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ET
COMPTES RENDUS
DE LA
SOCIÉTÉ ROYALE
DU
CANADA

SECONDE SERIE—TOME III

SÉANCE DE JUIN 1897

EN VENTE CHEZ
JOHN DURIE ET FILS, OTTAWA ; LA CIE COPP-CLARK, TORONTO
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1897

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AND
TRANSACTIONS

OF THE
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OF
CANADA

SECOND SERIES—VOLUME III

MEETING OF JUNE 1897

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EDITOR OF TRANSACTIONS :

J. G. BOURINOT, C.M.G., LL.D., D.C.L., Lit.D., Honorary Secretary.

PRINTING COMMITTEE :

DR. S. E. DAWSON,

DR. BOURINOT,

BENJAMIN SULTE, ESQUIRE.



ROYAL SOCIETY OF CANADA.

PROCEEDINGS FOR 1897.

SIXTEENTH GENERAL MEETING.

SESSION I. (June 21st.)

The Royal Society held its sixteenth general meeting in the Chamber of the Legislative Council of the Legislature of Nova Scotia, in the city of Halifax, on Monday, June 21st. The President, His Grace Archbishop O'Brien, took the chair at 11.30 a.m., and formally called the meeting to order.

In the absence of Dr. Bourinot, Dr. Stewart, F.R.G.S., acted as Secretary, and called the roll of Fellows, of whom the following answered to their names :

LIST OF MEMBERS PRESENT.

President, Archbishop O'Brien.

Vice-President, Hon. F. G. Marchand.

Honorary Treasurer, Dr. Fletcher.

SECTION I.—Abbé Gosselin, Sir James LeMoine, J. Edmond Roy, Benjamin Sulte.

SECTION II.—D. Brymner, W. W. Campbell, S. E. Dawson, Very Rev. G. M. Grant, A. Lampman, W. Kingsford, Rev. G. Patterson, G. Stewart.

SECTION III.—C. Baillairgé, H. T. Bovey, N. T. Dupuis, Sir S. Fleming, A. Johnson, T. C. Keefer, J. G. MacGregor, C. H. McLeod.

SECTION IV.—L. W. Bailey, T. J. Burgess, G. M. Dawson, R. W. Ells, J. Fowler, E. Gilpin, G. U. Hay, G. F. Matthew, A. H. Mackay, W. Saunders, A. R. C. Selwyn, J. F. Whiteaves.

DELEGATES INTRODUCED.

Sir S. Fleming introduced the following delegates, who had been specially invited to attend the present meeting on behalf of certain Universities, Cities and Societies, as set forth in the report of Council. (See *infra*, p. xxiii.):

Corporation of Bristol City—W. R. Barker, J.P., and W. Howell Davies, J.P., ex-Mayors and Councillors of Bristol.

City of Venice—Consul General Solimbergo, Montreal.

American Geographical Society, New York—Professor Libbey, Ph.D., of Princeton University, and Mr. Gustave Kissel.

American Historical Association—Professor Rand, Ph.D., of Harvard University.

Royal Geographical Society, London—General D. R. Cameron, F.R.G.S., C.M.G., Montreal.

University of Fredericton—Professor L. W. Bailey, LL.D., F.R.S.C., Fredericton.

General Society of Colonial Wars—H. Pell (absent).

Harvard University—Professor Ashley, M.A., Cambridge, Mass.

School of Practical Science, Toronto—L. B. Stewart, D.T.S., Secretary, Toronto.

Dalhousie University—Rev. Dr. Forest, President, Halifax.

Victoria University—Rev. Chancellor Burwash, LL.D., Toronto.

Scottish Geographical Society—Dr. J. W. Sterling, M.B., C.M., and Mr. J. J. Henderson, Montreal.

McGill University—Hon. Mr. Justice Archibald, Montreal.

Albany Historical and Art Society—Hon. J. Boyd Thacher, Mayor of Albany.

King's College, Windsor, N.S.—Hon. Mr. Justice Hodgson, D.C.L., Chancellor, Charlottetown, P.E.I.

Geographical Society of Rome—Signore G. Solimbergo, Consul General of Italy, Montreal.

Princeton University—Professor Libbey, Ph.D., of Princeton University.

Queen's University, Kingston, Ont.—Dr. R. V. Rogers, Q.C., Kingston, Ont.

Massachusetts Society of Colonial Wars—Hon. Hosea M. Knowlton, Attorney-General of Massachusetts.

Trinity University, Toronto—Rev. Mr. Crawford, M.A., Halifax, N.S.

American Antiquarian Society—J. Evarts Greene, Esq., Worcester, Mass., and Rev. E. G. Porter, A.M., Dorchester, Mass.

Brooklyn Institute of Arts and Sciences—H. L. Bridgman, Brooklyn, N. Y.

Cornell University—Professor Moses Coit Tyler, Ithaca, N.Y.

McMaster University—Professor T. H. Rand, D.C.L.

Acadia College—Professor Tufts, M.A.

Geographical Society of Philadelphia—F. A. Cook, M.D.

Polar Research Club of America—F. A. Cook, M.D., and H. L. Bridgman.

Johns Hopkins University—Professor Archibald MacMechan.

Massachusetts Historical Society—Rev. E. G. Porter.

Women's Canadian Historical Society, Toronto—Miss Ellerby.

Nova Scotia Institute of Science—H. Piers.

L'Institut Canadien, Quebec—Dr. Ollivier.

Cercle Littéraire et Musical de Montréal—Rev. R. P. Duolos.

Entomological Society of Ontario—J. D. Evans.

Numismatic and Antiquarian Society of Montreal—R. McLaughlan.

Nova Scotia Historical Society—Hon. J. W. Longley.

Natural History Society of New Brunswick—Professor Duff.

The acting Secretary then read the following

REPORT OF COUNCIL.

The Council of the Royal Society of Canada have the honour to present their fifteenth annual report.

1. PRINTING OF TRANSACTIONS.

The second volume of the new series of Transactions, in the octavo form, has been distributed to Fellows and others entitled to receive them. It contains the same number of pages as the first volume, but exceeds it in illustrations, which are exceptionally numerous and interesting. The publication was delayed a little on account of the care necessary to bring out a valuable monograph on the "Place Nomenclature of New Brunswick," by Professor Ganong, who has given the Royal Society another paper of much historical value in a field not hitherto occupied. He proposes continuing in the next issue the subject of New Brunswick History—which he is specially qualified to treat, and which opens a new and interesting field of study and research to so critical and thorough a writer as Mr. Ganong.

2. ACCOUNTS.

All the printing accounts have been referred, as in previous years, to the accountant of the Printing Department of the Government, to be duly checked and audited by experts. The illustrations have been given at the lowest rates to artists and engravers under the personal direction of Dr. Dawson, the Queen's Printer. A considerable saving has been effected in this way for years.

The following statement of the financial condition of the society to

the date of meeting, shows that the revenue of a year now nearly meets the expenditure and that there is every prospect of a considerable surplus next year, apart from the subscriptions, which can be allowed to accumulate :

PUBLISHING ACCOUNTS.

MONTREAL, June 10th, 1897.

*Royal Society of Canada,*TO GAZETTE PRINTING CO., *Dr.*

Balance due Gazette Co. on May 19th, 1896.....	\$ 541 86
Printing account for Vol. 2, N.S., June 10th, 1897.....	2,896 35
	\$ 3,438 21

Cr.

June 15, 1896—By cash.....	\$ 532 25
“ 10, “ “	9 59
Nov. 21, “ “	1,000 00
Feb. 4, 1897— “	750 00
April 30, “ “	750 00
Balance due Gazette on June 10, 1897....	396 37
	\$ 3,438 21

BINDING AND DISTRIBUTING ACCOUNT.

To the Manufacturers' Stationers' Co. (Dawson Bros.), Montreal.

Dr.

May 19—To balance due them.....	\$ 192 83
Amount of account to date for binding Vol. I., N.S., etc.....	873 58
C. H. McLeod's 100 pamphlets of paper left out of previous account.....	2 25
June 10—Binding account of Vol. II., N.S., to date (distribu- tion not yet included)	555 30
	\$ 1,623 96

Cr.

May 29, 1896—By cash.....	\$ 200 00
June 20, “ “	185 76
March 1, 1897—By cash	682 82
Balance due Dawson Bros., June 10, 1897*.	555 30
	\$ 1,623 96

* This account is for binding only to date and does not include account of distribution of the second volume, which has yet to be provided for.

*General Financial Statement of Royal Society from May 19th, 1896,
until June 15th, 1897.*

Dr.

To cash on hand (Hon. Secretary), May 19th, 1896.....	\$ 969 59
Government grant for 1896-97	5,000 00
	<hr/>
	\$ 5,969 59

1896.

Cr.

May 27—To Gazette Printing Co.....	\$ 532 25
“ 27— “ S. T. Ami (proof reading).....	15 00
“ 27— “ W. C. Bowles (clerical).....	40 00
“ 27— “ Manufacturing Stationers Co. (binding).....	200 00
June 19— “ Gazette Printing Co., balance.....	9 59
“ 19— “ Manufacturers’ Stationers Co.....	185 76
Oct. 26— “ For illustrations.....	20 60
Nov. 21— “ Gazette Printing Co.....	1,000 00
“ 21— “ Grip Printing Co.....	40 50
“ 21— “ Dominion Photo-Engraving Bureau.....	12 00
“ 21— “ For illustrations	0 95
June 27— “ J. H. Ridgway (illustrations)..	46 50
Nov. 30— “ S. T. Ami (proof reading).....	40 00
Dec. 7— “ A. P. Muchmor (illustrations).....	98 00
1897.	
Jan. 11— “ Toronto Engraving Co.....	8 25
“ 11— “ Sir J. W. Dawson (illustrations)	20 50
Feb. 4— “ Grip Printing Co.....	50 00
“ 4— “ Ottawa Engraving Co.....	19 53
“ 4— “ Gazette Printing Co.....	750 00
March 1— “ Toronto Lithographing Co.....	35 00
“ 1— “ Grip Printing and Publishing Co.....	10 00
“ 1— “ Dawson Bros.....	682 82
“ 1— “ G. Cox (illustrations).....	23 00
April 15— “ Mortimer & Co. (illustrations).....	45 00
“ 17— “ S. T. Ami (proof reading).....	60 00
“ 17— “ A. Fréchette (proof reading).....	50 00
“ 30— “ Gazette Co.....	750 00
June 15— “ Cash in hands of Honorary Secretary.....	1,224 34
	<hr/>
	\$ 5,969 00

Amount of subscriptions in Treasurer's hands to June 15, 1897..\$ 162.82

3. AID TO SCIENTIFIC AND OTHER STUDENTS.

In view of the present satisfactory condition of the finances of the society, arising chiefly from the more economical mode of publication, the society will be immediately in a position to assist, from time to time, any special and important investigations in which scientific, ethnological, archaeological and historical students may be engaged. The question of the best method of effecting this desirable object is referred to the earnest attention of the scientific and other sections. All recommendations from sections should come before the council who will make such allowances of money as the funds available at the time may permit.

4. MESSAGE OF CONGRATULATION TO THE QUEEN.

The Royal Society of Canada are called upon to unite with all classes of people throughout this Dominion in paying their tribute of loyalty and affection to Her Most Gracious Majesty the Queen, at this most auspicious time in the history of the Empire.

The council recommend that the President, on behalf of the society, communicate at once with the Honorary President, His Excellency the Governor-General, and request him to send an appropriate telegraphic message to Her Majesty expressing their appreciation of the blessings of a reign during which Canada has attained its prosperous and happy condition, and their recognition of her noble qualities as a Woman and a Queen.

5. DECEASE OF MEMBERS.

Since the last general meeting of the society two distinguished members have died. Mr. Faucher de Saint-Maurice was one of the original members of the society and had always taken a deep interest in



FAUCHER DE SAINT-MAURICE.



HORATIO HALE.

its proceedings, to which he contributed several papers of value. His many friends will always recall his amiable qualities, and his readiness to

sympathize with the success of literary aspirants. His contributions to Canadian literature brought him not a few readers, as he possessed much charm of style. His love for the sea and nature in its varied aspects is seen in his sketches of the Gulf of St. Lawrence, and its historical places.

Mr. Horatio Hale was an aged man when he was called to the ranks of "the great majority." His physical infirmities prevented him from ever attending the meetings of the society to which he was elected on the motion of Sir Daniel Wilson, who like so many other distinguished men, had much respect for the learning of our late colleague. Mr. Hale contributed two papers to our proceedings,—one of them dealing with the subject of Iroquois customs, which he was more competent to discuss with authority than probably any other man of his generation except the late L. H. Morgan of New York State, the author of "The League of the Iroquois," and other books of much ethnological value. All those who had the honour and pleasure of Mr. Hale's friendship will never forget his modesty of demeanour and his varied attainments always at the command of the students in the field of thought and research, where he won so high a place during the many years of usefulness.

A distinguished scientist, Mr. Frank Boas, of Columbia College, New York, who is exceptionally well qualified to speak of Mr. Hale's merits, has paid him a well-deserved tribute which we give in full from the New York MONTH.

"By the death of Horatio Hale, which occurred at Clinton, Ont., on December 29th, ethnology has lost a man who contributed more to our knowledge of the human races than perhaps any other single student.

"Horatio Hale was born on 3rd May, 1817, at Newport, N. H., and was the son of Sarah Josepha Hale, whose efforts largely contributed to the completion of the Bunker Hill Monument and to the general introduction of Thanksgiving Day. In 1837 he graduated from Harvard, and in the same year was appointed philologist of the Wilkes Expedition. He improved to best advantage the opportunities offered to him during this memorable journey, accumulating an astounding mass of philological material, which he collected partly directly from the natives, partly with the help of missionaries who had become familiar with the various languages. His labors confirmed the theory of the Malay affinities of the Polynesian languages, and his theories on the migrations of the Polynesians, which he based on linguistic studies, opened a most interesting and important view of the early history of the Pacific Islands. No less important were his contributions to the philology of Australia, but nowhere was his genius for linguistic research shown more clearly than in his masterly treatment of the difficult languages of Northwest America. His classifications and investigations have stood the test of all later inquiries, and, as we grow more familiar with the subjects treated by him, we become more and more forcibly impressed by the keen insight

into the structure of language which enabled him to make a contribution to science that has marked an epoch in the development of linguistics. The results and method that he pursued are the more admirable when we consider how few the advantages were that the young Harvard student enjoyed in those times in this line of research, and that the methods of investigating primitive languages were to a great extent his own creation. The "Ethnography and Philology of the United States Expedition" was published in 1846. The following years were spent in travel and study. In 1853 Mr. Hale was studying law in Chicago; he was admitted to the bar in 1855. In 1856 he moved to Clinton, Ont., where he devoted himself partly to the practice of his new profession, and partly to the pursuit of ethnological and philological studies.

"Many are his contributions to science, and they rank among the best work done in America. The nearness to his new home of the Iroquois reservations incited his interest, and the results of his studies have been laid down in numerous brief papers, but principally in his book, "An Iroquois Book of Rites" (Philadelphia, 1883). His investigations of the origin of the Hiawatha legend, the historical basis of which he made clear, assure him an important place among folklorists. It was due to his studies among the Iroquois, also, that he made a discovery of great importance regarding the early history of the American tribes. He was fortunate enough to find the last Tutelos who were able to speak their language, and in 1870 he ascertained beyond cavil that they spoke a dialect of the Dakotan or Siouan stock. In 1883 he published a fuller record of their language. In 1885 Mr. Hale was elected Vice-President of the Anthropological Section of the American Association for the Advancement of Science. In 1886, when presiding over the meetings of the section, he delivered a presidential address, in which he set forward a well-conceived theory of the origin of linguistic stocks, which is undoubtedly one of the best ever suggested in regard to this difficult problem, and received favorable consideration from many eminent linguists.

"In 1883 the British Association for the Advancement of Science appointed a committee for the investigation of the tribes of Western Canada. Mr. Hale, as editor of the reports of this committee, bore for many years the principal share of its labors. He wrote a useful circular of inquiry, and laid out the detailed plan of work. In connection with the investigations of this committee the writer of these lines had the pleasure of coming in close contact with him. His wise counsel, his amiable guidance, his kindly friendship ensure a grateful memory to him whose works students of ethnology and of linguistics will admire for all time to come. Science has lost a worker to whose enthusiasm and faithful labor we owe much; mankind has lost a man whose wisdom, kindness and steadfastness it is hard to lack."

6. PORTRAITS OF MEMBERS.

In the second volume of the new series we commenced the practice of adding the portraits of deceased members to any sketches of their scientific or literary labours that may appear from time to time.

In this connection we may remind the new Fellows of the advisability of sending to the Honorary Secretary their photographs in accordance with the resolution passed two sessions ago.

7. ASSOCIATED SOCIETIES.

The customary invitations to attend the present meeting and report on the scientific and literary work of the year were sent to the following Canadian societies who have heretofore co-operated with the Royal Society :

SOCIETY.	PLACE.	DELEGATE.
Natural History Society.....	Montreal.....	J. F. Whiteaves.
Numismatic and Antiquarian Society....	do	R. McLachlan.
Microscopical Society.....	do .....	.....
Société Historique	do .....	.....
Cercle Littéraire et Musical de Montréal.	do	{ Rev. R. P. Duclos. { Dr. Ami.
Literary and Historical Society	Quebec	Sir J. M. LeMoine.
Geographical Society.....	do	C. Baillairgé.
Institut Canadien.....	do	Dr. Ollivier.
Literary and Scientific Society.....	Ottawa	Otto J. Klotz.
Field Naturalists' Club.....	do .....	.....
Hamilton Association.....	Hamilton .....	.....
Entomological Society of Ontario.....	London.....	J. D. Evans.
Canadian Institute	Toronto.....	.....
Natural History Society of St. John, N.B.	St. John	Prof. A. W. Duff.
N. S. Institute of Natural Science.....	Halifax	H. Piers.
Historical Society of Nova Scotia.....	do	Hon. J H. Longley.
Natural History Society of B. C.....	Victoria, B. C.....	.....
Wentworth Pioneer and Historical Society.....	Hamilton, Ont.....	Senator MacInnes.
Elgin Historical and Scientific Institute.	St. Thomas, Ont.....	.....
Historical Society of Manitoba.....	Winnipeg .....	.....
Botanical Club of Canada.....	Halifax, N. S.....	Dr. A. H. McKay.
American Folk-lore Society	Montreal .....	.....
Historical Society.....	Kingston.....	.....
Astronomical and Physical Society,	Toronto.....	Sir S. Fleming.
Lundy's Lane Historical Society.....	Niagara Falls South.....	.....
New Brunswick Historical Society.....	St. John, N. B.....	.....
Pioneer and Historical Association of Ontario.....	Toronto.....	Miss Ellerby.
Women's Canadian Historical Society.....	.....	.....
Niagara Historical Society.....	Niagara, Ont.....	Dr. Bourinot.

