of force.

2. *Material Point, not free:* Movement of a heavy particle on an inclined plane, with and without friction, the initial veolcity acting along the line of greatest inclination. Total pressure on the plane; reaction of the plane. Small oscillations of a simple pendulum without friction; isochronism.

Descriptive Geometry.

Intersection of Surfaces: Two cones or cylinders, cone or cylinder and surface of revolution, two surfaces of revolution of which the axes are in the same plane.

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[1] It is admitted that a force applied at a material point is geometrically equal to the product of the mass of the point by the acceleration that it impresses on the point.

[2] It is admitted that, if several forces act at a point, the acceleration that they impress on the point is the geometric sum of the accelerations that each of them impresses on it, if acting alone.

II.—Lessons on the Subjects of the Programme of the Seconde and Première (C and D) and Mathématiques A.

Seconde (C. and D.).

Algebra: Resolution of equation of the first degree in one unknown. Inequalities of the first degree. Resolution and discussion of two equations of the first degree in two unknowns.—Problems; substitution in equation. Discussion of the results.—Variation of the expression $ax+b$; graphic representation.—Equations of the second degree in one unknown (theory of imaginaries not discussed). Relations between the coëfficients and the roots.—Existence and signs of the roots. Study of the trinomial of the second degree.—Inequalities of the second degree. Problems of the second degree. Variation of the trinomial of the second degree. Graphic representation. Variation of the Expression $\frac{ax+b}{a'x+b'}$; graphic representation.—Notion of derivative; geometrical significance of the derivative. The sign of the derivative indicates the direction of the variation; applications to very simple numerical examples and in particular to the functions studied before.

Geometry: Simple notions of homothetic figures. Similar polygons. Sine, cosine, tangent and cotangent of positive angles less than 2 right angles. Metrical relations in a right triangle and in any triangle. Proportional lines in the circle. Fourth proportional; mean proportional.—Regular polygons. Inscription in a circle of a square, of a hexagon; of an equilateral triangle, of a decagon, of a quindecagon. Two regular polygons of the same number of sides are similar. Ratio of their perimeters. Length of an arc of a circle. Ratio of the circumference to the diameter. Calculation of π (confined to the method of the perimeters).—Area of polygons; area of a circle. Measure of the area of a rectangle, of a parallelogram, of a triangle, of a trapezium, of any polygon.—Ratio of the areas of two similar polygons—Area of a regular convex polygon. Area of a circle, of a sector and of a segment of a circle. Ratio of the areas of two circles.

Première (C. and D.).

Geometry.

Translation: Rotation about an axis. Symmetry with respect to a line. Symmetry with respect to a point. Symmetry with respect to a plane. This second kind of symmetry is equivalent to the first.

Trihedral Angles: Disposition of the elements. Trihedral symmetry. Each face of a trihedral is less than the sum of the other two. Limits of the sum of the faces of a trihedral.—Supplementary trihedrals. Applications.—Inequalities of the trihedrals.

Homology: Parallel plane sections of polyhedral angles. Areas.

Polyhedra: Homothetic polyhedra, similar polyhedra. Prisms, Pyramids.—Summary of notions on the symmetry of the cube and of the regular octahedron.—Volumes of parallelopipeds and of prisms. Volume of the Pyramid.—Volume of a pyramid truncated by parallel sections. Volume of a truncated triangular prism.—Ratio of the volumes of two similar polyhedra.—Two symmetrical polyhedra are equivalent.—Sphere: plane section, poles, tangent plane. Circumscribed cone and cylinder. Area and volume.

Mathématiques A

Arithmetic: Common fractions. Reduction of a fraction to its simplest terms. Reduction of several fractions to a common denominator Least common denominator. Operations with common fractions.—Decimal numbers. Operations (considering the decimal fractions as particular cases of ordinary fractions). Calculation of a quotient to a given decimal approximation.—Reduction of an ordinary fraction to a decimal fraction; condition of possibility. When the reduction is impossible, the ordinary fraction can be regarded as the limit of an unlimited periodic decimal fraction.—Square of a whole number or of a fractional number; nature of the square of the sum of two numbers. The square of a fraction is never equal to a whole number. Definition and extraction of the square root of a whole number or of a fraction to a given decimal approximation.—Definition of absolute error and of relative error. Determination of the upper limit of an error made in a sum, a difference, a product, a quotient, knowing the upper limits of the errors by which the given quantities are affected.—Metric System.

Algebra: Monomials, polynomials; addition, subtraction, multiplication and division of monomials and of polynomials. Equations of the second degree in one unknown. Simple equations which are equivalent. (The theory of imaginaries is not developed).—Problems of the first and second degree.—Arithmetic Progressions. Geometric Progressions. Common Logarithms. Compound Interest, annuities.

Trigonometry: Circular Functions. Addition and Subtraction of arcs. Multiplication and division by 2.—Resolution of triangles. Applications of Trigonometry to various questions relative to the elevation of planes. (The construction of the trigonometric tables is not to be considered).

Geometry: Inversion. Applications. Peaucellier's Cell.—Polar of a point with respect to a circle. Polar plane of a point with respect to a sphere.—Hyperbola: Trace, tangent; asymptotes; simple problems on tangents. Equation of a hyperbola with respect to its axes. Plane sections of a cone and of a cylinder of revolution.

Vectors: Projection of a vector on an axis; linear moment with respect to a point; moment with respect to an axis. Geometric sum of a system of vectors; resultant moment with respect to a point. Sum of the moments with prospect to an axis. Application to a couple of vectors.

Descriptive Geometry: Rabatting. Change of plane of Projection; rotation about an axis perpendicular to a plane of projection.—Application to distances and angles; distance between two points, between a point and a line, between a point and a plane; the shortest distance between two lines of which one is vertical or at right angles to the plane, or of two lines parallel to the same plane of projection; common perpendicular to these lines. Angle between two lines; angle between a line and a plane; angle between two planes.

Kinematics: Units of length and of time.—Motion. Relative motion. Trajectory of a point. Examples of motion.—Rectilinear motion; uniform motion; velocity, its representation by a vector. Varied motion, mean velocity; velocity at a given instant, its representation by a vector; mean acceleration; acceleration at a given instant; its representation by a vector. Uniformly varied movement. —Curvilinear motion. Mean velocity, velocity at a given instant defined as vectors. Algebraic value of velocity. Hodograph. Acceleration.—Uniform circular motion, angular velocity; projection on a diameter. Simple oscillation in a line.—Change of the system of comparison. Resultant of velocities.—Examples and applications. (Purely geometrical applications are not to be insisted upon).—Geometrical study of the helix. Helicoidal motion of a body. Screw and nut.

Dynamics: Work of a force applied to a material point. Unit of work. Work of a constant force, of a variable force. Elementary work, total work. Graphical evaluation. Work of the resultant of several forces. Theorem of forces acting on a material point. Simple examples.

Cosmography: Moon. Apparent proper motion on the celestial sphere. Phases. Rotation. Variation of the apparent diameter. Eclipses of the moon and of the sun.

PART II.

EXAMINATIONS IN THE *CONCOURS* FOR 1909.

(1) WRITTEN.

MATHÉMATIQUES ÉLÉMENTAIRES.*

[Time, 7 hours; 7 a.m.-2 p.m].

Given two circles, with centres O and O', radii R and R'; these circles are exterior to one another, and the common exterior tangents are drawn, the points of contact being A and A', B and B', whilst the points of contact of the common interior tangents are C and C', D and D', the points A and C being on either side of the line of centres whereas the contrary takes place for the points A' and C' if we have, as is supposed, $R<R'$. The tangents AA' and CC' cut in E, the tangents BB' and DD' cut in F, and the line EF meets the line OO' in the point G; the tangents AA' and DD' cut in I, the tangents BB' and CC' cut in J and the line IJ meets the line OO' in the point K. Consider the lines AC, BD and $A'C'$, $B'D'$, which cross at the point K.

1°. In order that the lines AC and $B'D'$ become the coincident line r, in which case the lines BD and $A'C'$ become the same line s, it is necessary and sufficient that the orthoptic circles of the two given circles are orthogonal, which is equivalent to the metric relation

$$\overline{OO'}^2 = 2(R^2 + R'^2)$$

(The orthoptic circle of a circle is the circle which is the locus of points from which one sees the given circle under a right angle).—The point G is then the middle of the segment OO'—The preceding condition is supposed fulfilled in all which follows.

2°. If R is a point of the line r, the polars of this point with respect to the two circles O and O' cut in a point S situated on the line s;

3°. The envelope of the line RS is a conic, which is to be determined by metrical elements; determine the principal tangents. The locus of the orthocentre P of the triangle ORS is a conic, of which it is required to find some remarkable points; same question for the triangle $O'RS$.

4°. Suppose RM, RN and RM', RN' the tangents drawn from a point R of the line r to the two circles O and O'; the plane being oriented in the sense $ABCD$, let α, β and γ, δ be the angles, made with an axis r by the half-lines of the tangents, situated on the same side of the line r for each of the circles O and O' (these angles are found again at O and O'); setting

$$\frac{\alpha+\beta}{2} = x, \quad \frac{\gamma+\delta}{2} = y, \quad \frac{\beta-\alpha}{2} = u, \quad \frac{\delta-\gamma}{2} = v.$$

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*See for solutions to questions in this paper *Nouvelles Annales de Mathématiques* (4) IX, 455-67, 1909.

MECHANICS.

[Time, 7 hours; 7 a.m.-2 p.m.]

A kite of weight P is subject to normal action by the wind, represented by a force $\frac{3\sqrt{3}}{2}P$. In its position of equilibrium it is inclined at an angle of 30° to the horizon; it has an axis of symmetry on which is its centre of gravity G and the centre O of the push of the wind; O is above G and OG equals 4 centimetres.

At a point A of the axis, below G, 40 centimetres, is attached a string of length l; two other strings of length l' are attached in two points B and C symmetrical with respect to the axis, the line BC, equal to $2d$ is 29 centimetres above G. In the position of equilibrium these three strings, flexible, inextensible and without mass are tight and united in a point M at which is attached the string which holds the kite.

1°. Find the relation which connects l, l' and d; supposing these lengths known calculate the tensions of the three strings.

2°. The point M being 30 metres above the earth's surface, what is the tension of the other extremity E of the string supposed fixed on the earth, flexible, inextensible and of weight p per unit of length; determine p such that the tangent at E is horizontal (action of wind on the string is to be neglected).

3°. Under these conditions, suppose that the string, lengthened from E, unroll with friction of coefficient f along a helix traced on a fixed cylinder of revolution, of which the axis is perpendicular to the plane of the string, the radius of the cylinder being r and the pitch of the helix h; what will be the necessary force to maintain equilibrium, this force being applied at the new free extremity of the string supposed unrolled for a complete spiral? (The weight of the part unrolled is to be neglected).

4°. The string holding the kite having the form found above (2°) and being supposed indeformable, place at the extremity situated on the earth a runner [*postillon*] subject to a force, the resultant of the weight of the runner and of the action of the wind; this force is constant and is in the plane of the string; what condition must be fulfilled that the runner move, supposing that there is a coefficient of friction 1?

Study the movement of the runner in the case where the force is horizontal. (It is supposed that the runner is a material point moving with coefficient of friction 1 on the material curve represented by the string which is supposed indeformable.

6 July.

Differential and Integral Calculus.

[Time, 7 hours; 7 a.m.-2 p.m.]

Ox, Oy, Oz being three given rectangular axes, consider a surface S, of a single sheet. Suppose s any portion of S, without any common point with Oz and not having a tangent plane parallel to Oz.

I. Suppose A the area of the projection of s on the plane of xy; B the volume bounded by the area s, its projection A and the projecting cylinder; C, the volume bounded by the area s and the cone having this area for base the origin for vertex; D, the volume bounded by the area s and by the conicoid which has the contour of s for directrix, Oz for axis and xOy for director plane.

The quantities B, C, D representing the volumes in question with suitable signs, show that

$$(1) \qquad 3C = B - 2D$$

as long as the area s is not cut by certain lines situated on S. Show also that the formula is still true without this last restriction, if the elements of B, in magnitude and sign, be always such that

$$B = \int\int z\, dx\, dy$$

(the double integral being applied to the area A), and if at the same time the elements of volumes C, D, are also affected by suitable signs depending on x, y, p, q $\left(p = \frac{\partial z}{\partial x},\ q = \frac{\partial z}{\partial y}\right)$. Indicate as far as possible the geometrical conventions of sign to which we are thus led.

II. The cone (supposed reduced to a single nappe) which bounds the volume C, determines, on the cylinders of revolution of radius 1 which has Oz for axis, an algebraic area of which the elements will be affected by the same signs as the corresponding elements of C, in conformity to the preceding conventions: suppose E this area.

On the other hand turn s about Oz and designate by F the volume of revolution thus generated; by G, the area of the meridian section of this volume, an element of F or of G being equally affected by a sign (the same in the two cases) according to suitable convention.

Determine the surface S such that, for every portion s (without point common with Oz or tangent plane parallel to Oz) taken on this surface, we have the relation

$$(2) \qquad aA + bB + 3cC + eE + \frac{f}{2\pi} F + gG = 0$$

where a, b, c, e, f, g are constants. Show that S will verify a certain partial differential equation of the first order of which the coefficients are rational functions of x, y, z, ρ, where $\rho = \sqrt{x^2 + y^2}$ (the radical being taken as positive). Indicate (again geometrically) the determination of the common sign to give to any element of F and to the corresponding element of G such that this equation is the same for the whole surface under consideration.

Volumes of parallelopipeds and prisms; of the pyramid. Unnecessary to consider truncated pyramid or prism.

Notion of the derivative. Geometrical interpretation. Applications.

Homothetic polyhedra. Similar polyhedra. (Programme of the Première).

Problems of the second degree.

First lesson on regular polygons.

Work, kinetic energy for a particle. Simple examples.

Decimal numbers. Operations. Calculation of a quotient to a given decimal approximation.

Resolution of triangles (omitting right angled triangles).

Multiplication and division of arcs by 2.

Summary of notions on the symmetry of the cube and of the regular octahedron.

Rabatting. Applications; angle between two lines, a line and a plane, two planes.

Calculation of Π.

Upper limit of absolute error of a sum, of a difference, of a product of two factors, of a quotient, of a square root.

Volume of a sphere. Spherical segment.

Tangent to a hyperbola. Asymptotes. Simple problems on tangents.

Theory of moments with respect to, a point, an axis.

Mathématiques Spéciales.

Movement of a heavy particle on an inclined plane with and without friction, the initial velocity being zero or directed along the line of greatest inclination.

Power Series. Interval of convergence. Differentiation. Integration.

Series of positive terms. Nature of the convergence or divergence drawn from the study of the expression

$$\frac{u_{n+1}}{u_n}, \quad \sqrt[n]{u_n}, \quad n^p u_n, \text{ numerical examples.}$$

Discussion of the commensurable roots of an equation with integral coefficients. Examples.

Movement of a point attracted by a fixed centre of force in the ratio of the inverse square of the distance.

Functions of several independent variables. Partial derivatives. Formula of finite increments; derivatives of a compound function.

Concavity, convexity. Points of inflexion (rectangular coordinates).

Elimination of one unknown between two algebraic equations by means of symmetric functions.

Normal to an ellipsoid.

Establish the relations,

$$\cos^2 u = \left(1 + \frac{R'^2}{R^2}\right) \cos^2 x, \ \cos^2 v = \left(1 + \frac{R^2}{R'^2}\right) \cos^2 y,$$

$$\frac{1 + \tan x}{1 + \tan y} = - \frac{R'^2}{R^2} .$$

Verify by means of these relations, that the tangents RM, RN and RM', RN' form a harmonic pencil.—The point R of the line r can also be replaced by a point S of the line s.

2 July.

Mathématiques Spéciales.*

[Time, 7 hours; 7 a.m.-2 p.m.]

Given a parabola (P) and a line (D) of which the equations with respect to a system of rectangular coordinate axes, are :

$$(P) \begin{cases} y - 2\,px = 0 \\ z \quad = 0 \end{cases} \qquad (D) \begin{cases} y = 0 \\ z = a \end{cases}$$

and, suppose the surface (S) generated by a variable line (Δ) which meets (P) in A and (D) in a point B, such that the distance AB is a constant l.

1°. Construct the projection on the plane XOY of a section of the surface by a plane parallel to the plane XOY; construct the tangent in a point of this projection and show that the curve obtained can be regarded as the locus of the middle points of the chords parallel to OX and limited, on the one hand by a parabola of vertex O and axis OX, on the other hand by an ellipse of which the axes are in the direction OX and OY.

2°. Two kinds of lines $\triangle$ can be distinguished, according as the abcissa of A is superior or inferior to that of B; in the preceding sections separate the arcs which correspond to the generatrices of the one system or the other and find the locus of the points which limit these arcs.

3°. Consider the solid limited by the surface (S) and by the planes $z + a = 0$ $z - 2a = 0$; find its volume and construct its apparent contour on the plane ZOX.

4°. Determine the orthogonal trajectories of the lines $(\triangle)$. Through a point A, two lines $(\triangle)$ can be drawn to meet an orthogonal trajectory in two points C and C'; show that this trajectory can be chosen such that the sum $\overline{AC} + \overline{AC'}$ is proportional to the abcissa of A—Can the given constants be chosen such that only one orthogonal trajectory meets all the lines $(\triangle)$ between their points situated on the parabola (P) and on the line (D)?

3 July.

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*The solutions of the questions in this paper are given in *Revue de Mathématiques Spéciales* Juin, 1910; X, 532-540.

Find the characteristic curves of the partial differential equation thus obtained, by employing the semipolar coordinates ρ, ω (polar coordinates of the projection of the point on the plane xOy), z (coordinate of the point).

Study the projections of these characteristic curves on the plane xOy. Show that there exist characteristic curves which are situated on a cylinder of revolution with the axis Oz, and discuss their form.

III. Suppose the constants b, c, bound by the relation

$$(3) \qquad b + 3c = 0$$

and consider the curvilinear integral,

$$I = \int \left[z \left(c + \frac{e}{\rho^3} \right) - \frac{a}{2} \right] (x\partial y - y\partial x) \pm \rho \left(\frac{\rho}{2} f + g \right) \partial z$$

taken from a point M to a point M' of the surface S, along the path L situated entirely on this surface. Show that if S satisfies the condition which has been imposed on it in the II. part, and if, under the sign $\int$, the sign of the term in ∂z has been suitably chosen, the integral I does not change its value, when M and M remaining fixed, we change in a continuous manner on the surface, the line L traced between these two points.

If, instead of the relation (3), the constants b, c are connected by the relation

$$(4) \quad b + 6c = 0$$

a property analogous to the preceding appertains to the integral

$$J = \int z \frac{(c\rho^3 + e)^2}{\rho^3} (x\partial y - y\partial x) - \epsilon g z \frac{c\rho^3 + e}{\rho} (x\partial x + y\partial y) + P\left[\epsilon f \rho^2 \partial z - a(x\partial y - y\partial x)\right]$$

where P is a suitably chosen polynomial in ρ and ϵ is one of the two quantities $+1$, -1.

IV. Suppose further that the surface S contains a circumference of which the plane passes through Oz and which has no point common with Oz, or with the cylinder of revolution considered above (end of II. part).

On each of the characteristic curves for the different points of this circumference take a finite arc, such that the portion Σ of S thus determined does not contain any singularity.

Supposing given the value of the integral I (in the case of relation (3)) or J (in the case of the relation (4)), the length of a certain path L joining M and M' and situated on Σ, what are the other values that this integral can acquire when L is successively replaced by all the other paths which can be traced between the same points on Σ?

Indicate the relation which exists between the radius of the circumference the distance of its centre to Oz and the coefficients of equation (2) in order that the integral considered be unique under these conditions.

5 July.

FINAL EXAMINATIONS.

Numerical Calculation.

Consider the differential equation

$$\frac{d^4y}{dx^4} = m^4y.$$

Find the smallest value to give to m in order that the equation admits a solution of which the representative curve, symmetric with respect to Oy is tangent to Ox at the points A, A' of abscissae $x = +1$, $x = -1$, the value y corresponding to, $x = 0$ being equal to 1 (point B)—Determine the points of inflection between A and A' of the representative curve of y. Find, as exactly as possible, the portion AB of this curve, the unit of length being supposed equal to 40 divisions of the square employed.

Descriptive Geometry (Diagram).*

An equilateral hyperbolic paraboloid has for vertex the point *de cote* 10 cm. and *d'éloignement* 10 cm. projected on the major axis of the sheet; a principal parabola P is horizontal and its focus *de cote* 10 cm. and *d'éloignement* 10 cm. is situated 1 cm. 5 m. to the right of the vertex.

A second hyperbolic paraboloid has director plane, a plane of profile; of rectilinear generativers there are: 1°. the axis of the first paraboloid; 2°. a horizontal *de cote* 13 cm., of which the projection on the plane of the parabola P meets the axis of this parabola 3 cm. to the left of the vertex and the tangent at the vertex 3 cm. in front of the vertex.

Consider, on the one part, the region A of the space limited by the first paraboloid and which corresponds to the interior of the parabola P; on the other part, the region B of the space limited by the second paraboloid and which corresponds to the part of the horizontal plane *de cote* 10 cm. situated in front of the axis of the first paraboloid.

Represent the solid bounded by the two paraboloids, by the horizontal planes *de cote* 17 cm. and 2 cm. and by the plane of the profile situated 10 cm. to the right of the vertex of the first paraboloid, the solid part being always in the regions A, B.

It is supposed that the planes of projection are transparent.

(2) ORAL.

Mathématiques Élémentaires.

Supplementary trihedral angles. Applications.

Symmetry with respect to a line, a point, a plane. (Programme of the Première).

Relations between the coefficients and the roots of the equation of the second degree. Applications.

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*A solution of the problem in this paper is given in *Revue de Mathématiques Spéciales* Nov. 1910, XI, 42-45.

Tangent at a point of a curve of which the coordinates are rational functions of a parameter. Points of inflection. Singular points at a finite distance.

Small oscillations of a simple pendulum without friction (isochronism).

Intersection of a surface of revolution and of a cone.

Theory of envelopes in Plane Geometry.

Conjugate points in connection with a surface of the second order. Conjugate planes. Pole and polar planes. Conjugate lines.

Symmetric and rational functions of the roots of an algebraic equation.

Construction of a curve $\rho = f(\omega)$ in polar coords. (It is supposed that lessons on tangents and asymptotes have been given).

Gauche curves. Tangents. Osculating plane. Curvature. Application to the circular helix.

Number e – limit $\left(1 + \frac{1}{m}\right)^m$.

Field—line of force, function of force, surface de niveau. Theory of kinetic energy at a point.

Theorem of Descartes.

Movement of a point under the action of a force issuing from a fixed centre and proportional to the distance.

MEMBERS OF THE JURY.

NIEWENGLOWSKI, *Inspector General of Instruction—President.*
HADAMARD, *Professor, University of Paris.*
COMBETTE, *Inspector General of Public Instruction.*
FONTENÉ, *Inspector of the Académie.*
GRÉVY, *Professor, Lycée Saint-Louis.*

PART III.

THE AGRÉGÉS DES SCIENCES MATHÉMATIQUES 1885–1909.

Year	Number of Agrégés fixed by Govt.	Number presenting themselves at Concours	Number admitted to Oral	Number of the Agrégés who became Doctors [1]	Average Age	Number of Agrégés who had been Elèves E.N.S.
1909	14	81	27	0	24+ [21–27]	7
1908	13	75	20	0	25 [22–35]	9
1907	14	54	25	0	27— [23–37]	7
1906	14	58	24	1	27+ [23–37]	7
1905	14	60	20	2	27 [21–33]	7
1904	14	72	26	4	28— [22–33]	10
1903	12	78	25	1	28+ [24–41]	8
1902	12	87	23	1	27—]22–40]	9
1901	10	77	23	2	28 [23–37]	6
1900	8	76	20	0	28— [23–34]	4
1899	8	86	16	1	25— [23–33]	6
1898	8	96	19	2	26— [21–33]	8
1897	7	93	18	3	25— [21–33]	3
1896	12	112	26	1	26+ [23–30]	6
1895	14	125	24	0	24 [20–35]	8
1894	11	126	20	2	26— [21–37]	7
1893	13	134	..	1	26— [22–29]	9
1892	12	125	19	3	24+ [21–27]	7
1891	13	..	22	5	26— [22–30]	7
1890	12	..	16	1	26— [23–30]	4
1889	13	..	..	5	23— [21–32]	7
1888	14	..	23	3	25+ [21–34]	9
1887	13	..	15	5	23— [21–36]	10
1886	13	..	15	6	23+ [20–31]	7
1885	12	..	22	2	27 [20–44]	6
Total....	300			51	$25\frac{4}{5}$	178

[1] These figures were compiled in February, 1910.

The sixth column contains the average age; "24 +" means an age > 24 and $< 24\frac{1}{2}$, "24—" is short for a number < 24 and $\geqq 23\frac{1}{2}$. The figures in square brackets, [ ], show the range of ages for the year.

APPENDIX B.

Mathematical Courses Offered in Universities Outside of Paris

1909–10.

There is nothing in France corresponding to the *Universitäts-Kalendar* of Germany, and it is almost impossible to get any exact information about courses to be offered at even the Uuiversité de Paris, until a couple of days before the Semester commences. The following list is compiled from a variety of sources. It will be observed that Lyons is the only university outside of Paris where any courses, over and above those for the licence and agrégation, are offered.

The letters in brackets after the names of the Academies, indicate the Faculties of the Universities: La. = Law, S. = Science, Le. = Letters, M. = Medicine. The numbers in brackets after the names of Professors, are those in the list of doctors (Appendix C). An "A" added in the brackets is an abbreviation for agrégé.

No information is at hand regarding the Professors in the Université d'Alger which was opened at the beginning of this year, with the Faculties of Science and of Letters, and the mixed Faculty of Medicine and Pharmacy.

Aix—Marseille (La. S. Le. M.)

Sauvage (142. A)	1. Calculus.
	2. "Cours Complémentaire"
Charve (137)	Mechanics.
Bourget (A)	Astronomy.
Jamet	Cours Complémentaire with Sauvage.

Besançon (S. Le.)

Lebeuf (231)	Astronomy.
Carrus (272, A)	Calculus.
Andrade (181)	1. Mechanics.
	2. Cours Complémentaire for Engineers.
Franchebois	Préparateur in Mechanics.

Bordeaux (La. S. Le. M.)

Cousin (209, A)	Calculus.
Delassus (217, A)	1. Mechanics.
	2. Preparatory Mathematics.
Picart (188, A)	Astronomy.
Esclangon (262, A)	Prof. Adjoint and Maître de Conférences.

CAEN (La. S. Le.)	
Riquier (161,A)	Calculus.
Husson (268, A).	Mechanics.
Villat	Maître de Conférences.
CLERMONT (Sc. Le.)	
Pellet (122)	Calculus.
Guichard (151, A)	1. Mechanics. 2. Astronomy.
DIJON (La. Sc. Le.)	
Baire (238, A)	Calculus.
Duport (135, A)	1. Mechanics. 2. Astronomy.
GRENOBLE (La. S. Le.)	
Collet (107)	1. Analysis. 2. Astronomy and Geodesy.
Cotton (242, A)	Mechanics.
Zoretti (264, A)	Maître de Conférences. Cours Complémentaires: 1. Analyse Superieure. 2. Math. Générales.
LILLE (La. S. Le. M.)	
Demartres (156, A)	Calculus.
Petot (171, A)	Mechanics.
Clairin (253, A)	Mathémetiques Générales.
Boulanger (230, A)	Prof. Adjoint and Maître de Conférences: Mechanics.
Traynard (278, A)	Maître de Conférences.
LYON (La. S. Le. M.)	
André (117)	1. Astronomy. 2. Elementary Mathematics (Conférence d'Agrégation.)
Flamme (170)	1. Mechanics. 2. Math. Générales. 3. Mechanics (Conf. d'Agrégation).
Vessiot (192, A)	1. Differential Equations and Calculus of Variations. 2. Theory of Groups of Transformations. 3. Math. Générales: Algebra and Calculus. 4. Higher Geometry (Conf. d'Agrégation).

Le Vavasseur (198, A)	1. Theory of Functions of a Complex Variable and Geometrical Applications of Analysis. 2. Mathématiques Spécial (Conf. d'Agrégation).
Wiernsberger (312)	1. Mechanics. 2. Math. Générales: Analytical Geometry.
Merlin	Chargé de Cours. Astronomy.
MONTPELLIER (La. S. Le. M.)	
Fabry (159, A)	Calculus.
Dautheville (157, A)	Mechanics.
Lattès (274)	Maître de Conférences.
NANCY (La. S. Le. M.)	
Floquet (126, A)	1. Analysis. 2. Calculus.
Vogt (177,A)	Applied Mathematics.
Hahn	Maître de Conférences. Mechanics.
POITIERS (La. S. Le.)	
Lesbesgue (256, A)	1. Calculus. 2. Math. Générales. (Cours Complémentaires)
Boutroux (259)	1. Mechanics. 2. Astronomy.
RENNES (La. S. Le.)	
Lacour (215)	Analysis.
Le Roux (216, A)	Mechanics.
Fréchet (273, A)	Maître de Conférences.
TOULOUSE (La. S. Le. M.)	
Drach (236)	Calculus.
Paraf (193)	Mechanics
Cosserat (176, A)	Astronomy.
Buhl (248)	Math. Générale.
Blondel (A)	Chargé de Conférences.
Saint-Blancat (276)	Assistant Astronomer.

ROYAL SOCIETY OF CANADA

TRANSACTIONS

SECTION IV.

GEOLOGICAL AND BIOLOGICAL SCIENCES

PAPERS FOR 1910

I.—*Review of the Flora of the Little River Group, No. III.*

By G. F. MATTHEW, D.Sc., LL.D.

(Analysis of the Flora of the Little River Group, with Description of Pseudobaiera.)

(Read 27th September, 1910.)

To form a clear conception of the nature of the flora of the Little River Group, so interesting on account of its geological antiquity and the wide range of forms it contains, it becomes necessary to separate it from the association in which Sir William Dawson placed it, and contrast it with the rest of the plants which he described as Devonian.

And this treatment of his species is the more necessary since several leading phytobiologists have asserted that these plants belong to the Carboniferous System, a view of their age which is not surprising when one notices the remarkably close resemblance of some of the species (one may even say many of them) bear to well-known Carboniferous types.