It is earnestly to be hoped that any societies that may fail to report to the present meeting will do so before the Transactions go to the printers, and prevent any break in the publication of their proceedings.

8. BIBLIOGRAPHY.

As the few copies issued two years ago of the Bibliography of the Royal Society are already exhausted, and there is now a constant demand for an edition distinct from the publication in the twelfth volume, the Honorary Secretary proposes, as soon as possible, to print this useful information in octavo form up to the latest date possible, possibly for the third and certainly for the fourth volume. Members will therefore revise the list of publications as it appears in the twelfth volume and send it to the Honorary Secretary by the beginning of 1898. They are also requested to follow the plan of publication, as it appears already in print, and so save the Secretary the great labour he had in 1893, in re writing in not a few cases the lists sent to him by members.

It has always been the object of the society to make its proceedings, as far as practicable, a complete summary of all the scientific and literary work of Canadian societies. In this way, much interesting and important information is given to students in other countries of the work that is being done in various departments of scientific and historical investigation throughout Canada.

In the same connection, the council may again call attention to the suggestion that was made in their report of 1894, and generally approved at the general meeting of that year: that one of the members of each section should be charged with the preparation of a bibliography of all important books and essays that may yearly appear in Canada and are not printed by societies. To each title might be added a short abstract and critical appreciation of the book or essay. In this way the society's Transactions will be made a still more useful book of reference for the current literature of Canada.

9. ELECTION OF NEW MEMBERS.

During the past year the members of section three were called upon to elect an additional Fellow, under the rule allowing the increase of the members of a section to twenty-five persons in all.

Professor Cox, of McGill University, who has on more than one occasion contributed to the work of the Royal Society, notably his popular lecture on "Unsolved Problems in the Manufacture of Light," has received a majority of votes, and it is well for the society to ratify this election.

In this place, the council may call attention to the fact that not only are there two vacancies in sections one and four, caused by the decease of M. Faucher de Saint-Maurice and Mr. Hale, but two gentle-

men are now residents of other countries, and are taking no part whatever in the work of the society. It is therefore open to sections two and four to consider the cases of Professor Roberts, now in New York, and of Professor Chapman, now in England, and to follow the precedents of previous years and place these two gentlemen on the retired list.

It is important that a society of so limited a number as ours should have all its members in a position to co-operate in its work and usefulness.

10. MEETING OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The council of the Royal Society of Canada hear with satisfaction that arrangements have been completed for a successful meeting of this popular scientific association in the city of Toronto. The council propose that an address be presented by the Royal Society to the association, as an expression of their confidence that this meeting on Canadian territory of so many gentlemen engaged in the study of science, will stimulate a greater interest in the varied departments of scientific thought and investigation in which they are distinguished, as well as enlarge the knowledge of Canada and its resources in the parent State. A committee should be appointed by the society to draft and present the address at the proper time.

11. THE PROPOSED NATIONAL MUSEUM.

Ever since its formation, fifteen years ago, the Royal Society of Canada has, time and again, directed the attention of the Government and the people of Canada to the absolute necessity that exists for the construction of a National Museum worthy of the Dominion. At present the magnificent collection, illustrative of our geological and natural history, cannot be exhibited to any advantage in the unsafe and ugly building in which it has been housed for years. The subject, we are glad to find, is now under the consideration of the Government. During the last session of Parliament, Mr. Belcourt, one of the representatives of Ottawa, made a motion with respect to the project, and ably supported it by a speech in which he dwelt on the value of the collections in the Geological Museum, which "are of the greatest practical utility, not only to scientists, but to miners, manufacturers and agriculturists, and are worthy of the high meed of praise and admiration they have received from all quarters."

Mr. Belcourt's expression of hope that immediate measures will be taken by the Government to give to Canada a National Museum which "will be a credit to the country," was followed by a most encouraging reply from the Premier, the Honourable Mr. Laurier. "The Government," he said, "quite realizes that it is advisable that the country at

large should be made aware of the numerous representations which have been made from time to time, in days past, and at the present day as well, as to the necessity for having a suitable location for the valuable collection comprised in our Geological Museum. The Government is fully aware of the fact which was brought to the notice of my honourable friend from Norfolk (Mr. Charlton), that when the collection was removed from Montreal to Ottawa it was thought that a suitable place should be provided for it. The present Government has under its serious consideration now the question of seeing what can be done in that respect. That something should be done will go without saying. We cannot be otherwise than alive to the fact that under existing circumstances the valuable collection of the Geological Museum, which has cost a great deal of labour and money, could be at any moment burned to ashes. There is no protection whatever for it now. If the Government thinks it advisable at some time or other to ask Parliament for an appropriation to have a suitable building erected, I suppose it can rely upon the concurrence of all parties in this House." (Hear, hear.)

In again urging the construction of a National Museum the council of the Royal Society reiterate their hope that it will contain adequate accommodation, not only for geological and other specimens of value to students of geology and natural history generally, but also for a permanent exhibition of history, ethnology and various departments of industrial and artistic work which will be creditable to Canada and of infinite value to all those who are now devoting themselves to scientific, historical and other useful studies. This suggestion naturally opens up the interesting subject of

12. THE COLLECTION OF HISTORICAL MATERIAL.

It is with much satisfaction that the council of the Royal Society note a growing interest in some sections of Canada in the collection and preservation of material out of which students and historians are to describe the making of Canada. Still there is much need for greater effort on the part of individuals and provincial governments, outside of Quebec, where much energy and enterprise has been shown for years in the collection and publication of valuable documents. The same subject is also attracting interest among students in the United States, where, as with us, much historical material is disappearing from human view for ever, the loss of which will be a serious one, not only to the students of history, but to the country and the world.

The remarks of Professor Sparks, of Chicago University, and other writers in an April number of *The Dial* of that city, may well be considered by Canadians. Much material cannot in many instances be duplicated once destroyed, there is often nothing left of the facts but conjecture and tradition. The generation of to-day could place much

historical matter for the present in the libraries that are accessible, until a National Museum is built at Ottawa. Pamphlets, newspaper files, letters of pioneers and settlers of Canada, broadsides, posters, medals, badges, campaign ballads, ballots, banners, paper money, photographs of historic events, public letters of prominent men, proclamations—all these are worthy of place in our libraries and in a National Museum, since they illustrate various phases of our social, political and industrial life.

13. DOMINION ARCHIVES.

In the report on Canadian Archives for 1896, by Dr. Brymner, there is a continuation of the calendar of the documents relating to the War of 1812, begun in the report for 1893, those for 1894 and 1895 containing the results of inquiry in London into the papers relating to the Maritime Provinces. Many of the papers, reported on in 1896, relate to the disputes between the Hudson's Bay and the Northwest Companies, but they are so voluminous that the Archivist has refrained from summarizing them, so that the information in respect to the discussions between these two companies must be sought in the documents themselves. The calendars of the documents concerning Lower and Upper Canada are brought down to the year 1818, and as usual the abstracts will give a clear idea of the events dealt with in the volumes to that date.

What the Archivist calls notes treat of the questions relating to Indian lands on the Grand or Ouse River in Upper Canada (Note A), to the Anticipation of the War of 1812 (Note B), and to the Roman Catholic Church in Upper Canada (Note C).

As usual a preliminary report contains general remarks on the contents of the report, and in the notes the documents relating to the subjects of them are given in full, without alteration, so that the investigator is supplied with material for such conclusions as he may be able to draw from the papers. As an illustration to Note A, a plan of the Grand River is given in the report.

14. SURVEY OF TIDES AND CURRENTS IN CANADIAN WATERS.

SUMMARY OF PROGRESS FOR THE YEAR 1896.

The following is a summary of the progress made during the year in the above survey, which is being carried on by the Department of Marine and Fisheries, under the direction of W. Bell Dawson, C.E., engineer in charge of tidal survey:—

Tidal Observations.

In the Gulf of St. Lawrence there are regions in which the tides show great irregularity, and where constant differences with ports on the Atlantic will not apply. This is chiefly due to an unusually great diurnal inequality in Cabot Strait, which forms the main entrance by which the

tides enter the gulf from the Atlantic. The resulting irregularity in the gulf is in marked contrast with the even progress of the tide up the estuary of the St. Lawrence when once it enters the mouth of the river.

As the southwestern side of the gulf is the more important, arrangements were made last season (1896) to take observations for tidal differences throughout the region extending from Gaspé, along the gulf coast of New Brunswick, through Northumberland Strait, and around Prince Edward Island. The object of these observations was to determine how far south of Gaspé and in the Bay des Chaleurs the tides could be referred by constant differences to Anticosti and Quebec, and where the irregularities due to diurnal inequality first manifested themselves, and therefore to which of the principal stations the tides in this region could best be referred.

For the purposes of this comparison, the tide gauge at St. Paul Island, commanding Cabot Strait, was essential; and as it had been twice destroyed by winter storms in three years, on account of its exposed situation, it was necessary to obtain the required observations without delay. A tide gauge had also been erected at Halifax in the previous season, and the gauge at Anticosti had been put in good order; and as comparisons with any of these might be required, it was advisable to obtain the new observations while they continued in good working order.

A series of twelve stations was selected in the region referred to, and at eight of these self-registering instruments were placed, and staff readings were taken at the others which were relatively of less importance. The erection of these temporary gauges and the superintendence of the observations was entrusted to Mr. H. M. Mackay, assistant on the tidal survey. A very valuable series of observations was thus obtained, especially because of its simultaneous character. In working them up, an exhaustive series of comparisons has been made with the principal tidal stations. (The results of these comparisons, and the progress of the tide throughout the gulf, are given in a paper prepared by Mr. Dawson for Section III.)

The seven principal stations have been in continuous operation throughout the year, without any interruption of consequence. The chief cause of anxiety results from a feature in the construction of the recording instrument which is common to all forms of tide gauge now in use. The driving clock forms an integral part of the instrument, and if it requires cleaning or repair the instrument has to be entirely removed and sent away to some city. The inconvenience resulting from this is specially felt at the more isolated stations, which are inaccessible during the winter months; and the most serious interruptions that have occurred have been occasioned by the failure of the driving clock.

A form of recording instrument has now been devised by Mr. Dawson which obviates the uncertainty and expense connected with the

use of the ordinary type of instrument. The essential point is to have a driving clock which can be readily detached from the rest of the instrument. This is secured by placing the driving clock inside of the revolving cylinder which carries the sheet of paper on which the tidal record is marked, as is done in some types of self-registering instruments of smaller size used for meteorological purposes. In case of failure of the clock, a duplicate cylinder with clock inside can be substituted in one or two minutes, as it is released by a single screw. The defective clock can then be sent away for repairs without interruption to the record. This new form of instrument is also provided with interchangeable gearing, by which any one of four scales can be used, corresponding to a range in the tide of 9 feet, 18 feet, 27 feet, or 36 feet. Our tides have such a variety in their range that when an instrument requires to be changed to a new position, it has usually been first necessary to return it to the makers in Britain to have the gearing altered to another scale. There are also several minor improvements, especially in so arranging the carriage of the marking pencil that the point of the pencil is readily accessible. This is important in making the comparisons on which the datum depends, to which the observations have ultimately to be reduced. A recording instrument of this new type, manufactured by Messrs. A. L  g   & Co., London, has been in use at Pictou during last season with very satisfactory results. This type of instrument will be substituted for those now in use at the more isolated stations.

Tide Tables and Tidal Differences.

The improvement which can be made in the tide tables each year has to depend upon the balance remaining out of the small vote available for this survey after the charges of first importance are met.

The tide tables for Quebec for 1897 were accordingly calculated from the same data as before, namely, one full year's record. These are now accompanied by tidal differences for the whole tidal portion of the St. Lawrence waterway from Three Rivers to Gasp  , a distance of 450 miles. The basis of the tide tables for Halifax has been extended to include the four years for which record was found to exist, namely, 1851, 1852, 1860 and 1861. At the request of the Pilot Service tide tables for Father Point, the St. Lawrence pilot station, have been prepared for the present season of navigation. To save the expense of printing, these are in manuscript only, and are posted at the lighthouse at Father Point. In the St. Lawrence above Quebec special tide tables have been prepared for St. Croix Bar, which is at present the shallowest point in the river, until the deep channel-way is completed. Provisional tide tables have also been prepared for Charlottetown and Pictou in time for the present season of navigation, based upon the observations of the previous season, already referred to. These observations showed that the tidal station to

which the tides in Northumberland Strait can best be referred is St. Paul Island ; but as the tidal data for that station have not yet been worked out, it was found possible to obtain a satisfactory comparison with Halifax. The difference in the time of the tide between Pictou and Halifax is not constant ; but a variable difference in terms of the moon's declination, which allows for the diurnal inequality by which these tides are affected, has been made use of. These tables will be sufficiently accurate to be of practical value in the meantime, until better data are available.

The tide tables for 1897 have been supplied to the leading British and Canadian Almanacs for publication, as was done last year.

Tide tables for 1898 are being prepared for St. John, N. B., which commands the Bay of Fundy. These will be based upon a record of two complete years, extending from 30th April, 1894, to 18th May, 1896. The height of the tide is referred to a low water datum carefully determined by this survey. This will be specially valuable at a port where the tide has so great a range that repairs to vessels are commonly made at low water without the aid of dry docks. The basis of the Quebec tables is also being extended by the incorporation of a second year's record. There will thus be three leading ports in Canada, for which tide tables, based upon direct observation, will be available.

Survey of the Currents.

An investigation of the currents in the northeastern portion of the Gulf of St. Lawrence was made during the season of 1896 ; and for this the SS. "Lansdowne" was again placed at Mr. Dawson's disposal for three months ; namely, June, July and August. This is the third season given to the examination of the gulf ; and some conclusions with regard to the general circulation in the gulf have now been arrived at.

The region examined last season comprises the northeastern arm of the gulf, extending from Anticosti to the Strait of Belle Isle ; and with the channel north of Anticosti, the area of this region is nearly the same as the English Channel. The currents proved to be very different in their character from those examined in the other parts of the gulf ; and the methods employed in former seasons required to be modified accordingly. The currents in those parts had usually considerable strength, from one to three knots ; and generally a uniform direction for at least some hours at a time. Their chief variation was in velocity, which fluctuated with the tide or fell off with the depth. But the currents in this region varied chiefly in their direction. They usually veered in direction from hour to hour, often going completely around the compass ; and the direction at any depth was often different from the surface direction. Their speed was always low, seldom exceeding one knot per hour. Hence the direction of the current, both at the surface and below, was of much more importance relatively than the accurate determination of velocity.

With currents of this low speed, the surface current is much influenced by the wind; and it is therefore the undercurrent at 20 and 30 fathoms which often shows a tidal fluctuation or a tendency to flow in some dominant direction, which may be obscured by disturbance in the surface current. It was therefore very necessary to make a careful study of the undercurrent to arrive at the normal conditions in any locality.

The temperature of the water and its density were also taken extensively; and these were found useful, especially in tracing the general circulation.

Very favourable opportunities occurred for ascertaining the effect of the wind upon the surface current while anchored in the open, at stations which were occupied for a number of days together. A good determination was found for the increase of the temperature of the water with the progress of the season. Much useful information was obtained from fishermen and others regarding the currents at other seasons, especially as indicated by the drift of ice; and the nature of the indications which ice affords, with reference to the surface and undercurrents and the effect of the wind, were also carefully considered. The results obtained will appear in the Annual Report of the Department of Marine and Fisheries for 1896.

In the region examined, there are few instances of currents which run steadily enough to be termed constant; but it is possible from continuous observation or long experience to arrive at a dominant direction for each locality, or the direction in which the current runs more frequently, and in which therefore the water makes on the whole.

In considering the Gulf of St. Lawrence as a whole, it is the principle of the balance of flow which is the most evident one. Wherever a current of a constant character occurs, there is a corresponding return current to make up for it. Thus, in Cabot Strait, the outflowing water off Cape North is balanced by the inflow at Cape Ray; the northeastward current on the west coast of Newfoundland is balanced by the westward direction of the movement along the North Shore; and we have fairly good indications of a return flow to compensate for the Gaspé Current. It is this balance of flow which points to the nature and direction of the circulation of the water in the gulf. If we begin to trace it from Cabot Strait where the balance between the gulf and the ocean takes place, there is an inflow off Cape Ray which appears to diffuse itself more or less widely over the central part of the gulf, but it regains its strength on the west coast of Newfoundland, and makes a deep bend into the northeastern angle of the gulf, and returns westward along the North Shore. On reaching Cape Whittle, it still makes westward; and whether as an actual set, or by displacing water which comes more directly from Cape Ray, it appears to work around the eastern end of Anticosti, and

so compensates for the outflow of the Gaspé Current from the estuary of the St. Lawrence. This current, after rounding the Gaspé coast, makes southeastward as a general set or drift across the gulf to the western side of Cabot Strait, and its waters there leave the gulf in the outflowing current off Cape North. This current is still felt along the sweep of the northeastern coast of Cape Breton Island, sometimes as far as Scatari, before it mingles with the waters of the Atlantic.

This general movement of the water in the gulf is in accord with the uniform and relatively high density of the water as found in its northeastern portion, and explains why this density should be so nearly the same as in the open Atlantic, and also why there should be so small an increase in the temperature of the surface water with the progress of the season.

It also appears that the whole of the balance or compensation in the gulf currents takes place at the surface and in the ordinary under-currents, which do not probably extend to a greater depth than some 50 or 60 fathoms. There is nothing therefore to show the necessity for any appreciable movement in the deep water from 60 or 80 fathoms downwards, which lies in the deep channels of the gulf. Such direct indications as have been obtained, also favour the belief that this deep water is quiescent.

How far the prevailing westerly winds may influence these general movements of the water, it is difficult to say. The prevailing winds over the gulf generally are northwesterly in winter and southwesterly in summer. These winds may have an appreciable influence in maintaining the current on the western side of Newfoundland, and in carrying it further into the northeastern angle of the gulf before it returns. If this effect is attributed to the wind, however, it makes it all the more difficult to understand why it is that the water of lower density, in making its way from Gaspé to Cape North, is not carried further over the gulf, but keeps to the southwest, which is the windward side. Although a satisfactory explanation is not yet apparent, it may be well to point out that the bias of the current in both cases accords with the rotation of the earth. As the Gulf of St. Lawrence lies between 46° and 52° north latitude, it is possible that this may have an appreciable effect.