The Devonian species (including the Little River forms) are summarized by Sir William in the table given at page 85 of the Pre-Carboniferous Plants of North Eastern America,[1] wherein he shows (beside a few of Upper Silurian age) the plants that severally belong to the lower, middle and upper divisions of the Devonian System. In this table the Little River species are shown in the middle Devonian column.

After eliminating the Little River plants, the true Devonian types stand out with sufficient distinctness, and certain genera become prominent as Devonian: among these are *Psilophyton*, *Lepidodendron* and *Archæopteris*.

Beginning with the second column of Sir William's list one may say that except the Psilophyta and one or two other genera the lower Devonian has but a scanty flora and it is only in the middle and upper Devonian that we find a more liberal grouping of species that may be regarded as characteristically Devonian.

Following Sir William's plan of beginning his list with the higher types of vegetation (and passing over the genera based on internal structure) one finds species of plants grouped under Sigillaria and Stigmaria, that by their small and obscure markings, recall these genera only in a general way, and are not by any means characterized by the

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[1] The Fossil Plants of the Devonian and Upper Silurian Formations of Canada. Report, Geol. Survey Canada, 1871.

definite surface markings that distinguish the Coal-Measure plants thus designated.

The Lepidodendra of this list are much more common plants of the Devonian beds, and so, more characteristic, than the plants last mentioned; but here also one notices the prevalence of species with small areoles, as Dawson himself has stated, and the species would rather fall under *Sagenaria* of Brongniart and the old German authors, or *Bothrodendron* L. & H. of more recent geologists, than under the type represented by the Coal measure species of Lepidodendron. The same may be said of *Leptophleum* and *Lepidophloios*.

In *Psilophyton* one strikes a type which above all others, Sir William seems disposed to regard as preëminently a genus of the Devonian Age. He has recognized it, even as low down as the Silurian, in Gaspé, and the most typical species has been found to extend through the Devonian terranes; it is with reason then regarded as one of the most notable forms of this system, and the author of the genus has given much care to its study. Mr. Penhallow has added a species to this genus from the Hamilton beds of the New York series.[1]

Arthrostigma and *Cyclostigma* have species in the lower and middle Devonian of Gaspé, with small leaf scars, described by Sir William, but it is among the Filicoid plants (or more probably Cycadofilices) that we find some of the most marked Devonian types.

The old genus *Cyclopteris* was formerly the receptacle for most of these; as now distributed there are two genera (often regarded as one) that contain most of the Devonian forms. The first that I shall refer to is *Aneimites*. Dawson established this genus to contain the species *A. Acadica*, from the Gaspereau R. in Nova Scotia, in beds which he referred to the Lower Carboniferous. According to Schemper the genus is Devonian as well as Lower Carboniferous, and some geologists regard the beds in which it occurs as Upper Devonian. It is difficult to distinguish this genus from Triphyllopteris of a similar horizon in Europe.

The genus *Archæopteris* in which the venation is similar to Aneimites, but in which the pinnules are arranged on the rachis in a more exactly pinnate manner, and in which the fruiting bracts, in place of being tufted at the base of the vegetative pinnæ, are pinnately distributed on one or more fruiting pinnæ along the rachis, is abundant in the Devonian floras. This genus above all other of the Filicoid plants is characteristic of Devonian strata, for while plants of the Aneimites type range from the Silurian to the Lower Carboniferous, this seems to abound most in the Devonian beds; it is true that in the middle States

[1] Notes on Erian Devonian Plants from New York and Pennsylvania. Proc. U.S. Nat. Mus. Vol. XVI. p. 105, 1893.

species referred to it ranges higher, but in Eastern Canada it is confined so far as is known to the Devonian system and is especially common in the Upper Devonian. Sir William Dawson assigned four species as plants of this system *A. Jacksoni* Dn., *A. Halliana,* Göpp, *A. Rogersi* Lx. and *A. obtusa* Lx. In Prosser's sections I find the following added, *A. sphenophylloides* Lx., *A. Hibernicus,* Forbes and *A. minor,* Lx.

These three genera then specially mark the Devonian Age among the fossil plants of North America, Psilophyton, Lepidodendron (with small areoles) and Archæopteris. Aneimites or Triphyllopteris is less characteristic; it begins in the Silurian and extends into the Carboniferous deposits.

We give below Sir William Dawson's list of the Devonian Plants of Eastern North America, and have added species described or cited by C. S. Prosser and D. P. Penhallow. But from this catalogue the fossils of the Little River plant beds are omitted. The four columns show the plants of the Silurian (of Gaspé) and three divisions of the Devonian. Sir William has noted the district where the several species have been found, but in the quotations from Prosser's sections, the special Devonian group from which the plant came is more closely indicated. Thus *G*=Gaspé, *N.Y.*=New York, *M*=Maine (Perry Group); and further *H*=Hamilton Group, *P*=Portage, *C*=Chemung, *Ck*=Catskill.

In considering the Devonian types the writer has not confined himself entirely to Sir William's list,[1] but has used C. H. Prosser's report on the Devonian sections in Eastern Pennsylvania and New York, (U.S. Geo. Surv. Bull. 120.), Prof. D. P. Penhallow's comments on this flora,[2] and other sources of information.

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[1] Fossil plants of Devonian and U. Sil. formation of Canada, p. 85.

[2] Notes on Erian (Devonian) plants from N. York and Penn., Smithson Inst., U.S. Nat. Mus. 1893, p. 105.

	Silurian.	Lower Devonian.	Middle Devonian.	Upper Devonian.
Prototaxites Logani, Dn.		G.		
Dadoxylon Hallii, Dn.			N.Y.	
D.—Newberryi, Dn.			N.Y.	
Sigillaria Vanuxemii, Göpp.			N.Y.	
S.—simplicitas, Van'x.				N.Y.
Stigmaria (or Cyclostigma, Dn.) exigua, Dn.				N.Y.
S.—pusilla, Dn. (Leptophlæum D. White).				M.
S.—areolata, Dn.			G.	
S.—minutissima, Dn.		G.	N.Y.	
Didymophyllum reniforme, Dn.		G.		
Calamites inornatus, Dn.			G. N.Y.	N.Y.
Anarthrocanna (Barrandeina Stur, fide D. White) Perryana, Dn.				M.
Annularia laxa, Dn.			G.	
Lycopodites Richardsoni, Dn (Barinophyton, White).				M.
Lepidodendron Gaspianum, Dn.			G., N.Y.	N.Y., M.
L.—Chemungense, Dn.			H.P.	N.Y., Ck.
L.—corrugatum, Dn. (allied to the following).				C., N.Y. ?
L.—primævum, Dn. (=Veltheimianum.			H.P.	N.Y.
Leptophleum rhombicum, Dn.			G.	M.
Lepidophloios antiquus, Dn.			H., N.Y.	
Psilophyton princeps, Dn.	G.	G.	{G.N.Y. H.}	C. Ck.
P.—robustius, Dn.	G.	G.		
P.—grandis, Penhallow.			H.	
Haliserites Dechenianus-lineatus Pen.			H.	Ck.
Arthrostigma gracile, Dn.		G.	G.	
Cyclostigma densifolium, Dn.			G.	
Cordaites flexuosus, Dn.				M.
Archæopteris Jacksoni, Dn.				G. M. C.
A.—Halliana Goepp.			P.	N.Y.
A.—Rogersi, Lx.				N.Y. M. Ck.
A.—obtusa, Lx.			P.	C. Ck.
A.—sphenophyllifolia, Lx.			H.P.	
A.—Hibernica, Forbes.			P.	
A.—minor, Lx.				C.
Cyclopteris Brownii, Dn=Rachophyllum truncatum, Lx.				N.Y. M.
Carpolithes siliqua, Dn.				M.
C.—spicatus, Dn.				M.
C.—lunatus, Dn.				M.
C.—compactus, Dn.				M.
Sporangites Huronensis, Dn.			N.Y.	

Such is the nature of the Devonian Flora of North Eastern America as developed by Sir William Dawson and later investigators. Was there a flora anterior to this and how did it stand out from the Devonian on one hand and the Carboniferous on the other? What are the genera and species that mark it as distinct from these two? From the former it is easily distinguished, but to the latter it has many points of similarity.

The general facies of the Silurian Flora of the Little River group, is so like that of the Carboniferous, that it might very readily be thought to be the same, if the stratigraphy did not preclude such a possibility; the geological structure clearly shows that the Devonian Flora stands between.

Still it may be well to note that there are a number of genera known that give a special facies to the Silurian Flora. One may refer particularly to the genera *Pseudobaiera* (described in the sequel) *Ramicalamus*, *Lepidocalamus* and *Ginkgophyton* are specially characteristic of the lower portion of the Little River Group, (though the second genus has also a wider range in that group).

The middle portion exhibits genera that more nearly compare to those of the Carboniferous system, as *Aneimites* or *Triphyllopteris*, *Sphenopteris*, *Neuropteris*, *Pecopteris* and *Johannophyton* (with the vegetative foliage of *Alethopteris*). Although there are forms that have been referred to *Psilophyton*, these differ much from the typical species of this genus that are found in the Devonian; one is a small tufted form, differing considerably in the fruiting branches from the Gaspé types, and the other, the author of the species referred only with doubt to this genus.

The filicoid form which Sir William referred to *Alethopteris*, is thought by the present author to be a Pteridosperm of which the fruit bracts, and are freely scattered over certain layers of the shales. Whether the objects in this flora described as *Whittleseya*, are fruiting parts of Pteridosperms, only closer investigation of the flora can determine, but it seems probable that other Pteridosperms besides those already observed, find a place here.

The genus *Megalopteris* Dawson, is one which so far as we know, had its birth in this flora. In some southern habitat, it may have tided over the trying time of the Devonian Age, ready to appear in the lower Coal Measures of the great central plain of North America in the Mississippi valley, when the time of strain had passed by, and the warm and humid atmosphere of the southern latitudes came back to North Eastern North America. That this was its history, seems probable from the fact that the next oldest species of this genus known are found in the lower Coal measures of the Mississippi Valley, whence the genus may have found its way to Pennsylvania.

The portion of the Little River group which contains the Filicoid genera above described, that are so like those of the Coal Measures, is that by which its flora is best known, from containing mostly species described by Sir William Dawson; but sufficient emphasis has not been given to the fact that only a certain part of the plant remains of this group has been exploited; both the underlying and overlying parts of the group have a considerable flora and yield species differing from those of the rich collecting ground where Prof. Hartt and others made their chief gatherings.

But although there are these differences in the genera, and species of plants of this group at different horizons, its flora possesses a unity of aspect in strong contrast to theDevonian flora which came after. So wide is the difference in the composition of the two floras that we must look upon them as having flourished under very different conditions of soil and climate. The conditions under which the Coal Flora grew, have received careful study and from these we may infer similar conditions in southern New Brunswick when the plants of the Little River Group were living.

But the influences surrounding the Devonian Flora when it flourished in the same region must indeed have been different. The conditions of climate which would seem to have best suited the Devonian types was that of a dry and cool atmosphere, broken annually by a short period of rains, when the short and scanty vegetation made a rapid growth. Such conditions at least would best accord with the prevalence of xyrophytic forms like the Psilophyta and the small leaved Lepidodendra, and the rarity of the Equisetinæ. Broad leaved plants like the Cordaites are rare in the Devonian vegetation and the Filicoid plants are mostly of the genus Archæopteris. The plants that did prevail are mostly recorded as having had rhizomes or fleshy root stalks, and in these could have stored up the nourishment which enabled them to throw out a vigorous growth at that time of the year when the season of expansion arrived.

To account for the very diverse floras that appeared from time to time in North-eastern North America, one may suggest some such succession of events in Palæozoic Time as the following:—

(1). The oldest flora that we know is so complex that a long period of Geological time would have been required for its differentiation, and development. As this flora with its complexities appeared near the base of the Silurian terrane, its ancestors must have far antedated that time[1].

(2). Moreover, it is not plants alone, but various types of animals of the land that appeared, which also show an early development, such as

[1] Since this was written a still older flora has been discovered in a lower group of this terrane.

Snails, Crustaceans, Myriapods, Insects, and even Batrachians; these also must have had a terrestrial home for a long anterior period.

(3). The Flora as it appeared in Silurian time with many broad leaved, and many reed-like plants, indicating a humid, warm and perhaps insular climate. The flora was presented in three aspects (*a*) that of the Dadoxylon Sandstone (*b*) that of the Lower Cordaite Shales (*c*) that of the Upper Cordaite Shales.

Here occurs a change of Climate and a new type of Flora.

(4). Here follows the Psilophyton Flora of the Mispec Group (Lower Devonian).

(5). Acadia becomes continental, but no land fauna or flora are known there, (Middle Devonian.)

Extrusion of granite with folding and metamorphism of the strata.

(6). The Psilophyton—Lepidodendron—Archæopteris—Aneimites Flora becomes fully developed (Upper Devonian). This affords passage to the Lower Carboniferous Flora.

Plants of the Little River Group, described chiefly by Sir J. W. Dawson.

The names used in this catalogue are chiefly those of Sir J. W. Dawson, alternative names and those of new genera, species, etc., are in italics.

EQUISETINÆ.

The writer has put this ancient group of plants first on the list because of their variety and perfection. The large number of genera and species show an early differentiation and prove the antiquity of the group and the fact that one species persisted from near the beginning of Silurian to Permian time shows its adaptability to Palæozoic conditions, and other of the type were almost equally long-lived. The seaweeds of Ordovician Time described by Whitfield, Rudemann and others show the early utilization of this mode of division of the stem by the marine Algæ. Prof. O. Lignier in his Morphological Evolution of the Vegetable Kingdom shows how Land Plants may have been derived from the Algæ, etc.

Calamites transitionis, Göpp (*Archæocalamites scrobiculoides.*)[1]
C.—cannæformis, Brongt.
C.—Suckovii, Brongt.
C.—geniculosus.
C.—Cistii Brongt, *mut.*
Calamodendron antiquum, Dn.
C.—tenuistriatum, Dn.
Ramicalamus dumosus,[2]
Asterophyllites lentus, Dn.
A.—parvulus, Dn. & *var.*
A.—*longifolius*, Sternb.
Asterophyllites fasciculatus.
A.—fissus.
A.—[*Lepidocalamus*] scutigera, Dn.
Annularia (Asterophyllites, Dn.) latifolia, Dn.
A.—(Asterophyllites, Dn.) latifolia, Dn. mut. *minor.*
A.—(Asterophyllites, Dn.) acicularis, Dn.
Palæostachya acicularis.
Annularia longifolia Brongt, mut, *Leavitti.*
A.—recurva.
A.—(?) *ligata.*
Sphenophyllum antiquum, Dn.
S.—latum & var. *minus.*
S.—gemma.
S.—innocens.

LYCOPODIACEÆ.

This group in the paucity of forms no less than in the scarcity of individuals shows a remarkable contrast between the Little River flora, and the usual groupings found in Devonian floras, and although I have inserted several species on the authority of Sir Wm. Dawson, the comments under the several species will show it is quite probable these should be eliminated.

Lycopodites Matthewi, Dn., a small species, and rather rare, only the vegetative branch known.

Psilophyton elegans, Dn., a small tufted, trailing form, whose fruiting branches are slender and elongated. Placed here in accordance with the old classification, but it is probably a Pteridosperm.

P.—(?) glabrum, Dn., referred to this genus with doubt by its author.

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[1] Trans. Roy. Soc. Can. 2d Ser. Vol. XII, p. 112.
[2] Ibid, p. 114.

? P.—princeps, Dn., inserted on the authority of the author of the species, but there is nothing to represent it in the collection of types.

? Lepidodendron Gaspianum, Dn.; the remarks in reference to the preceding species apply to this.

Rhizomes and roots which may belong to the above group, are here added, viz:

Pinnularia dispalans, Dn. Probably the stolens or roots of Annulariæ.

P.—elongata, Dn.

P.—nodosa, Dn. The author of this name suggests that this may be the root or rhizome of Asterophyllites [Lepidocalamus] scutigera.[1]

FILICINÆ.

Of the many genera which Sir William Dawson's list places among the Ferns, there is only one, Pecopteris, which modern discoveries of the fruiting organs of several of these "fern" genera, with certainty, leaves there. Among the Pecopterids there is at least one species possessing the usual sori (or an appearance of such) which we are accustomed to associate with the reproductive organs of the Filicidæ. These organs are in rows on the backs of the pinnules, and the plant has the pectinate arrangement of the pinnules on a stout rachis which we are accustomed to associate with the typical species of this genus.

PECOPTERIDÆ.

Pecopteris serrulata, Hartt, (allied to *P. plumosa* Brongt. and *P. Silesaica*, Göpp. fide Dawson.)

? P.—obscura, Lesq. (The occurrence of this species is doubtful).

P.—(Aspidites) pretiosa, Hartt.

P.—(Cyathites) densifolia, Dn.

PTERIDOSPERMA.

In cases where we think it has been shown that seed-bearing species of fern-like plants have been found in this flora, the generic name has been changed for the species in question from that given by Sir William Dawson; but, otherwise his name has been preserved even where the port of the plant indicated a generic relationship to one of the Carboniferous Age that has been shown to be seed-bearing.

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[1] Except a few species the remainder of this flora has not yet been revised, the list therefore is only tentative.

Group Johannophyton.[1]

Johannophyton (Alethopteris Dn.) discrepans, Dn.)

Sporangites acuminata Dn. (Fruit of the above Pteridosperm.

Alethopteris ingens, Dn. (A rare species, no type in the Natural History Society type collection).

A.—Perleyi, Hartt.

Group Ginkgophyton.[2]

The next group is not uncommon in the Devonian as well as in the Little River group, and in the latter is represented by

Ginkgophyton Leavitti.

Cyclopteris (Aneimites) obtusa, Dn.

C.—(Archæopteris) valida, Dn. (This species has the aspect of an Aneimites or Triphyllopteris, rather than of Archæopteris).

? C.—(Aneimites) Bockshii, Göpp. Dn. (A smaller form than *A. obtusa* but the specific reference needs revision).

Group Pseudobaiera.[3]

This group also has resembling species in the Devonian, viz., certain dissected Sphenopterids (*Sphenopteridium*), and has mucronate tips to the lobes of the pinnules like certain Archæopterids, and Ginkgophyllids.

Pseudobaiera McIntoshi.

? Cyclopteris (Archæopteris) Jacksoni, Dn. (I have not found this form in the Little River group, nor is it among the types returned by Sir William to the Natural History Society Museum at St. John).

Group Lyginopteris.[4]

Species of the type included in this group, of Coal Measure age, have been found to be Pteridosperms, but the connection of seed-bearing parts with the vegetative branches has not yet been shown for the corresponding forms of the Little River group.

Sphenopteris marginata, Dn.

S.—Hoeninghausi, Brongt, Dn.

? S.—Hitchcockiana, Dn. [Said by Dawson (page 52) to be possibly the spore cases of an Archæopteris].

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[1] Trans. Roy. Soc. Can. 3d Ser. Vol. III, Sec. IV., p. 83 (1909).

[2] Trans. Roy. Soc. Can. 3d Ser. Vol. III, p. 87 (1909).

[3] Bull. Nat. Hist. Soc. N.B. Vol. V., p. 393 (1906).

[4] Proc. Roy. Soc. t. LXXI., pp. 477-83 (1903).

S.—Harttii, Dn.

S.—splendens, Dn.

S.—(Callipteris) pilosa, Dn. (The venation is obscure in this species.)

Most writers refer to Sphenopteris a group of forms with narrow dissected pinnules, few nerves and alated margins which Sir William has separated as Hymenophyllites. It may be noted that the mode of forking in *Psilophyton* (?) *glabrum*, Dn., is somewhat like that of this group of Sphenopterids.

Sphenopteris (Hymenophyllites) curtilobus, Dn.

S.—(H.—) subfurcatus, Dn.

S.—(H.—) Gersdorffii, Goepp. Dn.

S.—(H.—) obtusilobus, Goepp, Dn., (larger than the preceding, but like it).

S.—(H.—) Hildreti, Lesq. Dn., (Found at Lepreau by T. C. Weston)

Group NEUROPTERIS.[1]

The next group of forms we have to deal with are those which have the Neuropteroid nervation, typified by *Neuropteris polymorpha*, Dn. This species is the Silurian equivalent of *Neuropteris heterophylla* of the Carboniferous Time, which has been found to be a Pteridosperm.

Neuropteris polymorpha, Dn.

N.—Selwyni, Dn. (A single specimen among the types in the Natural History Society Collection; another noted by Mr. David White, on a slab in the Redpath Museum, having on it also the type of *Whittleseya Dawsoniana*, D. White).

N.—crassa, Dn. (A single pinnule collected by Wm. Lunn, fide Dawson).

N.—retorquata, Dn . (Common at Lepreau, rare at St. John).

Cardiopteris Eriana, Dn. (The fossil referred to this genus by Sir William is very like certain lateral pinnæ near the base of the rachis in *Neuropteris polymorpha*, Dn.

Whittleseya Dawsoniana, D. White.

W.—concinna and varieties, *lata* and *arcta*.

Allied to the Neuropterids are certain forms placed by Dawson under other genera; some have the venation of Aphebia, and may be basal or rachial pinnæ of species of Neuropteris, others are of the allied genus Odontopteris.

Cyclopteris (Nephropteris) problematica, Dn.

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[1] Proc. Roy. Soc. t. LXXII, p. 487 (1903)—Phil. Trans. Roy. Soc. Vol. 197 B. p. 1 (1904).

C.—(*Odontopteris*) varia, Dn. (Referred by Dawson to Nephropteris, but the latter name would refer only to the larger pinna he has *figured* under this name; the smaller figure, which is the basis of his *description* is Odontopteroid.

Neuropteris serrulata, Dn. (This appears to be the same as *Pecopteris serrulata*, Dn., which see; it has not the venation of a Neuropteris).

Neuropteris (Megalopteris, Dn.) Dawsoni, Hartt.

Group Sigillariæ.

Following Sir Wm. Dawson, we have here separated Sigillaria from the Lepidodendra with which it is usually classed; true Lepidodendra appear to be unknown in this flora, if existant at this time they were not denizens of the delta and lagoons of the Little River Group, or at least were rare there.

Sigillaria palpebra, Dn. (The leaf scars are small and obscure.)

Stigmaria perlata, Dn., is placed here on account of the usual connection in the Coal Measures between this genus and Sigillaria and Lepidodendron.

Group Cordaites.

The plants of most advanced structure in this flora are Dadoxylon and Cordaites, the former based on stems the latter (so far as the study of this flora by Sir Wm. Dawson is concerned) on leaves. But the very great abundance of the leaves of Cordaites, and of the fruit called *Cardiocarpon cornutum* Dn., in this flora, leads one to infer the association of these objects in the relation of leaf and fruit of the same plant. Prof. D. P. Penhallow has described *Dadoxylon Ouangondianum*, Dn., as a Cordaites.

Dadoxylon Ouangondianum Dn.

Sternbergia (or *Artisia*)—a pith mould of Dadoxylon.

Cordaites Robbii, Dn., (and perhaps other species, not separated.)

? Cordaites angustifolia, Dn. (This plant is probably different from the Devonian (Gaspé) type specimens of this species described by Sir Wm. Dawson.

Cardiocarpon cornutum, Dn.

C.—Baileyi, Dn.

Fruits of Undetermined Relation.

Whittleseya is listed with the Neuropteris Group, but its connection there is not established.

Cardiocarpon ovale, Dn. (The general structure is that of Cardiocarpon, but the form is not typical).

C.—Crampii, Hartt, has not the form of a true Cardiocarpon.

C.—obliquum, Dn., is probably of another genus.

Trigonocarpon racemosum, Dn.

T.—perantiquum, Dn. (The author of these species considered them to be fruits of Sigillariæ or Conifers).

Antholithes Devonicus, Dn.

A.—floridus, Dn. (Attention may be called to the resemblance of these objects to the male inflorescence of Cordaites.

PSEUDOBAIERA.

New material of the species *Pseudobaiera McIntoshi*, has been obtained that more fully exhibit the features of the plant than those upon which the description was based, and an account of these is given with the original description which is as follows:—[1]

"PSEUDOBAIERA, n. gen.

"This genus is represented by certain thick, smooth leaves, which in appearance and structure combine the characters of Filicales and Ginkgoales. The leathery leaves, having strap-like lobes, ending in mucronate points recall Baiera, while the general port of the plant is that of a fern.

"The frond is tripinnate and seems related to Sphenopteridium, or to Eremopteris, and Triphyllopteris. It is regularly alternately pinnate, the pinnules deeply cleft into strap-like lobes, which lobes also are alternately pinnate, and decurrent on the midrib. Venation obscure owing to the thickness, and smooth surface of the pinnules.

"In the fertile pinnules the lobes are replaced by obovate sporangia or seed vessels, alternately pinnate, as in the barren frond, and becoming smaller toward the end of the pinnule.

"The plant representing this genus has a general resemblance to *Cyclopteris dissecta*, Göpp (Sphenopteridium)[2] as well as to *Eremopteris* Schimper; but both of these forms are bifurcate in the rachis, and we do not know that this is, they also have more numerous veins and a more flabellate pinnule. It differs from *Sphenopteris* in the thick broad, flat pinnules, and the absence of a prominent nerve in the lobes, from *Hymenophyllites* also by the absence of alation on the rachis and its subdivisions.

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[1] Bull. Nat. Hist. Society of N. Bruns'k, Vol. V, p. 393, 1906.

[2] Zittel's Palæontology, Vol. III, (Plant) p. 108.

The fruitage may be compared with Archæopteris, except that the pedicelled series of reproductive organs of the fertile pinnules of that genus are replaced by alternate sporangia or pod-like bodies in this.

"PSEUDOBAIERA MCINTOSHI, n. sp. See plate, page 21.

"The species is represented by incomplete fronds.

"The rachis is smooth, but has a longitudinal shallow furrow. Attached to it are pinnæ the rachis of which has a somewhat scabrous, undulate surface, and shows when decorticated a number of vascular bundles.

"The pinnules are set on this rachis about half an inch apart on each side, and at an angle of about 50° to 70°; they are long-oval in form, are about an inch and a half or two inches long, and are about three quarters of an inch broad, and are slightly arched forward in the outer half. They are deeply incised into about five long narrow lobes on each side, and a terminal lobe; the side lobes are directed forward at the ends, and are decurrent on the mid-rib; the lobes are alternately pinnate, slightly arched forward, have nearly parallel sides, and are truncato-lacineate at the ends, where there are from three to five mucronate points; in the lateral pinnules the first two lobes on the upper side are frequently united for one half of their length. The pinnules are thick and smooth, and the venation quite obscure, except near the ends of the lobes, where from three to five veins can be made out, one vein running to each mucronate point; decorticated examples show several parallel nerves about the mid-length of the leaf (or pinnule).

"The fertile pinnæ are of smaller size, and bear alternately pinnate, spatulate-ovate (hollow?) pod-like bodies, or sporangia; in the examples known these bodies do not extend to the base of the pinna, but there are one or two barren strap-like lobes at the base. This pinna is about an inch and a half long and half an inch wide, and shows about four spatulate lobes on each side. These spatulate lobes show a branched venation and possibly held seed vessels which became detached.

"From the number of detached pinnules of this species found scattered on layers of the shale, it seems probable that the plant had a deciduous habit.

"*Horizon* and *Locality*.—This plant was collected from a thin bed of shale, about 200 feet below the summit of the Dadoxylon Sandstone by Mr. William McIntosh at Duck Cove, Lancaster N.B.—Not rare.

"The resemblance of this plant in its mode of branching, etc. to Baiera may be seen by comparing its narrow, upright, pinnate lobes to the lobes of the leaves of Baiera; compare also the alternate pod-like fruit.[1]

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[1] See Zittel's Palæontology, Vol. III (Plant), p. 253.

The following plants were found to occur with this species—A species of Cordaites is quite abundant. It is probably a variety of *C. Robbii*, Dn., but the Cardiocarpon that occurs with it is smaller, and less fleshy than *C. cornutum* of the Lower Cordaite shales. Two abundant plants are an Asterocalamites, allied to *A. scrobiculatus* Schloth, and a Calamites cf. *C. Cistii*, *C.* cf. *Suckovii*, also occurs, but is not nearly so plentiful. The remains of these four plants, according to Mr. McIntosh comprise three quarters of the collection (of plant remains) made by him from this bed.

"Remains of ferns are rarer. There is an Alethopteris differing from *A. discrepans*, Dn., the common species of the Lower Cordaite Shale. A Neuropteris occurs which is not *N. polymorpha*, Dn., so abundant in the higher measures. An obscure Sphenopteris and two forms of Pinnularia occur, one of which is *P. dispalans*, Dn.

"In consequence of the coarseness of the matrix it is difficult to read the intimate characters of these ferns, but it is evident that the flora occurring with Pseudobaiera was somewhat varied.

"MUTATION FLABELLATA n. mut.

"In this form the pinnules were somewhat more than half an inch apart on the side of the rachis. The pinnules appear to have been about one and a half inches long, and were about three quarters of an inch wide; they were thinner than in the typical form, and the lobes were more spreading; also the ends of the lobes were more frequently and more deeply gashed; the veins also were more readily seen.

Horizon and *Locality*.—Found in Plant Bed No. 2 of Hartt's series (at Fern Ledges, Lancaster, N.B.)—Scarce.

"I have had this form in my collection for many years, but thought it too imperfect for description. It is now clearly seen to be related to the plant discovered by Mr. McIntosh.

"At page 516 of Sir Wm. J. Dawson's Acadian Geology, Professor C. F. Hartt has given a section of the strata at the "Fern Ledges" on the Bay Shore in which he gives the Dadoxylon Sandstone an assumed thickness of 300 feet. Considering this as the thickness of these sandstones at Duck Cove, the following would be the relative position of the beds containing the fossils above described to the section studied by Professor Hartt.

	Feet.
"Dadoxylon Sandstone below the horizon of Pseudobaiera and its associates.	88
Dadoxylon Sandstone including the seams carrying these plants.	12
Dadoxylon Sandstone above these beds	200
Lower Cordaite Shales, part containing Hartt's plant beds	140
	440

The new material shows variation in several respects. One fine pinna shows evidence of a more generous growth than was noted in those first observed, as the pinnules are placed three quarters of an inch apart on each side of the rachis. But on the other hand there are sheafs of narrow leaves that appear to have sprung from the sides of stout stems; these in size show a deviation from those first examined, and are either growths from running root stocks, or are of the nature of Aphebiæ.

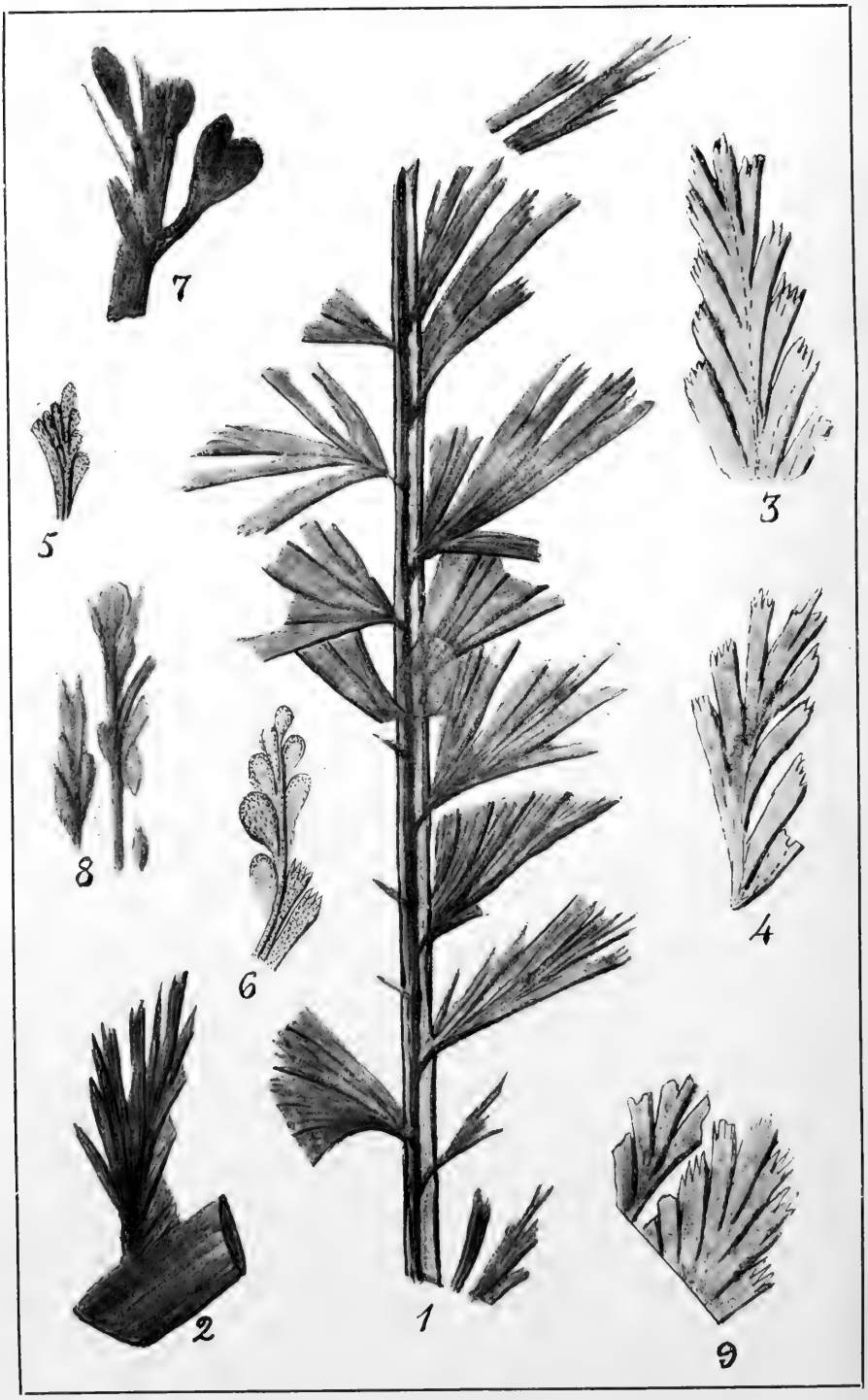
The typical pinnules of this species appear to have been somewhat clasping on the rachis, unless this appearance is due to the strong leaf-strands that spring from the centre of the rachis; the rachis is channelled on the upper side. A short way above the base of the main sheaf of the pinnule a lateral lobe sets off on the inferior side of the pinnule; but the rest of this sheaf runs forward from a narrow base strongly ribbed, spreading, and forking as it goes into about five main divisions which have broad mucronate ends.

Some specimens were observed which may show phases of the fruiting pinnæ differing from those first described, though it is not quite certain that they belong to this plant as they do not have the two vegetative pinnules preserved at the base which mark those first observed. One example shows a pair of thick and substantial seed vessels attached by a stem of their own length to a stout rachis. The rachis is wider than that of the vegetative stem of Pseudobiera; other obscure fruits are visible higher up on this rachis.

Beside this object another pair of stemlets are present; these bear lance-oval objects placed alternately on the sides, which possibly were male-organs of this species. The substance of these objects was much thinner than that of the pod-like organs and has left but a faint impression on the shale.

The study of this plant with its parts and associations, its thick leathery leaves, its pod-like fruit and other Cycado-filicene characters would incline one to class it with the Pteridosperms.

For description of plate see page 21.



PSEUDOBAIERA.

DESCRIPTION OF PLATE OF PSEUDOBAIERA MCINTOSHI.

Fig. 1. Vegetative branch, showing the pinnules alternately placed on the rachis; owing to pressure, the vascular axis of the rachis is visible, and the bundles going to the several pinnules.

Fig. 2. Alphebian pinnule with narrow lobes.

Fig. 3. A terminal vegetative pinnule

Fig. 4. A lateral vegetative pinnule.

Fig. 5. A young fertile pinnule with several spatulate lobes and one strap-like lobe.

Fig. 6. A fertile pinnule with two vegatative lobes, and a raceme of pod-like sporangia.

Fig. 7. An old fertile pinna with a few mature pods.

Fig. 8. Inmature fruit pods, or possibly male-organs. All of the above figures are of the natural size, and the examples are from the Dadoxylon Sandstone at Duck Cove, Lancaster, N. B.

Fig. 9. Mutation *flabellata*. Portions of two vegetative pinnules. Natural size. From Lower Cordaite shale at Fern Ledges, Lancaster, N. B.

II.—*The Formation of Coal.*

By D. B. DOWLING.

(Communicated by L. M. LAMBE and read 27th September, 1910.)

The materials from which coals are supposed to have been derived are the remains of former living organisms. Among the lower grade coals, such as the lignites, some are found to be so manifestly made up of woody fibre that their derivation from decayed vegetable matter is without doubt. In the more altered coals evidence of the same origin is given in microscopic fragments of cellular matter and plant spores. There are however certain coals sometimes in seams or portions of seams that show apparently no organic structure or have strongly marked bituminous characters which have suggested a possible enrichment from petroleum deposits. If we assume that the bituminous characters are derived from the decay of plant or animal life we need only enquire into the possible method of decay and subsequent alteration. In this we are already assured that bitumen in many cases has been proven to have originated from the decay of plant and animal life. If the bitumen or bituminous characters of coals are assumed to have originated from petroleum deposits deeper seated than the coals then the method of impregnation must be considered—a matter that is much harder to account for.

In considering the question of the derivation of the various kinds of coal from a common origin, an enquiry into the composition of the several varieties is necessary. The general alteration toward coal is accepted as an increase in the carbon content; but at each degree of alteration there are variations in character among the different deposits. These variations are almost entirely due to variations in the hydrogen percentages. The behaviour of coals having hydrogen above the normal will be—free-burning, bright flame, coking, or that generally described as due to fatty characters, while those with hydrogen below the normal will be short flame, non-coking and be generally what is described as dry coals.

The question then of the derivation of the different varieties of oal from a somewhat uniform constituent, namely woody fibre, involves the consideration of the possibilities, in the different stages of alteration, for the preservation or the loss of the hydrogen of the original material. As comparatively little has been written on this part of the subject the present paper aims at a presentation of some possible conditions that may have had an influence on the variations that are found in the final product.

The stages in which variations in the hydrogen percentage and other chemical differences may be expected can be discussed under the three following heads:—

(1). Variations in the original composition.

(2). Duration and character of decay.

(3). Amount and kind of alteration due to dynamic and geologic influences.

Variations in Original Composition.

The plants which made up the deposits now found in the coal measures of the Carboniferous are of early types and we can judge of their composition only by referring to those of somewhat similar forms which belong to the existing flora. There is a possibility that in the old forms the composition has been preserved more or less in the simpler ones of the present; but as there is found no great range in composition among these, it is inferred that the composition of the old plants had no very wide range. The early types have given rise to many varieties so that in plants of later times there is a much larger variation in chemical composition. The plants which are supposed to contribute largely to these coal deposits even in later times are the smaller varieties in which variations from the average woody fibre are small. We may therefore conclude that in original composition the plants have had no very great influence on the final composition of the coal; but that physical characters which indicate different rates of decay are of more importance.

It is quite noticeable in plants that the herbaceous parts are more susceptible to decomposition and disintegration than the stems and harder parts. Differences in chemical composition in the several parts of the plant are also noticeable in that the leaves and twigs contain higher hydrogen percentages than the wood and bark.

This seems to indicate that the herbaceous plants would be high in hydrogen compared with varieties having woody tissue as a principal component, so that there is a possibility that the smaller plants might form deposits which would originally differ in composition from other masses. Where however vegetation was of a mixed character although there may have been original differences in composition of the different plants, they were so mingled together in the mass that they do not affect the coal except in appearance. The soft vegetation by its easy disintegration loses its organic structure and assumes the appearance of a jelly-like mass which probably constitutes the material which in many cases forms the bright coals or the bright streaks in dull varieties, such as the Lower Cretaceous coals of the Rocky Mountains. The partly obliterated

cellular tissue remnants of the more resistant parts of the vegetation, are found generally in the duller parts of the coal and though originally this was as low in ash as the softer parts it now probably contains, most of the ash originally in the whole mass, since the jellied portion has no doubt lost part of its original ash by gravitation through to the firmer material beneath. The chemical variations in coal due to original composition seem to be influenced greatly by the physical character of the original mass. The softer vegetation seems to contain a lower percentage of carbon and is easily macerated and consequently more quickly subjected to the alterations of the decaying stage.

Process of Decay.

The initial change in the vegetal mass follows immediately after the death of the plant. The vital energy of the cells which throughout the living period was expended on the absorbing of carbon compounds, is then relaxed and compounds of carbon and oxygen are quickly formed as well as others including volatile hydrocarbons. Should there be a general loss of carbon dioxide the effect, that is if the process is maintained for a long period, will be a general raising of the hydrogen and carbon percentage of the remaining mass. The hydrogen, however, when it is in excess is liable to be set free and to take with it some carbon which means the loss of both hydrogen and carbon, generally in the form of marsh gas, until they are reduced again to a point of greater stability. The decaying stage, then, appears to induce the liberation of carbon dioxide to a point at which the mass remaining is high in hydrocarbons and then the hydrocarbons being unstable give off volatile gases until stability is arrived at. Variations then in the resulting coal may depend largely upon the period or stage at which the process of decay was stopped.

Bacteriological fermentation which seems to be present in all decay apparently aids the production of carbonic acid, at the same time forming more stable hydrocarbon compounds in the mass. This, if proven, means that fermentation directly raises the hydrogen and carbon percentages, possibly by forming from the complex mass definite compounds between the hydrogen and carbon and allowing compounds of oxygen and carbon to escape.

The assimilation of hydrocarbons is common to both plant and animal life. In animal life large percentages of nitrogen are stored in the body cells, while in plants a much smaller amount is required. In the forms of life which we have in ferments a very small nitrogen content is required, so that one function of fermentation seems to be the liberation of nitrogen from the mass as well as of carbonic acid gas. Humic acid, which arrests the process is also formed; but if the bog or

bed be not stagnant, this is drained away and the fermentation continued to the stage where volatile hydrocarbons cannot be retained and marsh gas is given off. The point at which fermentation is arrested no doubt determines in great measure the chemical composition of the ultimate product. The possible history of the process of the chemical change may be summed up as follows:—

During the fermentation stage the loss of CO^2 is raising the percentage of hydrogen and carbon, then marsh gas is lost and these two percentages decrease. This process may be repeated many times, but cannot continue indefinitely, entombment under other deposits evidently will check it and the hydrogen percentage of the mass may vary from a stable condition with low hydrogen to an unstable one with high hydrogen percentage.

Experiments on fermentation have been undertaken with the object of tracing the origin of natural gas. The composition of the gas given off has been carefully noted and in all the published results, the tendency has been first toward a production of CO^2 with N. in small amount and toward the end of the experiment the production of CH_4. The results of several of these experiments may be here cited.

Substance fermented:—

Pure cellulose—$C^6 H^{10}O^5$.
Experimenter—Tappeiner.[1]

Gas evolved	at beginning	at end.
CO_2 / H_2S	85.40	76.98
H.	0.0	0.0
CH_4	11.86	23.01
N.	2.73	0.0
	99.99	99.99

In another experiment given by "Hoppe-Seyler" the gas expelled from the marsh gas fermentation of cellulose was:—

CO^2	50.
CH_4	45.
H.	4.

[1] Ber. I. Chem. Geo. 1883 Part 16, pp. 122 & 1734.

In the decay of seaweed Phillips[1] gives results from seaweed from Santa Barbara which was left to decay in water. The gases given off at three periods were as under:—

	1st.	2nd.	3rd.
CO_2	18.23	32.47	53.44
CH_4	0.30	0.28	0.08
H.	62.24	48.97	42.02
N.	19.23	18.28	4.46
	100.00	100.00	100.00

An experiment by Frankland and Jordan[2], gives, for grass left to decay under water, an evolution, in 3 days of the following:—

CO_2	84.63
O.	0.13
H.	6.90
Combustible gases	2.51
N.	5.83

The change indicated in the case of seaweed is an early liberation of large quantities of hydrogen and nitrogen, a similar result to that which might be expected from animal remains and one which suggests that there is not as wide a difference in composition between low types of aquatic plants and animals as one might suppose. The liberation of hydrogen might also at first be partly due to decomposition of water in the oxidation of the tissue. In the later stages this hydrogen loss is reduced and the production of carbon dioxide rises.

In the case of the decomposition of grass under water, evolution of carbon dioxide is the principal result, although free hydrogen seems to be present and tends to reduce the hydrogen content of the resultant mass. This loss of hydrogen would probably not be kept up for any length of time and the process of decay would actually result in an increase in the carbon and decrease of oxygen percentage.

The simple heating of vegetable matter such as hay, manure, etc., indicates an alteration comparable to a slow combustion. That the alteration results in the increase of carbon has been demonstrated by Mr. A. Strahan[3] in analyses of the fresh material and the darkened compact masses from hay ricks. The analyses for ash free material are:

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[1] The Am. Chem. Journal 1894, p. 427.

[2] Journal Chem. Soc. 43 295 (1883.)

[3] Memoir Geol. Survey England & Wales. "The coals of South Wales."

	Fresh hay.	Darkened hay.
Carbon	48.96	51.61
Hydrogen	6.33	5.88
Oxygen	42.41	40.50
Nitrogen	2.30	2.01

The increase in ash in the two samples may indicate the amount of loss and on this basis it may have been as high as 18 per cent distributed as follows:—

Carbon	6.63
Hydrogen	1.51
Oxygen	9.29
Nitrogen	.65
	18.08

The form in which this loss occurred was probably gaseous. Of the ordinary combinations the following will satisfy the above proportions:—

Ammonia	0.79
Carbon dioxide	11.01
Marsh gas	4.84
Water	1.44
	18.08

Although other combinations could be formed free hydrogen would be liberated. If free hydrogen or nitrogen were liberated these amounts would be slightly altered; but they no doubt represent in a general way the combinations that were formed.

In a bed of mixed vegetable material the softer parts, which generally are lower in carbon, suffer both maceration and fermentation with a consequent increase in their carbon content, while the harder parts decompose more slowly; hence a uniform percentage of carbon is soon attained in the mass. Coals of a uniform bright fracture are evidently from homogeneous soft material in which the maceration was complete before entombment. In the bright coals frequently are found beds in which the ash is very low. In these cases it may be that the jelly mass had been derived by settlement in basins from the drainage of swamps or bogs, the transporting waters carrying the ash particles but short distances compared with the distance to which the gelosic material could be transported.

Aquatic plants are, as a rule easily disintegrated and microscopic algæ are especially so. The inference that these materials would rapidly decay and reach a higher stage of alteration before entombment is natural, so that the high hydrogen of cannel coal might be accounted for by ascribing its derivation to aquatic vegetation with no doubt microscopic animal life associated with it.

If cannel coals are of aquatic plant and animal origin they would be expected to occur largely in the marginal continental coal areas and only occasionally in inland lake basins. As aquatic plants preceded land forms, it is reasonable to expect that the majority of these beds would occur in the early coal measures. The sequence should be (1) beds formed from aquatic life both plant and animal, (2) beds in which aquatic plant life predominated and (3) beds formed mainly of land plants.

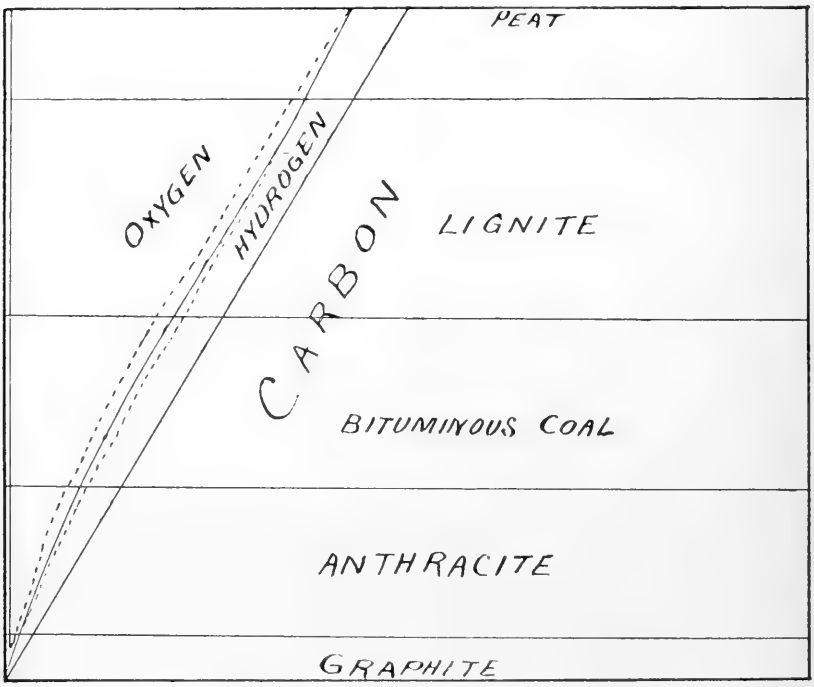
This sequence is borne out in general by (1) the oil shales being generally pre-Carboniferous, (2) cannel coals, frequently found in the early Carboniferous and (3) the coals which date from Carboniferous and later times.

Alteration due to Dynamic and Geologic Influences.

A mass of vegetable matter when covered by subsequent deposits, is for the remainder of its history (generally a long time interval), subject to alterations due to pressure and possibly also heat. Pressure without heat or a great lapse of time, produces merely a physical hardening or solidifying of the material, mainly by the exclusion of the water content. Heat alone, on the contrary, causes the rapid reduction of the total amount of carbon by the formation of combustible hydrocarbon gases as well as non-combustible compounds of carbon and oxygen. The process of eliminating the hydrogen and oxygen from vegetable matter by heat is the common one employed in the manufacture of charcoal. If the temperatures employed are sufficiently high nearly pure carbon remains; but out of the original 50 per cent there would then remain but 15, which shows the enormous loss of carbon the process entails. If the earthy material which existed as ash in the plants be not driven off by the action of heat the original amount instead of being part of 100 units would be a fraction of 15, so that the percentage of the ash would be raised to a possible six times that originally in the plant. But, as the ash of coals seldom shows such a possible increase as this, it seems that in the formation of coals, some restraining influence, possibly high pressure, had prevented this great loss of carbon.

If we assume that the most altered coals have passed through all the other grades in their formation, the composition then must have

followed that of the peats, lignites and bituminous coals and consequently the history of a coal can be placed in diagrammatic form by a compilation of the analyses of the different grades.



In this way we find that for each stage in the development we have a fairly constant decrease in oxygen with the increase in carbon. Also we have a mean hydrogen content which shows a slight decrease compared with that for oxygen. The variations for hydrogen above or below the mean as previously mentioned accompany certain characters in the coal.

If we now attempt to follow the alterations by suppositions as to the materials lost to the mass we may first assume that the loss was possibly in hydrocarbons. Those that are indicated in the application of heat are the loss of carbondioxide and marsh gas. The relation of these, in order that the material left conform in analysis to that of the diagram, should be near the following ratio by weight $\frac{CO_2}{CH_4} = \frac{44}{16}$. At the same time we must allow for the reduction of the nitrogen by the formation of ammonia. Under this supposition, when the coal reached the anthracitic stage, the possible loss of carbon would be as high as sixty per cent of the original carbon or thirty per cent of the original mass. The carbon remaining (practically the whole mass) would be

only twenty per cent of the original mass, so that the ash would be magnified over four times. This would indicate that coals should have high ash and does not seem reasonable when we find coals containing as low as two or four per cent of ash when the vegetable material from which it was derived had only from one to two per cent.

We therefore assume that pressure has prevented a waste of carbon and for confirmation of this we turn to the experiments being made in the reduction of modern peat to a higher grade fuel. In the charring of peat to make charcoal there is a great loss; but in the processes in which the wet peat is subjected to pressure and heat either in furnaces or by superheated steam, it is definitely stated that no volatile combustible gasses are formed during the operation of raising the carbon percentage.

If this is true combinations between oxygen and hydrogen and oxygen and carbon must have been formed. The formation of water, in this way, increases the carbon of the solid matter but leaves it slightly low in hydrogen. Should there be a small per cent of carbonic acid gas formed, the hydrogen would be raised to the normal and the alteration would then follow that outlined in the diagram, and coals of various grades will be formed depending on the relation between the amounts of these two that are eliminated. If carbon dioxide is freely formed, fatty coals result or if only small amounts are dissolved and carried away in the water formed, lean coals or those with low hydrogen are formed. For the general average the proportion by weight would be $\frac{H_2O}{CO_2} = \frac{7}{1}$

This entails a loss up to a possible 6 per cent of the carbon and will not unduly raise the ash percentage.

We have in this way outlined two extreme cases in which coals could be formed—the one wasteful and the other much less so. It is not to be supposed that the majority of the coals could be classed as having been formed altogether in either of these methods; but examples possibly could be found which would approximate in character the expected resultant of either. The majority will possibly show a range of ash (not taking into consideration any possible material from extraneous sources, such as partings in seams which denote a subsidence or flooding) which will indicate some loss of hydrocarbons; but not of any great amount, the alteration being due largely to the elimination of oxygen compounds.

The formation of coal from the peat stage depends mainly on the application of pressure maintained for long periods—the alteration being hastened by heat. Extreme alteration or loss of oxygen is found in the anthracites which, especially in America show relatively higher ash than the bituminous coals of the same formation. This suggests that their

alteration was accomplished by extreme or heavy pressure and possibly heat which subjected the beds to such unequal strains that fractures were formed whereby the escape of gases was possible.

Other coals which have anthracite characters with less ash than the bituminous coals are found in South Wales where the beds have been subjected to pressure but with little disturbance. The coal fields are in basin form and the carbon percentage seems to rise gradually with the depth, that is, seams near the eastern edge of the basin have certain bituminous characters or are below the anthracite grade but pass into anthracites at greater depths. Fault lines across the fields show no effect on the seams and it is supposed that the faulting was subsequent to the main alteration in the coal. Intrusions are not present and unless deep seated cannot be counted on to have raised the temperature. A supposition in this case may be stated as: (1). The deep parts of the field owes its alteration to pressure without the formation of gases.

(2). The marginal parts, owing to less covering beds, were altered by the escape of hydro-carbon and carbon-dioxide gases.

To test this theory we will take a concrete example and suppose that a peaty substance is altered according to each of the above suppositions.

An average peat will have the following general composition:—

Carbon	50
Hydrogen	7
Oxygen	42
Nitrogen	1
	100

For beds that are deeply buried.

Assume that the combinations formed, owing to pressure, were between hydrogen and oxygen and carbon and oxygen. For convenience we will use the combinations H_2O seven parts by weight and CO_2 one part.

The composition of the mass remaining will be:—

For a loss of 46 per cent.		For a loss of 47 per cent.	
Carbon	89.70	Carbon	91.32
Hydrogen	4.67	Hydrogen	4.59
Oxygen	3.78	Oxygen	2.21
Nitrogen	1.85	Nitrogen	1.88
	100.00		100.00
Ash 1.85 times the original.		Ash 1.88 times the original.	

Compare with this the analysis of the Swansea four foot seam near Swansea and a similarity will be apparent.

Swansea four foot seam.
(Analysis from Bull. Geol. Surv. Eng. and Wales).

Carbon.	91.54	
Hydrogen.	4.62	Ash 2.2 per cent.
Oxygen and Nitrogen..	3.84	
	100.00	

In this we suggest a theoretical method by which could be produced a coal similar to the Welsh anthracite with very low ash.

For beds not deeply buried.

For beds in the same field which show high ash and lower carbon percentage, it might be suggested that less pressure resulted from their position and that greater opportunity was given for the accumulation of earthy material in the beds, raising their ash correspondingly. These suggestions have weight and cannot be disregarded. If however the high ash is not to be thus accounted for we still have an argument in that waste of material will raise the ash. For the marginal portions, then, we will assume an escape of gas containing hydrocarbons. These we will call mixtures of carbon dioxide and marsh gas in various proportions by weight. As the combinations are supposed to be formed readily and their escape not greatly retarded the loss for the time interval allowed in the previous example will possibly be much greater.

Allowing for losses of 75 per cent and over the results will be found in the following table:—

Ratio		Loss 75%		Loss 77%		Loss 78%	
		C	78.28	C	81.57	C	83.41
CO^2	44	H	7.08	H	7.09	H	7.13
	= 17	O	10.64	O	7.00	O	4.91
CH^4		N	4.00	N	4.34	N	4.55
			100.00		100.00		100.00
CO^2	44	C	80.00	C	83.47	C	85.45
—— =	—	H	8.00	H	8.13	H	8.20
		O	8.00	O	4.06	O	1.81
CH^4	16	N	4.00	N	4.34	N	4.54
			100.00		100.00		100.00

		C	81.80	C	91.15
CO^2	44	H	8.92	H	3.42
—— =	—	O	5.28	O	1.09
CH^4	15	N	4.00	N	4.34
			100.00		100.00

Swansea four foot seam in eastern part of field.

(Analysis from Memoir Geol. Surv. Eng., and Wales. Coals of South Wales).

Carbon	86.94	
Hydrogen	5.64	
Oxygen	5.84	Ash 7.3 per cent.
Nitrogen	1.58	
	100.00	

In the above calculations no account has been taken of the nitrogen. This can be reduced by forming ammonia but does not in that case reduce the hydrogen materially and would only increase the other members. In treating it as inert its percentage gives the amount by which the ash has been raised. In the above calculations the ash would all be four times the original.

Comparing these with the Welsh coal it will be seen that a somewhat similar analysis could be obtained by varying either the amount or the ratio between the gases lost. The increase in ash is noticeable when compared with that given for the alteration by the formation of water from the material in the coal. For the same degree of alteration the ash may be at least double.

The Welsh coals cited are from the same seam in different localities and the ash of the bituminous or steam coal is about three times that of the anthracite, part of which could be accounted for by the loss of hydrocarbons.

Comparison of the two methods of formation.

(1)	(2)
Confinement under pressure.	Less pressure, porous beds for cover.
Water and carbonic acid formed.	Combustible gases escaping.
Loss in mass 46 to 47% by weight.	Loss in mass 75 to 78%
Carbon raised to 89 and 91%.	Carbon raised to 78 and 91%.
Ash raised to 1.8 of original.	Ash raised to 4 and 4½ original.
Anthracite.	Steam and anthracite coal.

These suppositions may serve to suggest reasons why an anthracite may be low in ash while softer coals of the same age may have much more. They show also that the escape of hydrocarbons may not raise the carbon percentage as rapidly as has been generally supposed. There is here also a suggestion that outcrops of coal seams may by the loss of gases be high in ash and not necessarily very high in carbon.

The general assumption that the carbon percentage shows the amount of alteration may not always be true. It may show the degree but is not always an index of the amount lost.

It has been pointed out that the hydrogen percentage has a direct bearing on the character of the coal. During the final process there are many chances that the hydrogen may increase or diminish. With an alteration depending on the formation of water the hydrogen may fall below the mean; but the concurrent formation of carbonic acid raises it rapidly. With the escape of combustible gases it may fall to zero and at almost any percentage of carbon obtained. The chances of producing fatty coals seem greater for the process requiring confined pressure.

Summary.

Variations in coal may be due to:—

(1).—*Original composition.*—The softer varieties of vegetation having an initial high hydrogen percentage are rapidly dessiccated and prepared for fermentation and subsequent change.

(2).—*Duration and character of decay.*—The initial loss of carbon dioxide may be prolonged by fermentation, thereby raising the hydrogen to the critical point at which it forms an unstable hydrocarbon compound. The character of the product thus depends in great measure on the stage reached in the process.

(3).—*Pressure.*—Restrains the loss of carbon and promotes the formation of water and carbonic acid. This produces an alteration without raising the ash unduly or allowing the hydrogen to be lowered very much. The process is hastened by heat.

Heat causes the formation of hydrocarbons gases and raises the ash by the great loss of material. The loss of hydrogen also tends toward the production of a dry or lean coal.

III.—*Place-Names in Northern Canada*

By JAMES WHITE, F.R.G.S.

(Read 27th September 1910.)

The geographical limits of Northern Canada have been taken as including the present North-West Territories which contain the so-called "districts"[1] of Ungava, Keewatin, Mackenzie and Franklin and the territory of Yukon. In considering in the large, the derivations of the place-names in this area, it is convenient to divide them into two groups:

1.—The names of the Arctic islands. of the Arctic coast of the mainland, and of the coasts of Hudson bay and strait.

2.—What may be called the "inland" names, including practically all not in the first class.