The general examination of the currents within the Gulf of St. Lawrence and in the straits connecting it with the ocean, which has been made during the past three seasons, has had special reference to the leading steamship routes which pass through it. Little attention has yet been given to the currents in the wide bay formed by the sweep of the coast from Gaspé to Cape Breton, in which Prince Edward Island lies. The strong tidal currents of the Lower St. Lawrence have not yet been examined; as they are usually parallel with the shore, and have less tendency to set a vessel out of its course, and also because from Father

Point to Quebec vessels have the advantage of the pilot service. It was also necessary to obtain first some knowledge of the gulf currents and their relation to the ocean. No detailed examination has yet been made of the currents in the Atlantic off the outer end of the Strait of Belle Isle, for the assistance of vessels in making the strait. On the alternative steamship route, south of Newfoundland, it is reported that there is a strong indraught into the larger bays; and to this several wrecks are attributed. The distance from shore that this indraught is felt, and the conditions of wind and tide which give it the greatest strength, should be ascertained. The currents on the southwestern coast of Nova Scotia and at the entrance to the Bay of Fundy also require examination in the interest of the steamship lines running to St. John. Also in the upper part of the bay, navigation is entirely dependent on the tide, and the time and height of the tide itself are there of the first importance.

As the currents in these regions are chiefly tidal, and their behaviour can only be ascertained by direct comparison with a tidal record, it is important that these investigations should be made as soon as possible, while the present tidal stations are in good working order.

Before leaving this important subject, to which the Royal Society has always devoted its earnest attention, the council feel called upon to express their regret that the government of the Dominion have reduced the expenditure on this service for the ensuing financial year from \$15,000 to \$2,500 in accordance with their policy of reducing expenses in those departments that are not considered absolutely necessary for the present. It is to be regretted that the Department of Marine and Fisheries has not seen its way clear to the effective continuance of a service which must be of incalculable advantage to the great maritime and commercial interests of the Dominion. We hope that the government will reconsider their recent decision and at another session of Parliament recommend a larger vote for the service. We hope that the merchants and shipowners, at home and abroad, interested in the commerce of Canada, will unite in pressing the favourable consideration of the subject upon the authorities at Ottawa.

The following facts from various sources show the high estimate of the work already performed :

In reviewing the work of this survey, the Liverpool "Journal of Commerce" (of 6th Feb., 1896) speaks of the work as an excellent one, and compliments the Department of Marine and Fisheries on the early result of their researches, and the laudable desire to supply accurate information; and adds that the reports should be placed in the hands of every navigator trading in the region concerned, without charge. From the reports of progress which have been issued, two comprehensive summaries have already been made by Dr. Gerhard Schott for his "Annuals

of Hydrography and Maritime Meteorology" published in Hamburg. A review is also given, in Dr. Petermann's "Mitteilungen," of the investigation of the currents.

The "Scottish Geographical Magazine" gives concise reviews of the work from time to time, and the "Annales de Géographie," Paris, gives an outline of the reports in its book notices. The work of this survey is thus becoming widely known to those interested, whether from a scientific standpoint or as practical navigators.

15. THE CABOT CELEBRATION.

The council are called upon to refer to the measures they have taken to carry out the decision of the Royal Society, as expressed at the general meetings of 1895 and 1896, and pay an appropriate tribute to the memory of the famous Italian navigator, John Cabot, who performed such valuable service for England four hundred years ago. In accordance with the instructions of the council the Honorary Secretary sent invitations to the Corporation of the city of Bristol, from which Cabot sailed in the *Matthew*, to notable geographical and historical societies in Europe and America, as well as to the city of Venice, to send delegates to the meeting at Halifax.

To these invitations the following answers have been received from Bristol, Venice and Rome :

"THE COUNCIL HOUSE, BRISTOL, March 9th, 1897.

"SIR,—Referring to my letter of 8th January and in further answer to your letter of 15th December last, I have now the pleasure of informing you that the council of this city have, in accordance with the polite invitation of the council of the Royal Society of Canada, requested two members of the city council, viz., Mr. William Robert Barker and Mr. William Howell Davies, to attend as guests of the society and representatives of the Municipal Corporation and Citizens of Bristol the meeting to be held in the city of Halifax, Nova Scotia, under the auspices of the society in June next for the purpose of commemorating the voyage of the Cabots to North America in 1497.

"I need hardly say that the gentlemen the city council have nominated to represent the city of Bristol on such an important and interesting occasion are prominent citizens of the highest repute. They have been members of the council for many years and are justices of the peace, and have both filled the high office I have now the honour to hold—Mr. Barker in 1892-3, Mr. Davies in 1895-6. They are members of the executive committee appointed to carry out the Cabot Commemoration to be held in Bristol simultaneously with that to be held in the city of Halifax.

"May I ask you to be good enough to assure the Royal Society of

the deep sympathy felt by the citizens of Bristol with the society's proceedings for commemorating an event so interesting to Englishmen and their descendants in all parts of the globe, but specially to the people of Nova Scotia and the inhabitants of Bristol.

"I remain, dear sir,

"Yours very faithfully,

"ROBERT HENRY SYMES,

"*Mayor of Bristol.*

"John George Bourinot, Esq., LL.D., D.C.L., C.M.G., Etc., Etc.,

"Hon. Secretary, The Royal Society of Canada,

"Ottawa, Canada."

"ROMA, February 14th, 1897.

"SIR,—I have the honour to acknowledge receipt of your letter of the 14th inst., containing the kind invitation of the Royal Society of Canada, to attend its meeting of June 20–26, 1897, in the city of Halifax.

"I, consequently, must gratefully thank His Grace Archbishop O'Brien, D.D., President, and the members of the Council of the Royal Society.

"But, as I am unable to attend personally the meeting, a representative of the *Società Geografica Italiana* will be elected in due time.

"With my best thanks to you, I am most respectfully,

"Yours,

"President,

"MARQUIS G. DORIA.

"Mr. J. G. Bourinot,

Honorary Secretary, Royal Society of Canada."

"VENEZIA, 6 Marzo, 1897.

"ILLUSTRISS. SIGNORE,—A mio nome, e a nome pure del Consiglio Municipale, esprimo alla S. V. Illma. e prego far aggradire a S. E. l'Arcivescovo O'Brien, D.D., Presidente di cotesta Società Reale del Canada e agli altri Membri del Consiglio della medesima, i sentimenti di profonda riconoscenza pel grazioso invito di inviare un rappresentante di Venezia alle solenni adunanze del Giugno 20–26 a. e. nelle quali sarà commemorato Giovanni Caboto ed eretta una memoria al sommo navigatore nel palazzo del Parlamento.

"Se la grande distanza che ci divide e la necessità di una lunga assenza non fossero ostacoli gravissimi per me e pegli altri membri del Corpo Municipale avremmo accettato con vero entusiasmo l'onorifico invito, ed uno di noi sarebbe certo venuto a rispondere all'altissimo omaggio reso da un grande e libero paese a chi può dirsi nostro concittadino, il cui singolare ardimento ebbe a segnare la via alla futura prosperità coloniale dell'Inghilterra.

"Ma se siamo costretti ad associarsi soltanto col pensiero ricono-

scente a questa solenne manifestazione di simpatia, a questo tributo d'onore consacrato al genio, non mancheremo certo di pro vedere a che il salute di Venezia venga portato in seno di cotesta Illustre Societ  e vi esprima, coi ricordi di una storia che non si cancella, il sentimento di fratellanza che congiunge tutte le nazioni nel culto degli uomini benemeriti per opere e per virt  eccezionali.

“Voglia la S. V. accettare l'espressione del mio grato animo insieme all' attestato della mia perfetta osservanza.

“Il Sindaco,

“S. GRIMANI.

“Illmo. Signore John George Bourinot,

“Secretario Onorario della Societ  Reale del Canad ,

“Ottawa, (Canad ).”

Although it was not possible for the council of the city of Venice or the Societ  Geografica Italiana to send special representatives, they have asked the Consul-General of Italy in Canada to attend the meeting as the following letters show :

“VENEZIA, 12 Maggio, 1897.

“In relazione alla lettera che mi fu gradito ufficio dirigere alla S. V. Illma. in data 6 Marzo a c. mi reco ad onore di informarla che questo Municipio ha pregato l'Illmo. Sig. Comm. Giuseppe Solimbergo, Console Generale d'Italia a Montreal, di rappresentare la citt  di Venezia alle onoranze che saranno rese nel prossimo mese di Giugno nella Citt  di Halifax a Giovanni e Sebastiano Cabotto.

“Voglia la S. V. accettare l'espressione della mia piena stima.

“Il Sindaco,

“S. GRIMANI.

“All' Illmo. Signor John George Bourinot,

“Segretario Onorario della Societ  Reale del Canad ,

“Ottawa, (Canad ).”

“MONTREAL, May 1st, 1897.

“DEAR SIR,—I have the honour to inform you that I have just received a note from the Royal Italian Government, in which I am told that the Italian Geographical Society, accepting your courteous invitation to the celebration of the fourth centenary of Cabot's discovery of the shores of North America, has chosen me, being one of its members, as the delegate to represent them at the said important event of June next in the city of Halifax.

“I have the honour to be

“Yours very respectfully,

“G. SOLIMBERGO,

“Consul-General of His Majesty

the King of Italy for Canada.

“To the President of the Royal Society of Canada and Chairman of the Local Committee for the Cabot Celebration, Halifax.”

The following letter from the distinguished President of the Royal Geographical Society in London, Sir Clements R. Markham, K.C.B., F.R.S., shows the interest he has taken in this meeting, although it has not been found possible to find any member of that institution free to come out to the Dominion and represent it at the meeting :

“ 21 ECCLESTON SQUARE, LONDON, S.W., 3rd April, 1897.

“ DEAR DR. BOURINOT,—Many thanks for your note of March 25th, and its inclosures.

“ I would certainly come to Halifax myself if it was possible ; but I am obliged to be in London on those days of June. I will, however, try to get a suitable representative of the Royal Geographical Society to be present.

“ I think the Royal Society of Canada has adopted a very wise course in avoiding debatable ground, and adopting a mode of commemoration which will unite all who take an interest in the subject.

“ On Monday, April 12th, I am going to read a paper on the voyages of Cabots at the Royal Geographical Society, as a commemoration of the great achievement on our part.

“ I trust then to find a suitable delegate for the society.

“ I regret that I shall be prevented from coming to Halifax, but I feel sure that the gathering will be worthy of the occasion, and I wish the Royal Society of Canada all possible success in the laudable and patriotic course it has adopted.

“ Ever yours sincerely,

“ CLEMENTS R. MARKHAM.”

Since the receipt of this letter the council have been advised of the appointment of General D. R. Cameron, C.M.G., F.R.G.S., as the representative of the society.

Invitations were also extended to several universities and societies in the United States and Canada, and a large number have duly appointed delegates to attend the present meeting.¹

It is time indeed that English-speaking peoples recognized the services of a man who has been almost forgotten for four centuries except by a few enthusiastic and patient students of history. For many years writers have given to Sebastian Cabot, the son, that honour which should have been paid to John Cabot, the father, and it is only within a few decades that the latter has found his true place alongside of the pioneers of American discovery and exploration. The great Genoese, Christopher Columbus, has been long honoured by monuments in many lands, and only five years ago the civilized world sent its representatives to Chicago to pay him a tribute that few benefactors of the human race

¹ See *supra*, p. II, for list of delegates in attendance.

have ever received. The intrepid sailor of St. Malo, Jacques Cartier, has his memory perpetuated in the nomenclature of the valley he first discovered and by a noble monument on the banks of the St. Charles, close to the walls of Quebec, ancient Stadacona, where he passed his first winter in Canada. Now, four hundred years after Cabot's discovery of the continent of North America, an effort is at last made to pay him honours.

On Thursday, the 24th day of the present month—the probable date of John Cabot's first sight of northeastern America—the Governor-General of Canada, the Earl of Aberdeen, will unveil a brass tablet which the Royal Society of Canada has had made with a suitable inscription in commemoration of the American voyages of the famous Italian navigator, John Cabot. This tablet is to be placed in the entrance hall of the old stone Province House, in which the representatives of the ancient colony of Nova Scotia have annually met for the greater part of the present century. The Royal Society have very properly chosen the city of Halifax on the Atlantic shores of the Dominion for the celebration of a great historical event. In view of the controversies with respect to the land-fall of 1497, Halifax has been considered as a neutral ground on which all the disputants can happily meet without giving up their respective theories. The Royal Society does not identify itself with any of these theories but calls upon all the disputants to meet on a common ground of action and join in paying a just tribute to a great navigator, whose claims to fame are tersely set forth in an inscription whose historical truth will be generally admitted by the student of those old times.

On a beautiful specimen of brass work, decorated by the arms of England, Bristol and Venice, and other appropriate emblems we find these emphatic words :¹

THIS TABLET IS IN HONOUR OF THE FAMOUS
ITALIAN NAVIGATOR, JOHN CABOT,

Who, under the authority of letters patent of Henry VII., directing him to conquer, occupy and possess for England any lands he might find "in whatever part of the world they be," sailed in a Bristol ship, "The Matthew," and first planted the flags of England and Venice in the month of June, 1497, on the northeastern seaboard of North America, and by his discoveries in this and the following year gave to England a claim upon the Continent which the colonizing spirit of her sons made good in later times.

This Tablet was placed in this hall by the Royal Society of Canada, in the month of June, 1897, when the British Empire was celebrating the Sixtieth Anniversary of the accession of Her Majesty Queen Victoria, during whose beneficent reign the Dominion of Canada has extended

¹ For illustration of tablet, see *Cabot Celebration, infra.*

from the shores, first seen by Cabot and English sailors four hundred years before, to the far Pacific coast.

C. O'BRIEN, D.D., Pres. R.S.C.,
(Archbishop of Halifax).

H. E. THE EARL OF ABERDEEN,
Governor-General of Canada.

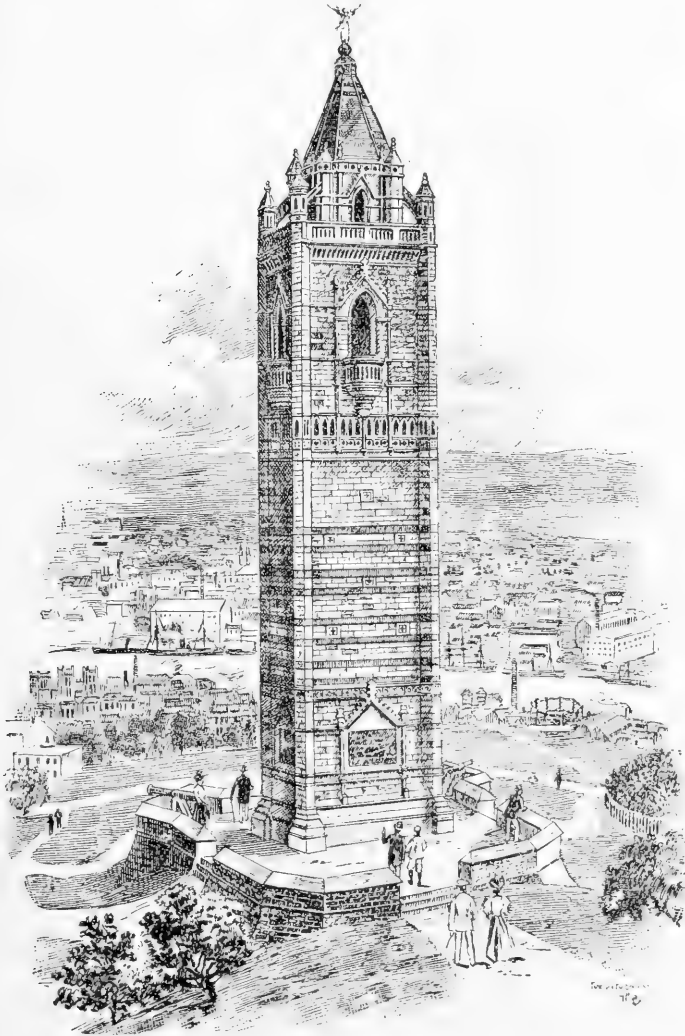
J. G. BOURINOT, C.M.G.,

HIS HONOUR M. B. DALY,

Hon. Sec. R.S.C.

Lieut.-Governor of Nova Scotia.

Bristol Delegates: W. H. DAVIES, Esq., J.P.; W. R. BARKER, Esq., J.P.



BRISTOL MONUMENT.

The city of Bristol, with commendable enterprise, is erecting a stately monument in Cabot's honour on Brandon Hill, which recalls the mysterious island which ever eluded the search of the adventurous seamen of the old historic port in the fifteenth century.

The tower is to be a square structure of an ornamental character, adapted from a well-known example in the Department of the Loire, in France. It has buttresses at the angles from base to summit, and in order that it shall not appear heavy, the sides of the square, reckoning to the outside of the buttresses, do not exceed 27 feet. There are two stages, each of which is relieved with an ornamental balcony, which adds much to the appearance of the structure. The floor of the upper balcony is 75 feet from the base, and above this is an octagonal spire of 30 feet, making a total height of about 105 feet. A circular staircase of fair width goes up the centre of the tower to the first stage, and above that there is a spiral staircase for the second stage, and should a lift be required for the future, the well-hole of the tower forms a convenient position for it.

The style of the design, although original, is typical of the style prevalent in England at the time of Henry VII. The spire of freestone is to be surmounted by the figure of Peace (or Commerce) mounted on a globe typifying the world, and it is proposed to gild these, so that they would be very conspicuous from a distance. Provision is made at the base for an insertion of panels with bronze bas-reliefs, one of which will be reserved for the Bristol inscription, and the others are proposed to be filled in by the American Subscribers and the Peace Society. The platform will be square, and it is proposed to make it about the same dimensions as the present circular inclosure on Brandon Hill, about 42 feet across. At its angles will be projected bold epaulements for the reception of the Russian trophy guns, so that the platform will still present the appearance of a fortification.

In Newfoundland a signal station and observatory are also to be built in honour of the Italian sailor. These honours are relatively insignificant compared with those paid to the great Genoese, and even to the Breton sailor of St. Malo, but still they are an instalment of that justice which the Anglo-Saxon communities of America have so long delayed awarding to a man to whom they owe so deep a debt of gratitude.

16. HISTORICAL STUDIES.

The erection of this tablet in honour of a navigator whose name was hardly remembered in Canada until the Royal Society undertook the task of recalling his services, may be cited as an instance of the growing interest throughout Canada in historical investigation and in famous events of American annals.