Arctic and Hudson bay exploration in British North America can be divided into three periods of activity:—

(*a*) From Frobisher's first voyage in 1576 to James' and Foxe's voyages in 1631.

(*b*) From Ross' voyage in 1818 to the Belcher expedition, 1852-54.

(*c*) From the Nares' expedition of 1875-76 to the present time.

The first period includes the explorations of Frobisher, Davis, Hall, Hudson, Button, Baffin, Munk, Foxe, James and others. Between the first and second period, there were occasional small expeditions in search of the North West passage, by way of the north-western portion of Hudson bay.

The Ross expedition of 1818, followed Baffin's track and verified the discoveries of Baffin, made over 200 years before and which had been expunged from the 18th century maps as unfounded. Following the extensive discoveries of Parry, 1819-25 and Franklin's, 1821 and 1826,, the Admiralty, in 1845, dispatched the famous, but ill-fated, Franklin expedition. When a year and a half had elapsed, a feeling of uneasiness manifested itself and, in the next thirty years, over forty expeditions were sent out from England and America to rescue the survivors or bring home the records of the lost expedition. As the nature of the

[1] The boundaries of these "districts" have been indicated in accordance with the Order in Council of Dec. 18, 1897, except that a narrow strip lying between long. 100° W. and the eastern boundary of Saskatchewan has been included in Keewatin. As the Order in Council was contingent upon subsequent legislation, and as the legislation was never had, these divisions never had any legal status.

search necessitated a minute examination of all the coasts of the great Arctic archipelago, one of the indirect results was the mapping of tens of thousands of miles of coast line and the naming of hundreds of topographical features.

Between the second and third periods, Hayes and Hall discovered Kennedy and Robeson channels—the northern extension of Smith sound—and the great sea of Palæocrystic ice that extends northward from the northern shore of Ellesmere island and Greenland.

During the third period, various expeditions attempted to reach the Pole and, last year, Peary's efforts were crowned with success. As one result, nearly all the names of features along the eastern coast of Ellesmere island, are named after citizens of the United States, more or less celebrated; the west coast of Ellesmere and the islands to the west of it were explored by the Sverdrup expedition and, therefore, bear Norwegian names. Elsewhere, British names are almost universal, though many non-British royalties and statesmen have not been overlooked.

The study of the place-names of Arctic Canada is an extremely fascinating one and involves the study of all the narratives of Arctic exploration, of the previous careers of the principal actors—their relations, friends, brother officers, past and present, of their former commanders, of contemporary officials of the Admiralty and scientists, particularly those interested in the exploration of the North, etc. Naturally, as about nine-tenths of the coast was explored by naval officers, the names of Arctic explorers, of naval officers and officials and of Arctic exploring vessels predominate, the most striking feature in a general survey, being the extreme paucity of native names, due, partly, to the uninhabited nature of the greater part of the region and, in a minor degree, to the lack of communication with the Eskimos owing to the failure to provide the expeditions with interpreters. To this rule, there is one exception, viz., along the south shore of Victoria island and along the Arctic coast of the mainland between Coronation gulf and the northern extreme of Melville peninsula. As these coasts were explored by Rae, Dease and Simpson, officers of the Hudson's Bay Co., they are a veritable directory of their contemporary chief traders and chief factors, of the Hudson's Bay Co.

Derivations of place-names are arrived at in a number of ways:—

1.—When a definite statement by the author is obtainable. Fortunately, there are many books of Arctic exploration and, during the Franklin search the reports made by the various expeditions were published as Parliamentary blue-books. Unfortunately, the reports of the two most important expeditions sent out during this period—the Austin and the Belcher—do not give much information respecting the

many names given by them. Apparently Austin named all the features discovered by his officers as their reports and the sketch maps accompanying them are devoid of new names. Belcher seems to have given his officers a fairly free hand in this respect but only one, Lieut. Mecham, gives anything like a full statement of the derivations of the names for which he is responsible. Richards, who gave more names than any other officer in the expedition, gives absolutely no information.

2.—Where there are circumstances indicating the derivation that almost amount to a demonstration, particularly when the name is an uncommon one.

3.—Where the attendant circumstances indicate a probability. In such cases, the suggested derivation is always prefaced by the word "probable."

The first explorers gave remarkably few names, usually contenting themselves with bestowing their own and the names of some of their more influential patrons; thus, Baffin, himself, is commemorated by a great bay and island. He named Smith sound after Sir Thomas Smith, Jones sound after Alderman Thomas Jones, Digges cape after Sir Dudley Digges, Wolstenholme sound after Sir John Wolstenholme—all patrons and subscribers toward the expenses of the expedition.

Hudson bay and strait, James bay, Baffin island and bay, Davis strait, M'Clintock channel, Franklin, Dease and James Ross straits, Parry archipelago, Fox channel and Simpson peninsula commemorate the achievements of the explorers whose names they bear; Victoria island and strait, King William, Prince of Wales, Cornwall and Prince Patrick islands, Adelaide peninsula and Prince Regent inlet are named after British royalties, past and present, while Coronation gulf reminds us that it was discovered on the anniversary of the accession of George IV; Somerset island was named after Parry's native county, and Devon island after that of his lieutenant—Lieutenant Liddon. Other islands have been named after Admiral Sir Wm. Cornwallis, Earl of Bathurst, Earl of Ellesmere, Earl of Eglington, Earl of Southampton, Admiral Sir Thos. Byam Martin, Comptroller of the Navy; Sir Joseph Banks, President of the Royal Society, and Messrs. Heiberg and Ringnes, patrons of the Sverdrup expedition; Viscount Melville, first Lord of the Admiralty, has been immortalized by an island, a sound and a peninsula; Sir John Barrow, for many years Secretary of the Admiralty, by a strait and many minor features, and Sir Francis Beaufort, hydrographer, by the sea opposite northwestern Canada; Sir Robert Peel, sometime Prime Minister, by an inlet and a river; Henry Grinnell and Felix Booth, enthusiastic patrons of discovery, by Grinnell land and peninsula and Boothia peninsula and

gulf; General Lord Wellington, by the channel up which Franklin sailed in 1845; Robeson and Kennedy channels after United States Secretaries of the Navy; Committee bay after the governing body of the Hudson's Bay Co., and Jones, Lancaster and Smith sounds after the patrons of Baffin in his great voyage when he reached a latitude not surpassed till 1818, over two hundred years later.

"Inland" Names.—The "inland" names of Northern Canada differ from the "coast" names in that the majority of them are either native names or translations of native names. This is due to the fact that most of them were obtained by officers of the Hudson's Bay Company, who, as fur-traders, were in close touch with the native inhabitants.

Eastmain river recalls the Hudson's Bay Co.'s official designation of the east mainland coast of Hudson bay; George river was named by Moravian missionaries after George III; Koksoak is Eskimo for "big river" and Ungava signifies "far away"; Albany river after James, Duke of York and Albany, later, James II; Hayes river, after James Hayes, secretary to Prince Rupert; Nelson river after Button's master who died there; Churchill river after the victor of Blenheim; Backs river, after Admiral Sir George Back; Coppermine river after the reported copper mines that drew Hearne—first white man to sight the Arctic mainland coast of British North America—from Hudson bay; Dubawnt is corrupted Indian for "water-shore," and Slave denotes the contempt of the southern Indians for their less warlike northern neighbours; the Mackenzie bears the name of its famous explorer, Sir Alex. Mackenzie; the Pelly is named after one of the directors of the Hudson's Bay Company; the Frances, after the wife of its famous governor, Sir George Simpson, and the Lewes and Stewart after officers of the company; the Liard refers to the cottonwood trees ("liards") on its banks; Keewatin, as every student of Hiawatha knows, signifies the "north-west wind."

In preparing this paper, the historical interest connected with it and the fact that, so far as the writer knows, it has never been compiled before, has induced the addition of:—

(*a*) A list of the various Arctic expeditions—including Hudson bay —from 1576 to 1910.

(*b*) A list of the officers of these expeditions.

(*c*) Bibliography of the principal works consulted.

NOTE:—Owing to the limitations of the space allotted to the various sections, the publication of the paper as prepared, was found to be impossible. In addition to the lists of expeditions, lists of officers and bibliography, it contains notes respecting the derivations of the names of upwards of two thousand features. It is now, February, 1911, being published as an appendix to the ninth report of the Geographic Board of Canada.

IV.—*Upon the Number of Micro-Organisms in the Air of Winnipeg.*

By A. H. R. BULLER, D.Sc., F.R.S.C., and CHAS. W. LOWE.

(Read September 28, 1910.)

INTRODUCTION.

The authors have determined the number of micro-organisms present in the air of Winnipeg during every week throughout a whole year. Hitherto, no statistics of this kind have been compiled for Central Canada, and it was thought that the investigation might possibly have some bearing on the spread of certain diseases in addition to its general biological interest.

As long ago as 1887 Frankland[1] published a curve showing the seasonal variation in the number of micro-organisms in the air of London. The English climate, as is well known, is very humid; and the winters are usually wet and mild. In contrast with this, the climate at Winnipeg on the whole is very dry, especially during the winter. Whereas in England snow covers the ground for only a few weeks in the year, at Winnipeg the ground is frost-bound and covered with snow for something like five months. The difference in the climate of the two places, therefore, is very marked; and, as we shall see, a comparison of Frankland's observations with those made by us shows how greatly the distribution of micro-organisms is affected by climatic conditions.

Those who live in Manitoba are aware how very free the air is from dust particles during the winter months. On account of the dustlessness of the atmosphere, it was expected before the investigations began that, at this period of the year, there would be a very small number of micro-organisms in the air of Winnipeg relatively to that of London as determined by Frankland. This expectation has been fully realised; and for healthiness, so far as the number of micro-organisms is concerned, the climate of Central Canada during the winter must be one of the best in any civilised country in the world.

Among earlier workers upon the distribution of micro-organisms in the air may be mentioned Pasteur, Miquel, Hansen, Fischer, Moreu & Miquel, Minervini, Giacosa, Miflet, Selander, Cacace, Shibuya, and Frankland. Recently, Saito,[2] using the plate method, has carried out

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[1] P. F. Frankland. Further Experiments on the Distribution of Micro-organisms in Air (by Hesse's Method). Proc. of the Roy. Soc., Vol. 42, 1887, pp. 267–282.

[2] K. Saito. Untersuchungen über die atmosphärischen Pilzkeime, The Journal of the College of Science, University of Tokyo, Vol. xxxvii, 1904, pp. 1–58.

a series of experiments at Tōkyō throughout a whole year, and we refer the reader to his paper for the literature of the subject.

Methods.

Two methods have been employed: (1) the volumetric, and (2) the plate method; and parallel determinations have been made weekly, without any break, during the whole of one year. This is the first time that parallel observations by these two methods have been carried on during so long a period of time. The curves given by the results are not identical in form, and a study of them shows that variations in external conditions do not result in parallel variations in the number of micro-organisms given by the two methods. Thus, for instance, a strong wind increases the number of micro-organisms settling upon an exposed plate to a much greater relative extent than it increases the number in 10 litres of air.

The Volumetric Method.—The volumetric method is practically that devised by Professor Percy Frankland[1] for his experiments in England. However, for the experiments carried out on the campus of the university of Manitoba, it was found convenient to substitute a ten-litre aspirator for a pump, in order to draw the air through the collecting tubes. To this extent Frankland's method has been simplified and rendered much easier in carrying out, more especially during the great cold of the winter months and during those weeks in summer when mosquitoes are troublesome.

The essential parts of the apparatus were as follows: (1) two collecting tubes, which we shall term the experimental and control tubes respectively; (2) an aspirator capable of aspirating 10 litres of air through the experimental tube; and (3) a piece of lead piping ten feet long, by means of which the experimental tube was connected with the aspirator.

When the aspirator was set up on the University campus, it had the appearance shown in Fig. 1. The experimental and control tubes were attached to a clamp-stand at a height of about two feet from the ground, and the aspirator was supported on a stool.

The experimental tube (Fig. 2, A) was constructed from a glass tube which was 5 inches long and had an internal diameter of 0.25 inches. It was heated in a flame so as to make a constriction (Fig. 2, *c*), about 1.25 inches from one end. Some glass wool was pushed down the tube with the help of a small glass rod, so as to form a layer on one

[1] P. F. Frankland. A new method for the quantitative estimation of the micro-organisms present in the atmosphere. Phil. Trans. Roy. Soc., Vol. 178 (1887) B, pp. 113–152.

Fig. 1.

side of the constriction. Next, some finely powdered cane-sugar was introduced above the wool so as to form a second layer of about the same thickness, and then was added another layer of glass wool similar to the first.

Another constriction, similar to the first, was then made 1.25 inches from the other end of the tube (Fig. 2, *d*), and a plug composed entirely of glass wool was placed in front. Immediately after the first constriction had been made and, therefore, previously to the introduction of the sugar into the tube, the end of the tube *f* in Fig. 2, was rounded off in the flame and allowed to close slightly. The other end, *a*, was usually rounded off after the second constriction had been made.

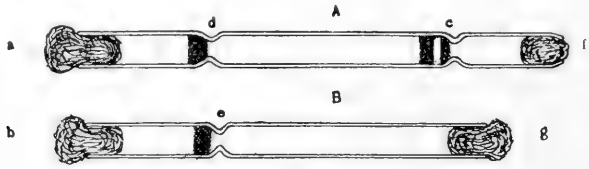

Fig. 2.

REDUCED TO ONE HALF ORIGINAL SIZE.

After the insertion of the plugs, two cotton wool stoppers were pushed into the open ends of the tube. The stopper at the end of the tube at which the air entered (*a*) was allowed to protrude somewhat, but that at the exit end of the tube (*f*) was trimmed in a flame so that no free hairs projected. The trimming prevented the stopper being pulled out during the removal of the connecting rubber tubing when it was necessary to take the tube back to the laboratory. The slightly closed condition of the exit end of the tube served to prevent the stopper from being sucked down the lead pipe whilst the air was being aspirated.

The control tube (Fig. 2, B) was made in the same way as the experimental except that it contained but a single plug of glass wool (*e*) and was usually one inch shorter.

The aspirator is shown in Fig. 1. It had a capacity of twelve litres and was graduated in litres by means of circular markings. At the top and bottom of the aspirator were holes fitted with perforated rubber stoppers. In the perforation of the lower stopper a glass tube was fixed which was connected by means of a short piece of rubber tubing with a long glass tube which reached nearly to the ground. The exit of the water was controlled by means of a clamp attached to the rubber tubing. Through the perforation of the upper stopper there projected one arm of a U-shaped piece of glass tubing provided with two stopcocks (s and s^1).

Before an experiment was to take place, the aspirator was filled up with water, set upright on its stand, and the level of the water allowed to descend to the first circular marking. Since nearly half of the experiments had to be carried out when the temperature of the air was below freezing point, and many when the temperature was below zero Fahrenheit, it was necessary under these conditions to fill the aspirator with warm water.

Owing to the extreme paucity of micro-organisms present in the air during the winter, it was found advisable very frequently to aspirate from 20 to 100 litres of air through the experimental tube, instead of merely 10 litres. When more than 10 litres was to be aspirated, a second aspirator, similar to the first, was prepared. As soon as 10 litres had been aspirated by the first aspirator, the stopcock, *s*, was closed and the stopper of the stopcock, s^1, was pulled out. The glass tube passing through the stopper at the top of the aspirator was withdrawn and the second aspirator substituted for the first, and connected in a similar mannner. The water in the fresh aspirator was allowed to descend to the first circular marking. The stopper of the stopcock, s^1, was then replaced, and when both of the glass stopcocks had been opened and the clamp from the exit tube had been removed, a further 10 litres could be aspirated through the experimental tube. The aspiration of 100 litres of air involved nine changes of the aspirators. Each change was carried out in about half a minute. The aspiration of 10 litres was accomplished in 12 minutes.

The flexible lead pipe, which was ten feet long and which had an internal diameter of a quarter of an inch, was connected with the experimental tube and the aspirator by short lengths of rubber tubing. The object in using the lead pipe was to allow of the air being aspirated through the experimental tube at a distance of about ten feet from the aspirator, which it was necessary for the experimenter to manipulate.

The apparatus was so arranged during the aspiration of the air that the wind always moved in a direction parallel to the axis of the experimental tube and from its exit to its entrance end. The direction of the wind is indicated in the figure by means of an arrow. The lead pipe was placed at right angles to the direction of the wind, so that any micro-organisms disturbed by the manipulation of the aspirator could not pass to the mouth of the experimental tube. The advantage of using tubing made of lead rather than of glass or rubber lies in the fact that a lead tube is sufficiently flexible but, at the same time, not readily cracked or broken.

A series of volumetric experiments was made at St. Charles, at a distance of six miles from the city of Winnipeg. Here, on the open prairie, it was not found convenient to use the aspirator, owing to the

difficulty of obtaining water. A pump like that used by Frankland was therefore employed. The apparatus, when set up with the pump included, is shown in Fig. 3. The pump, which was made of brass, was provided with two taps, the entrance (A) and the exit (B). The former was attached to the experimental tube by means of the lead pipe, and a mercury manometer was fitted up in the position shown in the figure. The capacity of the pump was carefully measured in the laboratory; it was found that 55 strokes of the pump were necessary in order to draw 10 litres of air through the experimental tube. The air was drawn through the tube in the following manner. The entrance tap A was closed and the exit tap B was opened, whereupon the handle of the pump was pushed down as far as it would go. Next, the tap A was opened and the tap B closed; the handle of the pump was then pulled out to its extremity, and by this means a definite volume of air was drawn through the experimental tube. As the handle of the pump was drawn upwards, the mercury rose in the manometer. The fall of the mercury in the manometer arm to the level of the mercury in the glass beaker—a process which was watched by means of a mirror inclined at an angle of 45° to the ground—served to indicate that the air in the pump stood at atmospheric pressure. When this was observed, the tap A was closed, the tap B opened, and the handle of the pump was pushed downward in preparation for another stroke. The time required for 55 strokes, which were necessary in order to draw 10 litres of air through the experimental tube, was about 25 minutes. With the aspirator, as we have seen, 10 litres could be drawn through in about 10 minutes, so that when the pump was used, the air passed through the experimental tube at somewhat less than one-half the speed it did when the aspirator was employed. The great advantage of the pump over the aspirator is its ready portability.

The sterilization and transportation of the experimental and control tubes were carried out as follows. The two tubes were each placed in a test tube closed with cotton wool stoppers. In order to prepare additional sterilised stoppers for the experimental and control tubes, for use after the aspiration of the air through the former, a short glass tube, similar to that used for the experimental and control tubes, was fitted up with cotton wool stoppers with small bits of a wooden or glass rod as cores. This tube was placed in a third stoppered test tube.

The three tubes, with their contents, were sterilised by placing them in a dry steriliser at a temperature of 130° C. for three hours. The test tube contents enclosed by the test tubes could readily be transported to the place where the experiment was to be made without any fear of contamination.

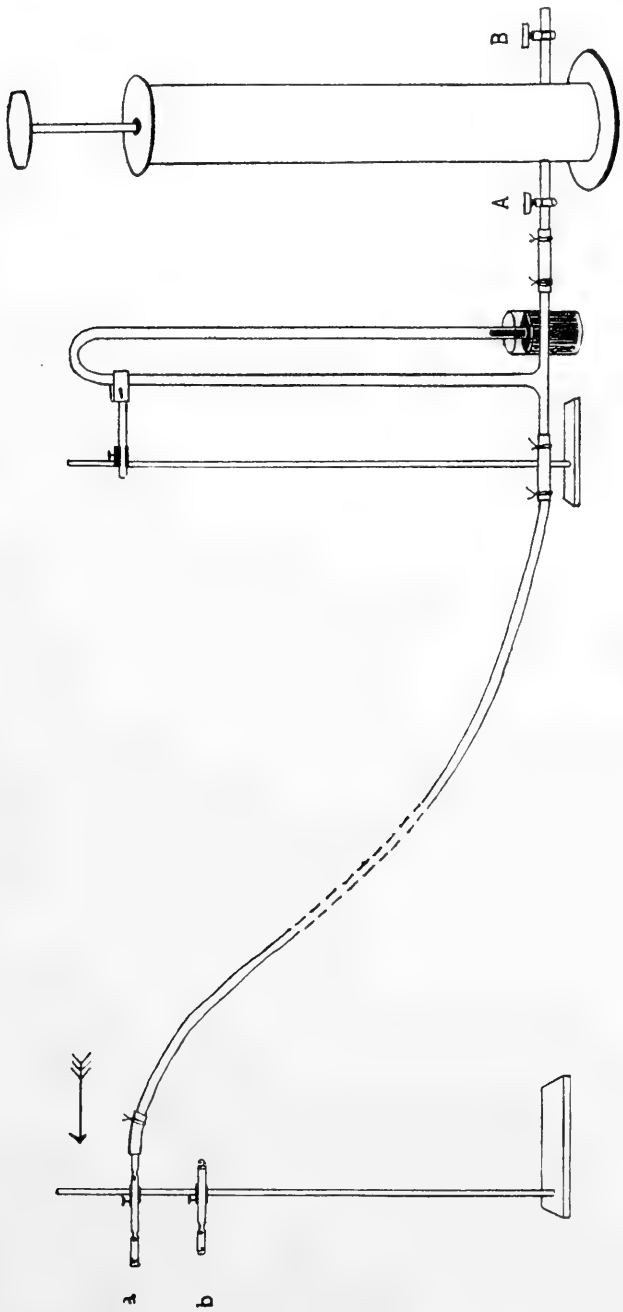

Fig. 2.

When it was desired to make an experiment, the aspirator or pump and the lead tubing were first set in their proper positions. The experimental and control tubes were taken out of their test tubes and attached to the clamp stand as shown in Figs. 1 and 3. A piece of rubber tubing on one end of the lead pipe was pushed over the exit end of the experimental tube. The cotton wool stoppers, *a* and *b* in Figs. 1, 2 and 3, at the entrance ends of the two tubes, were pulled out and thrown away, whereupon the air was drawn through the experimental tube by one or other of the two methods already described. As soon as this had been done, the third glass tube was taken out of its test tube and its stoppers removed and inserted into the entrance ends of the experimental and control tubes respectively. The lead pipe was then detached from the experimental tube which was then replaced in the sterilised stoppered test tube in which it had been transported; the control tube was also replaced in its test tube. The two test tubes were then taken into the laboratory.

For the purpose of cultivating the micro-organisms, three flasks, fitted with cotton-wool stoppers, were sterilised in the usual manner. One of them was a conical flask of 100 c.c. capacity, and the other two were Florence flasks of 250 and 500 c.c. capacity respectively.

The culture medium was composed of:

Distilled water	1000 c.c.
Grape sugar	10 gm.
Peptone	10 gm.
Liebig meat extract	3 gm.
Sodium chloride	5 gm.
Gelatine	100 gm.

This medium, before being cleared with an egg, was neutralised in as careful manner as possible, as our preliminary experiments showed us that even very slight acidity considerably diminished the number of colonies which developed. After the medium had been well mixed, neutralization was effected by the well-known phenolphtalein method. Fairly large test tubes were nearly filled with the medium, which was then sterilised in the usual manner.

For the purpose of determining the number of micro-organisms in the plugs, the medium contained within a test tube was melted by means of warm water; about one-half of it was poured into the largest flask and the remainder about equally divided between the other two.

The experimental tube was then removed from its test tube and, with the help of a file, broken across in the middle. The cotton wool stopper at the entrance end of the tube (Fig. 2, *a*) was then removed and inserted into the newly-made open end of the exit half of the tube,

and this half was laid on a sterilised surface. The glass wool plug, *d*, in the entrance half of the tube was then pushed by means of a sterilised glass ramrod into the largest of the flasks, which was again closed by its cotton wool stopper which had been temporarily removed. The exit half of the tube was then taken up, its cotton wool stoppers removed, and its plug of glass wool and sugar, *c*, pushed down into the medium-sized flask. The control tube was then removed from its test tube, its cotton wool stoppers taken out and its plug, *e*, pushed down into the small conical flask.

By shaking the three flasks, the plugs introduced into each became disintegrated and the constituent parts uniformly distributed in the still fluid medium. By rotating or otherwise manipulating the flasks under a stream of water, the gelatine in each was caused to solidify and become evenly spread over their bases and sides. When this had been done, the flasks were labelled and set in a dark cupboard in a warm laboratory, the temperature of which was usually about 17° C.

After three or four days' incubation, colonies of bacteria and yeast and the mycelia of moulds became visible; and their number was counted at the end of a week. The first plug, *d*, taken from the entrance end of the experimental tube gave the number of micro-organisms which had been collected from the 10 litres or other quantity of air which had been drawn through it. The second plug, *c*, taken from the exit end of the experimental tube served as a control for the first plug. It was argued that if any micro-organisms had failed to be collected in the first plug, they would be caught in the second, if not in the glass wool, at any rate in the finely powdered sugar. Only on very rare occasions were any micro-organisms developed in the flask containing the second plug, *c*, and not once did their number exceed three. On the single occasion when three were obtained in this plug, the maximum number of micro-organisms, namely 260, were developed from the first plug. It is clear from this that the first plug successfully arrested practically all the micro-organisms contained in the air drawn through it. When micro-organisms were developed from the second plug, their number was added to those developing from the first. The plug of the control tube (Fig. 2, *e*) served to show whether or not the experimental and control tubes had been properly sterilised in the first place, and whether or not any micro-organisms had settled in the mouth of the two tubes through the agency of the wind or air currents during the time that the cotton wool stoppers had been removed from the entrance ends of the two tubes. It was only exceedingly rarely that micro-organisms developed in the flask containing the plug of the control tube, and on no occasion did their number

exceed two. When an occasional micro-organism did develop, the contamination could be traced to a change in the direction of the wind during the exposure of the tubes in the field. When micro-organisms developed from this control plug, their number was counted and an equal number was deducted from the number which developed in the flask containing the first plug (*d*) of the experimental tube.

The Plate Method.—Shallow Petri dishes, five and a half inches wide and half an inch high, were sterilised and then partially filled with the culture medium in the usual manner. When this had solidified, the plates were enclosed in a sterilised glass vessel, to protect them during their transportation to the field. When the plates had been brought to the place of exposure, they were set on a horizontal support raised from three to six inches above the level of the ground which, it may be remarked, is exceedingly flat everywhere in the neighbourhood of Winnipeg. The lids of the Petri dishes were raised and the surface of the gelatine exposed to the atmosphere for one or more minutes. The time of exposure varied considerably: at those times when micro-organisms were abundant, *i.e.*, during the summer, and when the wind was strong, it was only one minute in length; but after heavy rain and during the winter months, when the air was almost sterile, owing to the exceeding paucity of the micro-organisms present, it was found necessary, in order to collect any micro-organisms at all, to increase the time of exposure to 5 minutes, 10 minutes, or, on some occasions, to one hour. After the exposure, the lid of the Petri dish was replaced; the closed lid was again covered with the sterilised glass vessel and then taken back to the laboratory. The Petri dishes were kept in the same room, and therefore subjected to practically the same conditions, as the flasks containing the plugs.

The counting of the colonies and fungus mycelia was usually carried out on the fourth day after making the cultures. It was always found that micro-organisms on the surface of the gelatine developed more rapidly than those which were embedded in the gelatine in the flasks. Doubtless, this difference in the rate of development is to be accounted for by the difference in the accessibility to oxygen for the micro-organisms in the two cases. In order to count the number of colonies, etc., which had developed, the plate was placed on a piece of black paper divided into small areas by white lines. The number in each area was counted in succession. The total was thus obtained without any danger of any colonies, etc., being overlooked or counted twice. The unit of measurement fixed upon for the rate of fall of micro-organisms was the number falling on one square foot per minute, and the results of the plate records have been tabulated according to this standard. The actual area of the gelatine exposed was 20.95 square inches.

RESULTS.

The results of the experiments are given in the appended Table. The first column gives the date of each experiment, the second the number of micro-organisms in 10 litres of air, the third the number falling per square foot per minute, the fourth the ratio of the number falling per square foot per minute to the number in 10 litres of air, the fifth the temperature at the time of the experiment in degrees Centigrade, and the sixth remarks upon the weather. Four degrees of wind velocity were recognised: slight, moderate, strong, and gale.

Date of Experiment	Number in 10 litres	Number falling per sq. foot per min.	Ratio of the number falling per sq. foot per min. to the number in 10 litres	Temperature in degrees Centigrade	Remarks upon the weather
1908					
April 6....	6	341	51	—6	Wind N.E., strong
" 9....	..	385	..	+2.5	" S.W., stronger
" 10....	..	4,180	..	+4	" N.N.W., gale
" 11....	..	436	..	13	" S,. moderate
" 13....	30	8,506	283	0.0	" N., gale
" 20....	22.5	407	13.6	10	" E., slight
" 27....	0.0	206	..	2	" N., strong, rain on 24th and 25th, snow on 26th
" 28....	—	694	....	3	Wind, N., moderate
" 29....	15	124	8.2	4.5	" N.W., slight
" 30....	..	1,839	....	6.5	" N.W., moderate
May 1....	25	821	32.7	3	" N.W., strong
" 2....	..	1,641	....	5.5	" N.W., slight
" 3....	..	2,394	....	13	" N.E., slight
" 4....	13	1,205	92.7	11	" N.E., slight
" 11....	37	2,304	62.1	15.5	" N.E., moderate, experiment made immediately before rain
" 18....	15	1,551	13.4	22.5	" S.W., strong, showery since 11th
" 23....	16	247	16.5	18	Wind, S., moderate, rain from morning of 11th to 22nd
" 29....	46	1,529	33.2	20.5	Wind, N., moderate
June 1....	40	203	5.07	25	" S.E., moderate
" 8....	19	527	22.7	8.5	" N.,strong, frosts on 6th and 7th

Date of experiment	Number in 10 litres	Number falling per sq. foot per min.	Ratio of the number falling per sq. foot per min. to the number in 10 litres	Temperature in degrees Centigrade	Remarks upon the weather
June 15....	25	545	21.8	15	Wind, S.E., moderate, cold week, frosts until 13th
" 22....	26	363	13.91	19	Wind, N., slight, heavy rain on 20th, less on 21st
" 26....	37	2,085	56.4	24	Wind, S., strong
" 29....	10	189	18.9	15	" N., slight, rain on 28th and early morning of 29th
July 6....	18	414	23	17	Wind, N., slight
" 13....	45	1,446	32.6	21	" N.W., moderate
" 20....	53	1,599	30.1	25	" N.W., moderate
" 27....	31	158	5.09	29	" S,. slight, after several hot days with very little wind
Aug. 3....	62	407	6.5	22	Wind, N.W., strong
" 10....	46	1,519	33	25	" W., strong
" 17....	38	846	22.4	22	" S.W., moderate
" 24....	137	988	7.2	20	" N., moderate
" 31....	12.5	312	24	19	" S.E., moderate, showery, 29th and 30th heavy rains
Sept. 7....	30	2,732	91	21	Wind, S.W., strong
" 14....	20	676	33.8	24	" S.E., moderate
" 21....	100	777	7.77	20.5	" S.E., moderate
" 28....	263	763	2.9	0.5	" N.W., moderate, warm rain from 24th to 26th, frosts on nights of 1st & 2nd
Oct. 5....	21	254	12.09	8	Wind, N.W., slight, snow on 1st and 2nd, rain on 5th
" 12....	26.25	1,439	54.8	6.5	Wind, S., moderate
" 19....	3	....	....	4.5	" S.E., slight, experiments made between showers, rain fell immediately after volumetric was finished and plate could not be exposed, rain ceased next day, 20th, and a gale commenced. Plate was exposed on 21st during gale

Date of experiment	Number in 10 litres	Number falling per sq. foot per min.	Ratio of the number falling per sq. foot per min. to the number in 10 litres	Temperature in degrees Centigrade	Remarks upon the weather
Oct. 21....	....	8,440	....	4.5	Wind, S., gale
" 27....	12.5	47	3.7	1.0	" N., moderate, experiment made 30 hours after rain
Nov. 2....	27	399	18.4	1.5	Wind, S., moderate
" 10....	0.0	36	higher than 36	—4	" W., moderate, after 2 days of snow
" 15....	2.2	58	26.3	+5	Wind, N.W., moderate
" 23....	4.25	64	15.5	—4	" N.E., moderate, starting to freeze after a warm week
Dec. 1....	0.725	81	108	—21	Wind, N., moderate, blizzard on previous day
" 7....	0.0	37	higher than 37	—8	Wind, W., slight
" 15....	0.19	8.7	45.7	—6.5	" W., slight
" 22....	0.3	38	126.6	—11	" S.E., moderate
" 29....	0.2	8.7	43.5	—8	" S.E., slight
1909					
Jan. 7....	0.2	3.1	15.5	—34	" N., moderate
" 14....	0.2	13	65	—21	" W., moderate
" 21....	1.0	22	22	—8	" E., moderate, no snow for 2 weeks
" 28....	1.0	18	18	—22	" N., strong, little snow since last experiment
Feb. 5....	0.6	23	38.5	—8	Wind, W., moderate
" 12....	0.4	3.5	8.7	—31	" W., moderate, experiment made shortly after fall of snow
" 19....	0.13	5	38.4	—24	Wind, N., moderate
" 26....	0.2	8.7	43.5	—8	" S.E., slight
March 6....	0.3	7.2	24	—7	" N.W., moderate
" 12....	1.0	23	23	—8	" S.E., moderate
" 17....	0.8	21	26.2	—7	" S.E., strong
" 25....	0.0	3	higher than 3	+2	" S., moderate, first thaw following a day of snow
April 1....	1.0	140	140	+2.5	Wind, S., strong
" 9....	2	425	212.5	0.0	" S., strong
" 16....	3	298	76	+6.5	" W., moderate
" 24....	11	2,309	209.9	—4.5	" N.W., strong, gale on previous day

The results of the volumetric experiments have been plotted in Plate 1. The thick continuous line joins the points indicating the results of each experiment. A second line gives the monthly averages. Two other lines give the temperature at the time of each experiment and the monthly average temperatures respectively. The results of the plate method are given in Plate II. The thick continuous line joins the points of each individual experiment. A second line gives the monthly averages. Two other lines give the temperatures at the time of each experiment and the monthly average temperatures respectively.

An examination of the two plates shows that during the winter months, *i.e.*, including the period from about the end of the first week of November to the end of the first week in April, the air in Winnipeg is remarkably free from micro-organisms. The average number in 10 litres during these five winter months is less than one. During the same period in England, as is shown by Frankland's curve,[1] the average number in 10 litres is about 15. The paucity of micro-organisms in the air of Winnipeg during the winter is accounted for by the fact that frost is continuous and therefore prevents micro-organisms from multiplying, also that the successive falls of snow cover up the dust on the ground and prevent its being carried into the air by the wind.

During what may be roughly called the summer half of the year, *i.e.*, from about the end of the first week in April to the end of the first week in November, the average number of micro-organisms in 10 litres was found to be 40.1. The number remains fairly constant during the five winter months, commences to rise in March, increases steadily until the middle of September, and then declines rapidly with the advent of early frosts.

The maximum number of micro-organisms in 10 litres of air, namely 263, was observed on September 28th, 1908. The next highest was 137, on August 24th, and the third highest 100, on September 21st.

The minimum number was found on March 25th, 1909, when 50 litres of air did not yield a single colony. Other low records were as follow: on February 19th, when one Pencillium plant was obtained from 75 litres of air; on December 15th. when one Penicillium plant was obtained from 55 litres; and on December 29th, 1908, and January 7th and 14th, 1909, when on each occasion two micro-organisms were found in 100 litres.

The average number of micro-organisms falling per square foot per minute, from the end of the first week of November to the end of

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[1] P. F. Frankland. Further Experiments on the Distribution of Micro-organisms in Air (by Hesse's Method). Proc. of the Roy. Soc., Vol. 42, 1887, Pl. 3.

the first week in April, was 19.5. The average number from the end of the first week in April to the end of the first week in November was 1,206.6. The highest monthly average was in October, and the next highest in April. Both of these averages coincided with the windiest periods of the year. The minimum number of micro-organisms falling per square foot per minute, namely 3, was observed on two occasions, January 7th and March 25th respectively. The next lowest record, of 3.5, was for February 12th. On February 19th the number was 5.

We may now discuss the effect of the weather on the results. The variation in the number of micro-organisms in the air is due, as has been explained by many other observers, to changes in temperature, alteration in the velocity of the wind, and to the fall of rain and snow. An inspection of the volumetric results plotted in Plate I, shows that temperature has the most influence, for the monthly averages are lowest during the cold winter months, rise steadily during the spring, and are highest during the hot summer months. Showers of rain or snow temporarily clean the air by carrying much of the suspended dust to the ground. This is shown by the following observations. On August 31st, after two rainy days, 12.5 micro-organisms were contained in 10 litres of air, whereas during the previous week, when the velocity of the wind and the temperature were almost exactly the same, the number was found to be 137. The plate method also showed a fall in the number for the same period. On November 10th, after two days' snow, 24 litres of air did not yield a single colony, and only 36 micro-organisms fell per square foot per minute; whereas a week earlier 27 micro-organisms occurred in 10 litres, and 399 fell per square foot per minute. The influence of the wind factor became obvious on several occasions. With an increase in the wind velocity, the number of micro-organisms usually increased, and with a decrease in wind velocity the number of micro-organisms in the air decreased; thus, on April 13th, 1908, there were 30 in 10 litres during a gale, whereas on April 6th, when the wind was only strong, there were 6, and on April 22nd, when the wind was slight, there were 22.5. The effect of wind on the number of micro-organisms falling per square foot per minute is very obvious; thus, during three gales, on April 10th, April 13th, and on October 21st, the enormous totals of 4,180, 8,506 and 8,440 were obtained respectively.

The nature of the Micro-organisms.—The micro-organisms which developed in the cultures were included in the three groups, Bacteria, Yeasts and Fungi. Usually the bacteria predominated; but this was not always the case. Thus on October 6th a pink yeast was a dominant form, there being four yeast colonies to three of other micro-organisms. This yeast came up in the cultures almost every week in the year,

but as a rule it formed only two or three colonies. In the winter, fungus mycelia often developed without any accompanying bacteria.

Up to the present we have not paid any special attention to the species of the micro-organisms. However, the bacteria flora of Winnipeg is extremely varied. This is shown by the differences in colour and modes of growth of the bacterial colonies. Both pink and white yeasts are frequent. Among the fungi we made out the following species: *Cephalothecium roseum*, *Stysanus stemonites*, *Macrosporium cladosporioides*, *Mucor racemosus*, *M. mucedo*, *M. stolonifer*, *Pencillium glaucum* and *Aspergillus glaucus*. There were several other species which, on account of sterility, we were unable to identify. One of these, which was not infrequent, produced a colourless mycelium without spores, but had the peculiarity of turning the gelatine a blood-red colour.

Experiments at St. Charles.

As has already been stated, St. Charles is a small village six miles west of the centre of the city of Winnipeg. The exact place where the experiments were made was a piece of bare prairie at a considerable distance from any human habitations. A single experiment by the volumetric pump method was made monthly during the summer and at intervals of six weeks during the winter. The following is a tabulated statement of the results. For the sake of comparison, the results of experiments made in Winnipeg on some of the same days have been added.

Month.	Number in 10 litres at St. Charles	Number in 10 litres at Winnipeg.
June	15	40
July	8	18
August	14	62
September	9	30
October	12	..
November	3	..
December	0	..
February	0	..
April	2	3
May	4	24

It thus appears that there are about three times as many organisms in the air of the City of Winnipeg as there are out on the prairie six miles away. This can be readily understood when one thinks of the

dust and dirt which are inevitably associated with the streets of a big city, where street-cars, automobiles and other agencies keep the air in constant motion and full of suspended particles.

Comparison of the Volumetric and Plate Methods.

In the course of the year's work altogether, 57 double experiments were made with the volumetric and plate methods on the same days. The plates were exposed immediately after the aspiration of 10 or more litres of air through the experimental tube. The ratio of the number of micro-organisms falling per square foot per minute to the number contained in 10 litres is given in the fourth column of the Table. The average ratio of 54 of the experiments[1] was found to be 45.48, and the ratio varied from 2.9 to 283.

The great variability in the ratio goes to show that the two methods have different values for estimating the number of micro-organisms in the air. The results given by one method are affected by changes in the weather in a different manner to the results given by the other method. Thus, during strong gales, the ratio tends to reach its maximum, as is shown by the data given in the Table for April 13th, 1908, and April 24th, 1909. The lowest ratio, namely 2.9, on September 28th, 1908, occurred when the number in 10 litres of air reached its highest value and when the wind was only moderate. In general, it is not easy to trace the exact causes of the variations in the ratio.

Summary.

The number of micro-organisms in the air of Winnipeg varies from week to week throughout the year. The variations depend, as in other localities, upon temperature, wind, and the fall of rain and snow.

The average number of micro-organisms in 10 litres of air, as the result of 52 weekly observations, was found to be 24. So far as the organic contents of the air are concerned, the year may be divided into two parts—the winter period of five months from the end of the first week of November to the end of the first week in April, during which the average number of micro-organisms in 10 litres is 0.7, and the summer period of seven months, from the end of the first week in April to the end of the first week of November, during which the average is 40.1. The remarkable paucity of micro-organisms in the air during the five winter months is to be accounted for by the continuous frost and the repeated falls of snow, which prevent dust particles

[1] The ratios for November 10th and December 1st, 1908, and for March 25th, 1909, could not be taken into account in obtaining this average, owing to their being indefinite.

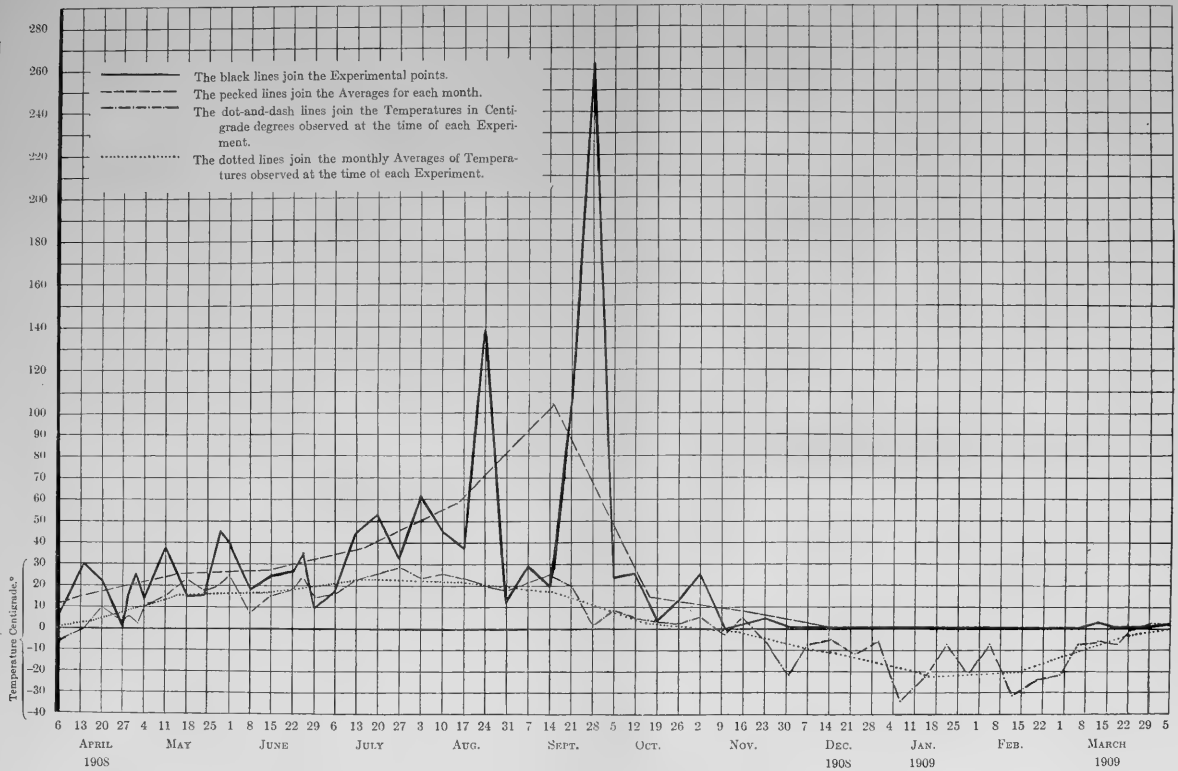
of all kinds from being carried into the air. In so far as fewness of micro-organisms is a factor in deciding the hygienic value of the air, Winnipeg must be one of the healthiest cities in the world.

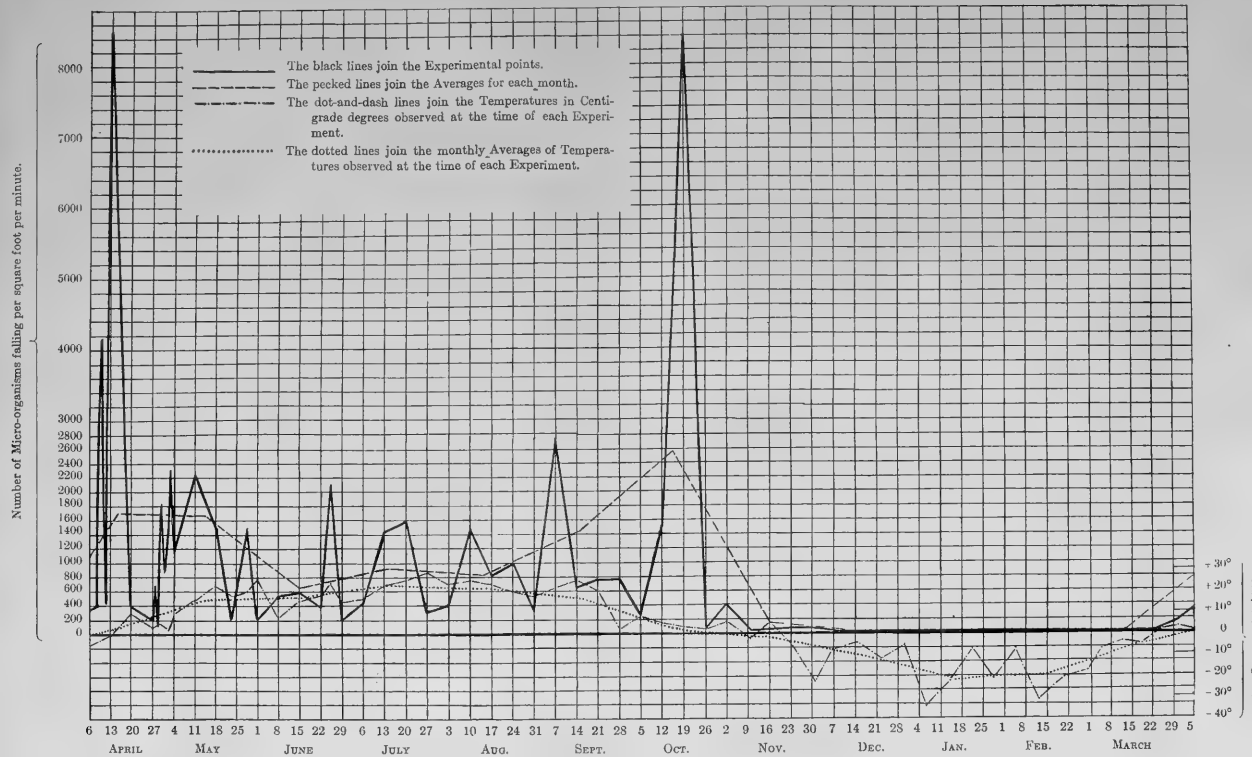
The highest number of micro-organisms found in 10 litres was 263 on September 28th, 1908. The lowest numbers were 0 in 50 litres on March 25th, 1909, and 1 in 75 litres on February 19th, 1909.

The highest number of micro-organisms falling per square foot per minute was 8,506 during a gale on April 13th, 1908. The lowest number was 3, which was registered on two occasions, once on January 7th, 1909, and again on March 25th in the same year.

Comparative experiments made on the same days on the bare prairie at St. Charles, a place six miles from the City of Winnipeg, and in the centre of Winnipeg showed that the air in the town was about three times richer in micro-organisms than that in the country.

The average ratio of the number of micro-organisms falling per square foot per minute to the number contained in 10 litres of air for 54 experiments made during the year was found to be 45.48, and the ratio varied from 2.9 to 283. From the great variability of the ratio we may conclude that the volumetric and plate methods each has its own particular and distinct value for estimating the number of micro-organisms in the air. A curve plotted from the results given by the one method does not coincide with the curve plotted from the results given by the other. Variability in external conditions does not affect the results given by the two methods in exactly the same manner.


The black lines join the Experimental points.
The pecked lines join the Averages for each month.
The dot-and-dash lines join the Temperatures in Centigrade degrees observed at the time of each Experiment.
The dotted lines join the monthly Averages of Temperatures observed at the time of each Experiment.
Number of Micro-organisms in 10 litres of Air.
Temperature Centigrade.°
280
260
240
220
200
180
160
140
120
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
6 13 20 27 4 11 18 25 1 8 15 22 29 6 13 20 27 3 10 17 24 31 7 14 21 28 5 12 19 26 2 9 16 23 30 7 14 21 28 4 11 18 25 1 8 15 22 1 8 15 22 29 5
April 1908
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec. 1908
Jan. 1909
Feb.
March 1909


The black lines join the Experimental points.
The pecked lines join the Averages for each month.
The dot-and-dash lines join the Temperatures in Centigrade degrees observed at the time of each Experiment.
The dotted lines join the monthly Averages of Temperatures observed at the time of each Experiment.
Number of Micro-organisms falling per square foot per minute.
8000
7000
6000
5000
4000
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Temperature Centigrade.°
+30°
+20°
+10°
0
-10°
-20°
-30°
-40°
6 13 20 27 4 11 18 25 1 8 15 22 29 6 13 20 27 3 10 17 24 31 7 14 21 28 5 12 19 26 2 9 16 23 30 7 14 21 28 4 11 18 25 1 8 15 22 1 8 15 22 29 5
April 1908
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec. 1908
Jan. 1909
Feb.
March 1909

V.—*The Actiniaria of Passamaquoddy Bay, with a discussion of their Synonomy.*

By J. PLAYFAIR McMURRICH, M.A., PH.D.

(Read 28th September, 1910.)

The first record of Actinians occurring in Canadian waters is contained in Stimpson's "Marine Invertebrates of Grand Manan" published as one of the Smithsonian Contributions to Knowledge in 1853. In this article six species are mentioned as occurring at the locality indicated, namely, *Actinia marginata* Lesueur, *A. carneola n. sp.*, *A. obtruncata n. sp.*, *A. coriacea* Johnst. (?), *A. dianthus* Johnston (?) and *A. sipunculoides n. sp.*

Four years later Sir William Dawson (1858), described two forms from Gaspé Basin, one of which he referred with some hesitation to *Actinia dianthus*, proposing for it, however, if it should prove to be distinct from that species, the name *A. canadensis*; the second form he regarded as probably identical with Stimpson's *A. carneola*, but again suggested for it the name *A. nitida*, in case it should prove to be distinct.

Packard in 1863, mentioned *Tealia crassicornis?* Gosse as occurring on the southern coast of Labrador, and in 1867 he published a more complete list of the Invertebrata collected in that region, in which he mentions the occurrence of *Metridium marginatum*, *Rhodactinia* (*Tealia*) *Davisii*, and *Edwardsia sipunculoides* Stimpson. The first named species, whose similarity to the European *dianthus* is noted, is stated to occur in 15–20 fathoms, as far north as Square I. and Indian Harbour. The second is regarded as probably identical with *Tealia crassicornis* Gosse, and was dredged in 8 fathoms at Caribou I, while a single example of the third species was obtained in 4 fathoms in Henly Harbour, Chateau Bay.

In 1871, 1872 and 1873, the late Mr. J. F. Whiteaves made numerous dredgings in the Gulf of St. Lawrence, his results, so far as they concern Actinians, being contained in the Report of the Minister for Marine and Fisheries for the years 1872 and 1873, in the Annals and Magazine of Natural History 1872, and in the American Journal of Science 1874. In 1901, however, Whiteaves published a catalogue of all Invertebrates recorded from the Canadian Atlantic seaboard, including in the list not only all the forms that he himself had observed, but also those dredged by the United States Fish Commission in the deeper water off the coast of Nova Scotia. Disregarding for the present these latter forms, as representatives of the fauna of the western Atlantic trough rather than of the Canadian coast, the following Actiniaria are included in the Catalogue:—*Cerianthus borealis* Verr, *Epizoanthus*

incrustatus, Edwardsia sipunculoides, E. farinacea (U.S.F.C., Bay of Fundy in 8–90 fathoms), *Peachia parasitica* (on Cyanea arctica, Bay of Fundy), *Metridium dianthus, Actinauge Verrillii* (U.S.F.C., Bay of Fundy in 50–150 fathoms), *Cribrina stella, Urticina crassicornis, Stomphia carneola, Bolocera tuediae* (U.S.F.C., Bay of Fundy in 50–150 fathoms), *Actinopsis Whiteavesii.* Finally Ganong (1885), mentions *Metridium marginatum* as occurring at Craig's Ledges, Passamaquoddy Bay.

A visit to the Biological Station at St. Andrews, N.B., during the summer of 1908, gave me an opportunity for studying the forms occurring in that locality, and in the present paper I desire to record those observed and to discuss their synonomy.

Metridium senile (Linn.)

This is the most abundant form, occurring in considerable numbers both between tide marks and in deeper water. The individuals obtained in the former situation, as, for instance, on the beacons marking the channel into the harbour of St. Andrews, were all young, the larger individuals, so far as my observations go, being only obtainable by dredging in the deeper water.

The species has been frequently described and accounts of its anatomical characters have been given by Carlgren (1893), and myself (1901), under the name *Metridium dianthus*, so that a further description of it is unnecessary here. There are some questions as to the synonomy of the species, however, that require discussion, and, first of all, the synonomy of Canadian forms which should evidently be assigned to it may be considered.

The American representatives of the species were originally described by Lesueur (1817), as *Actinia marginata*, the individuals to which the name was applied having been obtained in Boston Bay, and to the individuals occurring on the eastern coast this name has since been generally applied. To the west coast forms the name *M. fimbriatum* was given by Verrill in 1865, but a study of them convinced me (1901), that they were identical with the east coast forms, and a comparison of the structure of both with that described for the European *M. dianthus* by Carlgren led to the definite identification of all three, a confirmation of suggestions that had previously been made by several authors, notably by Verrill (1869) and Andres (1883).

In Stimpson's list of Actinians occurring at Grand Manan (1853) the species is twice recorded. It appears under the name *Actinia marginata* Lesueur, and a large example dredged in 50 fathoms, but unfortunately lost before it could be thoroughly studied, is doubtfully identified as *A. dianthus* Johnston. Probably both identifications are correct

as far they go, the two forms being representatives of one and the same species. The *A. dianthus* described by Dawson (1858) from the St. Lawrence is again correctly identified, so that there is no necessity for the name *A. canadensis* that Dawson suggested, and the *Metridium marginatum* mentioned by Packard (1867), by Ganong (1885), and by Whiteaves in his earlier papers is no doubt that form, and is listed by Whiteaves in his Catalogue (1901), as *M. dianthus*, my conclusions as to its identity with that form having been accepted.

When we come to consider the validity of the term *M. dianthus* the case is not so clear. The generic term *Metridium*, proposed by Oken in 1815, is without doubt the proper one, having fifteen years priority over Actinoloba, proposed by Blainville in 1830, and employed by Gosse and Andres. But the use of *dianthus* as the specific name is, I believe, incorrect for more than one reason, and I wish to consider the early synonomy of the species and decide once for all, if possible, what its proper name should be.

The name *Actinia dianthus* dates back to 1767, when it was proposed by Ellis. But in that same year there was published that part of the Systema Naturæ Ed. XII, in which Linnæus describes the Actinians, and in this, as will be shown later, there is a form that is undoubtedly the same as that described by Ellis. It does not seem probable that we can now determine whether Linnæus' name had priority of publication over that of Ellis, but this is a matter of little importance, since in the preceding year, 1766, Pennant had described what is evidently the same form under the name *A. pentapetala*, the allusion being to the lobation of the disk which is so characteristic of the species. Pennant's term, therefore, has priority over that of Ellis, but the term employed by Linnæus in 1767, was used at an earlier date than Pennant's, as an examination of its history will show. The term is *Actinia senilis*, and the specific portion of it was first used by Linnæus in 1761, in the second edition of the Fauna Suecica. In that work there is to be found the following description:—

> 2103. Priapus *senilis* subcylindricus, rugosus.
> Habitat in Ostreis Oceani.
> Descr. Corpus magnitudine extimi articuli digiti; sordidum, extremitate fuscum, rugosum, apice perforatum, constans tunica subcoriacea, intra quam tunica tenera, mollis, sanguinea, intus referta seminibus flavis sparsis.

It is impossible to determine from this description alone the form that Linnæus had under observation, but in the Systema Naturæ Ed. XII, he employs the same specific name for a species which it is possible to identify. In this work the form is thus described:—

Senilis. 2. A. subcylindrica transverse rugosa.

Jonst, Exsang. t. 18, f. 2. Urtica major: minor

Baster, Subs 3. p. 122. t. 14. f. 2. t. 13. f. 2. Actinia rugis orbicularibus, proboscidibus multis tenuibus.

Fn. Suec. 2103 Priapus senilis.

Strom Sondr. 204 Soekuse.

Habitat in M. Atlantico super ostreas, rupes.

Here again the actual description of the species affords no basis for an identification, but a study of the synonomy given does yield a very pertinent clue.

The reference to Jonston is of little consequence; the descriptions and figures which that author gives of Actinians are merely compilations from earlier writers and the two forms mentioned are illustrated in his work by copies of Belon's figures illustrating the genus Urtica. One of the figures represents a contracted, and the other an expanded Actinian, and Belon designates them as *Urtica contracta* and *U. explicata* respectively. In the text he gives no special description of the forms figured, merely stating that he had observed several kinds of Urtica, some of a red colour and other larger ones, blue with granules arranged in a circle. Whether his figures are intended to represent these two varieties or whether they merely illustrate two conditions of one and the same variety it is impossible to say, and any attempt to refer them to a recognized species would be giving definiteness to what is and must remain a bare conjecture.

The reference to Baster is, however, of great consequence. This author in his Opuscula subseciva (1762) described three species of Actinia and illustrated them by figures which are readily recognizable. The first species, which he says may be named "Actinia rugis longitudinalibus, proboscidibus longis crassis," is represented in fig. 1, pl. XIII, and is evidently that now usually known as *Urticina crassicornis*; the second is named "Actinia rugis orbicularibus, proboscidibus multis tenuibus" and is represented on Pl. XIII, figs. 2, 3, and 4, from which it is at once recognizable as the form later described by Ellis as *dianthus*. The third species is represented in fig. 2 of Pl. XIV, and is that to which the Linnean name *effœta* is generally applied.

In his synonyms of *A. senilis* Linnæus quotes in full Baster's name for his second species, but unfortunately he cites as illustrations of it not only fig. 2 of Baster's Pl. XIII, but also fig. 2 of Pl. XIV. It hardly seems probable that Linnæus should have intended to include under one name two forms that are so manifestly different in appearance, and the view that the citation of Pl. XIV, fig. 2 in this connection was a *lapsus pennæ* is practically substantiated by the fact that he quotes the

same figure a second time as an illustration of his *A. effœta*. That it was the intention of Linnæus to identify his *A. senilis* with the form figured by Baster in his fig. 2, Pl XIII, seems so evident that it is difficult to understand the amount of importance that has been attributed in the literature to the additional erroneous citation of Pl. XIV, fig. 2.

The third reference in the Systema is to the original description of *P. senilis*, and the fourth is to the mention in a work by H. Stroem, entitled Physisk og œconomisk Beskrivelse over Söndmör, Soröe, 1762, of an Actinian known locally as Söekuse, and described as being red with red streaks. There is nothing very definite in this description and considering the imperfections in the specific identifications of Actiniæ at the time of the publication of the Sytema, Ed. XII, it is not surprising that Linnæus was tempted to identify the form with one with which he was personally familiar. It seems very probable, however that O. F. Muller (1776) was correct in identifying Stroem's form with his *A. crassicornis*, an identification that had much influence on the confusing *A. senilis* and *A. crassicornis* of which so many later authors were guilty.

It may be of interest to note that in the copy of Stroem's work in the library of the Linnean Society of London there is a marginal note opposite the description of the Söekuse, reading "Priapus senilis" and said to be in the handwriting of Linnæus.