The deep interest that is now taken in the history of Canada is quite apparent from the list of works which have appeared within a decade of years from the presses of the Dominion as well as of other countries. At least a hundred important books have been published during that time.

without including the numerous local histories—some of considerable merit—as well as the many elaborate monographs and essays that have been printed in the Transactions of the Royal Society of Canada. When we consider that Canada is only a country of five millions of people it is surprising that so much literary activity should be shown in a single department of thought and study. In comparison even with the older countries of Europe, or even with the great Federal Republic of seventy millions of people to the south of the St. Lawrence and the Great Lakes, the issue of the historical work in Canada is certainly remarkable. The reason of this interesting phase of the intellectual development of the Dominion—a phase hardly ever mentioned in the many essays that appear from time to time on that country—may be attributed to the national sentiment of the people, to their growing desire to occupy a higher place among the communities of the world, to their deeper appreciation of their own history so full of many interesting and inspiring incidents, worthy of the study of the statesman and the publicist as well as of the lover of the romantic and picturesque.

In this connection we may refer to the publication of a most valuable edition of the Jesuit Relations and Allied Documents, with a translation in English opposite the original French, and with notes by the able editor, Mr. Reuben Gold Thwaites, the well-known Secretary of the State Historical Society of Wisconsin. The publication of such a complete work will be invaluable to the student of Canadian history. Mr. Benjamin Sulte, one of the most industrious members of the Royal Society from the first year of its foundation, has also performed a useful task in reproducing in the Transactions the original text of a very rare Canadian history, P. Boucher's *Histoire Vritable et Naturelle des Mœurs et Productions du Pays de la Nouvelle France* (1674). Mr. Sulte has given a biographical introduction and bibliographical notes which make the book of still greater service to students to whom the book is not generally accessible. It is hoped that other historical students will imitate Mr. Sulte's example and in this way facilitate historical research and inquiry.

17. UNIFICATION OF TIME AT SEA.

In accordance with a resolution of the society the council took steps to bring to the attention of the Imperial Government the desirability of giving effect to the sixth resolution of the Washington Prime Meridian Conference of 1884, which implies the unification of time-reckoning at sea. A memorial was presented to His Excellency the Governor-General on the subject, setting forth the facts and praying His Excellency to bring the matter under the notice of Her Majesty's Government. Communications were likewise transmitted to a number of associations in the United Kingdom representing science, commerce and shipping, inviting

their co-operation in moving the home Government to adopt the change so that it might take effect on the first day of the new century.

The better to accomplish the desired end the council sent with each communication various documents bearing upon the subject in pamphlet form, viz. :

1. Memorandum of the Royal Society of Canada of October 14th, 1896.

2. Memorial from the Royal Society of Canada to His Excellency the Governor-General, April 27th, 1896.

3. Communication from Canadian Institute, Toronto, April 9th, 1896.

4. Second report of the Joint Committee of the Canadian Institute and the Astronomical Society of Toronto, May 10th, 1894.

5. Third report of the Joint Committee, etc., Sept. 21st, 1895.

6. Opinions of British Shipmasters and others on the proposed reform.

7. Letter to the Governor-General's Secretary on the same subject, Toronto, April 23rd, 1896.

8. Summary of Shipmasters heard from on the Unification of Time at Sea up to July 25th, 1896.

Many associations in the United Kingdom responded to the invitation of the council. The Association of Lloyd's, the most perfect organization known in connection with shipping and commerce, was one of the first to take definite action in favour of the movement. The council of the Royal Colonial Institute for themselves and on behalf of its four thousand members, forwarded to the Prime Minister a memorial urging on the Government the advisability of making the desired change. The Chambers of Commerce at London, Liverpool, Glasgow, Leith, and other great shipping ports, acted similarly. The Royal Society of London appointed an influential committee to consider the best course to follow in meeting the wishes of this society.

Last month information was received through the Secretary of State for the Colonies, that the Lords Commissioners of the Admiralty repeated their readiness to make the change and give direction for the Nautical Almanac to be so altered to give effect to it, provided certain other powers agreed to do the same. They stated, however, among other things, that having invited foreign governments to act with them, the United States of America had categorically declined the invitation of Her Majesty's Government. The Lords of the Admiralty decided in consequence to proceed no further in the matter. It was further stated that as the Nautical Almanac for 1901 is now in an advanced state of

preparation on the basis of the old system of reckoning astronomical time, no change is now possible at the beginning of the next century.

The following letter has recently been received from the Royal Society of London :

“ THE ROYAL SOCIETY,
“ BURLINGTON HOUSE,
“ LONDON, May 25th, 1897.

“ SIR,—In my letter of February 6th I informed you that the council of the Royal Society had appointed an influential committee to consider whether anything further could be done in the matter of the assimilation of astronomical and civil time.

“ The report of the committee was communicated to the council on the 20th inst., and was to the effect that as there is a great diversity of opinion as to the advisability of the adoption of civil reckoning for astronomical purposes, and as it is impossible to carry out such a change in the ‘ Nautical Almanac ’ for the year 1901, they did not recommend that the Royal Society should at present take any steps in support of the suggested change of reckoning.

“ After full consideration, the council accepted the report of the committee and do not propose to take further action in the matter at present. I therefore regret that the council are unable to comply with the request of the Royal Society of Canada that they will urge Her Majesty’s Government to move in the matter, as they do not consider the occasion to be opportune for presenting the assimilation of astronomical and civil time upon the attention of the powers who have not already assented to the change.

“ I have the honour to be, sir,

“ Your obedient servant,

“ ARTHUR W. RUCKER,

“ *Sec. R.S.*

“ Dr. J. G. Bourinot, C.M.G.,

“ Hon. Secretary, Royal Society of Canada,

“ Ottawa.”

The council deem it proper to remark in respect to the statements in the second paragraph of the above letter, that while there has been some divergence of opinion among individual astronomers as to the advisability of the adoption of civil reckoning for astronomical purposes, the investigations of the Canadian Institute and the Astronomical and Physical Society of Toronto have established that the astronomers of the world as a class are in favour of the change, provided it could be carried into effect at a time-epoch easily remembered, such as the beginning of a century.

The publications of this society make it plain that among mariners there is no such diversity of opinion; with this class of men, who so much use the Nautical Almanac, there is almost universal consensus of opinion in favour of the unification of time at sea. It will likewise be remembered that the suggestion to defer the adoption of the Washington resolution until the change of the century was made thirteen years ago at the request, and to meet the views, of individual astronomers.

It is deeply to be regretted that the unification of time at sea on the first day of January, 1901, is not now possible owing to one great Power declining to co-operate with the other nations in giving the recommendations of the Washington Conference practical effect. The council, however, trust that in the interest of commerce, shipping and general progress, even if it should cause some inconvenience to a few astronomers, the adoption of the reform will not be long delayed.

The report of the council was adopted on motion of Professor Bailey, seconded by Mr. J. F. Whiteaves.

TELEGRAM OF CONGRATULATION TO H. M. THE QUEEN.

The following telegram was ordered to be sent to His Excellency the Governor-General, for transmission to Her Most Gracious Majesty the Queen (on motion of Dr. S. E. Dawson, seconded by Professor Bovey):

“The Royal Society of Canada now in session at Halifax, Nova Scotia, respectfully requests your Excellency to convey to Her Most Gracious Majesty the Queen their sincere congratulations on the completion of the sixtieth year of her eventful, glorious, and happy reign, and their earnest hope that she may long continue to govern the Empire, which has been so greatly extended and has so widely prospered during her beneficent and glorious reign. God save the Queen.”

GENERAL BUSINESS.

The following motions were agreed to:

(1) “*Resolved*, That the matter of the election of a member to Section III. be referred to Section III. for consideration and report.” (On motion of Professor MacGregor, seconded by Dr. A. H. Mackay.)

(2) “*Resolved*, That Mr. Gilbert Parker, the eminent author, be elected a corresponding member of the society, and that Rule 8 be suspended in relation thereto.” (On motion of Dr. Stewart, seconded by Sir James LeMoine.)

(3) “*Resolved*, That a petition be presented to the Dominion Government and a deputation appointed to wait on the Minister of Marine and Fisheries, at such time as may be arranged, to urge the continuance

and increase of the grant heretofore made for the survey of the tidal currents, and the more perfect organization of a Hydrographic Survey Department for the Dominion." (On motion of Professor Johnson, seconded by Dr. Stewart.)

(4). "Resolved, That the nominating committee of officers of the society be composed of Archbishop O'Brien, Benjamin Sulte, Dr. George Stewart, Sir S. Fleming, and Dr. G. M. Dawson.

The society then adjourned until 2.45 p. m. the same day.

SESSION II. (June 21st.)

The society resumed at 2.45 p. m. and the following reports from societies were read in due order :

REPORTS OF ASSOCIATED SOCIETIES.

I.—From *The Quebec Geographical Society*, through Mr.
C. E. BAILLAIRGÉ.

The Quebec Geographical Society has the honour this year, and is glad of the occurrence on this exceptional occasion, of presenting itself before the Royal Society of Canada in a new and improved garb as represented by the volume of transactions which the undersigned, as delegate, has been requested to lay on the table.

The society has, so to say, taken a new lease of life, activity and usefulness, as, it is presumed, will be admitted on a perusal of the illustrated contents of its bulletin, amongst which will be noticed its study of the Hudson Bay and Labrador territories, with papers and reports thereon by Dr. Bell, M.D., and by Mr. A. P. Low, of the Geological Bureau, Ottawa, the latter of whom introduces us to the Great Hamilton cataract, of which the height is 302 feet and the flow equal to that of the Ottawa above Grenville; the question of the exploitation of the land and water resources of the bay and a railway thereto, or from Lake St. John to James Bay by the valleys of the Chamouchouan, the Waswanipi and the Nottawai, by M. Baillairgé; the effect on the St. Lawrence and Great Lakes of the so-called Chicago drainage canal, which will lessen its flow by 600,000 cubic feet of water per minute, one-thirtieth of the whole flow over Niagara, to be diverted by the Des Plaines, Illinois and Mississippi rivers towards the Gulf of Mexico, also by M. Baillairgé; an interesting paper by Dr. Bell on the differential elevation of the northeastern territory, corroborated also by Mr. Low in his report on the Labrador territory; an interesting paper by M. LeVasseur, Honorary President of the society, descriptive of the Island of Anticosti and explanatory of M. Menier's new venture in the exploitation of its resources, and a full biography of the life of old Gamache, its first inhabitant and pioneer; a

report by Mr. O'Sullivan, Director of Surveys, P.Q., on the territory, rivers and resources of the country between the Height of Land northward of Quebec and James Bay; a paper by M. Baillairgé on Von Schroen's pretended discovery of organic life in crystals; Honourable M. Nantel's homestead scheme for the province of Quebec, and a letter to that gentleman from the undersigned expressive of the fact that the carrying out of the project will be eminently conducive to the suppression of the cry for communism and socialism, and its concomitant evils of discontent and dynamiting as a remedy for existing evils; M. LeVasseur's inaugural address and retrospective view of the labours of the society since its inception in 1879, or during the last eighteen years; an article by Mr. Hammond, from the *New York Journal*, expressive of that gentleman's views on the amelioration of the climate of the New England States by a barring or damming of the Strait of Belle Isle—a subject alluded to some ten or more years ago by M. Baillairgé *et al.*, and again synoptically rehearsed as to its softening effect on the climate of the surrounding country and territory about the Gulf of St. Lawrence; the analogy between the tempering effects of the "Gulf Stream" on the climate of the British Isles and of the western coast of Europe, and of the contrary or refrigerating effects of the return Arctic current pouring through the Strait of Belle Isle into the Gulf of St. Lawrence, on the climate of Anticosti, as conveyed in a letter of M. Baillairgé to N. LeVasseur, M. Menier's manager or agent in the colonization and exploitation of the island, and suggestive of the necessity, or apropos of M. Menier, who can well afford it, and in his own pecuniary and other interests, as in those of the inhabitants of the island, having the effect of the closing of the Belle Isle Strait reported on by European and American scientists, as to the probable climatic effects which the execution of such a scheme, estimated to cost some \$9,000,000, would bring about, and in how far such expenditure would be warranted by the concomitant advantages, not only to Anticosti, but to all the gulf surrounding territories.

The volume of transactions is illustrated with portraits of Honourable S. N. Parent, lately sworn in as a member of the Marchand Government, who was made patron of the society, in consideration of the society having obtained from him, as mayor of the city of Quebec, a room for its library and sittings in the new City Hall, Quebec, and to which the society would invite the attention of members of the Royal Society desirous of consulting its exchanges from almost every civilized country of both continents, as well of Australia, Iceland, etc. We also present portraits of Dr. Bell, M.D. and have reproduced some of the engravings from his last report to the Dominion Government; of Mr. Low, the hardy explorer of the Labrador territory; of Mr. O'Sullivan, already mentioned; of M. Bignell, our pioneer Canadian surveyor and explorer of

so much of the territory of the Ottawa, the St. Maurice and so many other rivers between Quebec and the Gulf, together with portraits of the newly elected officers of the society—Messrs. LeVasseur, Honorary President; F. D. Tims, Esq., President, and Chevalier Baillaigé, Librarian.

The society has been sorely pinched for means, and more especially during the three or four last years that its heretofore annual local government grant has been withheld, and now concludes this synopsis of its last year's labours, by a request to the Royal Society of Canada, if satisfied that it has been of some utility to Canada, to say a good word for it in the way of restoring to it the pecuniary annual grant to which it considers itself entitled, in the interests of the province of Quebec in particular and of the Dominion of Canada in general.

II.—From *The Niagara Historical Society*, through Dr. STEWART.

This society begs leave to lay before the Royal Society of Canada its constitution, list of officers, and report of president on its work :

Constitution.

Article 1. That this organization shall be called the Niagara Historical Society.

2. Its objects are the encouragement of the study of Canadian history and literature, the collection and preservation of Canadian historical relics, the building up of Canadian loyalty and patriotism, and the preservation of all historical landmarks in this vicinity.

3. The officers shall consist of a president, vice-president, secretary, treasurer, curator, and an executive committee in addition of five; five members to form a quorum, the president to be ex-officio member of all committees.

4. The society shall hold regular meetings of its members and occasional open meetings, when the public shall be invited.

5. Each member shall pay an annual fee of fifty cents; any member whose subscription is unpaid shall not be entitled to vote at the annual meeting.

6. This society shall affiliate with the Ontario Provincial Historical Society, paying annually thereto the tax of ten cents per capita of membership of society.

7. This constitution may be amended by a two-thirds vote of membership present at any annual meeting, notice to be handed to the secretary one month previous.

8. Neither politics nor differences in religion shall be discussed at any meeting of the society.

Standing Orders.

1. The annual celebration shall be held on the 17th of September in each year, or as near thereto as possible.

2. The society shall hold eight regular meetings during the year. These meetings to be held on the second Thursday of each month.

3. The annual meeting to be held on October 13th.

4. Order of business of the annual meeting shall be : Minutes, roll call, correspondence, president's remarks, annual report of secretary, annual report of treasurer, nomination and election of officers by ballot, amendment of constitution, motions.

5. Order of business at regular meetings of the society shall be : Minutes, correspondence, old business, new business, papers read or addresses.

6. At all regular meetings of the society seven shall form a quorum.

7. In the absence of the president and vice-president the members shall elect an acting president.

8. The president shall preside at all meetings and conduct them after the prescribed order of business, shall call special meetings at the request of five members.

9. The secretary shall issue all notices of meetings, keep a correct record of meetings held, shall read minutes and present a full report of the year's proceedings at the annual meeting, and shall keep all letters received.

10. The treasurer shall receive, collect, hold and receipt for all fees and money, disbursing the same by order of the society.

11. Amendments may be made at any regular meeting, notice to be given at the previous meeting.

Officers, 1896-7.

Patron, Wm. Kirby, F.R.S.C.

President, Miss Carnochan.

Vice-President, Henry Paffard.

Secretary, Alfred Ball.

Treasurer, Mrs. A. Servos.

Curator, Russell Wilkinson.

Committee, Rev. J. C. Garrett, Jas. B. Secord, John D. Servos, W. M. Seymour, B.A., Mrs. Asher.

Hon. Vice-Presidents, Warner Nelles, Peter Whitmore, Mrs. Roe, Charles Ball.

Honorary Members, Dr. Scadding, Rev. Canon Bull, Wm. Gibson, M.P., Capt. Cruikshank, Capt. M. Konkle, R. O. Konkle, Maj. Hiscot M.P.P.

*Address of the President on Work of Society.**(Read Oct. 13th, 1896.)*

It is with peculiar feelings of gratitude and pleasure that we meet the evening of the day selected for our annual meeting, it being also the anniversary of the victory at Queenston Heights eighty-four years ago. How different our surroundings and circumstances from those of that night of grief and triumph, following a day of bitter contest with alternations of gloom and exultation. Around were the dead, the dying, burning buildings, prisoners, but the chief thought of all, that the beloved commander was no more.

It is much to be regretted that an historical society had not been formed here a score of years ago, when pioneers and veterans were alive, who could have told us so much that we have now no means of obtaining.

Our thoughts to-night must be both retrospective and prospective. We speak of what has been done and what we hope to do. In 1892 a small society was formed, chiefly with the view of giving assistance in the centenary proceedings on July 16th. It is believed only two meetings were held, and one open meeting, at which a paper was read, "Niagara One Hundred Years Ago," which was printed by the Lundy's Lane Historical Society. The officers were: President, Wm. Kirby; Secretary, Dan. Servos; Treasurer, D. McDougall. In November, 1895, a meeting was called by all interested, as it was felt strongly by a few that in this historic spot such a society should exist. I had thought of a very suitable president to propose, but found to my astonishment and dismay that I was selected for the position. It was with feelings of great diffidence that I engaged in the task, for we had been assured that it was useless to try to break down the cold, dead wall of apathy and indifference that we everywhere encountered, and as to collecting relics, everything valuable had disappeared, was either destroyed or given away; or that if any remained it would not be given to us. But all these dark prognostications proved false. What have we done? Briefly this: We have a list of over fifty members, have adopted a constitution and by-laws, a motto too, "The Love of Country Guides." We have had interesting meetings, three of them being open to the public, at which papers were read. One by Capt. Cruikshank has been printed in pamphlet form with an old engraving. We have had a successful anniversary; on the platform representatives of five historical societies, indeed the presidents of four. A poem was read, dedicated to our society, by Mrs. Curzon. A paper was read by Canon Bull, and addresses were made by Miss Fitzgibbon, Capt. Cruikshank, Rev. J. C. Garrett, Rev. P. Spencer, Col. Currie, Major Hiscott. You heard the satisfactory reports of the secretary and treasurer, showing a balance in the treasury.