A study, sine ira et studio, of the significance of Linnæus' synonyms leads, then, to the conviction that he intended his *Actinia senilis* to be regarded as identical with Baster's Actinia rugis orbicularibus, proboscidibus multis tenuibus as illustrated in Pl. XIII, fig. 2, and since this is the only one of the forms referred to whose identification is certain, it would seem that we must now accept Linnæus' term for that species. There is of course the possibility that Linnæus was in error in this identification, that his *P. senilis* was really an entirely different species; but his descriptions of that form are too indefinite to yield any evidence either for or against such a supposition, and we must, I think, accept his identifiation of a form which he originally described from his personal observaion with a form so readily recognizable from Baster's figure. *Senile*, then, is the correct specific name for Metridium dianthus.

This has been recognized by several authors, as, for instance, Adams (1800), Johnston (1838), Fischer (1874) and Haddon (1889); but the majority of writers have preferred some other name, usually *dianthus*. Various other specific names have been proposed: Pennant's *pentapetala* has already been mentioned; *plumosa* was proposed by O. F. Müller in 1776; *polymorpha* by Bishop Gunner in 1774; *caryophyllus* by Martin in 1786; it was described by Dicquemare (1773) as Anemonie

de la quatrième espèce; and I have elsewhere (1901) pointed out that it has also been described by Tilesius (1809) as *A. priapus* and possibly by Brandt (1835) as *A. farcimen.* The terms *marginatum and fimbriatum* applied to American representatives of the species have already been mentioned.

More serious, however, than this multiplication of names was the confusion that arose in the application of the Linnæan terms. This began very early, for Baster in the explanation of his figures describes fig. 2 of Pl. XIII (the figure of *M. senile*) thus:—"Priapus sive Actinia proboscidibus tenuibus brevibus; Priapus equinus dicta." That is to say, he identified the species under consideration with that described by Linnæus in the Systema Naturæ Ed. X as *Priapus equinus,* which Linnæus himself regarded as quite distinct from his *Actinia senilis.* O. F. Müller in the discussion of the synonomy of his *A. rufa* (1788), which is identical with the form usually known as *A. equina,* suggests that if one considers the specific descriptions of *A. senilis* given by Linnæus, *rufa* may be identical with that form; but if the synonyms of Linnæus be considered this is less probable. Bruguière, however, accepted Müller's suggestion and made *A. senilis* identical with *A. rufa,* an error in which he was followed by Bosc (1802).

More frequent, however, has been the identification of Linnæus' *A. senilis* with the form usually known as *Urticina crassicornis* (O.F.M.), whose correct name will be discussed later. The first step towards the establishment of this confusion was taken by Linnæus himself in mentioning Stroem's Söekuse as a synonym for *senilis,* and this was followed up by Bishop Gunner describing in 1767 as *A. senilis* a form which is quite evidently *U. crassicornis.* Further, it would seem that the form identified as *senilis* by Fabricius in 1780 was also *crassicornis,* and that described by Dicquemare in 1773 as his seconde espèce, again evidently *crassicornis,* was identified by Solander as the *senilis* of Linnæus. Gmelin in the XIII Ed. of the Systema Naturæ gives *A. senilis* as a synonym of *A. crassicornis,* and Oken does the same in his Lehrbuch (1816), and in his Allgemeine Naturgeschichte published in 1835, he describes *crassicornis* as *A. senilis.* Cuvier in his Règne Animal (1817), gives *A. senilis* as a synonym of his *A. coriacea,* which again is identical with Müller's *crassicornis,* and this synonomy was very generally accepted by subsequent authors, as, for instance, by Rapp (1829), Ehrenberg (1834), Hollard (1848 and 1854), and Milne-Edwards (1857).

This confusion, it may be added, has been somewhat aggravated by Andres (1883), who describes the species under consideration as *Actinoloba dianthus.* His reasons for rejecting the generic term Metridium will not, however, hold, and he further seems to have fallen into some errors in his interpretation of the Linnaean specific names. Thus he

states in one place (p. 347) that Linnaeus founded his *P. equinus* on the figure of *senilis* given by Baster, a statement for which I have found no evidence, and in another place (p. 418) he states that Baster's fig. 2, Pl. XIII according to Linnaeus' citation is *A. senilis*, but according to his description it is *A. felina*. I cannot find any evidence of such a confusion; Linnæus' description of the column of *senilis* as "transverse rugosa" agrees well with Baster's description of the form represented on his Pl. XIII, fig. 2, as "rugis orbicularibus", and certainly does not agree with Baster's description of the form cited by Linnæus as *A. felina*, which is said to be "rugis longitudinalibus." It is to be noted that Andres gives *A. felina* L. as a synonym of *A. dianthus*, an error based on that just mentioned.

All this confusion has led to the general disuse of Linnæus' term *senilis*, but from the discussion of the term given above it would seem perfectly clear that Haddon was quite correct in principle when he stated that "If strict priority be observed, the species commonly known as *Actinoloba dianthus* (Ellis) will have to be called *Metridium senilis* (Linn.)."

Urticina felina (L) Haddon.

Examples of the form which I identify with this species were obtained from the rocks between tide marks, and also by dredging in deeper water, about 22 metres, in the St. Croix River. All were very evidently identical with the *Rhodactinia Davisii* of L. Agassiz.

The largest individual was found under a rock ledge, a short distance above low water mark, and its dimensions were as follow: The column had a height of 4 cm. and a diameter of 5 cm., the disk reaching a diameter of 7.5 cm; the tentacles were stout and had a length of about 2 or 3 cm., with a basal diameter of 0.7–0.9 cm.

The coloration shown by all the specimens was exceedingly attractive. The column was either of a uniform red or else had a ground colour of pale red or yellowish, upon which were closely set irregular blotches, and streaks of carmine (Pl. I, fig. 1), so that the general effect was that of brilliant carmine. The somewhat massive tentacles were of a beautiful translucent pink, sometimes uniform throughout, in other cases deepening somewhat in tone at the tips and also at about the middle, where an indistinct band occurred. At the base each tentacle was surrounded by a pair of deeper pink streaks, which were prolonged some distance upon the disk. This was pink in colour; the peristome was dotted and streaked with crimson and the gonidial angles were flesh colour.

The base was strongly adherent and more or less expanded in all the examples obtained. The column wall in individuals preserved in

formalin was more or less wrinkled, but showed no signs of verrucæ; in living specimens it appeared quite smooth, although inspection with a lens revealed minute white dots scattered over the surface. The examination of sections did not, however, yield any distinct evidence of the occurrence of verrucæ. The margin formed a distinct fold, a fosse intervening between it and the bases of the tentacles.

The spincter (Pl. II, fig. 2), was of the palmate circumscribed type, although the central axis was somewhat elongated. The lamellæ were delicate and very numerous, showing a tendency to anastomose in certain areas, and especially towards the base, to form a reticulum.

The tentacles, when fully expanded, are stout and obtusely pointed at the tips, but show little or no signs of being longitudinally ridged. In contraction, however, the existence of longitudinal ridges is very evident. A good deal of variation exists with regard to the arrangement of the longitudinal muscles. In one of the two large forms examined these were ectodermal throughout the greater part of the circumference of the tentacles (Pl. II, fig. 4); but in one part a very thin layer of mesoglœa connected the tips of the supporting lamellæ, so that the musculature might be said to be mesoglœal. In the other individual the musculature was completely imbedded in the mesoglœa throughout the entire circumference, the cavities forming, for the most part, a single row situated but a short distance from the ectodermal surface of the mesoglœa (Pl. II, fig. 3). In neither individual was the radiating musculature of the disk distinctly imbedded in the mesoglœa, although in the second individual a certain amount of anastomosis between the supporting lamellæ occurred.

Two well marked siphonoglyphs were present. The mesenteries were arranged in four cycles and were on a decamerous plan. In one half the circumference of one of the large individuals, from one pair of directives to the other, I found five pairs of the first cycle, five of the second, ten of the third and nineteen of the fourth, one member of this cycle, that succeeding the first member of the second cycle next one of the directives, being wanting. The members of the first, second and third cycles were perfect, those of the third only partially so, while those of the fourth cycle were imperfect. The longitudinal musculature was well developed, the supporting processes gradually increasing in height toward the stomatodæum, and terminating abruptly at the central edge of the muscle (Pl. III, fig. 5). The parieto-basilar forms a distinct fold, which, in the older mesenteries is fused throughout almost its entire length to the mesoglœa of the mesentery, the line of fusion being plainly indicated by a series of epithelial inclusions in the mesoglœa. The basilar muscles have the form of distinct folds projecting from the bases of the mesenteries and bearing lateral lamellæ arranged in a

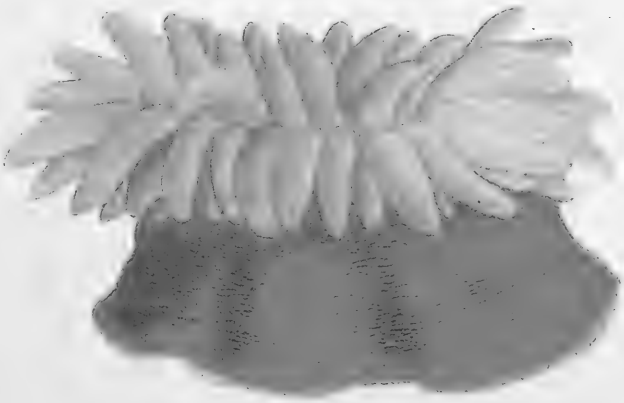


FIG. 1.

J. P. McM. *del.*

FIG. 2

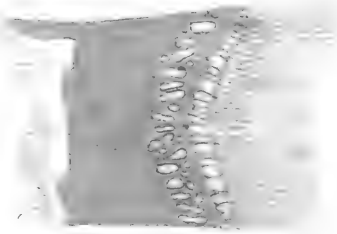


FIG. 3.

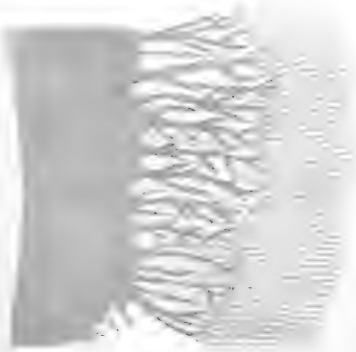
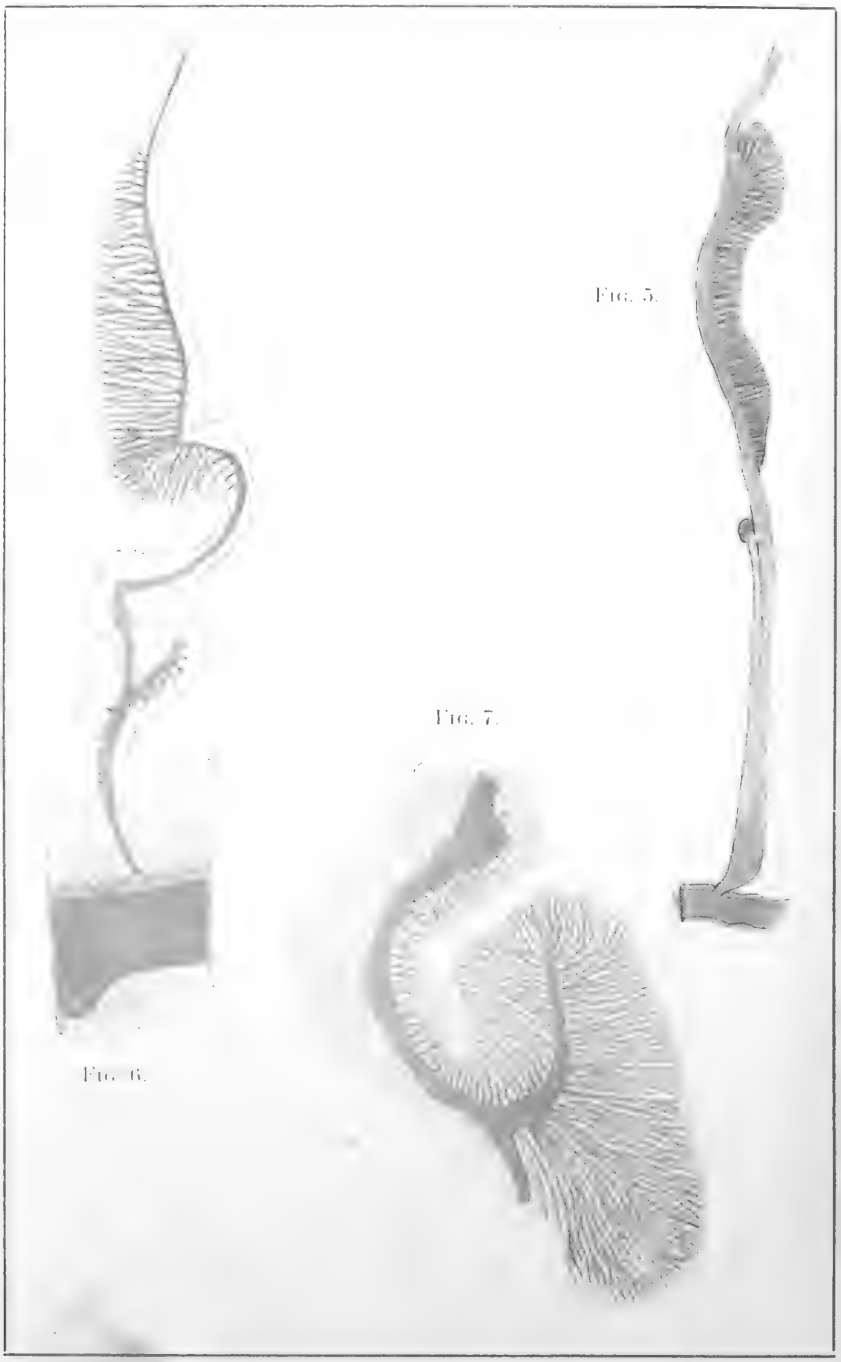


FIG. 1.

J. P. McM. *del.*



J. P. McM. *del.*

pinnate manner. In the only large individual in which the distribution of the reproductive cells could be determined with certainty, these structures were confined to the mesenteries of the youngest cycle, none occurring on any of the perfect mesenteries.

I have described the anatomical features of these individuals with some detail on account of the uncertainty of the status of the species to which I have referred them. They are certainly identical with the form for which L. Agassiz (1847) proposed the name *Rhodactinia Davisii* and which was later described by Verrill (1864), under that name. They are also identical with the form described by Stimpson (1853) as *Actinia obtruncata*. Of these two names that proposed by Agassiz has the priority, but in 1866 Verrill noted that the species was probably identical with the *Tealia crassicornis* of Gosse, a form originally named by O. F. Müller (1776). This identification has been generally accepted, with the exception that the fourth variety of the species recognized by Verrill in his original description was subsequently (Verrill, 1899), identified with Stimpson's *A. carneola*, which will be discussed later.

In 1902, however, Carlgren, basing his conclusions on the study of a large number of examples of so-called *crassicornis*, claimed that three distinct forms had been confused in that species, two of them, indeed, really belonging to a distinct genus. He proposes to restrict the term *crassicornis* to the more northerly European forms, and with these he identifies Agassiz *Rh. davisii* and also *Act. elegantissima* and *A. laurentii* of Brandt (1835) and *Leiotealia spitzbergensis* of Kwietniewski (1898), referring the species to the genus Rhodactinia. The other two species are the *Act. coriacea* of Cuvier (1798) and *Madoniactis lofotensis* of Danielssen (1890) *pro parte*, both these forms being assigned to a genus for which the term Tealia, originally proposed by Gosse (1858), is appropriated. On comparing the definitions of the two genera as given by Carlgren one notices only the following differences. In Rhodactinia the verrucæ of the column wall are described as "schwach unbedeutend," while in Tealia they vary from "gut bis schwach entwickelt"; in Rhodactinia the radial musculature of the disk and the longitudinal musculature of the tentacles are "meso-ectodermal bis mesoglœal" while in Tealia they are "uberwiegend mesoglœal"; in Rhodactinia all the mesenteries are fertile with the exception of the directives, while in Tealia ten to twenty of the older pairs are sterile; and in Rhodactinia the development of the embryos is always (?) in the cœlenteron of the parent, while in Tealia it is always outside the body.

If all these peculiarities were definite it might seem advisable to accept Carlgren's conclusion, but, as is indeed to some extent indicated in his definitions, the features selected as distinguishing the two genera are very variable and therefore hardly reliable for the decided distinc-

tions Carlgren suggests. In none of the examples of *Rh. davisii* collected at St. Andrews were there any visible verrucæ, either in the living or the preserved condition, but, on the other hand, examples of *crassicornis* from Puget Sound possess well developed verrucæ, to which small particles of gravel and shells adhere, and both these forms, according to Carlgren's classification, should be referred to his genus Rhodactinia. Furthermore, it may be pointed out, that more than one author, Teale (1837), and Lütken (1861), for example, describe the verrucæ as varying in distinctness from time to time in the same individual, and that Carlgren himself refers to the genus Tealia a species, *T. lofotensis*, in which the verrucæ are so small that he at one time proposed to term it *Urticina crassicornis* forma *lævis* (see Appellöf, 1900). It would seem, then, that the verrucæ afford no satisfactory basis for distinguishing the two genera.

A similar variability obtains in the longitudinal musculature of the tentacles. In examples from Puget Sound, and in one of the specimens from St. Andrews this musculature was entirely mesoglœal; in a second example from St. Andrews it was partly mesoglœal and partly ectodermal, and this is the condition described by Carlgren for *T. lofotensis*. Further, in the Puget Sound specimens the first two cycles of mesenteries were sterile, a condition that would assign the forms to the genus Tealia, and this is also true of the St. Andrews specimen examined. As to whether the ova are retained within the cœlenteron during development in the American forms I have no personal knowledge, but Verrill (1864) states that *Rh. davisii* "discharges young of various sizes, and probably eggs also."

It seems clear, therefore, that in all the features assigned as distinctive between the two genera recognized by Carlgren great variation occurs, and it would seem more accurate and convenient to look upon *crassicornis* as a widely distributed and somewhat variable species, rather than to divide it into distinct species, to say nothing of genera, whose definitions are too uncertain for relatively exact application. There may be, it is true, varietal peculiarities associated with the wide distribution, our west and east coast forms, for instance being at first sight very different in appearance, but I would not go further than to recognize them as possible races or varieties of the same species.

Assuming, then, the unity of the species, there remains for consideration its proper name, and first with regard to the generic term. Up to 1832, the species was referred to the genus Actinia, but in that year Ehrenberg divided that genus into several subgenera characterized by the equality or inequality of the tentacles, and the Act. isacmæa he further divided into two sections which he named Discosoma and Urticina. In the Urticina section the first species named is *A. crassicornis*

Ehr, and this having been accepted as identical with Müller's *crassicornis*, it too became generally known as *Urticina crassicornis*. Ehrenberg, however, doubtfully identifies his *crassicornis* with the *Act. crassicornis* of Gmelin and Lamarck, and describes it as having a smooth column wall and as inhabiting the Mediterranean. He further points out that Rapp (1829), identifies the species with the *Act. mesembryanthemum* of Ellis and Solander. It seems certain that Rapp was correct in this identification and that, therefore, Ehrenberg's species was not Müller's *crassicornis*, but really the form properly known as *Actinia* (or *Priapus*) *equina* L. We may, therefore, regard Urticina as a synonym of Actinia (Priapus) and reject it, as Carlgren has done, or, since Ehrenberg has selected no type for this section, we may select one by the process of elimination. The second species named as belonging to the section is *Act. erythrosoma*, but this cannot be taken as the type, since Klunzinger (1877), has referred it to Paractis, although it is more probably a Condylactis (McMurrich, 1889). The third species named is *Act. papillosa*, which seems to be identical with Müller's *crassicornis* and has generally been so regarded. This, then, may be selected for the type and *Urticina crassicornis* be taken, provisionally, as the proper name of the type species. This procedure has the advantage of preserving a name, which since its first employment by Verrill in this application (1869) has been very generally in use. The name Rhodactinia, as already indicated, was proposed by L. Agassiz in 1847, and Tealia by Gosse in 1858. Both of them are, accordingly, antedated by Urticina.

So much for the generic name, but the specific one also requires consideration. Müller's term *crassicornis* dates back to 1776, but before that time the species was well figured by Baster in 1762 and described as "Actinia rugis longitudinalibus, proboscidibus longis crassis." Linnæus in the XIII Ed. of the Systema (1767) bestowed upon this form the name *Actinia felina*, his actual words being:

> Felina. 3. A. subcylindrica striata lævis, glande muricata.
> Baster Subs. 3 p. 120, t. 13, f. I. Actinia rugis longitudinalibus, proboscidibus longis crassis.
> Habitat in O. Europæo.

Linnæus' description is somewhat difficult of explanation, but it is sufficiently evident that he intended the name *felina* to be applied to the form described by Baster and figured on his Pl. XIII, fig. I. I have already referred to the confusion occurring in the literature on account of the application of the Linnean name *senilis* to Müller's *crassicornis* and need not repeat the story here. It is worthy of note, however, that Müller recognized the identity of Baster's form, referred to by Linnæus

as *felina*, with his *crassicornis*, and there is no doubt but that the species should be known as *felina*, as has been maintained by Bruguière (1789), Fischer (1874), von Marenzeller (1877) and Haddon (1889).

Cribina stella (Verrill).

This form is not uncommon on the rocks of St. Andrews, occurring between tide marks and usually under stones in tidal pools. It was originally described by Stimpson (1853) as *Actinia coriacea* Johnston, with some doubt, however, as he was not able to examine the specimens while they were still alive. Later it was described by Verrill (1864) as *Bunodes stella*, this description being accompanied by excellent figures from drawings by Professor E. S. Morse.

In the largest example obtained the column had a height of 1.3 cm., and the diameter of the disk was about 2 cm, in the expanded condition. The tentacles were about 2 cm in length. Larger examples, however, occur, since Verrill states that he obtained one measuring 5 cm. in height and he also received large specimens from Greenland and Cumberland Bay, which were at first identified with *A. spectabilis* Fabr. (Verrill, 1879), and later (1899), referred to the present species.

The column in the St. Andrews examples was olive green or brown in colour and the tentacles a translucent greyish or brownish, with an opaque white spot at the base and a faint whitish chevron mark about half way between the tip and the base. In some examples the tentacles of the first cycle had an additional whitish band between the basal spot and the chevron. The disk was brownish, and in young individuals showed opaque white bands radiating to the bases of the primary tentacles. The stomatodæum was white.

The base is adherent and expanded. The column wall is provided in its upper part with rows of verrucæ to which particles of shell and gravel may adhere; the verrucæ extend from the margin to about the middle of the column or even further, but do not reach the limbus. In structure they resemble closely those I described for *Phymanthus crucifer* (McMurrich, 1889), their ectoderm consisting of slender cells and lacking almost entirely the gland cells which are elsewhere abundant on the column wall. The cells stain feebly, but at their bases they enlarge somewhat and take the stain a little more deeply; these enlargements correspond to the oval or pyriform structures I described in Phymanthus and may possibly be muscular in character. A distinct layer of nerve fibrils intervenes between them and the surface of the mesoglœa.

The margin is separated by a fosse from the bases of the outer tentacles, and on the inner wall of the fosse there is a well developed

endodermal circumscribed sphincter of the form shown in fig. 7, and which may perhaps be best referred to the palmate type. The longitudinal musculature of the tentacles is throughout ectodermal as is also the radial musculature of the disk. Two siphonoglyphs were present in all the specimens examined, their walls being greatly thickened in a manner similar to what I have described for *Cribrina elegantissima* (McMurrich, 1901).

The mesenteries are arranged in four cycles and are on an hexamerous plan, which is imperfect only to the extent that some of the mesenteries (and tentacles) of the last cycle may fail to develop. Those of the first and second cycles are perfect, the rest imperfect. The longitudinal muscles form a diffuse pennon, the supporting lamellæ increasing rapidly in height at its outer border and tapering gradually towards the central edge (Pl. III fig. 6). The parieto-basilars form distinct folds and the basilars are strong stout processes bearing secondary lamellæ. In none of the examples studied were the reproductive cells well developed, the breeding season being, apparently, shortly before the time of my visit to St. Andrews (the end of May), since one of the individuals captured gave birth to a number of larvæ in various stages of development when placed in an aquarium. In one individual I observed immature ova in some of the mesenteries of the second and third cycles, but whether they are confined to these mesenteries when fully developed cannot be stated.

The fact that three out of four of the species described in this paper are identical with European forms suggests a possibility that the one now under consideration may also be identical with a European species, and that which naturally comes first to mind is *C. verrucosa*. *C. stella* lacks, however, the longitudinal bands of colour seen on the column of that form and, what is of more importance, its sphincter is much stronger and more complicated than that which G. Y. and A. F. Dixon (1889), figure for *C. verrucosa*. It presents much more similarity to *C. thallia* both in coloration and in the form of the sphincter, this latter in *thallia*, according to the Dixons, resembling that described by R. Hertwig (1882) for his *Tealia bunodiformis*. I have not, however, found that variability in the arrangement of the mesenteries which the Dixons described for *C. thallia*, and, furthermore, it is to be noted that both that form and *C. verrucosa* are of a somewhat more austral distribution than are the other European species represented on the western side of the Atlantic. It seems advisable, therefore, until direct comparison can be made, to regard *C. stella* as a distinct species.

Stomphia coccinea (O. F. Muller) Carlgren.

The American representative of this species was first described by Stimpson (1853) as *Actinia carneola*, and in 1858 Sir William Dawson

described a form which he had collected at the mouth of Gaspé Basin, suggesting its identity with Stimpson's species, but proposing for it, if it should prove distinct, the name *Actinia nitida*. There can be little doubt as to its identity with Stimpson's *A. carneola*, and this same species was described by Verrill (1864), as the young of L. Agassiz' *Rhodactinia Davisii*. In 1899, however, Verrill corrected the error into which he had fallen, recognizing the distinctness of the species from Rhodactinia, and at the same time noting that there was little doubt but that it was identical with the form described by Gosse (1859, 1860), as *Stomphia Churchiæ*. This form had been thoroughly described by Carlgren (1893), and identified by him (p. 138) with O. F. Müller's (1776), *Actinia coccinea*, with which he also identified (1902), after a personal examination, *Sagartia repens*, *Tealiopsis polaris* and *Kylindrosactis elegans* of Danielssen (1890).

I have been able to examine examples of the species from Eastport, Me., and from St. Andrews, and have no doubt as to the correctness of its identification with the *S. Churchiæ* described by Carlgren. The identification of that form with Müller's *coccinea* seems also to be well founded and the correct name for the species is, therefore, *Stomphia coccinea* (O.F.M.) Carlgren.

The individuals captured at St. Andrews were all taken by the dredge in about 10 or 12 fathoms. I found none between tide marks. None of them reached the size given by Verrill and Carlgren, the largest having a height of only 1.5 cm. with a diameter at the base of 3.0 cm; the length of the tentacles was about 1.2 cm. The species is so variable in form, however, that measurements of the column can be of only moderate value.

In their general appearance the forms obtained at St. Andrews resembled not a little smaller examples of *Urticina felina* and might readily be mistaken for them. The column had a cream white ground which was irregularly marked with carmine so that it had as a whole a distinct reddish or scarlet tone. The carmine was lacking toward the margin, so that there was a distinct cream white capitular zone. The tentacles were translucent and marked by two circular bands of orange red, and their tips were of the same colour. The disk was of a pale orange red colour, deepening in tone at the peristome and at the bases of each of the tentacles of the inner cycles there was an opaque white spot.

The base was in all cases expanded, but the column, though cylindrical in form, is subject to much variation in height and diameter. It was smooth and the moderately thick mesoglœa of its wall was almost homogenous in structure. The mesoglœal sphincter in the forms examined agreed in structure with that figured by Carlgren, and, as that author has also noted, the longitudinal musculature of the tentacles and

the radial of the disk were both imbedded in the mesoglœa. I did not observe, however, any inclusion of the endodermal musculature of the disk in the mesoglœa.

Two siphonoglyphs and two pairs of directive mesenteries were present and, in addition to these mesenteries, there were fourteen other perfect pairs in two individuals examined, making a total of sixteen pairs of perfect mesenteries, which were also sterile. Assuming that these represent two cycles, there was a third cycle of sixteen pairs which were imperfect and fertile, and thirty-two pairs of a fourth cycle, also imperfect and fertile. The members of this fourth cycle show the peculiarity observed by Carlgren. In sections through the uppermost part of the column no traces of the cycle can be seen, but about half way down one finds a single unpaired representative of it in each interspace, between pairs of the first or second, and third cycles, these fourth cycle mesenteries having their longitudinal muscles on the side directed toward the pair of the third cycle. A little lower still and another representative of the fourth cycle makes its appearance in each of the interspaces mentioned, forming a pair with the member already present, but remaining much narrower than its fellow throughout the rest of the length of the column. I did not, however, find representatives of the fifth cycle described by Carlgren. As regards the structure of the mesenteries and their musculature, these agree perfectly with the description given by Carlgren and I have nothing to add to this except to say that the thickening of the mesenteries at their outer edges does not always occur and is possibly due to a certain amount of contraction.

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Explanation of Plates.

Plate I.

Fig. 1. *Urticina felina.* Nat. size.

Plate II.

Fig. 2. Transverse section of the sphincter muscle of *U. felina.* x40.
Fig. 3. Portion of a transverse section of a tentacle from an example of *U. felina.* x120.
Fig. 4. Portion of a transverse section of a tentacle from another example of *U. felina.* x120.

Plate III.

Fig. 5. Transverse section of a perfect mesentery of *U. felina.* x8.
Fig. 6. Transverse section of a perfect mesentery of *Cribrina stella.* x40.
Fig. 7. Transverse section through the sphincter muscle of C. *stella.* x40.

VI.—*On the Nature and Significance of the Calcium Content of the Blood.*

By ALBERT G. NICHOLLS, M.A., M.D., D.Sc.

(Read 28th September, 1910.)

In the somewhat inadequate remarks which I have the honour of presenting at this time to the Royal Society of Canada, I have ventured to bring forward a subject to which I have recently begun to give some little attention, a subject which has a distinct practical bearing in the matter of therapeutics, and is at the same time, I believe, not without interest to the biologist, the physiologist, and the pathologist. Inasmuch, however, as I am only at the threshold of my observations I wish this present communication to be regarded as merely preliminary, and hope to present my views more in detail, and with a greater weight of experience at our meeting next year.