A remarkable and valuable exhibit, for which we were indebted chiefly to the zeal of Mr. John D. Servos, of documents, weapons, old silver, flags, Indian relics, was universally commended. We also followed the example of the L. L. Society, in decorating the graves of those who died to save their country, the four to whom a tablet was placed in St. Mark's Church on May 27th; the granddaughter of one of them, Capt. McClelland, is among us.

Other encouragements we have had. The mayor kindly allowed the use of his office for our first meetings. The town council granted the use of the old library room. A large case was presented by Mr. Long for our collection of curios; our large table by Mrs. Servos; a case for weapons by Mr. Jno. D. Servos; chairs by the members, and other articles. Contributions have come in rapidly. Such valuable historic relics as General Brock's cocked hat, obtained from Mrs. Herbert Ball, through the kindness of Mr. Alfred Ball; and the sword surrendered at the taking of Fort Niagara by our troops, in 1813, from Mr. Alexander Servos; papers printed in Niagara 1794, presented by Mr. C. Ball, and many other articles, form the nucleus of what we hope may become an extensive and valuable collection. Our curator, Mr. Wilkinson, has nobly performed his task and deserves our hearty thanks. The work of correctly and neatly labelling and entering 250 articles is no slight one.

In collecting I have taken as my special work the books, papers, pamphlets, printed in Niagara in early days, and am happy to say that so far I have been very successful, though much is yet to be done.

And now for what we hope to do. The respected president of the L. L. H. S., Canon Bull, has assured us that the greatest cause of its vitality is its publications, and thus it has earned the right to receive grants from the county and the province, has thus disseminated useful and valuable historic information. It has also honoured the names of brave men, has put in order the cemetery, the scene of the battle, has by its persistent efforts obtained from the Dominion Government the erection of the handsome monument to those who fell for their country. Canon Bull, in his address a year ago, advocated the erection in Niagara of a memorial of the landing of the U. E. Loyalists, with the names of the refugees, at the spot on the beach where so many of them landed, and this would be a legitimate work for us. The preservation of our forts and historic spots is another worthy object of our ambition, and we rejoice that already a step has been taken in that direction. That our constitution should be printed is almost a necessity, and we hope some day to print a catalogue of the articles in our collection. The Provincial Historical Association, which met this year at Hamilton, is to meet at Niagara next year in June, and this, it is hoped, may stir up a greater feeling of interest. Let us unite to give them a hearty welcome. We hope to obtain from the county council and the Provincial Government

a small grant for printing purposes, as we already have other historical documents to print. It may thus be seen that we have much work before us. Let us all then enter on this new year with renewed zeal, each trying to advance the interests of the society, helping it to make history, to encourage the young, to inspire the old, to develop love of country. Let us sink minor differences and follow our motto, "The Love of Country Guides." The great apostle gives in the same breath the command, "Fear God, Honour the King," and Moses and Paul breathed out the truest patriotism when they wished to perish to save their country. We are not asked now to die for our country, but let us work for her, let us live for her. We feel that as a society we have much reason for thankfulness for what we have been able to accomplish in less than a year, and should the same zeal, the same hearty support, be given in the ensuing year as in the last, we shall have no reason to feel ashamed of our record.

III.—From *The Kingston Historical Society*, through Mr. R. V. ROGERS.

Our society was formed because it was believed that in Kingston and its vicinity there was much historical material which it was important to collect and preserve. Kingston has been in the past and may still be said to be an important military, commercial, social and political centre. From the earliest times it was regarded as an important strategical point. It was established by the French as a military post for the protection of the country and the commerce of the lakes from the ravages of Indians and hostile neighbours, and the forts and defences which were erected and maintained attest the importance which they attached to its possession. It was associated with the names of Frontenac, La Salle, and other great Frenchmen whose adventures read like a chapter of romance. It formed the basis for warlike expeditions and journeys of discovery, and up to the time of the cession of Canada to England was held with a tenacious grasp. When the country fell into the hands of the British it became their chief naval station on the lakes and the base of their maritime expeditions, and it was fortified with jealous care so that its continual possession might be assured. When the Loyalists came to Canada it formed the basis of their settlement in the Quinté district. It became, too, an important educational and commercial centre, and in later years was selected and used for a short time as the seat of government. It has trained and sent forth many men who have become famous in the councils of their country, and altogether it has acquired an importance not to be measured by its size and population. It was therefore to be expected that those who appreciate the importance of preserving its historical associations should unite in the foundation of a society for that purpose. We can, I think, review the work of the past three years with satisfaction, and claim that our expectations have so far been fully

realized. The objects of the society are stated in the constitution to be "the investigation and, as far as possible, the collection and preservation of books, documents and other objects of historical interest, the reading at the meetings of the society of papers on historical subjects, and the publication, so far as the funds of the society would permit, of such documents and papers as it might be deemed advisable to publish."

The following papers have been read during the last season :

1896.

Nov. 3—"An Outlook from Kingston, One Hundred Years Ago,"
Rev. S. Houston.

Dec. 8—"Further Researches into the Early History of Banking in
Upper Canada," Prof. Shortt.

1897.

Jan. 12—"Slavery in Canada Before and After the Conquest," Dr.
Neilson.

Feb. 16—"The Old Fortifications on Points Frederick and Henry
(Kingston)," R. T. Walkem, Q.C.

March 9—"The Cabots and Discovery of Canada," Prof. Ferguson.

May 4—"Early Settlement of the Northwest," J. Fortescue, Esq.

With reference to that part of our work which consists in the collection and preservation of books, documents and other objects of historical interest, I might say that it was hardly to be expected that there should be much of this material gathered in in view of the fact that for many years past active collectors of these objects have been busy in every direction. There are, however, I am told, gleanings still to be obtained in the shape of old letters, etc., in the hands of the descendants of U. E. Loyalists and others which bear upon the early history of the country and some of which the society may hope to obtain. Some of our friends have presented to the society books and papers which are interesting, even if they cannot be regarded as possessing historical value. Our books and documents are confided to the care of Prof. Shortt, and are kept by him, I understand, in Queen's University. As regards the printing of our papers we have, through the influence of some of our most prominent members, been able to arrange for the publication of such as may be regarded as original and as dealing with certain special subjects, in the *Queen's Quarterly Magazine*, without expense to the society. Those of a special character and of general interest, such as Prof. Shortt's essay on "Banking in the Early Days," have been published elsewhere. So far there has been no difficulty in securing the publication of such papers as any of the authors may wish to see published, and I do not anticipate any difficulty in the future. Any of the papers read heretofore before the society would have been eagerly accepted, I think, by some of the magazines or literary journals.

IV.—From *The Nova Scotia Historical Society*, through Hon. J. W. LONGLEY.

The 17th of December, 1896, being the centenary of the birth of the Nova Scotian author, Thomas Chandler Haliburton, commonly known as "Sam Slick," a commemorative meeting was held by the society in the House of Assembly. Besides the members of the society there were present, the Lieutenant-Governor, the Archbishop of Halifax, Lieutenant-General Montgomery Moore with his staff, the Speaker and other members of the legislature, a delegation from the Haliburton Club of Windsor, and representatives from other parts of the province.

Following introductory remarks by the chairman, Senator Power, and by the Lieutenant-Governor, addresses were made by Archbishop O'Brien on Haliburton's connection with the removal of Catholic disabilities; by Professor De Mille (the president of the Haliburton Club) on Haliburton and King's College; by Mr. Justice Townshend on Haliburton as a judge; by Speaker Laurence on Haliburton as a legislator; by Mr. J. W. Longley on Haliburton as a litterateur; and by Mr. J. J. Stewart on the bibliography of the great Nova Scotian writer. Mr. W. H. Hill read specimens of Sam Slick's humour. A complete list of his works was placed on exhibition with many photographs of himself and his last residence, Gordon House, Isleworth-on-Thames, whose present owner, Lord Kilmorey, has erected a clock tower in honour of him. And the end of this centennial commemoration is not yet, for the Haliburton Club announce an illustrated volume entitled "Haliburton; a Centennial Chaplet" as "ready in July." It will contain papers by R. G. Haliburton, Q.C., Professor Horning of Victoria University, F. Blake Crofton, Professor De Mille of King's College and P. Scott, with a complete bibliography by J. P. Anderson of the British Museum.

On the 13th April, 1897, an interesting paper was read before the society by the Rev. E. M. Saunders, D.D., upon the History of Wilmot and Aylesford, N.S., during the last half of the eighteenth century.

The following are the officers for the current year:

President, Hon. J. W. Longley.

Vice-Presidents, Hon. L. G. Power, Rev. John Forrest, D.D., and A. H. Mackay, LL.D., F.R.S.C.

Corresponding Secretary, F. Blake Crofton.

Recording Secretary, W. L. Payzant.

Treasurer, R. J. Wilson.

The president was appointed to represent the society at the meeting of the Royal Society of Canada with Mr. J. J. Stewart as an alternative.

V.—From *The Hamilton Association*, through Dr. BURGESS.

During the past session there have been held eight regular and two

special meetings of the general association, and thirteen sectional meetings.

At most of these meetings papers of scientific and literary interest were read and discussed, as follows :

1896.

Nov. 5—"Inaugural Address," President A. T. Neill.

1897.

Jan. 7—"The Battle of Stony Creek," Inspector J. H. Smith.

Jan. 29—"Notes on some Recent Additions to Ontario Palæontology,"
Col. C. C. Grant.

Feb. 4—"The Function of Poetry," F. F. Macpherson, B.A.

Feb. 26—"Local Fossils and Additions to Palæontology," Col. C. C. Grant.

March 26—"Local Palæontological Notes," Col. C. C. Grant.

April 30—"Minerals of Our Local Rocks," Col. C. C. Grant.

May 6—"The Dynamics of Social Peril," Mr. J. T. Barnard.

May 27—"Concrete Forms and Stratification of the Cutting of the
Spur Line, Hamilton," Mr. A. E. Walker.

June 3—"Lake Medad and the Kwin-ni-bi-nah Collection of Indian
Relics," J. O. McGregor, M.D.

The members of the biological section have, during this session, devoted much time to identifying and cataloguing the botanical specimens collected during the past few seasons. A careful comparison of these with the lists of Logie and Buchan, and with the additions made in this society's Proceedings of 1889-1890, shows that we have collected 120 species and varieties not hitherto reported from this locality. Of these, two are new to America, a few new to Canada, and several new to Ontario. Three critical forms are withheld subject to further examination. We hope to give a full list of the flora of the district in our Proceedings of the present year.

The members of the geological section are also commencing a complete list of local fossils contained in the museum. This will, likely, be completed during 1897-98.

A large number of additions have been made to the museum during the past session, the most important being Mrs. S. E. Carry's valuable collection of shells and Indian relics, which contains upwards of three thousand specimens, properly classified and labelled.

VI.—From *The Natural History Society of New Brunswick*, through Prof. A. W. DUFF.

The Natural History Society has much pleasure in reporting a year of active work and steady growth. The library has increased considerably, and many of our members have taken the opportunity of consulting the leading scientific periodicals.

Considerable work has been done in the museum, particularly on the birds and insects. The latter collection has been remounted and rendered much more attractive.

Bulletin XIV., which was issued in the early part of the current year, contains a biographical sketch of Abraham Gesner, by G. W. Gesner; an account of a trip down the Restigouche, with notes on its Flora, by President George U. Hay; three articles by Professor W. F. Ganong, and two short notes by Dr. Philip Cox. These articles, besides adding much to our knowledge of the natural history of New Brunswick, are of general interest. Two field-meetings were held, one at the summer residence of President Hay, the other at the summer residence of Vice-President H. George Addy, M.D. Both were very successful.

The membership list shows additions to the number of forty-four persons, while it records but few resignations. Two patrons and two ordinary members were lost through death during the year.

Sir Samuel Leonard Tilley, on his appointment to the Lieutenant-Governorship of the province became patron, and continued to hold the office during his double term as Lieutenant-Governor. His death was deeply felt, not only by the society and the community in which he lived, but by Canada generally, to the best interests of which he devoted many years of his life.

Hon. John James Fraser, who succeeded Sir Leonard, died in October last at Genoa.

Sixteen meetings were held, at which the following papers were read :
1896.

- June 2nd (1)—Address on "The Pottery of the Cliff Dwellers," by S.W. Kain.
 (2)—Note on "The Outlet Delta of Lake Utopia," by Prof. W. F. Ganong.
 (3)—Address on "Artesian Wells," by Dr. George F. Matthew.
 (4)—"Adaptation of Plants to Reproduction, Including Cross-fertilization," by Prof. W. F. Ganong. (Read by title).
- Oct. 6th—"Wild Berries of New Brunswick," by W. S. Butler.
 Dec. 1st—"The Restigouche," with notes on its Flora, by President George U. Hay.

1897.

- Jan. 7th (1)—"The Oldest Siphonatreta," by Dr. George F. Matthew.
 (2)—"The Cambrian System in the Kennebecasis Valley," by Dr. George F. Matthew.
 (3)—Notes upon "Temperature Measurements with the Thermophone in Clear Lake," by Prof. W. F. Ganong.

- Feb. 2nd (1)—“Tidal Phenomena in the River St. John,” by Prof. A. Wilmer Duff.
 (2)—“Secondary Undulations,” by Prof. A. Wilmer Duff (read by title).
- March 2nd (1)—Address on “Peat Bogs,” by Dr. George F. Matthew.
 (2)—“Earthquakes that have been felt in New Brunswick,” by S. W. Kain.
- April 6th (1)—Notes on “The Height of New Brunswick Hills,” by Prof. W. F. Ganong.
 (2)—Address on “The Geological Features of Quaco,” by Dr. George F. Matthew.
 (3)—“The Relation of France to Newfoundland,” by H. George Addy, M.D.
- May 4th (1)—“A New Palæozoic Insect, with notes on the Fauna in which it occurs,” by Dr. George F. Matthew.
 (2)—“Some Probable Jesuit Influences upon our North-eastern Flora,” by Prof. M. L. Fernald.
 (3)—Notes on “The Intrusive Rocks near St. John,” by Dr. W. D. Matthew (read by title).
- June 1st (1)—“The Indian Potato; What was it?” by Rev. W. O. Raymond.
 (2)—“Trees and Forests,” by James Vroom.

In addition to the above the following elementary lectures were delivered :

“English Museums,” three lectures, by Dr. George F. Matthew.

“Trinidad,” one lecture, by J. V. Ellis, Jr.

“Pre-historic Pottery,” one lecture, by S. W. Kain.

“Birds,” three lectures, by A. Gordon Leavitt.

Annual address, by President George U. Hay.

At the thirty-fifth annual meeting held in January last, the following officers were chosen for 1897-98 :

Patron, Hon. Abner R. McClelan, Lieutenant-Governor of New Brunswick.

President, George U. Hay, M.A., F.R.S.C.

Vice-Presidents, H. George Addy, M.D., Wm. Murdoch, C.E.

Treasurer, Robert Matthew.

Secretary, Percy G. Hall.

Curators, Dr. George F. Matthew, S. W. Kain, A. Gordon Leavitt.

Librarian, Wm. Gilchrist.

Additional Members of Council, Gen. D. B. Warner, J. Roy Campbell, W. Watson Allen.

VII.—From *le Cercle littéraire et musical de Montréal*, through Rev. R.-P. DUCLOS.

Le Cercle littéraire et musical de Montréal, vient de clore sa douzième année. Nous sommes heureux de constater que le zèle dans l'assistance ainsi que dans la production des travaux ne s'est pas ralenti. Peut-être est-ce dû au caractère social que ses membres ont cru devoir donner à ses séances; aussi n'ont-elles rien de compassé ni d'officiel, la présidence étant confiée à celui ou celle qui le reçoit, réception qui se fait à tour de rôle et dans l'ordre alphabétique—peut-être aussi est-ce dû à la présence des dames et à leurs contributions musicales et même littéraires qui donnent à ses séances une variété et une fraîcheur justement appréciées.

Il laisse à ses membres la plus parfaite liberté dans le choix des sujets qu'ils désirent traiter, sentant que la moindre restriction pourrait avoir une fâcheuse influence sur l'inspiration des contributeurs.

Il est composé d'hommes de lettres, d'écrivains de profession, de littérateurs, de professeurs, de pasteurs, d'hommes d'affaires, de représentants de puissances étrangères, de mères de famille, de dames livrées à l'enseignement, dont quelques-unes consacrent une partie de leur temps à la culture des beaux arts. Tel rend compte de voyages entrepris dans un but récréatif, tel autre fait part d'impressions reçues au cours de lectures faites dans des moments de loisir; d'autres consignent dans des pages concises le résultat d'études philosophiques ou historiques, recueillant les souvenirs d'incidents déjà relégués dans un passé heureux où ils risquaient d'être pour toujours oubliés; d'autres, observateurs attentifs des habitudes des champs et des chantiers, recueillent des contes dont les coureurs de bois égayaient les longues soirées d'hiver; puis ce sont des peintures de mœurs pleines d'un vif intérêt, ce sont des événements historiques et des personnages que le temps entoure de nuages poétiques et que le génie dramatise à faire frémir d'horreur et ravir d'admiration le lecteur et l'auditeur. Ajoutez à tout cela, de petites comédies bien jouées, des lectures, des récitations et de la musique vocale toujours accompagnée d'un ou de plusieurs instruments, et vous aurez une idée assez juste de ces séances.

Durant l'année qui vient de s'écouler, le cercle s'est réuni quinze fois, et vingt-sept travaux ont été lus représentant presque tous les genres littéraires depuis les contes naïfs et joyeux jusqu'à la grande et émouvante poésie dramatique et aux plus profonds problèmes de la philosophie. Nous avons essayé de les classer.

I

Et d'abord, sous le chef de contes, souvenirs, impressions de voyage et observations, nous avons eu :

(a) des contes hollandais, caractérisant bien le génie moral et prati-

que de ce petit peuple, (b) et Une nuit de blocus sur les côtes de Sumatra, par M. Boissevain, consul général de Hollande ;

(c) Pensées suggérées par un jour d'élection à New-York, par M. Lafleur, pasteur ;

(d) un Episode militaire sur les frontières, par M. Reeb ;

(e) des Tableaux rustiques, par M^{me} Cornu, professeur à l'école Normale ;

(f) Le village suisse à l'exposition de Genève en 1896, par M^{me} Demole ;

(g) des contes de cageux, un travail sur les mœurs électorales, Une visite à Leconte de l'Isle, le Lac du Bourget, deux fois rendu immortel par des poètes : Lamartine et le poète lauréat de la province de Québec, que M. Fréchette a tirés de ses tiroirs bondés de travaux inédits.

II

En deuxième lieu nous avons eu des études sociales, morales, philosophiques et historiques :

(a) Le travail et le capital ou le travailleur et le travail, par M. Morin, professeur à l'université McGill ;

(b) Voltaire dans ses relations avec les Genevois ;

(c) Voltaire jugé par Victor Hugo, par M. Duclou, pasteur ;

(d) une Exposition de la philosophie d'Auguste Comte ;

(e) Le système de Saint-Cimon, (f) La moralité et la croyance, et une littérature retrouvée, par M. le D^r Coussirat, professeur en théologie et de langues orientales à l'université McGill ;

(g) La république romaine, par M. Lafleur, pasteur ;

(h) Le prince de Galles, la position où le relègue la politique de son pays, par M. J. Herdt, président de la chambre de commerce française ;

(i) un Episode de la guerre des Vaudois du Piémont, par M. Buffapan ;

(j) La gavotte, par M^{me} Cornu, professeur à l'école Normale ;

(k) L'astronomie des anciens, par M. Fréchette.

III

En troisième lieu nous avons eu des études sur la musique et la peinture :

(a) L'influence de la musique sur la morale, par M^{me} Cornu ;

(b) Etudes sur la peinture, par M. Saudrentu, vice-consul suisse.

IV

Quatrièmement, dans la poésie dramatique, M. Louis Fréchette nous a lu son drame en vers *Veronica*, destiné à émouvoir le grand public.

V

Enfin, pour les sciences, nous avons eu une excellente exhibition et des explications claires de la récente découverte des Rayons X, par M. Louis Herdt, professeur à l'université McGill.

Ces travaux d'un mérite inégal ont tous celui d'avoir intéressé les membres du Cercle et d'avoir forcé l'intelligence de leurs auteurs à se fixer sur un sujet en lui donnant la forme qui lui convient le mieux, car si quelques-uns tiennent à se présenter dans un costume léger et comique d'autres par contre, sérieux de leur nature, ne veulent paraître que grave-ment revêtus.

Quelques-uns vont être préparés en vue de la publication et nous ne doutons pas qu'après avoir vivement intéressé leurs premiers auditeurs; ils soient favorablement accueillis du public; d'autres, moins ambitieux, ne doivent leur existence qu'à ce besoin d'une intelligence active et d'une conscience exigeante de mettre au clair des pensées qui s'agitent dans les chambres hautes du cerveau humain. D'autres enfin, et c'est le petit nombre, n'ont pris la plume et n'ont fouillé dans leurs souvenirs que pour obéir aux règlements qui exigent la co-opération de tous et de chacun, de sorte que dans notre cercle, vraie ruche ouvrière, tous sont contribuables et il n'est permis à personne de toujours recevoir sans ne jamais rien donner. Nous n'avons pas à nous repentir de ce règlement, puisqu'il a servi à révéler des dons inconnus, en faisant éclore de cerveaux qui se croyaient stériles des travaux d'un vrai mérite.

Il eût été facile de choisir un échantillon de nos travaux pour vous le présenter, mais ma nomination faite à la onzième heure ne nous l'a pas permis. Le secrétaire n'a pas même eu le temps de consulter ses minutes pour me donner des notes détaillées sur l'exercice. De sorte que pour vous présenter ce résumé de nos travaux, il m'a fallu interroger ma mémoire et évoquer des impressions reçues au cours de nos séances.

Je fais donc appel à votre indulgence, Monsieur le président, et vous prie d'excuser ce qu'il y a d'imparfait (dans la forme, sinon dans le fond) dans ce rapport que j'ai l'honneur de vous présenter.

VIII.—From *The Women's Canadian Historical Society of Toronto*,
through Miss ELLERBY.

Officers.

Honorary President, Mrs. Kirkpatrick, wife of the Lieut.-Governor of Ontario.

President, Mrs. S. A. Curzon.

Vice-Presidents, Mrs. Forsyth-Grant, Mrs. James Bain.

Treasurer, Miss C. N. Merritt.

Secretary, Miss FitzGibbon.

Executive Committee—Mrs. Charlotte Morrison, Mrs. W. Cummings, Mrs. Walton, Mrs. Edward Leigh, Miss Beard, Miss Sara Mickle.

This society is of comparatively recent formation. In consequence of a desire expressed by Mrs. S. A. Curzon and Miss FitzGibbon, who have for some time been enrolled as honorary members of the York Pioneer and Provincial Historical Associations of Ontario, and their representations of the advantages that might arise through a deeper interest in the historical events and records connected with the history of our own country being aroused in the minds of the women of Canada, a resolution was moved by D. B. Read, Q.C., seconded by the Reverend Dr. Scadding, and passed at a meeting of the Provincial and Pioneer Historical Association held in Toronto on September 5th, 1895, by which Mrs. S. A. Curzon and Miss Mary Agnes FitzGibbon were appointed a committee to form a Women's Canadian Historical Society in Toronto; said society to be in affiliation with, and having the authorization of, the Provincial and Pioneer Historical Association of Ontario, but in all respects to be a separate and distinct society with power to form its own constitution, by-laws, etc.

In pursuance of this resolution Miss FitzGibbon addressed herself to thirty Toronto women, members or representatives by name or descent of families long resident in the city, or whose ancestors had taken a more or less prominent part in the making of Canada's history, requesting their attendance at a meeting to be held on November 19th, 1895. Twenty-nine responded, expressing their sympathy and interest in the project. At this meeting provisional officers were appointed and the aims and objects of the proposed society ably demonstrated by the chairwoman, Mrs. S. A. Curzon, and at a subsequent meeting a form of constitution and by-laws was submitted and adopted. The provisional appointments were confirmed, and an executive committee appointed, the date fixed as that of the annual meeting for the election of officers and other business being November 16th, the late Col. James FitzGibbon's birthday, in recognition of the services rendered to Canada and Toronto during the first half of the present century by that officer.

The following preamble of the constitution adopted by the society explains its aims and objects :

“The rapidly rising status of Canada among the nations of the world; that a unity of national purpose and a high ideal of loyalty and patriotism in her people will alone sustain her in such high position; that to this end a thorough acquaintance by her people, both native and immigrant, with her heroic past, is of the first importance. That her history, literature and archives, her poetry and art, are yearly becoming more valuable in affording the necessary knowledge that an intelligent and self-respecting national pride in Canadian literature needs to be awakened and encouraged; that the value of documents, records and

relics, both private and public, as notes in the history of a people, is not generally realized, and that the collection of them is most important."

Papers of incorporation were presented to the society on February 14th, 1896, by T. H. Bull, Esq., barrister, of Toronto.

The motto of the society, "Deeds Speak," is taken from a banner worked by Toronto women for the Third Regiment of the York Militia, and presented to it after the battle of Queenston Heights. This banner is still preserved, and is in the possession of the Hon. George W. Allan, whose father, as major of the regiment, received it at the hands of the women who had designed and worked it, and has for some years been cared for and preserved to the present, by the ingenuity and care of a woman, Mrs. G. W. Allan. At the first regular meeting of the society the secretary read the story of the banner in justification of her choice of the motto as that of the society. This paper has been published as Transaction No. 1 of the Women's Canadian Historical Society.

At the end of the first year the society had a membership of 125, 34 honorary and 5 corresponding members. It now numbers 193 regular, 43 honorary, and 10 corresponding members. Three other societies formed in different parts of the province have applied to the secretary, and formed their constitution and by-laws on those of the Women's Canadian Historical Society of Toronto. The honorary membership is complimentary only, the society thus reserving to itself the privilege of showing its appreciation of work done by Canadian authors and artists in Canada.

The council of the Canadian Institute have hitherto kindly given the society the use of a room in which to hold their meetings. A hope is, however, entertained by the members that the membership will ere long warrant the erection of a building in Toronto that will be at once a place of meeting and a receptacle for the valuable documents and relics now, and to be, entrusted to the care of the society. Fourteen regular meetings have been held, and six open meetings, since the formation. On these occasions the following papers have been read :

"Some inedited Letters of Sir John Harvey," by Mrs. J. D. Edgar.

"One of Our First Legislators," by Mrs. S. A. Curzon.

"Some Notes on Canadian Pottery," by Miss Buik.

"Early Schools in the Niagara District," by Miss Carnochan.

"On the Study of Canadian History," by Mrs. S. A. Curzon.

"The Customs and Quaint Ceremonies of the Early Churches in Canada," by Miss E. Yates Farmer.

"On the Early History of Newfoundland," by Mrs. J. D. Edgar.

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"A page from Early Reminiscences of Old St. Andrews, N.S.," by Mrs. W. Hamilton Merritt.

"Some Historic Notes on the Chateau Bigot," by Miss Nellie Spence.

“A Romance of the U. E. Loyalist Time,” a poem, by Mrs. Edgar Jarvis.

“On Cabot and his Time,” by Mrs. S. A. Curzon.

“An Ancient Mode of Indian Divination,” by Mrs. C. Clifton Cameron.

“Something About our Canadian Indians,” by Miss FitzGibbon.

“Historic Homesteads, Sillery Manor; and Beverley House,” by Mrs. Forsyth-Grant.

Readings from the works of the following Canadian authors have also been given by members of the society: John Logan, Edward W. Thompson, Mrs. S. A. Curzon.

Addresses have also been given, and highly valued for the help and encouragement they conveyed to the society, by the Hon. George Kirkpatrick, Lieutenant-Governor of Ontario; the Hon. A. S. Hardy, the Premier of Ontario; the Hon. G. W. Ross, the Minister of Education; O. A. Howland, Esq., M.P.P., Dr. George A. Parkin, the late Hon. J. B. Robinson, Barlow Cumberland, Esq., J. S. Willison, Esq., J. Castell Hopkins, Esq., and Sanford Evans, Esq.

A valuable paper on “The Philosophy of Indian Women’s Work” was given by David Boyle, Ph. D., and a short lecture entitled, “A Page from Canadian History,” with lime light illustrations, by the secretary.

A number of valuable papers and relics have been presented to the society; a temporary receptacle provided for them, and the assistance of the Librarian of the Public Library in Toronto is most gratefully acknowledged. From the encouragement the projectors of the society have received and the measure of success their efforts have met with, as well as the many kind gifts sent them by honorary members and friends, especially from Charles Mair, Esq., Gilbert Parker, Esq., His Honour Judge Prowse, His Honour Judge Savary, and others, we may venture to hope an earnest of future good work to be done in carrying out and accomplishing some portion of the aims and ambitions set forth in the preamble of the constitution. In submitting this report to the members of the Royal Society of Canada, we desire to gratefully acknowledge the honour done us, and the compliment paid to our endeavour to do our share as women toward fostering a love of country in our people, and preserving the records of a past history of which we may well be proud, in that through the efforts of our forefathers against many difficulties and great odds, they were enabled to preserve Canada to Canadians, and the unity of the great empire over which floats the Union Jack, that inasmuch as the men and women of our past have counted all well lost for loyalty, honour and devotion to the British crown, we may build on the foundation laid by them, and leave to the future as lasting a record of lives well lived and deeds well done. We may, too, claim that to a woman in the person of our Queen and Empress, was re-

served the privilege of rewarding the men who in her grandsire's reign preserved to the crown the integrity of the Empire over which she has ruled so well for the good of all and the example of the world.

IX.—From *The Ottawa Literary & Scientific Society*, through Dr. AMI

As representative or delegate of the Ottawa Literary and Scientific Society, I have the honour to make the following report of the society during the year ending March 31st last :

The past year has been the most successful one in the history of the society if we are to be guided by membership and volumes issued. The receipts have shown a slight increase, too, over the previous year, having been \$1,141.55, including the Government grant of \$400.00. Over a hundred dollars worth of books were added to the library, while the reading room was supplemented by the *Athenæum* and *Fliegende Blätter*, the latter a German weekly much appreciated. The membership has increased to over 280, and the number of volumes issued 7,745, the latter being an increase of over fifty per cent over the preceding year. In this connection it is gratifying to state that the percentage of fiction read has fallen from the abnormally high ratio of 90 per cent to 76, (which is still higher than desirable) with a consequent increase in the more serious reading.

The total number issued is distributed in different classes, as follows :

History and Biography.....	282
Travels	183
Fiction	5,869
Poetry.....	27
Essays and Metaphysics	194
Theology and Religion.....	1
Geology, Geography.....	5
Natural History	7
Astronomy, Mathematics, Engineering	144
Magazines, Encyclopædias.....	1,033

The usefulness of the library has been increased by the preparation of a preliminary catalogue—both class and author. Special blank-subject, class and author-catalogues have been printed for a more detailed and systematic classification.

The system about to be adopted was considered the most suitable for the library, due consideration having been given to the decimal, expansive and dictionary systems.

As usual, the society has given a course of lectures during the winter, and, as in the previous year, in conjunction with the Field

Naturalists' Club. The course was eminently successful. The lectures were given in the assembly hall of the Normal School, and were free. Being of a popular nature, their educational influence is not to be underestimated. The course was opened by a *conversazione*, when short addresses were delivered by the presidents of the society, of the club, and of the teachers' association. There was an exhibition by lime-light of biological and natural history objects, besides other slides which were shown by lime-light.

The following is the programme of lectures :

- Nov. 19—*Conversazione*.
 27—"Electrical Discharge in High Vacua," Prof. J. Cox, of McGill University.
- Dec. 17—"Goethe," Prof. Leigh R. Gregor, of McGill University.
- Jan. 7—"Iceland," (illustrated) Prof. Jas. Mavor, of Toronto University.
 21—"Recent Explorations in Canada," Dr. G. M. Dawson, Dr. R. Bell, J. B. Tyrrell, and A. P. Low.
- Feb. 4—"Lyrics of the Elizabethans," Duncan Campbell Scott.
 18—"The American Lobster," Prof. A. Macphail, of Bishop's College.
- March 4—"Weather," (illustrated) Otto J. Klotz.
 11—"Fruit and Fruit Districts of Canada," (illustrated) J. Craig.

This year, as the Diamond Jubilee year of Her Majesty's reign, seems especially opportune for exerting ourselves in carrying out a long felt want and one that has annually found expression from the president—the erection of a building for the society. An earnest has already been given for carrying out this cherished wish, and it is to be hoped that the realization is not far off. In such event it is intended to publish annually a volume of proceedings of technical and original papers prepared by members of the society, and in this way add our quota to the world's doings, and by exchange keep more closely in touch with the labours of other literary and scientific societies throughout the globe, so essential for any society claiming to be progressive.

At the recent annual meeting the following officers were elected :

President, Otto J. Klotz.

First Vice-President, Dr. J. Saunders.

Second Vice-President, W. D. LeSueur.

Secretary, O. J. Joliffe.

Treasurer, W. J. Barrett.

Members of Council, J. Ballantyne, M. J. Gorman, Col. Macpherson.

Curator, J. Bronskill.

X.—From *The Astronomical and Physical Society of Toronto*, through
Sir S. FLEMING.

The seventh annual meeting of the society was held in the rooms, Technical School Building, Toronto, on January 5th, 1897.

The following were elected by acclamation :

Hon. President, Hon. G. W. Ross, LL.D., Minister of Education.

President, John A. Paterson, M.A.

Vice-Presidents, Arthur Harvey, F.R.S.C.; R. E. Stupart, Director Toronto Observatory.

Treasurer—James Todhunter.

Corresponding Secretary, Geo. E. Lumsden; Recording Secretary, George P. Sparling.

Assistant-Secretary and Editor, Thomas Lindsay.

Librarian, W. B. Musson.

The following is a brief review of the work done by the members in 1896, and of papers published in full or in abstract in volume VII. of the transactions.

A paper on the "Precipitation of Rain" was presented by Mr. John Hollingworth, of Beatrice, Muskoka, who reached the conclusion drawn from a long series of observations that the deforesting of lands in Ontario had not had the effect of diminishing the rainfall.

Observations of Jupiter were reported at considerable length by Dr. J. J. Wadsworth, of Simcoe, Ont. The instrument used had been a 12-inch reflector. Sketches of various celestial objects had been made by the doctor and his friends. Towards the end of the year Dr. Wadsworth had been successful in bringing into the field of active work a small party of lady artists who had become interested in sketching the lunar surface as seen in the telescope. This was a class of work valuable in itself, and for which it was thought ladies were particularly suited.

The society was much pleased to receive from His Lordship, the Bishop of Moosonee, a detailed account of observations of the aurora made at a far northern station. Mr. Nicolson, who makes the time observations at Moose Factory, sent also a classification of the aurora, illustrating by reference to the disturbances noted between September, 1895, and March, 1896.

An occultation of a faint star in Cancer by the planet Jupiter had been predicted for May 22nd at 15 h. 2m. Greenwich mean time, and efforts were made to observe the phenomenon at several stations in Canada. Reports were received from Mr. F. L. Blake at Toronto Observatory, Dr. J. C. Donaldson at Fergus, and Dr. J. J. Wadsworth at Simcoe. All had seen the star until within a few minutes of the time of contact, but the actual disappearance was not observed. The failure was attributed to the fact that the planet was low in the horizon and the air unsteady

Considerable satisfaction was felt at having made at least an effort to observe the rare phenomenon of the occultation of a fixed star by a planet.

Mr. A. Elvins read some notes upon "Planetary Mass and Atmosphere," and a short paper on "Rays of Energy." In the latter he called attention to the phenomenon of the X-rays, and thought there might be radiations from the sun which would focus within the sphere of the earth, possibly causing internal disturbances, manifested by eruption on the crust of the earth.

Mr. T. S. H. Shearman, of Brantford, Ont., presented a paper on "Coronal observations during Sunshine." He reviewed the several attempts which have been made to obtain a picture of the corona without an eclipse, and was still sanguine of success. Mr. Shearman also contributed a brief note descriptive of the observatory at Woodstock, Ont., where he was from time to time carrying on original research, using the large 8-inch refractor of the observatory. He proposed at an early date to commence work upon the satellites of Uranus.

The "Evolution of Star Systems," a subject which had been recently discussed by Prof. T. J. J. See of Chicago University, was taken up by Mr. W. B. Musson, who presented a review of the whole discussion. An abstract of Mr. Musson's paper was published in the transactions.