In an address published in April, 1909,[1] entitled "General Principles in the Treatment of Diseases of the Heart," a distinguished Liverpool physician, Sir James Barr, outlined the method of treatment which he adopts in the case of inflammatory rheumatism, in order to prevent the occurrence of valvular heart disease, an affection which is notoriously apt to complicate this painful trouble. He lays down the principle, that the presence of calcium salts in the blood is deleterious in two ways; first, by increasing the tendency to fibrin formation, in other words by promoting the coagulability of the blood; and, secondly, by raising blood pressure. We know, as a matter of experiment, and as a result of general pathological experience, that increased strain upon the heart valves and muscle distinctly predisposes to, and indeed aggravates inflammatory and degenerative processes in these structures. High blood pressure is a cause of increased strain upon the heart. Also, the inflammatory efflorescence upon the heart valves is in large part fibrin. Consequently, we can see how, if the action in question of calcium be established, a great deal depends on the adoption of rational therapeutic measures in inflammatory rheumatism. On the basis of these considerations Sir James Barr, advocates the use of a diet poor in calcium salts and particularly excludes milk. In this he is at variance with the general run of physicians. who for the most part give their patients little else but milk.

The practice of giving calcium salts in conditions such as hæmophilia, hæmorrhage, hæmoglobinuria, and purpura, where there is an actual

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[1] Sir James Barr. British Medical Journal, 1; 1909; 989.

extravasation of blood from the vessels; and in the allied conditions of urticaria, chilblain, œdema, and the so-called "lymphatic" headache, in which there is a passage out of the plasma only, is so universal among the profession that it seems almost heresy to question its propriety and yet I find that opinions are by no means unanimous on this point. For example, in a recent paper[1] read before the Royal Academy of Medicine in Ireland, Prof. B. J. Collingwood takes issue with the current belief that calcium chloride acts as a hæmostatic by increasing the coagulability of the blood. His experiments, conducted *in vitro*, afforded no warrant for concluding this to be the case. He thinks that the clinical effect attributed to this salt must be due to some other property. In the discussion that followed, Prof. McWeeney suggested that the hæmostatic power of the salt was due to its action as a general vasoconstrictor. In this latter regard, it may well be doubted whether such action on the vessels would be prolonged sufficiently to be effective, and some well-known surgeons, when they wish to obtain a hæmostatic action previous to an operation, have given up the use of calcium in favour of injections of an alien serum. An Italian observer, Ciuffini,[2] has come to the same conclusion as Prof. Collingwood. Such being the case, we may well pause to examine into the reason for the faith that is within us. With this end in view I have undertaken an investigation at the bedside into a number of different ailments, making a parallel series of observations on the calcium content of the blood, the coagulation time, and the degree of the blood pressure, hoping thereby to gain a footing on some firmer ground. For the purpose I have selected a class of diseases in which there seems to be a notable deviation from the normal in the matter of the coagulation power of the blood: To wit, typhoid fever, in which blood pressure is low and there is little tendency to the formation of fibrin; lobar pneumonia and acute rheumatism, in which fibrinous exudates are the rule and are well-marked: obstructive jaundice, in which there is a notable tendency to hæmorrhages; purpura; pernicious anæmia; arteriosclerosis; Bright's disease, &c. I soon realized, however, that an investigation on the lines I have just indicated would be of little value unless controlled by other factors. Of prime necessity is a knowledge of the laws governing calcium metabolism and the ordinary mechanism regulating blood pressure. We may usefully, therefore, pass in review what is the present state of things in regard to these subjects.

In all individuals having a separate existence the calcium in the system is derived directly from the food. The developing embryo obtains it from the maternal tissues, but in the last resort of course

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[1] Collingwood, Abstract in Brit. Med. Journ., 1; 1910; 507.

[2] Ciuffini, Il Policlinico, 16; 1909; 12.

from the mother's food. The functions of gestation and lactation put a great strain upon the maternal organism in many ways and not least in their demand for lime. As an illustration of this we may cite the disease known as osteomalacia, in which there is a rapid and progressive diminution in the amount of mineral matter in the bones, which consequently become soft, brittle or pliable. This disease is almost confined to the female sex and is particularly apt to develop during pregnancy or shortly after. The relationship of the sexual organs to calcium metabolism will be referred to again.

The amount of calcium existing in solution in the blood is very small, and in what form it circulates, whether phosphate or carbonate, or both, we do not certainly know. The amount, indeed, is so trifling that there is some ground for thinking, as some recent work would indicate,[1] that it may be present in the form of ions in combination with some of the proteins. Probably it exists in a dissociable and ionizable form and in a non-dissociable state as well. The amount, estimated as calcium oxalate, is given by Blair Bell as 0.025 to 0.02 per cent by weight. Considerable variation is found, however, in this regard in the different animal species. The blood of the rabbit, for example, contains about ten times as much calcium as does that of the dog. The amount in an ordinary state of health would appear to be fairly constant, with one or two exceptions. Bell and Hick[2] have shown that there is a marked rise in the calcium index during the later months of pregnancy and a marked fall during menstruation, in the latter case being apparently correlated to a considerable excess of lime in the menstrual blood.

The excretion of calcium from the body has been but little studied. Only a small proportion (about 5 to 15 per cent) of the total amount absorbed from the intestines is discharged in the urine. The bile is known to contain lime salts (chiefly phosphate), and it is probable that the larger part is eliminated by the intestinal mucosa and through the liver. The amount discharged by the urine is increased in osteomalacia, tuberculosis, and conditions of inanition.

There are two periods of life in which the calcium metabolism of the body is of special importance, childhood and old age. During infancy and adolescence there is a constant demand for lime salts to build up the growing bone, and after middle life retrogressive changes begin to manifest themselves as evidenced by the increasing lightness of the skeleton, and the deposit of lime in situations where it formerly was not present or only present in trifling amounts, such as the costal

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[1] Robertson, Journ. of Biol. Chem., 2; 1907; 317.

[2] Bell and Hick, Brit. Med. Journ. 1; 1909; 592.

cartilages, the larynx, and the medial coats of the arteries. Indeed we hardly grow up before we begin to die, for, as Klotz has shown, the majority of aortas of persons above thirty-five years of age show calcareous deposits. Both sets of phenomena are constant accompaniments of life processes, are inevitable, and, physiological. At times, however, a deposit of lime salts occurs in such amounts, and so out of the natural order of events as to be distinctly abnormal. This is found, to make a broad generalization, particularly where tissues are dead or dying. Thus we meet with it in old inflammatory foci, notably in tuberculosis: in the case of serous exudates: in the arteries in arteriosclerosis; in thrombi; in calculi; in parasitic cysts; in tumours, to mention only some. But this by the way.

We pass on to a phase of the subject which is to us, for the purpose in hand, of the chiefest importance, and one that in its latest developments is of absorbing interest. I refer to the part played by the ductless glands.

So far as we are aware at present, the amount of calcium in the circulating blood in conditions of health is fairly constant within certain narrow limits, with the two exceptions above noted. This implies a regulating mechanism and this we find in certain of the ductless glands, notably the thyroid and parathyroids, the pituitary body, and the genital glands (ovaries and testes), all of which have been shown a notable influence over the processes of growth and development, including calcium metabolism. So striking is this influence that, just as the old anatomists were accustomed to refer to the three organs, heart, brain and lungs, as "the tripod of life," I have been accustomed to think of the glands in question as "the tripod of growth." This conception I have rendered graphic in the diagram (vide p. 89), which I have made use of before.[1]

Not only are these glands mutually related one to the other in all possible combinations and permutations, but on their concerted action and balanced function normal development, and even existence itself, are dependent When one is diseased, also, we have the others exhibiting vicarious activity, a good illustration of what pathologists speak of as "the law of compensation." To illustrate what I mean.

Relationships between the pituitary body and the thyroid:—

(1). Both organs are highly vascular, and contain both colloid and iodine.

(2). After thyroidectomy or atrophy of the thyroid there is a compensatory hypertrophy of the pituitary.

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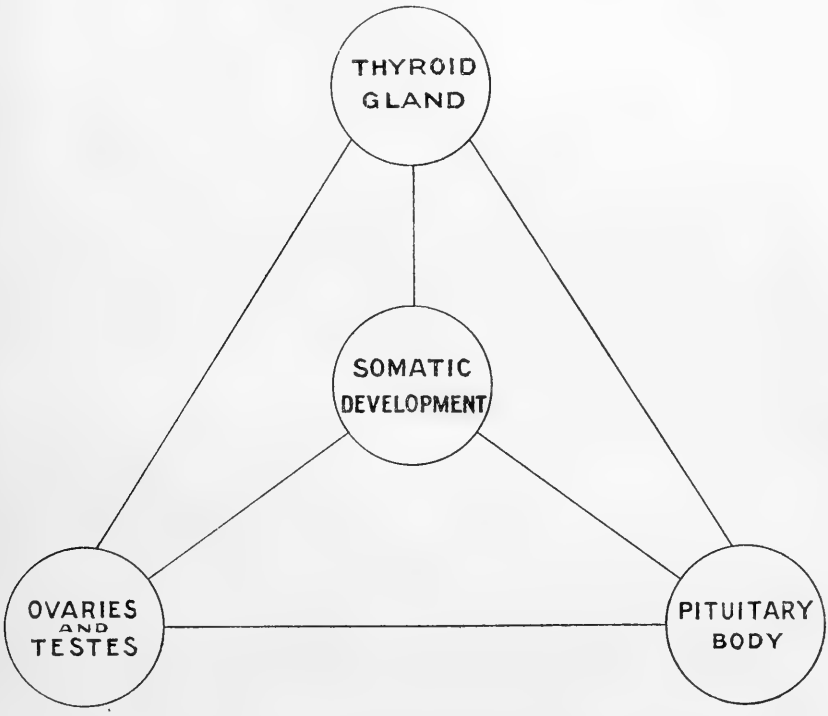
[1] Adami and Nicholls, Principles of Pathology, Vol. 2; 1909; 707., Lea and Febiger, Phila.

(3). In acromegaly, a disease due to some disorder of the pituitary, the thyroid has been found enlarged, cystic, or atrophic, and in some cases symptoms of myxœdema or exophthalmic goitre have developed.

(4). Extracts of the pituitary (infundibular portion) increase blood pressure; extracts of the thyroid lower it.



Relationships between the pituitary and the sexual organs and functions:—

(1). Tumours of the pituitary are known to be associated with hypoplasia of the genital organs, and lack of sexual power, both in the male and in the female.

(2). In giantism and acromegaly, diseases associated with gross disturbance of the pituitary function, genital hypoplasia and functional inadequacy have been observed.

(3). During pregnancy, and apparently in consequence of it, the pituitary enlarges, and shows hyperplasia of what are called the "Hauptzellen."

(4). Extracts of the infundibular portion of the pituitary excite powerful contractions in the pregnant uterus.

Relationships between the thyroid, and the genital functions:—

(1). The thyroid often manifests enlargement in girls, at or just before the first menstruation.

(2). It becomes tumid in many girls and women during the menstrual periods.

(3). It enlarges during pregnancy.

(4). In cretinism, a disease due to lack of thyroid secretion, there is a condition of sexual infantilism.

(5). Thyroid extract has been given with benefit in cases of amenorrhœa due to debility.

If, to use an arithmetical expression, we attempt to reduce the functional activity of these three organs (regarding the testes and ovaries as homologous and functionally similar), to a common denominator, we find it in their influence over growth and development, in which the formation of bone plays not the least part. Referring to the latter point entirely, the observed facts are striking and significant. In cretinism, the result of thyroid insufficiency, the bones are stunted and ossification is delayed. Certain tumours and cysts of the pituitary lead to great overgrowth of the bones as in giantism and acromegaly. Castration in the male, performed before puberty, results in the formation of a feminine type of larynx and an increase in the length of the lower extremities. The removal of the ovaries has been known to cure osteomalacia, a disease in which the lime salts are gradually withdrawn from the bones, which in consequence become brittle, soft and deformed.

Without being dogmatic on the point, it would seem extremely probable, on the ground of recent experimental work, that the explanation of these phenomena is to be looked for, at least to a large extent, in the influence which these glands exercise over calcium metabolism. The proofs are not yet absolutely final but all the available evidence points in this way.

What we know positively about it amounts to this. The brilliant experimental work of MacCallum and Voegtlin[1] has shown that extirpation of the parathyroids is followed by a remarkable increase in the elimination of calcium salts, leading to the production of tetany, convulsions and death. This result could be prevented by the exhibition of lime salts in sufficient amount. They suggest that the lime acts by neutralizing potassium salts, for the symptoms are exaggerated and the good effects of calcium prevented by the latter agents. Very recently Franchini[2] has discovered that the exhibition of pituitary

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[1] MacCallum and Voegtlin, Johns Hopkins Hosp. Bulletin, 19; 1908; 191.

[2] Franchini, Berliner klinische Wochenschrift, 47; 1910; 613, 670, 719.

extract results in a diminution in the amount of calcium in the system. In osteomalacia not only are the calcium salts removed from the bones, but there is a great increase in the amount eliminated in the urine. The influence of the ovaries on this process is referred to above. The relationship of the sexual organs in the female to calcium metabolism is so remakable that it merits a more detailed reference.

Blair Bell and Pantland Hick in a suggestive paper[1] record their observations on the connection between menstruation and the calcium content of the blood. They find that immediately before the menstrual cycle is instituted there is a marked drop in the calcium index, occasionally preceded by a slight rise. In some cases the calcium dropped to a sixth of the previous amount. Coincidently with this, they observed that the amount of lime in the menstrual discharge was greatly in excess of that in the systemic blood. They further show that the excretion takes place mainly by the migration of leucocytes, laden with salts from the uterine glands, to the uterine cavity. They note an analogous series of events in the case of hens. In the non-laying hen the calcium index remains low and fairly constant, in one chart varying from 0.9 to 1.4. In laying hens there is a marked drop in the calcium index after laying an egg, in one case from 3.2 to 0.5. Microscopical sections of the lower part of the oviduct in laying hens showed marked evidences of activity of function. They, further, point to the following clinical facts. Amenorrhœa due to general debility is cured and the symptoms relieved by the administration of calcium salts. Menorrhagia (not due to local pathological lesions) is similarly relieved. They explain the apparent paradox in this way. In the first case there is not enough calcium in the blood to initiate the process of menstruation. In the latter, there is enough lime to set up menstruation but the calcium index does not rise fast enough to bring about its cessation. The enlargement of the thyroid, before noted, which occurs just before the onset of menstruation, the authors in question associate with the fact that the calcium index is high at that time. The enlargement of the thyroid which is met with in the earlier months of pregnancy they explain as due to the fact that menstruation is suppressed, the lime accumulates in the system, and the fœtus as yet is unable to utilize all that is provided. They note, finally, that they have observed the same enlargement of the thyroid in artificial menopause. They conclude that the function of the thyroid gland is to stimulate calcium excretion, which usually takes place through the uterus, but failing this, by means of the kidneys or bowels. It may be observed, too, that while ovulation and menstruation are not necessarily correllated functions, the internal secretion of the ovaries is of importance in some way causing menstruation, for, as has long been

[1] Bell and Hick, loc. cit.

known, the complete removal of the ovaries results in menopause. It may be, that like the other ductless glands, the ovaries possess a similar power of accelerating calcium metabolism and the excretion of these salts. It is, of course, too much to claim, that the calcium metabolism in the body is the all in all in determining the nature and direction of the processes of growth or of retrogression, or that it is the sole factor in regulating sexual functions, but I think that I have adduced enough evidence to show that it is at least of prime importance.

Passing on to the next point, the question of blood pressure, I will in a few words recapitulate the main facts. The general systemic blood pressure depends first upon three things; the strength of the heart muscle, the tonus of the arteries, and the character and amount of the contained blood. A powerfully acting heart will raise blood pressure, a contracted state of the arteriolar wall will raise blood pressure, a condition of plethora, or the presence of certain toxic substances in the blood, will raise blood pressure. The contraction of the heart and the size of the blood vessels is under the control of the vasomotor nerves. I would emphasize that the character of the circulating blood and the contractile power of muscle are only two of the factors in the regulation of blood pressure. In studying the effect of calcium upon the circulation we must consistently remember this.

I have very little information on the relationship of calcium to blood pressure. It is stated that it leads to vaso-constriction, and this in itself would naturally increase blood pressure. It is also stated that a distinguished clinician in London makes use of lime as a cardiac tonic. I have not as yet come upon much experimental work bearing upon this question. Bell and Hick, found that calcium raised blood pressure, though not to the same extent as extracts of pituitary or adrenal.[1] I should judge, however, that observations should be made on the human subject if we are to get reliable information, for the blood of the rabbit, the animal ordinarily used for experimentation contains much more lime than does the human being, so that the results will not be strictly comparable. I would cite an experiment on myself, which may be taken for what an isolated observation is worth. The time chosen was about eleven o'clock a.m. when the process of digestion was nearly over, for it is held that if calcium is taken when the stomach is full of food its effects are largely neutralized. My blood pressure at the time was 132 (with the Riva-Rocci instrument). I then ingested 60 grains of Merck's calcium lactate. Three-quarters of an hour later my blood pressure was 134. This interval of time was chosen because Sir A. E. Wright, states that he found the maximum effect of calcium was pro-

[1] Bell and Hick, Brit. Med. Journ. 1; 1909; 777.

duced in an hour or less. The difference of 2 points is not greater than the possible error in observation. Further, the pulse rate which at first was sixty-eight was the sixty-eight at the end of the experiment. The only effect produced was slight nausea and fulness in the head for a few moments, and a speedy action of the bowel. The motion was not watery but well formed and preceded by slight cramp so that I judge the action of the calcium was upon the intestinal muscle rather than on the secreting structure. So far as I could see, therefore, the effect of this large dose, a dose greatly in excess of the daily amount usually given therapeutically, was nil so far as the circulation was concerned. Clinically, I have found no constant relationship between the calcium index in the blood and the blood pressure. Thus in typhoid fever, in one case with a blood pressure of 112, the calcium index was 0.802; with a blood pressure of 111 the index was 0.8. In the same case at other times, with a blood pressure of 102 the index was 0.708; and with a pressure 107 the index was 0.58. Again in case of pneumonia with a blood pressure of 140 the index was only 0.132.

The bearing of the calcium content of the blood on the coagulation time is also open to debate. Using the Wright coagulometer, in a case of pneumonia, in which disease the blood is supposed to contain a large amount of the fibrin-forming elements, the coagulation time was four minutes and a quarter (the normal time being two or three minutes) with a very low calcium index. To cite only one other instance, in a case of typhoid the coagulation time was found to be at one time four and a half minutes; at another, two and three-quarter minutes, with a calcium index practically the same in both cases.

We owe the prevalent belief that the administration of calcium salts will increase the fibrin forming power of the blood so as to shorten its coagulation period, while salts of citric acid have the opposite effect, mainly to the influence of Sir A. E. Wright, who, since his first publications[1] in 1893, has brought out a number of papers containing experimental evidence in favour of this position. Subsequently much clinical evidence has been accumulated to show that the exhibition of calcium salts is a valuable therapeutic resource in diseases characterized by imperfect coagulating power of the blood or a tendency to serious transudation. Wright's results showed that a dose of thirty grains of calcium chloride would reduce the coagulation time from a quarter to a half of the time required when the drug had not been given. It is only lately that Wright's results have been seriously questioned. The chief iconoclastic work has been done by Addis who in two recent papers[2] gives the

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[1] Sir A. E. Wright, Journal of Pathology and Bacteriology, 1; 1892; 434: also British Med. Jour., 2; 1893; 223.

[2] Addis. The Quarterly Journal of Medicine, 2; 1909; 149, and British Medica Journal, 1; 1909; 997.

results of his own experiments. Repeating Wright's work, but using a different and more reliable method, he was unable to substantiate Wright's conclusion, finding that neither calcium nor citrates had the slightest effect in altering the coagulation time. This discrepancy he attributes to the use by Wright of a faulty method. His objections to the technique is that in the Wright coagulometer the blood is exposed too much to the air, is brought too much in contact with foreign material, and is not kept at a constant temperature. Using Bogg's modification of Brodie and Russell's apparatus, and, later, his own modification of McGowan's method, in which these objections are practically eliminated, he obtained quite different, and as he believes, more accurate results. It is true that the addition *in vitro* of a certain amount of calcium (between 0.036 to 0.110 per cent shortens the coagulation time; between 0.110 and 0.366 per cent increases it; and 0.550 per cent prevents coagulation altogether, Wright.) markedly alters the coagulation time, but the experimental work shows that the amount necessary to shorten the time positively is much greater than it is possible to produce in the blood by even large doses of calcium. Or in other words, while calcium administered by the mouth or by intravenous injection, increases the amount of ionizable calcium in the blood, and salts of citric acid lessen it, the effect produced is too small to materially alter the coagulation time. If this be so, and it seems very likely, then the whole superstructure of therapeutics built upon Wright's work falls to the ground like a house of cards.

It remains to say a word about the relation of the coagulation time to the blood pressure. I have been unable as yet to trace any association. In typhoid fever the blood pressure is consistently low, in my observation being from 114 to as low as 85. In a case with the highest blood pressure (114), the coagulation time was the longest, four and a quarter minutes. But other cases exhibited a certain amount of parallelism. My observations are too few as yet for any certain conclusion to be reached. I hope to continue my studies on a more extended series of cases and by improved methods so as to speak with more definiteness on the disputed matters. In the meantime, without desiring to prejudge the case, after weighing all the evidence, and taking into consideration my own tentative work, I shall not be surprised if we eventually find that the therapeutic importance of calcium salts has been greatly overrated.

VII.—*Observations on the Parasitism of Isaria farinosa* (Dicks.) *Fr. with special reference to the Larch Sawfly* (*Nematus erichsonii* Hartig).

By H. T. GÜSSOW, Dominion Botanist.

(Communicated by Dr. Wm. Saunders, F.R.S.C., and read 27th September, 1910.)

The fungus on which I wish to record a few observations is, as no doubt you are aware, one of the commonest of those found growing on insects, at some time or other during different stages of their development. Far greater importance has been attached to these entomogenous fungi in recent years owing to their being regarded as natural factors in the control of insect pests. This question has interested both Entomologist and Botanist alike and, owing to the alarming increase at the present day of the larch sawfly on both sides of the Atlantic, a special study of this particular fungus has been made more opportune. There were several points of interest on which further research was desired. Was the fungus known to occur on the larch sawfly cocoons in Europe identical with that observed in Canada? This is, however, one of the minor points at issue. Still more prominent was the question—Does this fungus attack the living cocoons, or the pupating larvæ or is it only secondary, growing saprophytically on the dead cocoons? The third point of interest was to ascertain how infection took place.

I.

The first point was easily settled. Material i.e. larch sawfly cocoons collected by Dr. C. Gordon Hewitt in Canada, showed small patches of a whitish fungus growing on the surface. The cocoons were kept under suitable conditions for further study of the fungus. Some three weeks later the growth had become elongated and had taken the shape of the characteristic forked or tongued sporophores with which the investigator is quite familiar. These measured from 2-3 centimeters in length; their stalks were orange coloured at the base and about two-thirds of the upper portion was covered with a white farinaceous mass. On microscopic examination of these filaments the fungus was identified as belonging to the genus *Isaria*, being the conidial form of the ascigerous (pyrenomycetous) fungus *Cordiceps militaris*. To establish, however, the identity of the Canadian species with the European one it was thought advisable to make a series of pure cultures. I succeeded, with the necessary care, in obtaining immediately a pure culture by removing a small portion of the farinaceous mass composed of spores by means of a sterilized platinum needle. The spores at that

time densely covered the erect stroma. They were transferred to a sterile petri dish containing Standard Nutrient Gelatine. After 36 hours, small radiating colonies became visible to the unaided eye. Previously, the germination of the colourlous, oval-shaped conidia was observed with the aid of the microscope. After 6 hours the first signs of germination occurred, the spore sending forth one or two fine mycelial tubes. Sometimes the germination and development reminded, on account of the much enlarged spherical cells produced, of the development of common yeast spores; at other times the germination resembled more an ordinary hyphomycetous fungus. The growing colonies formed beautiful objects. Radiating from the central spore the hyphæ produced circular rays, which appeared slightly iridiscent when holding up the dish and looking at the colony through the medium. After a few days the surface of the petri dish and of "slants" in test-tubes became covered with a dense mass of tufty hyphæ of a creamish or pale orange tinge. Small portions of these were carefully removed and examined. Abundant spores had been produced in the meantime. They are born in long chains from 2-11 on finely drawn out flask-shaped sterigmata which are produced from the main or lateral branches of the mycelium in "whorls" from 2 to 7. They were, however, also observed singly. The spores produced in the cultures sowed themselves all around the growing fungus masses and new colonies were constantly observed and watched. The spores and sterigmata were measured and were found identical in every respect with those grown in pure cultures from European material. The fungus on the Canadian cocoons hence was identified as *Isaria farinosa.*

II.

There has long been the conception that *Isaria farinosa* grows parasitically on insect larvæ of various kinds. All textbooks of mycology agree on that point. In the absence, however (at least I was not able to discover any records), of demonstrating experiments, these statements did not exclude the possibility that the *Isaria* may occur secondarily. It was just as likely that it grew saprophytically on cocoons or larvæ that had died previously. In view of the fact that the larch sawfly was increasing here and elsewhere, it was thought advisable that the parasitism of the fungus, if such existed, would play an important role in the control of this enemy of tamaracks.

I must thank here my friend and colleague, Dr. Hewitt, for placing material in form of *Isaria* covered larch sawfly cocoons at my disposal. These cocoons were placed together with the moss in which they were imported from England into a flat glass dish. The moss was moistened and a well-fitting lid preserved the moisture satisfactorily. The cage

was kept in the dark under ordinary laboratory temperature. In about 22 days a considerable quantity of sporophores of the *Isaria* were produced. Originally 23 cocoons showing the white patches of the fungus were placed in the cage. No adult insect emerged from these cocoons. Some of the cocoons were dissected at intervals and were found to contain a blackened or dirty yellowish adult. The dissected cocoons were replaced and the *Isaria* developed further. I then obtained a handful of cocoons which were carefully examined and which showed no signs of an infection whatever. They were divided in equal numbers, 30 cocoons serving in each of the following experiments:—

Experiment A.

These sound living cocoons were introduced into a breeding chamber and were carefully kept free from external infection from *Isaria* spores. It was sought to ascertain how many of the cocoons would produce living adults and those emerging were carefully recorded. Ten adult larch sawflies emerged in the course of ten days. Eleven parasitic insects were also found to emerge from the cocoons; the remainder of the cocoons did not "hatch" at all. Some of these were found, on dissection, empty. Some showed remains of a dead adult. Only one cocoon showed signs of *Isaria*.

Experiment B.

The same number of cocoons were used. These were placed, together with infested moss and *Isaria* spores bearing cocoons, into a small breeder. After 10 days 6 adults and 6 parasites were observed and were left confined in the cage. One of the first peculiar symptoms observed in these cocoons was a darkening in colour of 16 of them. The colour of the normal cocoons being light chocolate, while in these cases the colour was of a pronounced dull chocolate tinge. Four more adults emerged on subsequent occasions. Although no signs of *Isaria* were then noticeable on the darkening cocoons some of them were dissected and microscopically examined. Two of the examined cocoons showed the interior walls lined with white fungus hyphæ; others showed fungal hyphæ in the dead adults' body. Later on white fluffy patches occurred externally rather suddenly on most of the remaining cocoons. From the appearance of these fungous growths it was evident that they were formed by the *Isaria*. About two months after beginning the experiments the fungi formed the well-known forked sporophores and the microscopical characters proved the fungus to be *Isaria*. Spores had been produced abundantly at very early stages and no doubt had become disseminated throughout the cage. When about three months

after starting this experiment I examined the interior of the cage again, I found the whole moss superficially and throughout the layer studded with fine whitish colonies of fungi. These were examined and found to be small colonies of *Isaria*. These colonies remained up to date very minute, but never disappeared. New ones constantly appeared and at present the moss is peculiarly studded all over with minute *Isaria* colonies. These colonies having no supply of congenial food remained small and were of course of starved appearance. I next separated a few and transferred them to a petri dish containing nutrient gelatine. Here they made three days' rapid growth and no doubt would have covered in the usual way the whole surface but for the appearance of gelatine liquifying bacteria which put a premature end to my observation. Nevertheless, it was proved repeatedly that the fungous spots consisted of *Isaria farinosa* and no other. It was surprising to me that, never throughout these experiments, I was able to observe other fungi; like *Penicillium* and other common moulds. Several important conclusions may be drawn from these experiments.

1. Granted that the cocoons used in experiments A and B were in equal condition as far as their being alive is concerned, it is shown from the greater number of adults or parasites emerging from cage (experiment A) and from the infection of a large proportion of cocoons in experiment B that the fungus *Isaria farinosa* is truly parasitic on larch sawfly cocoons.

2. It is evident that spore infection of the cocoons had taken place. On no occasion I observed the infection of adults; they died rapidly but remained uninfected.

3. The fungus *Isaria farinosa* is capable of vegetating saprohpytically for a considerable length of time, provided sufficient moisture is available. The conditions under which this mode of life was observed were close to natural conditions.

4. Owing to this saprophytic mode of life there remains little doubt that the pupating larvæ of the larch sawfly infect themselves when taking to the ground for pupation. The colonies observed in the moss appeared about the end of July and continued to show up to the end of September, during which time, of course, the pupation of the larch sawfly takes place in nature.

III.

I have to record some observations on another experiment undertaken to discover whether it is possible to infect larch sawfly adults and cocoons with spores of *Isaria* from pure cultures. For this purpose a flat glass dish containing *Sphagnum* was sterilized on three successive days in an hot air sterilizer. Although the moss became brown in colour

it still retained satisfactorily moisture subsequently introduced. I then placed a number of living adults and cocoons in this apparatus and dusted the whole with spores that had been produced in a pure culture of *Isaria*. The living adults had all died after three days and none of those (11) emerging from the cocoons contracted the fungous disease. After 21 days no more adults emerged, although 13 cocoons remained, which I had evidence to believe contained living adults. Of these, nine eventually developed the typical *Isaria* and the moss also began to be covered with numerous *Isaria* colonies. This experiment confirms my other observations and also indicates that the disease may be artificially introduced even at so late a stage in the development of the larch sawfly. Infection takes place in nature, no doubt, much earlier.