A paper on the "Reformation and Simplification of the Calendar" was read by Dr. A. D. Watson. The system of employing 13 months in the year was ably defended, and certain difficulties which were apparently in the way of the reform were shown to be easily overcome. In Dr. Watson's system the leap year day and the New Year's day were brought together at the end of one year and beginning of next, but neither were reckoned as days of the week.

Mr. A. F. Hunter, M.A., of Barrie, Ont., gave a most interesting lecture on "The Applications of the Polarization of Light," illustrated by experiments. This was a subject which had engaged the attention of Dr. Hunter for many years, several papers on Polarization having been read by him when the society was merely a meeting of a few friends.

Mr. Thomas Lindsay read the second and third chapters of a sketch of the "Greenwich Nautical Almanac," dealing with the first issue of the Almanac and with some of the problems met with in the construction of an ephemeris.

Mr. J. G. Ridout and Mr. R. F. Stupart gave graphic descriptions of a visit to Europe. Mr. Stupart had attended the International Meteorological Conference at Paris representing Canada.

At the meetings of the Opera Glass section there were occasionally short papers read after spending the evening in observation. Mr. Arthur Harvey at one of the meetings read an exhaustive paper on "Falling Stars and Meteorites."

During the year the society lost two of its members by death, Mr. John Goldie of Galt, and Dr. J. C. Donaldson of Fergus. Both these gentlemen had taken always a most active interest in astronomical science.

A report of the work of the lunar section of the society was read at the annual meeting by Mr. G. E. Lumsden. The interest had been general and the success most gratifying. Several telescopes ranging from 2-inch to 12-inch had been brought into active service in the work of lunar observations.

The annual address by the president was delivered on January 19th at an open meeting, and took the form of an exhaustive review of astronomical progress during 1896.

The annual report of the Meaford Astronomical Society is appended to Vol. VII. of the Transactions. The society has been very active during the year, having adopted most practical methods of carrying on astronomical work. A similar society has been formed at Tavistock, Ontario.

XI.—From *The Entomological Society of Ontario*, through Mr. J. D. EVANS.

Having been selected as the delegate to represent the Entomological Society of Ontario on this most interesting occasion, it becomes my privilege to submit a report of its work and proceedings during the past year.

The membership of the society, I am pleased to report, has been well maintained, and in addition thereto it is very gratifying to be able to say that on or about the opening of the current year a branch of this society was inaugurated in Toronto by the affiliation of the local society formed about a year before, thus starting out with quite a considerable membership, and manifesting much enthusiasm under the new regime.

The additions to the library were quite important, including, among others, a full set of the annals of the "Entomological Society of France." The additional volumes, numbering nineteen, bring the total library register up to 1,418 volumes.

There was also a limited addition to the collection of insects.

The official organ of the society, "The Canadian Entomologist," still maintains its high standing among its class of literature. During the year 1896 it completed its twenty-eighth volume of 319 pages. Of the forty-eight contributors, thirty were from the United States, two from New Mexico, one from New Zealand, two from Europe, the remaining thirteen being Canadian. The contributors aggregated eighty-six articles, in some of which were described one hundred and eleven new species and four new genera.

Among the more important papers published during the year the following deserve particular mention :

"The Coleoptera of Canada," by Prof. H. F. Wickham. These are a very useful series of illustrated articles for beginners as well as those more advanced, they were continued through five numbers, and are a continuation of similar articles in two previous years.

"The North American Species of *Gnathodus*," by Mr. Carl F. Baker.

"The American Species of *Isotoma*," by Mr. Alex. D. MacGillivray.

"Canadian Hymenoptera No. 7," by W. Hague Harrington, F.R.S.C.

"A Contribution to the knowledge of North American *Syrphidæ*," by Mr. W. D. Hunter.

"*Lepyrus*," by John Hamilton, M.D.

"The Cigar case-bearer of the Apple," (*Coleophora Fletcherella*) by Dr. Jas. Fletcher.

"New American Parasitic *Cynipidæ*," (*Allotrünæ*) by Mr. Carl F. Baker.

"The Larger Species of *Argynnis* and the Mystery of their Life History," by H. H. Lyman, M.A.

"On two Interesting New Genera of Scale Insect Parasites," by Mr. L. O. Howard.

"Index to the *Mantidæ* of North America north of Mexico," by Mr. Samuel H. Scudder.

"A Summary of the Members of the Genus *Chilosia*, Meig, in North America, with Descriptions of New Species," by Mr. W. D. Hunter.

"Some Notes on Insect Enemies of Trees," by Mr. A. D. Hopkins.

"Some New Nematids," by Mr. C. L. Marlatt.

"Notes on the Preparatory Stages of *Erebia Epipsodea*, Butler," by H. H. Lyman, M.A.

A number of book notices, current publications of entomological literature, correspondence, obituary notices, etc., also appear.

The society deplores its serious loss during the past year from death, of two of its very active members, Mr. Jno. M. Denton, of London, and Captain J. Gamble Geddes, of Toronto.

The thirty-fourth annual meeting of the society was held in its rooms in London on Wednesday and Thursday, the 21st and 22nd of October, 1896. A very full report of these proceedings is given in the annual report published by the society (in addition to the *Monthly Magazine*) to the Department of Agriculture of the province of Ontario.

This report consists of 127 pages replete with numerous illustrations. Two plates of these illustrations are worthy of particular mention as illustrating the study of economic entomology in the public schools, a work which should be heartily commended.

In addition to the report of the proceedings of the parent society in which is embodied an extended and interesting annual address from the president ; it contains also :

The report of the Geological, Botanical, and Microscopical Sections of the Entomological Society.

The report of the Montreal branch with the annual address of its president.

And the report from the Entomological Society of Ontario to the Royal Society of Canada.

The following papers also appear in this annual report, viz. :

“Notes on the Season of 1896,” by Rev. T. W. Fyles, F.L.S.

“Some Insectivorous Mammals,” by Mr. Robert Elliott.

“Entomology for Rural Schools,” by Prof. J. Hoyes Panton. Especially to be commended for the introduction and propagation of knowledge of economic entomology among the children of both sexes.

“The Importance of Entomological Studies to an Agricultural and Fruit-growing Community,” by Rev. Thos. W. Fyles, F.L.S.

“Two Insect Pests of 1896,” by Prof. J. Hoyes Panton.

“Notes on Insects of the Year 1896,” by Rev. C. J. S. Bethune.

“Insect Injuries to Ontario Crops in 1896,” by Dr. Jas. Fletcher.

“Some Beetles Occurring upon Beech,” by W. Hague Harrington, F.R.S.C.

“Notes on the Season of 1896, by Mr. J. Alston Moffat.

“Warning Colours, Protective Mimicry, and Protective Coloration,” by Mr. F. M. Webster.

“The San Jose Scale,” by Mr. F. M. Webster. A very exhaustive and valuable treatise on the subject.

“Lepidopterous Pests of the Meadow and the Lawn,” by Rev. T. W. Fyles, F.L.S.

“Rare Captures during the Season of 1896,” by Mr. Arthur Gibson.

“The Butterflies of the Eastern Provinces of Canada,” by Rev. C. J. S. Bethune.

The geological section reported that regular meetings were held weekly during the year with a fair attendance. Several places of geological interest had been visited by members and collections made ; valuable papers had been read, also four or five lectures given.

A collection of minerals having been presented by the Dominion Government to the free library, which is accessible to our members, will be an incentive to more active work and increased membership.

The botanical section reported that the weekly meetings from the 1st of May to the middle of July were well attended, several very pleasant outings had been had, and that the work of the year had been encouraging.

The microscopical section reported having had a year of continued success with fortnightly meetings from October 11th to April 17th,

when its meetings were discontinued in favour of the botanical section. The subjects studied were arranged under ten different classifications, each led by a different member.

Each of the sections above enumerated, as well as the parent society, look forward with anticipations of much greater usefulness and increase of membership upon occupying the new suite of rooms which have been secured and are now occupied.

The Montreal branch presented its twenty-third annual report, which showed a very marked increase in the membership. Eight meetings had been held during the course of the year at which ten excellent papers had been read, and the financial status was explained to be in a very healthy condition. The president's annual address was a very impressive one, urging upon the members to undertake and work up some special subjects, among the very many open and now neglected, enumerating a long list of such.

XII.—From *The Nova Scotian Institute of Science*, through MR. HARRY PIERS.

On behalf of the Nova Scotian Institute of Science, I beg to communicate the following report on its proceedings during the past season, which was the thirty-fifth since its organization.

Monthly meetings were held from November, 1896, to May, 1897, inclusive. At the opening meeting the president gave an address reviewing the work done by the society during the previous year, and also presenting an account of the system of instruction for mining officials in Nova Scotia.

The finances of the society continue in a satisfactory state. This is largely owing to the liberality of the provincial government.

The transactions are sent to a large number of institutions in every part of the world, and in return are received many extremely valuable publications. As a result the library is growing with great rapidity, and the need of more room in which to house the volumes has become absolutely imperative.

The Proceedings and Transactions, volume ix., part 2, for the session of 1895-6, have been distributed, and the volume for the past session is in press, and will be issued ere long.

The following were elected officers for the year 1896-7:

President, Edwin Gilpin, Esq., LL.D., F.G.S., F.R.S.C., F.R.M.S.

1st Vice-President, Alexander McKay, Esq.

2nd Vice-President, A. H. MacKay, Esq., LL.D., F.R.S.C.

Treasurer, W. C. Silver, Esq.

Corresponding Secretary, Professor J. G. MacGregor, D.Sc., F.R.S.S., E. & C.

Recording Secretary, Harry Piers, Esq.

Librarian, Maynard Bowman, Esq.

Other Members of Council: Martin Murphy, Esq., D.Sc.; F. W. W. Doane, Esq., C. E.; William McKerron, Esq.; Watson L. Bishop, Esq.; S. A. Morton, Esq., M.A.; P. O'Hearn, Esq.; Roderick McColl, Esq., C.E.

During the session the following papers were read:

1—"On the Relation of the Physical Properties of Solutions to their State of Ionization," by Prof. J. G. MacGregor, D.Sc., F.R.S.S., E. & C.

2—"Recent Discoveries Regarding the Eggs and Young of Fishes," by Prof. E. E. Prince, Commissioner and General Inspector of Fisheries for Canada, Ottawa.

3—"On the Relation of the Physical Properties of Solutions to their State of Ionization," (second paper) by Prof. J. G. MacGregor, D.Sc., F.R.S.S., E. & C.

4—"Remarks on a Number of Plants Collected in the Vicinity of Halifax," by Rev. Brother Peter.

5—"Measurements of two Beothuk Skulls," by W. H. Prest, Esq.

6—"New Arrangements in Sailing Gear," by Charles Twining, Esq.

7—"Some Analyses of Nova Scotia Coals and Other Minerals," by Edwin Gilpin, Esq., LL.D., F.G.S., F.R.S.C.

8—"A Note on our Calcareous Algæ," by A. H. MacKay, Esq., LL.D., F.S.Sc., F.R.S.C.

9—"Zoological Notes," by Harry Piers, Esq.

10—"Supplementary Note on Venus," by A. Cameron, Principal of Yarmouth Academy.

11—"Phenological Observations for 1896," by A. H. MacKay, Esq., LL.D., F.S.Sc., F.R.S.C.

12—"On the Rainfall of 1896," by F. W. W. Doane, Esq., C.E.

13—"On the Tides of the Bay of Fundy" (Second paper), by Martin Murphy, Esq., D.Sc.

14—"On the Water Supply of the Towns of Nova Scotia," by Prof. W. R. Butler, M.E., King's College, Windsor.

XIII.—From *The Natural History Society of Montreal*, through Mr. J. F. WHITEAVES.

In compliance with the invitation of the Royal Society of Canada, the Natural History Society of Montreal begs to submit the following report:

The work done during the past year may be regarded as most satisfactory. The meetings of the society and council have been well attended, the attendance at lectures has been large, and the number of visitors to the museum, especially upon Saturdays, decidedly on the increase. Many

important additions, also, have been made to the museum and library. Fifteen new members have joined the society during the past year, but it has lost by death six of its old members, some of whom were among its most active workers.

The "Record of Science" has been issued regularly, although the usual grant of \$400 from the local government has not been received.

The following papers were read at monthly meetings of the society and led to interesting discussions :

1896.

- April 20—"A visit to the Lake dwelling at Robenhausen, Switzerland,—and notes on a remarkable deposit of stalagmite from Gold Hill, Nevada," by Frank D. Adams, Ph.D., F.R.S.C.
- Oct. 26—"Some additions to the Flora of the Island of Montreal," by Rev. Robert Campbell, M.A., D.D.
- Nov. 30—"Development of Animal Intelligence," by Prof. Wesley Mills, M.A., Ph.D.

1897.

- Jan. 25—"Some Ancient Canadian Fossils and their Allies Abroad," by Sir J. W. Dawson, LL.D., F.R.S., etc.
- At this meeting the lower jaw of a *Hippopotamus* dredged from the bottom of the St. Lawrence, opposite the city of Montreal, was exhibited by Dr. Deeks.
- Feb. 22—"Plants outside the Island of Montreal, illustrated by numerous specimens," by Rev. Robert Campbell, M.A., D.D.
- March 29—"Some remarkable valleys on the earth's surface, and some recent studies on the canals of Mars," by Frank D. Adams, Ph.D., F.R.S.C.
- April 26—"The Holdfasts of the Rhodohyceæ," by Miss Carrie M. Derick, M.A.

The Sommerville free course of lectures for 1897 was delivered as follows, and attracted large audiences :

- Jan. 14—"Food and Digestion : what we eat and what becomes of it," by W. S. Morrow, M.D.
- Jan. 21—"The Blood and its circulation and distribution in the body," by John W. Scane, M.D.
- Jan. 28—"Respiration : what, why and how we breathe," by A. Bruère, M.D.
- Feb. 4—"Waste and Repair : the body as a factory," by G. Gordon Campbell, M.D.
- Feb. 11—"The Nervous System : the mechanism that governs the body and how it does it," by Neil D. Gunn, M.D.
- Feb. 18—"The Senses : how and what we learn of the world about us," by A. Proudfoot, M.D.

Feb. 25—"Voice and Speech : how we sing and speak," by H. S. Birkett, M.D.

March 4—"Age and Function : the body and its work at different periods of life," by D. J. Evans, M.D.

A special illustrated lecture, on "Extinct Monsters," was given at a later period by Dr. H. M. Ami.

A course of free half-hour lectures to young people, was given at the museum on Saturday afternoons during the winter, as follows, and was largely attended :

1897.

Feb. 6—"A few Montreal Summer Flowers," by Rev. Robert Campbell, D.D.

Feb. 13—"Spiders and their Homes," by C. T. Williams.

Feb. 27—"Ducks and Geese," by J. B. Williams, F.Z.S.

March 6—"Herb-eating and Cud-chewing Animals," by Prof. T. Wesley Mills, M.D., etc.

March 13—"The Mummies of Ancient Egypt," by Prof. S. H. Capper.

March 20—"The Life of a Moth," by A. F. Winn.

March 27—"Coal : where it comes from and what it teaches us," by Frank D. Adams, Ph.D.

The usual annual field day was held on the first Saturday of June, last year, at St. Jovite, in the Laurentian mountains, and was much enjoyed by all those who attended it.

The following are the names of the officers and members of the council for the session 1896-97 :

Patron, His Excellency the Governor-General of Canada.

Honorary President, Sir J. W. Dawson, LL.D., F.R.S., etc.

President, Rev. Robert Campbell, M.A., D.D.

First Vice-President, John S. Shearer.

Vice-Presidents, Prof. T. Wesley Mills, M.D., Sir Donald A. Smith, G.C.M.G., Prof. B. J. Harrington, Ph.D., George Sumner, Hon. Justice Würtele, J. H. R. Molson, Prof. John Cox, M.A., Prof. Frank D. Adams, Ph.D., J. Stevenson Brown.

Hon. Recording Secretary, Chas. S. J. Phillips.

Hon. Corresponding Secretary, John W. Stirling, M.B., Edin.

Hon. Curator, J. B. Williams.

Hon. Treasurer, F. W. Richards.

Members of Council: George Sumner, chairman ; Albert Holden, G. P. Girdwood, M.D., C. T. Williams, James Gardner, Joseph Fortier, Hon. J. K. Ward, Walter Drake, J. H. Joseph, Edgar Judge.

Superintendent, Alfred Griffin.

XIV.—From *The Numismatic and Antiquarian Society of Montreal*, through Mr. R. W. McLACHLAN.

On behalf of the Numismatic and Antiquarian Society of Montreal, I have the honour to communicate the following résumé of its proceedings during the past year :

The society having completed the second year of its occupation of the Château de Ramezay, has now been able to arrange its museum and historical gallery in a most attractive manner. The additions have been :

To the Museum.—Over fifty antiquities, some of which are of great historical interest to Canada, and a hundred coins and medals ; among these is a coronation medal of the Czar of Russia, presented by the Grand Duke Sergia Alexandrovitch.

To the National Gallery.—Over fifty plans, maps, and old engravings of scenery in Canada, thirty engraved portraits, and ten portraits in oil.

The gallery has already become a representative one in Canada, and is destined at no distant date to be a répertoire of personages prominent in our history.

To the Archives Department.—The correspondence of Ludger Duvernay, comprising upwards of five hundred letters and documents relating to the troubles of 1837, which, when collated, will unfold many doubtful points in the history of that time ; also, a series of commercial papers bearing the signatures of many business firms of Montreal from 1734 to 1846, besides, some fifty other documents signed by governors, intendants, and others.

To the Library.—Two notable gifts have been presented, one from the Government of France, comprising two hundred volumes, mainly historical and educational, the other, a collection nearly as large, of rare and beautifully bound works of travel from Prince Roland Bonaparte. These, with other donations, make the aggregate of the additions of nearly two thousand books and pamphlets.

The members have been so occupied with improving the museum that few papers have been read. They are as follows :

- 1—"Some Notes on the de Ramezay Family," by R. W. McLachlan.
- 2—"Charles Lemoine," by J. B. Vallée.
- 3—"La rue Notre Dame, il y a Cinquante Ans," by Hon. Justice Baby.
- 4—"The First Servant in the Château de Ramezay," by R. W. McLachlan.

A series of free public lectures were delivered under the auspices of the society during the winter months on subjects connected with the history of Canada. These, which were well attended and highly appreciated, were as follows :

"Le Canada depuis Champlain jusqu'à Talon, 1636-1664," by Benjamin Sulte.

"The Pepperrell Family," by Prof. D. P. Penhallow.

"Some Prominent French Canadian Litterateurs," by Prof. L. R. Gregor.