Although none of my experiments were made under strictly natural conditions; that is to say in the open air, yet the observation that the fungus *Isaria* is regularly found year after year under larch trees, when once it has been found, may indicate that the results obtained really closely show what takes place in nature.

In conclusion, I may say that in *Isaria farinosa* we possess one certain factor, by which the increase of the larch sawfly may be controlled. Whether it is necessary to resort to these means in the face of the every year increasing number of insect parasitized larch sawfly cocoons—is somewhat doubtful.

VIII.—*Bibliography of Canadian Zoology for* 1909.[1]

(Exclusive of Entomology.)

By LAWRENCE M. LAMBE, F.G.S.

(Read by title, September 28, 1910.)

INVERTEBRATA.

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From the Proceedings of the United States National Museum, 1909, vol. 37, pp. 301–320, with plates 30–32.
Critical remarks are made on nineteen species of the families Craspedotæ, Siphonophoræ, Scyphomedusæ, and Ctenophoræ.

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The American Naturalist, September, 1909, vol. xliii, No. 513, pp. 542–555, with text figures.

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Range of Lymnæa umbilicata.
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Pyramidellidæ of New England and the adjacent region.
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[1] Communicated by permission of the Director of the Geological Survey, Department of Mines.

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The larva and spat of the Canadian Oyster. I. The larva.
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BARTON, WARREN EVERMAN. See JORDAN.

JORDAN, DAVID STARR, and BARTON, WARREN EVERMAN.
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The Ontario Natural Science Bulletin, No. 5, 1909, p. 51.
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The Ontario Natural Science Bulletin, No. 5, 1909, pp. 37–45.
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The destruction of birds at Niagara falls.
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The Ottawa Naturalist, September, 1909, vol. xxiii, No. 6, p. 116.
Notes on the birds of Durham, Ont.
The Ottawa Naturalist, October, 1909, vol. xxiii, No. 7, p. 132.
The Sharp-shinned Hawk migration.
The Ottawa Naturalist, December, 1909, vol. xxiii, No. 9, pp. 156–160.
Rare Birds at Point Pelee.
The Ottawa Naturalist, December, 1909, vol. xxiii, No. 9, pp. 160–162.
The third specimen of the Summer Tanager for Canada.
The Auk, July, 1909, vol. xxvi. No. 3, p. 308.
The Acadian Flycatcher in Ontario.
The Auk, October, 1909, vol. xxvi, No. 4, p. 430.

STANSELL, SIDNEY, S. S.
Birds of Stony Plain, Alberta.
The Ottawa Naturalist, October, 1909, vol. xxiii, No. 7, pp. 125–127
A list of 123 species, with dates of first appearance in 1907 and 1908, and remarks on each species as to whether it breeds at the above locality, and is common, or otherwise, etc.
Birds of central Alberta.
The Auk, October, 1909, vol. xxvi, No. 4, pp. 390–400.
Gives a valuable list of 157 species.

TERRILL, L. McI.
Bird notes.
The Ottawa Naturalist, June, 1909, vol. xxiii, No. 3, p. 59.

TOWNSEND, CHARLES W.
Labrador Notes.
The Auk, April, 1909, vol. xxvi, No, 2. p. 201.
Consists of observations on the following species: *Anas platyrhynchos, Dafila acuta, Somateria spectabilis, Porzana carolina, Falco islandus, Colaptes auratus luteus, Dendroica æstiva* and *Hirundo erythrogaster.*

TROTTER, SPENCER.
The geological and geographical relations of the land-bird fauna of north-eastern America.
The Auk, July, 1909, vol. xxvi, No. 3, pp. 221–233.
Includes references to the land-bird fauna of eastern Canada.

VENABLES, E. P.
The Burrowing Owl (*Cunicularia hypogæa*).
The Ottawa Naturalist, March, 1909, vol. xxii, No. 12, p. 261.

MAMMALS.

KEEN, J. H.
Caribou on the Queen Charlotte islands.
The Ottawa Naturalist, March, 1909, vol. xxii, No. 12, p. 260.

MACOUN, J. M.
An early Bat.
The Ottawa Naturalist, March, 1909, vol. xxii, No. 12, p. 266.
Records the appearance of *Vespertillo fuscus*, Beauv. in Ottawa, Ont., on February 24th.

NELSON, E. W.
The rabbits of North America.
U. S. Department of Agriculture, Bureau of Biological Survey, North American Fauna, No. 29, pp. 1–287, with thirteen plates.

OSGOOD, WILFRED H.
Revision of the mice of the American genus Peromyscus.
U. S. Department of Agriculture, Bureau of Biological Survey, North American Fauna, No. 28, pp. 1–267, with eight plates.

PRINCE, E. E.
The prong-horn Antelope.
The Ottawa Naturalist, June, 1909, vol. xxiii, No. 3, pp. 41–46.

SAUNDERS, W. E.
On the hibernation of the Jumping Mouse, and notes on the Check List of the mammals, issued by the Department of Education, Toronto. The Ontario Natural Science Bulletin, No. 5, 1909, pp. 4–8.

SETON, ERNEST THOMPSON.
Life-histories of northern animals. An account of the mammals of Manitoba, Vol. I.—Grass-eaters, pp. 1–673; Vol. II—Flesh-eaters, pp. 675–1200. Beautifully and copiously illustrated with plates and text figures from original drawings by the author.

MISCELLANEOUS.

BERNIER, J. E.
Report on the Dominion Government Expedition to Arctic Islands and the Hudson Strait on board the C.G.S. "Arctic," 1906–1907, pp. 1–127, 1909.
In chapter ix are to be found short notes on the whales, seals and fishes of the northern waters of Canada.

HALKETT, ANDREW.
Natural History Report.
Appendix No. 21, 42nd Annual Report, Department Marine and Fisheries, 1908–9, Fisheries, pp. 386–394, 1909.

KERMODE, FRANCIS.
Guide to the Natural History and Ethnological collections in the Provincial Museum, pp. 1–92, with 34 plates illustrating the principal mammals, birds and fishes of British Columbia. Victoria, B.C., 1909.

OSGOOD, WILFRED H.
Biological investigations in Alaska and Yukon Territory.
U. S. Department of Agriculture, Bureau of Biological Survey, North American Fauna, No. 30, pp. 1–92.
Mammals and birds.

PIERS, HARRY.

Report on Provincial and Science Library of Nova Scotia, pp. 1–16, Halifax, N.S., 1909.

Mentions on pp. 8–10, rare accessions to the museum from within the limits of the province.

SETON, ERNEST THOMPSON.

Fauna of Manitoba (Mammals and Birds). Handbook to Winnipeg and the province of Manitoba, British Association meeting, Winnipeg, 1909, pp. 183–227.

TURNER, J. P.

The game fields of the west.

Hand-book to Winnipeg and the province of Manitoba, British Association meeting, Winnipeg, 1909, pp. 253–267.

IX.—*Bibliography of Canadian Entomology for the year* 1909.

By Rev. Prof. C. J. S. BETHUNE, D.C.L.

(Read by title, 28th September 1910.)

ALDRICH, J. M.

The Fruit-infesting forms of the Dipterous genus Rhagoletis, with one new species. (Gives a table of the species and describes a new form, *R. intrudens*, from Victoria, B.C. The shading and venation of the wings of four species are depicted. All are of much interest to Canadian fruit growers as well as Entomologists). Canadian Entomologist, xli, 69–73, February 1909 (plate).

AMI, H. M.

Dr. Fletcher as a leader. (A vivid description of the attractive personality and inspiring influence of this remarkable man, who was on all occasions and among people of all sorts a leader instinctively to be followed). Ottawa Naturalist, xxii, 215–220, January 1910.

BACK, ERNEST A.

The Robber-flies of America, north of Mexico, belonging to the subfamilies Leptogastrinæ and Dasypogoninæ. (An elaborate monograph of these divisions of the Dipterous family Asilidæ. A number of the species occur in Canada). Transactions American Entomological Society, Philadelphia, xxxv, 137–400 (eleven plates), 1909.

BANKS, NATHAN.

New Canadian Mites. (Describes 27 new species, all of which were collected by Prof. Tennyson D. Jarvis at Guelph, Ontario). Proc. Entomological Society of Washington, xi, 133–143, four plates, including 31 figures. July-September, 1909.

BETHUNE, C. J. S.

Report of the Professor of Entomology and Zoology. 34th Annual Report of the Ontario Agricultural College and Experimental Farm, Guelph, 1908, pp. 24–35.

BETHUNE, C. J. S.

Injurious Insects in Ontario in 1908. (Brief accounts of some of the principal insect attacks of the year). 39th Annual Report, Ent. Soc. Ont., 1908, pp. 128–135.

BETHUNE, C. J. S.

Obituary notice of the late William Henry Edwards, with portrait. Can. Ent. xli, 245–248, August 1909.

BEUTENMULLER, WILLIAM.

North American Cynipidæ: The N. Am. species of *Rhodites* and their Galls. (The first of a series of six papers. A large number of Canadian

species are included.) Bulletin, American Museum of Natural History, New York, xxiii, 629–651 (five plates), 1907.

The species of *Holcaspis* and their Galls., ibid, xxvi, 29–45 (three plates), 1909.

The species of *Amphibolips* and their Galls. ibid, 47–66 (six plates).

The North American species of *Diastrophus* and their Galls. ibid, 135–145 (four plates).

The species of *Biorhiza, Philonix* and allied genera, and their Galls. ibid, 243–256 (three plates).

Some North American Cynipidæ and their Galls. (Includes the genera *Eumayria, Belenocnema, Solenozophera,* and *Compsodryoenus.*) ibid, 277–281 (one plate).

BIRD, HENRY.

New Histories and Species in Papaipema (Hydroecia). (Continuation of a series of papers on the life-histories of this interesting family of moths). Can. Ent. xli, 57–68, February; 115–118, April 1909.

BRAUN, ANNETTE F.

Phylogeny of the Lithocolletid group. (A review of the position and relationships of this group of Tineid moths, and a statement of theories concerning its descent.) Can. Ent. xli, 419–423, December 1909.

BRODIE, WM.

Lepidopterous Galls collected in the vicinity of Toronto. (A series of three papers, the continuation of which was prevented by the death of the elderly writer). Can. Ent. xli, 7–8, January; 73–76, February; 157–160, May; 242–252, August 1909.

BUENO, J. R. DE LA TORRE and KIRKALDY, G. W.

A Catalogue of American Aquatic and Semi-Aquatic Hemiptera. (A very useful list, including synonomy, bibliography and locality data). Proc. Entomological Society, of Washington, D.C., x, 173–215, 1909.

BURQUE, L'ABBÉ.

Société de Québec pour la protection des Plantes contre les Insectes et les Champignons nuisibles. (An account of the second annual meeting of this new Society, held at Macdonald College, Ste. Anne de Bellevue, P.Q., on March 10, 1909). Le Naturaliste Canadien, xxxvi, 49–56, Avril 1909.

BUSCK, AUGUST.

A generic revision of American Moths of the family Oecophoridæ, with descriptions of new species. (A number of Canadian species of these Tineid moths are referred to). Proceedings U. S. National Museum, xxxv, 187–207, October 1908.

BUSCK, AUGUST.

Notes on Microlepidoptera, with descriptions of new North Amer can species. (Mentions that *Aristotelia* [*Gelechia*] *placidella*, Zeller, from Vancouver Island, B.C., has hitherto been overlooked, and is not included in Dyar's List nor in the writer's Gelechiid Revision). Proc. Ent. Soc. Washington, xi, 87–103, 1909.

CASEY, THOMAS L.
Studies in Caraboidea and Lamellicornia. (Includes an exhaustive study of the genus *Omus*, with descriptions of several new species and sub-species; also many new forms of *Cicindela* and *Carabidæ*. In the Lamellicornia a number of new species in both Lucanidæ and Scarabæidæ are described.) Can. Ent. xli, 253–284, August 1909.

CHAGNON, G.
Coléoptères de Labrador. (A list with the place of capture of forty-six species from this little-known region). Le Naturaliste Canadien, xxxvi, 71–74, Mai 1909.

CHAGNON, G.
L'Erebus odoratus, Linn., au Canada. (Refers to the capture of this large moth in Quebec, and gives a list of other places in Canada where specimens have been taken, ranging from the lower St. Lawrence to Vancouver.) Le Naturaliste Canadien, xxxvi, 129, Septembre 1909.

CHAGNON, G.
Erebus odoratus ou odora. (Explains the reason why the former specific name should be adopted.) Le Naturaliste Canadien, xxxvi, 181–2, Décembre 1909.

CHAGNON, G.
Les Buprestides de la Province de Québec. (A list of the species with excellent tables and descriptions of the genera and species. It is to be hoped that the writer will extend his work to the whole Dominion, and publish similar synopses). Le Naturaliste Canadien, xxxvi, 145-152; October; 161-171, November, 1909.

CHITTENDEN, F. H.
The Hop Flea-beetle, *Psylliodes punctulata*, Melsh. (A full account of the life-history, so far as known, of this insect which of late years has been seriously destructive to the hop plant in British Columbia, and to rhubarb and sugar-beets in other localities. Methods adopted for its control are described). Bulletin No. 66, Part vi, Bureau of Entomology, U.S. Department of Agriculture, Washington, May 8, 1909, pp. 71-92, 3 plates, 8 text figures.

DOD, F. H. WOLLEY.
What is a species? (Some interesting contributions to the literature of this complicated and much discussed question). Ottawa Naturalist, xxiii, 69-73, July 1909.

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Discourses upon the Lepidoptera, I, Variation. Ottawa Naturalist, xxiii, 122-125, October 1909. II—Familiarity with local forms, ibid, 144-146, November.

EASTHAM, J. W.
Some enemies of Ontario Coccidae. (Gives the results of a series of careful observations made at Guelph during an entire season). 39th Annual Report, Ent. Soc. Ont., 1908, pp. 54-56.

EVANS, J. D.
Collecting with a Lantern Trap during the season of 1908. (A short account with diagrams, of a successful trap). 39th Annual Report, Ent. Soc. Ont., 1908, pp. 64-65.

EVANS, J. D.
Notes on the occurrence of Lachnosterna in 1908. (A brief record of the numbers of several species taken by attraction to light). 39th Annual Report, Ent. Soc., Ont., 1908, p. 66.

FALL, H. C.
Revision of the species of *Diplotaxis* of the United States. (An excellent monograph of this genus of Scarabaeid Coleoptera. Seven species are recorded from Canada). Transactions American Entomological Society, Philiadelphia, xxxv, 1-98, plate, January, 1909.

FELT, E. P.
The Interpretation of Nature. (Abstract of an address in which many instances were given of the deductions that may be formed from apparently insignificant details, and which are often of great value to the economic Entomologist). 39th Annual Report, Ent. Soc. Ont., 1908, pp. 23-30'

FELT, E. P.
The economic importance and food-habits of American Gall Midges. (Gives brief descriptions of the galls produced by a number of species of Cecidomyiidae and of the injuries caused by them.) 39th Annual Report, Ent. Soc. Ont., 1908, pp. 43-46.

FELT, E. P.
Gall Midges of the Goldenrod. (Gives a useful table of the galls made by Cecidomyiidae, with brief descriptions of the various species of midges.) Ottawa Naturalist, xxii, 244-248, February 1909.

FENYES, A.
Dissecting small beetles. (Describes a method which will be of much use to students of Coleoptera). Can. Ent., xli, 84, March 1909.

FLETCHER, JAMES, and GIBSON, ARTHUR.
Entomological Record, 1908. (The eighth annual publication of this valuable record of captures of new and rare insects made by collectors throughout the Dominion in the Lepidoptera, Diptera, Coleoptera, Hymenoptera, Hemiptera, Orthoptera, Odonata, Neuroptera, Trichoptera and Araneida.) 39th Annual Report, Ent. Soc. Ont., 1908, pp. 99-116.

FROST, C. A.
The food plant of *Enarmonia tristrigana*, Clemens. (This species of Micro-Lepidoptera has been taken in eastern Canada. A description of the full-grown larva and some account of the life-history are given). Psyche, xvi, 13-16, Boston, February 1909.

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The Farmer's Wood-lot. (An interesting paper, giving an account of the various trees to be found and the insects, and other animals that frequent them). 39th Annual Report, Ent. Soc. Ont., 1908, pp. 138-145.

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Report of the Division of Entomology. (Gives an account of the insects that were chiefly injurious in 1908, and a description of the Brown-tail Moth, its discovery among shipments of nursery stock from France to Canada, and experiments with hydrocyanic acid gas for the destruction of the larvae). Experimental Farms' Report for the year ending March 31, 1909, Ottawa, pp. 48-64.

GIBSON, ARTHUR.
James Fletcher, LL.D. (Obituary notice with portrait). Ottawa Naturalist, xxii, 189-191, Janary 1909.
Dr. Fletcher as an Entomologist, ibid, 207-211.
The Published Writings of Dr. Fletcher, ibid, 227-233.

GIBSON, ARTHUR.
Description of *Psilocorsis Fletcherella*, a new species of moth of the family Œcophoridae. Ottawa Naturalist, xxii, 226-227, January 1909. Can. Ent., xli, 96, March 1909.

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Report of the Entomological Branch of the Ottawa Field Naturalists' Club for 1908. Ottawa Naturalist, xxiii, 28-31, May 1909; ibid 50-53, June; ibid. 76-77, July.

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Farmers' Friends and Foes. (A series of 42 articles containing replies to enquiries respecting noxious and beneficial insects). Montreal Weekly Star, January to November, 1909. Among these articles are the following—
Strawberry Weevil, January 13.
Joint-worms, March 3.
Onion Maggots, May 12.
Spruce-Gall-louse, May 26.
Currant Worms, July 7.
American Silkworm, September 29.

GIBSON, ARTHUR.
Snow-worms. (An account of the appearance in considerable numbers of so-called "Snow-worms," the larvae of a Lampyrid beetle, probably *Telephorus bilineatus*). Ottawa Naturalist, xxiii, 129-130, October 1909.

GIBSON, ARTHUR.
The larva of *Neoarctia Beanii*, Neum. (The specimen described was sent from Banff, Alberta, to the late Dr. Fletcher). Can. Ent., xli, 400, November 1909.

GIBSON, ARTHUR.
Hydrocia micacea, Esp., in Canada. (An account of this newly imported moth whose larvae are found to attack corn and several garden plants). 39th Annual Report, Ent. Soc. Ont., 1908, pp. 49-51.

GIBSON, ARTHUR, and FLETCHER, JAMES.
Entomological Record, 1908. (Owing to the lamented death of Dr. Fletcher, this issue of the Record is largely the work of Mr. Gibson, on whom it devolved to prepare the manuscript for publication). 39th Annual Report, Ent. Soc. Ont., 1908, pp. 99-116.

GIBSON, ARTHUR.
Insects of the year 1908 at Ottawa. (Describes the occurrence and work of a number of insects of economic interest, some of them being recently observed for the first time). 39th Annual Report, Ent. Soc. Ont., 1908, pp. 116-120.

GIBSON, ARTHUR.
The Clover-seed Midge. (A popular account of this very injurious insect). Montreal Weekly Star, January 8, 1909; Toronto Weekly Mail and Empire, January 7, 1909.

GIBSON, ARTHUR, and MACOUN, W. T.
Calendar Guides to Spraying—Farmers' Advocate, London, Ontario, xliv, p. 527, 1909.

GIRAULT, A. ARSENE.
A Monographic Catalogue of the Mymarid genus Camptoptera, Foerster, with description of one new North American form. (Includes a brief description of *C. clavata*, Provancher, from Quebec). Annals Ent. Soc. America, ii, 22-29, March 1909.

GODBOUT, J. B.
La Vrillette. (An interesting account of an Anobium beetle, commonly called "The Death Watch," and often regarded with superstitious dread. The Editor adds a further description of the insect and its habits). Le Naturaliste Canadien, xxxvi, 81-85, Juin 1909.

GROH, HERBERT, and GIBSON, ARTHUR.
The Published Writings of Dr. Fletcher. Ottawa Naturalist, xxii, 227-233, January 1909.

HAMPSON, SIR GEORGE F.
Catalogue of the Noctuidæ in the collection of the British Museum. (This volume begins the sub-family Acronyctinæ, which contains some 3,000 species included in over 300 genera, and will require two more volumes for its completion. A large number of Canadian species are described.) Vol. vii, pp. 709; plates 108-122.

HARRINGTON, W. HAGUE.
Reminiscences of Dr. Fletcher. (The tribute of an intimate and life-long friend to the memory of one so deeply beloved by all who knew him). Ottawa Naturalist, xxii, 196-207, January 1909 (portrait).

HEWITT, C. GORDON.
Tent-building habits of Ants. (Observations on the structures made by *Lasius niger* for the protection of its Aphid colonies). Ottawa Naturalist, xxiii, 168-170, December 1909.

HEWITT, C. GORDON.
The Structure, Development and Bionomics of the House-fly, *Musca domestica*, Linn. Part iii, The Bionomics, Allies, Parasites, and the relation of *M. domestica* to Human Disease. (The completion of a series of papers on this subject; many details are given respecting the fly as the carrier of the bacilli of some infectious diseases.) Quarterly Journal of Microscopic Science, liv, Part 3, pp. 347-414, one plate, December 1909.

HINE, JAMES S.
Robber-flies of the genus Asilus. (A monograph of these predaceous Dipterous insects, containing a list of the species with references to the literature, a key to the species and dsecriptions of a number of new forms, several of which are from British Columbia. (Annals Ent. Soc. of America, ii, 136-170 (two plates), June 1909. Reprinted in Contributions from the Department of Zool. and Ent. of the Ohio State University, No. 32.

HOUGHTON, C. O.
Notes on Œcanthus. (Describes the various methods in which Tree Crickets of different species deposit their eggs, and other observations). Can. Ent., xli, 113-115, April 1909.

HOWARD, L. O.
Present condition of the work connected with the importation of the foreign Parasites of the Gypsy Moth and Brown-tail Moth. (A paper read at the annual meeting of the Entomological Society of Ontario). 39th Annual Report, Ent. Soc. Ont., 1908, pp. 121-124.

HUARD, V. A.
Entomologie: De la locomotion chez les Insectes. (Continuation of a series of papers dealing with structure, anatomy, etc., of insects). Le Naturaliste Canadien, xxxvi, 8-11, Janvier 1909.

HUARD, V. A.
La Vrillette. (An account of the Anobium beetle, commonly called "the Death Watch," appended to an article by Mr. J. B. Godbout). Le Naturaliste Canadien, xxxvi, 81-85, Juin 1909.

HUARD, V. A.
Capture d'un *Erebus odora*, Linn., à Québec—un souvenir entomologique. (An account of this remarkable tropical moth, a specimen of which was taken in Quebec during the evening of July 28). Le Naturaliste Canadien, xxxvi, 113–116, Août 1909.

JARVIS, TENNYSON D.
Further Notes on the Coccidæ of Ontario. (An addendum to his paper of the previous year, giving five additional species, and a map showing the extended distribution of the San José Scale). 39th Annual Report, Ent. Soc. Ont., 1908, pp. 52–54.

JARVIS, TENNYSON D.
Apparatus for collecting small Arthropods terrestrial and aquatic. (Describes, with figures, the apparatus employed and the materials from which a variety of mites were obtained). 39th Annual Report, Ent. Soc. Ont., 1908, pp. 66–69.

JARVIS, TENNYSON D.
A Catalogue of the Gall Insects of Ontario. (A very complete list of the gall-producing insects of various orders and the plants on which they are to be found, with numerous drawings and photographs in illustration). 39th Annual Report, Ent. Soc. Ont., 1908, pp. 70–98 (18 plates).

KEARFOTT, W. D.
Descriptions of new species of North American Crambid Moths. (Includes the following Canadian forms: *Crambus Cockleellus*, B.C., *C. Youngellus*, Ontario; *C. dorsipunctellus*, Manitoba; *Thaumatopsis Gibsonella*, Ontario.) Proc. U. S. Nat. Museum, xxxv, 367–393, October 1908.

KIRKALDY, G. W.
Hemiptera new and old. (Notes chiefly synonymical, and descriptions of some new species). Can. Ent. xli, 30–32, January; 388–392, November 1909.

KIRKALDY, G. W., and BUENO, J. R. DE LA T.
A Catalogue of American Aquatic and Semi-aquatic Hemiptera. (The list includes a large number of Canadian species. The bibliographical references and locality data make it particularly useful). Proc. Ent. Soc. Washington, x, 173–215, 1909.

KNAB, FREDERICK.
Some species of Calligrapha. (Describes three new forms of this genus of Chrysomelid beetles, of which one, *C. rowena*, was procured from Montreal and Hamilton, Ont). Proc. Ent. Soc. Washington, xi, 83–87, 1909.

LOCHHEAD, WILLIAM,
Entomology in the Graduate School of Agriculture, Cornell University, July 6–31, 1908. (An account of the course at this summer school). 39th Annual Report, Ent. Soc. Ont., 1908, pp. 31–32.

LOCHHEAD, WILLIAM.
The Strawberry Weevil, *Anthonomus signatus*. (A brief account of the insect and of the treatment recommended for its control). 39th Annual Report, Ent. Soc. Ont., 1908, pp. 124–125.

LOCHHEAD, WILLIAM.
What entomology the farmer and fruit grower should know. (Contains some very useful advice, which should be widely disseminated and acted upon). 39th Annual Report, Ent. Soc. Ont., 1908, pp. 125–128.

LOCHHEAD, WILLIAM.
Injurious Insects of Quebec in 1908. (An account of a few of the principal insect attacks of the year). 39th Annual Report, Ent. Soc. Ont., 1908, pp. 135–138.

LOCHHEAD, WILLIAM.
The Apple-maggot, Apple-tree Canker and the Apple-leaf Blister-mite. 40th Annual Report, Fruit Growers' Association of Ontario, for 1908, pp. 32–37.

LOCHHEAD, WILLIAM.
Brown-tail Moth—a new insect enemy threatening Ontario and Quebec. (A synopsis of the life history and methods of control). 1st Annual Report Quebec Society for the Protection of Plants, pp. 76–79, Montreal, 1909 (plate and six figures).

LOCHHEAD, WILLIAM.

Economic Entomology; a series of articles in the Quebec Journal of Agriculture during 1909.

Some early pests of the Apple, May 1.
Dangers of the House-fly, May 1.
Cabbage Root-Maggot, June 1.
Slugs and Millipedes, June 17.
Wire-worms and White Grubs, October 1.
Grasshoppers and Blister-beetles, October 1.
Curculio injury to apples, November 1.

LYMAN, HENRY H.

Notes on the preparatory stages of *Philometra metonalis*, Walk. (An interesting account of the larvæ of this Deltoid moth). Can. Ent. xli, 363–365, October 1909.

LYMAN, HENRY H.

Life-history of *Euchætias Oregonensis*. (A complete account of the early stages of this somewhat rare moth). 39th Annual Report, Ent. Soc. Ont., 1908, pp. 145–147.

MACGILLIVRAY, A. D.

A new genus and some new species of Tenthredinidæ. (Describes a new genus of Sawflies, *Phebatrophia* with the type species *P. Mathesoni*, from adult females bred from larvæ, leaf-miners on birch, collected at New Glasgow, Nova Scotia; also gives a table of *Caliroa*, with many species, among which is *C. laudata* from Vancouver, B.C). Can. Ent., xli, 345–362, October 1909.

MACGILLIVRAY, A. D.

A synopsis of the American species of Scolioneurinæ. (A sub-family of the Tenthredinidæ, Sawflies. One of the species described, *Metallus Canadensis*, Marlatt, was taken in Canada, but in what locality is not mentioned). Annals, Ent. Soc. America, ii, 259–271, December, 1909.

MACOUN, JOHN.

Dr. Fletcher as a Naturalist. (An appreciation by a distinguished botanist of the attainments in other departments besides Entomology of his lamented friend). Ottawa Naturalist, xxii, 212–214, January 1909.

MORRIS, FRANK.

Obituary notice of the late Dr. William Brodie, with portrait. Can. Ent. xli, 377–380, November 1909.

MORRIS, FRANK.

Some guests at the banquet of blossoms. (A delightfully written account of captures, chiefly beetles, made at blossoms). Can. Ent. xli, 409–418, December, 1909.

NEWCOMB, WILLIAM W.

A summer with *Chrysophanus dorcas*, Kirby. (A very interesting account of the life-history and habits of this little butterfly. Many extracts are included from correspondence with the late Dr. Fletcher). Can. Ent. xli, 221–229, July 1909.

PEARSALL, RICHARD F.
New Geometridæ and Notes. (Contains descriptions of thirteen new species of which *Eupithecia limnata* and *usurpata* are from British Columbia.) Proc. Ent. Soc. Washington, xi, 119-132, July-September, 1909.

PIERCE, W. DWIGHT.
A Monographic Revision of the Twisted-winged Insects comprising the order *Strepsiptera*, Kirby. (An excellent and very complete monograph of these little known parasitic insects. All the known species of the world are recorded with particulars of host, distribution, etc., including several from Canada). Bulletin 66, 1909, U.S. National Museum, Washington, pp. 232, fifteen plates and three text figures of structural details.

PIERCE, W. DWIGHT.
Studies of North American Weevils. (A list with localities of all species of Curculionidae found in North America, including Canada; a number of new forms are described and keys are given to many of the groups and genera). Proc. U. S. National Museum, xxxvii, 325-364, December 1909.

POULTON, E. B.
Mimicry in the Butterflies of North America. (An interesting account of the results of a study of the Butterfly fauna of this Continent with reference to mimetic resemblances. Several Canadian species are referred to). Annals, Entomological Society of America, ii, 203-242, December 1909.

PROUT, LOUIS B.
On the genera Venusia, Euchœca and Hydrelia. (Discusses the characters of these Geometrid moths and the synonymy of species assigned to them). Can. Ent., xli, 93-94, March 1909.

ROHWER, S. A.
The Sawfly genus Cryptocampus in Boreal North America. (The species included in this genus make their galls on various willows; many of them occur in Canada. Tables of the adults and of the galls are given as well as full descriptions). Journal N.Y. Ent. Soc., xvii, 7-25, March 1909.

SAUNDERS, WILLIAM.
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