"L'Astronomie chez les Anciens," by L. H. Fréchet.

"Les Origines des Canadiens Français," by Benjamin Sulte.

The society has again resumed the publication of the "Canadian Antiquarian," which was suspended about three years ago. The first number is just out, and already the library has been augmented by a most extended exchange list, embracing the proceedings of about one hundred and fifty learned societies.

The want of a catalogue of the society's collection has for some time been felt. This catalogue, which is in the course of publication, will be highly appreciated by the many citizens and strangers visiting the building, whose number during the past year it has been computed exceeded twenty thousand.

Materials are being collected for a history of the Château de Ramezay, which, it is hoped, will be published during the course of next year.

The society during the month of May last organized an excursion to visit and study Fort Carillon, and the site of Montcalm's victory over Abercromby at Ticonderoga, N. Y., and was joined on the way by a delegation from the Plattsburg Historical Institute. This fraternizing was very helpful, as many places of historical interest along the course of Lake Champlain and around the fort were pointed out. The president also delivered an address while standing among the ruins, describing incidents of the battle and of the fort.

The membership of the society has been augmented by one hundred and seventy who have enabled it to pursue its work with more vigour, and who have materially strengthened the position of the museum as a civic institution.

The following are the office bearers for 1897 :

President, Hon. Justice Baby.

Vice-Presidents, H. J. Tiffin, Rouer Roy, Q.C.; Lucien Huot, L. W. Sicotte, W. D. Lighthall, H. H. Wolff.

Treasurer and Curator, R. W. McLachlan.

Recording Secretary, C. A. Harwood.

Corresponding Secretary, Emanuel Ohlen.

Members of Council, H. C. Nelson, C. W. Wilson, M.D.; Louis Laberge, M.D., P. O. Tremblay, Vicomte de la Barthe, J. A. Nutter, J. A. U. Beaudry, George Durnford, G. H. Mathews.

Let me again urge the members of the Royal Society to present their portraits to the national gallery, and copies of all their works to the library.

XV.—From *The Royal Geographical Society*, through Major General D. R. CAMERON, C.M.G., F.R.G.S.

My Lord Archbishop :

It has fallen to my lot to be honoured by being directed to convey to Your Grace, and to the Council and Fellows of the Royal Society of Canada, the best thanks of the President and Council of the Royal Geographical Society for the invitation you gave them to be present at your meeting to commemorate the discovery of the North American continent by John Cabot, to express to you their high appreciation of your kindness and their warm sympathy with your gathering.

Their sympathy is partly founded in their recognition of the benefits to mankind which flow from the association of men influenced by the high aims which bind the Royal Society of Canada, but, specially on the present occasion do they experience communion of feeling with you, for John Cabot was a man who, were he now living, would be the object of the Royal Geographical Society's keenest interest. He was a leader amongst discoverers and explorers in an age when courage, self-reliance and resourcefulness were incomparably more essential to success than at the present day ; and he brilliantly succeeded in a direction which the Royal Geographical Society specially devote themselves to promote, encourage and aid.

The leader in most of the world's great movements in the advancement of civilization has been the discoverer and explorer. In few cases have his efforts not caused the initial tremor which has swollen into a mighty wave of consequent events, bearing with it and distributing vast stores of knowledge and blessings for mankind.

It is in this aspect of your gathering and the character of the influences you would now encourage, that the Royal Geographical Society most heartily join with you in doing honour to the memory of the renowned John Cabot.

I feel quite sure, too, that I shall have the full concurrence of the Royal Geographical Society generally in tendering congratulations to the Royal Society of Canada upon the striking progress made by their association, and in having amongst its number the distinguished Canadian, the latest of the world's famed explorers, to be enrolled on the Royal Geographical Society's list of illustrious gold medallists.

XVI.—From *The Botanical Club of Canada*, through Dr. A. H. MacKAY.

The work of the club during the past year was average. The centre of activity moved over to British Columbia, as will be seen from the list of new members. A strong local club was formed at Langley under the presidency of A. H. Hawkins, B.Sc., and the secretaryship of A. H. P. Matthew. Albert I. Hill, C.E., provincial secretary for the past year, was fortunate in having an active worker in J. K. Henry, B.A., of Vancouver City, who, among other things, made a good list of phenological observations on the flora of the region, only a portion of which could be used in the tables following. In Ontario extensive observations were noted by Miss Alice Hollingworth at Beatrice, Muskoka. Roderick Cameron, of Niagara Falls (south), has been specially interested in new forms of Trillium, (*grandiflorum*), one of which he calls the "Jubilee Trillium," and which he photographed, with its sepals three, its petals twenty-one, pure white, and flower three and a quarter inches across.

In Newfoundland Rev. A. C. Waghorne is yet adding to the list of the flora of the island; and his new finds are being published abroad. Dr. F. Arnold of Munchen, Germany, is publishing lists and descriptions of the lichens of Labrador and also of Newfoundland, and I have seen some very beautiful plates of the *Cladonias*. Mr. Waghorne is ready to give named sets of the mosses and lichens at the rate of 100 for \$8.00 or \$10.00. Of the mosses of Labrador and Newfoundland he has about 400 different species and varieties, and about as many lichens, with from 30 to 40 hepaticæ. This is a good chance for students and collectors of these forms.

The usual activity appears to prevail throughout Canada generally in the matters of botanical literature, papers in scientific societies, revision of botanical text books for the public schools, and the study of botany in the schools and colleges. In Nova Scotia the following circular, which explains itself, with a list of one hundred objects to be observed, (1) as to FIRST appearance, and (2) as to the date when they could be said to become COMMON, was sent to the teachers of every school in the province, as the basis of local observations to be made by the pupils of the school section under the direction and critical supervision of the teacher:—

“ [For the Teacher in the School Section.]

“LOCAL ‘NATURE’ OBSERVATIONS.

“This sheet is provided for the purpose of aiding teachers to interest their pupils in observing the times of the regular procession of natural phenomena each season. First, it may help the teacher in doing some of the ‘Nature’ lesson work in the Course of Study; secondly, it may aid in procuring valuable information for the locality and province.

Two copies are intended to be provided for each teacher who wishes to conduct such observations, *one* to be attached to the school register, so as to be preserved as the property of the section for reference from year to year; the *other* to be sent in with the Return to the Inspector, who will transmit it to the Superintendent for examination, and compilation if desirable.

“What is desired is to have recorded in these forms, the dates of the *first* leafing, flowering and fruiting of plants and trees; the *first* appearance in the locality of birds migrating north in spring or south in autumn, etc. While the objects specified here are given so as to enable comparisons to be made between the different sections of the province, it is very desirable that all other local phenomena of a similar kind be recorded. Each locality has a *flora, fauna, climate*, etc., more or less distinctly its own; and the more common trees, shrubs, plants, crops, etc., are those which will be most valuable from a local point of view in comparing the characters of a series of seasons.

“Teachers will find this one of the most convenient means for the stimulation of pupils in observing all natural phenomena when going to and from the school, some of the pupils radiating as far as two miles from the school room. The ‘nature study’ under these circumstances will be mainly undertaken at the most convenient time, thus not encroaching on school time, while on the other hand it will tend to break up the monotony of school travel and fill an idle and wearisome hour with interest and one of the most valuable forms of educational discipline. The eyes of a whole school daily passing over the whole district would let very little escape notice, especially if the first observer of each annually-recurring phenomenon would have his or her name recorded in the ‘Nature Record’ book of the school as the first observer of the phenomenon for that year. The observations would be accurate, as the facts would have to be demonstrated by the most undoubted evidence, such as the bringing of the specimens to the school when possible or necessary.

“To all observers the following most important, most essential principles of recording are emphasized. Better *no date*, no *RECORD*, than a *WRONG* one or a *DOUBTFUL* one. Sports out of season, due to very local conditions not common to at least a small field, should not be recorded except parenthetically. The date to be recorded for the purposes of compilations with those of other localities should be the *first* of the *many* of its kind flowering immediately after, etc. For instance, a butterfly emerging from its chrysalis in a sheltered cranny by a southern window in January would not be an indication of the general climate, but of the peculiarly heated nook in which the chrysalis was sheltered; nor would a flower in a semi-artificial, warm shelter give the date required. When these sports out of season occur, they might also be recorded, but within

a parenthesis to indicate the peculiarity of some of the conditions affecting their early appearance.

“A few accurate observations at first, if followed by larger lists each succeeding year, will be considered creditable to teachers and schools.”¹

The list is very much larger than that used by the Botanical Club, for it includes 100 double observations, and will serve for special provincial tables as well as for the Dominion tables which follow. Copies of the same were sent to the members of the Botanical Club as Circular No. 13, rather to show what was being attempted to be done in the province than for Dominion use, as the list was specially adapted to the Atlantic provinces.

No progress can yet be reported on the recommendation for the formation of complete Provincial Herbaria in the several provinces. The offer of the Curator of the Dominion Herbarium—address: The Curator, Herbarium of the Geological Survey of Canada, Ottawa—to determine and exchange specimens, should be remembered by members of the club.

There have been twenty-two members who reported “Phenological Observations” noted at as many stations from Yarmouth to Vancouver. Their names and stations follow, with tabular presentations of the observations in the briefest notation possible, on the Dominion schedule. The observations themselves are simply recorded here to the extent to which they have been made and noted. Criticism upon, discussion of, and inferences from them are left to the initiative of those taking now or, possibly, in a remote future, an interest in them.

¹ Between one and two hundred of these schedules have been already returned fairly filled at the date of going to press.

TABLE A.—Continued.

PHENOLOGICAL OBSERVATIONS, CANADA, 1896.

Number.	Wallace, N. S.	Pictou (M), N. S.	Pictou (R), N. S.	New Glasgow, N. S.	Antigonish, N. S.	Port Hawkesbury, N. S.	Average Southern Nova Scotia.	Charlottetown, P. E. I.	Saint John, N. B.	Richibucto, N. B.	Niagara Falls, O.	Muskoka, O.	Reston, Man.	Pheasant Forks, Assa.	Vancouver, B. C.
1	103	106	107	.....	117	.....	109·1	141	114	116	107	106	.....	.....	70
2	.....	.....	120	119	.....	140	120·8	136	121	.....	109	116	.....	136	.....
3	.....	140	140	146	153	153	146·4	.....	.....	140	.....	30	.....	.....	.....
4	.....	.....	.....	.....	.....	.....	.....	.....	130	.....	117	.....	112	116	.....
5	139	135	130	131	133	138	133·1	137	122	131	111	124	.....	.....	.....
6	.....	.....	.....	.....	.....	.....	.....	.....	122	.....	107	124	.....	.....	.....
7	.....	130	129	129	.....	.....	128·5	.....	128	.....	107	111	.....	.....	.....
8	110	106	105	108	108	117	107·4	113	128	117	.....	115	.....	.....	.....
9	128	129	129	124	125	135	128·9	139	128	138	119	124	.....	149	88
10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	82
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	162
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	116	.....	133	.....	.....
13	130	130	131	125	132	138	129·6	.....	130	127	123	132	144	134	102
14	160	167	.....	.....	171	174	168·3	.....	183	172	145	161	180	186	150
15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	126	.....	141	.....	.....
16	142	144	.....	149	158	157	149·0	.....	.....	146	118	.....	.....	.....	107
17	188	.....	.....	206	.....	223	205·6	.....	.....	204	153	.....	.....	.....	.....
18	.....	149	.....	151	153	.....	146·0	159	143	145	.....	130	.....	.....	126
19	.....	140	140	141	148	152	143·6	.....	136	144	118	124	138	150	128
20	.....	.....	.....	.....	.....	223	.....	.....	.....	208	.....	.....	.....	196	.....
21	.....	.....	.....	.....	154	173	.....	.....	.....	.....	145	.....	.....	.....	126
22	147	.....	.....	154	157	166	152·9	159	.....	152	131	132	.....	.....	126
23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	164	135
24	.....	.....	.....	.....	.....	.....	.....	.....	.....	148	131	.....	.....	.....	.....
25	.....	155	.....	149	.....	.....	155·0	166	.....	160	136	135	138	.....	149
26	159	161	.....	.....	166	174	163·5	.....	.....	158	132	135	.....	.....	136
27	.....	.....	.....	.....	.....	218	.....	.....	.....	.....	.....	.....	194	199	.....

TABLE B.
PHENOLOGICAL OBSERVATIONS, CANADA, 1896.

Number.	Day of the year, 1896, corresponding to the last day of each month. January 31 July 213 February 60 August 244 March 91 September 274 April 121 October 305 May 152 November 335 June 182 December 366	Yarmouth, N. S.	Berwick, N. S.	Maitland, N. S.	Halifax (P), N. S.	Halifax (M), N. S.	Average Southern Nova Scotia.	Amherst, N. S.	New Canaan, N. S.	River Philip, N. S.
		31	Spring Wheat, first sowing.....							
32	“ “ flowering.....									
33	“ “ harvesting.....									
34	Last Spring Frost.....		146				146 0	144		
35	First Autumn Frost.....		268		300		284 0	268		
36	Opening of still Lakes.....							104		
37	Closing of still Lakes.....									
38	Opening of Rivers, Spring.....								100	
39	Closing of Rivers in Fall.....								140	
							139	139	143	
							144	172	172	
			173				172	172	173	
							174			
40	Thunderstorms.....							212		
			222					222		
			232							
41	Droughts affecting Vegetation.....									
42	Song Sparrow, first appearance.....		95	97	*74	103		98		
44	American Robin, Eastern.....		83	95	*104	103		92		
45	Merula propinqua, Western.....									
48	Junco, Eastern species.....		104		104			110		
49	“ Western species.....									
50	Red-Winged Blackbird.....									
51	Spotted Sandpiper.....		137		105					
52	White-bellied Swallow.....		126	109	117			101	126	
53	Meadow Lark.....									
54	Kingfisher.....							120		
55	Hummingbird, first appearance.....		138		136			143	140	
56	“ Western species.....									
57	Night Hawk, Eastern species.....		147		139					
58	“ Western species.....									
59	Wild Ducks, first Birds.....							101		
60	“ “ “ Flocks.....									
61	“ “ last Flock.....				298					
62	“ “ “ Birds.....									
63	Wild Geese, first Birds.....		92		93					
64	“ “ “ Flock.....							78		
65	“ “ last Flock.....									
66	“ “ “ Birds.....				346					
67	Frogs piping, first date.....		107	108	106			105	110	

* Winters in.

TABLE B.—Continued.

PHENOLOGICAL OBSERVATIONS, CANADA, 1896.

Number.	Wallace, N. S.	Pictou (M), N. S.	Pictou (R), N. S.	New Glasgow, N. S.	Antigonish, N. S.	Port Hawkesbury, N. S.	Average Southern Nova Scotia.	Charlottetown, P. E. I.	Saint John, N. B.	Richibucto, N. B.	Niagara Falls, O.	Muskoka, O.	Restou, Man.	Pheasant Forks, Assa.	Vancouver, B. C.
31					125			127		127			114	126	
32				237				227		221			191		
33								144		159	113		137		
34	166				165	176	162.7	266		275	266	248		215	
35	281				249	239	259.2								
36						118									
37					329	353	341.0								
38					72			101		109	89		106	95	
39	357					111		356		336			309	295	
	110					139		111		109	89	107	126	98	
	133							111		109	109		129		
	169							131			113	146	132	145	
	173					172		174		156	128	157	137	158	
	174							185		170	136	159	162	169	
	180							192		174	138		166		
	194							194		194	148		168		
	197					197		197		197	158		169		
	203										160		174		
40	213					215		208					178		
	217					232		217		217			186	215	
	222					242		217		217			190		
	225					250		225		222			198		
	251					260				249			214		
	263					263							217		
						279									
												303			
												323			
41													178 to 198		
42						101		101			88				
44				99		97		102		106	88	95			
45											89			105	
48								101							
49															
50											88		291		
51													114	105	
52											104				
53	116					130		137		116	105		135		
54											94		97	108	
55						124				116	103				
56	139			138		141				138	140	121			
57											140				
58						177		179				141		149	
59						*							131		
60								91			88		104	87	
61											88		111	106	
62						264									
63	67	75									87	118	87	87	
64	68					80		98		87	87		94	98	
65	252					298		271				317			
66	340						.....							
67	103	103	103		107	111		105		116	105	104	112	115	50

PHENOLOGICAL OBSERVATIONS, CANADA, 1896.

STATIONS AND NAMES OF THE OBSERVERS.

Nova Scotia.

Yarmouth, Yarmouth Co.—Miss Antoinette Forbes, B.A.
 Berwick, King's Co.—Miss Ida Parker.
 Maitland, Hants Co.—Miss Bertha B. Hebb, B.A.
 Halifax, Halifax Co.—Mr. Harry Piers.
 “ “ Mr. G. M. Johnstone MacKay.
 Amherst, Cumberland Co.—Principal E. J. Lay.
 New Canaan, Cumberland Co.—Miss Sarah C. Ross.
 River Philip, Cumberland Co.—Miss Jean McLeod.
 Wallace, Cumberland Co.—Miss Mary E. Charman.
 Pictou, Pictou Co.—Mr. C. L. Moore, B.A.
 Pictou, Pictou Co.—Mr. C. B. Robinson, B.A.
 New Glasgow, Pictou Co.—Miss Maria Cavanagh.
 Antigonish, Antigonish Co.—Prof. D. M. MacAdam.
 Port Hawkesbury, Inverness Co.—Mrs. Louise Paint Forsyth.

Prince Edward Island.

Charlottetown, Queen's Co.—Principal John MacSwain.

New Brunswick.

Saint John, St. John Co.—Geo. U. Hay, M.A., Ph.B., F.R.S.C.
 Richibucto, Kent Co.—Miss Isabella J. Caie.

Ontario.

Niagara Falls, Welland Co.—Mr. Roderick Cameron.
 Beatrice, Muskoka Co.—Miss Alice Hollingworth.

Manitoba.

Reston, Dennis Co.—Mr. H. B. MacGregor.

Assiniboia.

Pheasant Forks—Mr. Thomas R. Donnelly.

British Columbia.

Vancouver City, High School—Mr. J. K. Henry, B.A.

Constitution, &c., of the Botanical Club of Canada.

The Botanical Club of Canada was organized by a committee of section four of the Royal Society of Canada, at its meeting in Montreal, May 29th, 1891.

The object is to promote by concerted local efforts and otherwise the exploration of the flora of every portion of British America, to publish complete lists of the same in local papers as the work goes on, to have these lists collected and carefully examined in order to arrive at a correct knowledge of the precise character of our flora and its geographical distribution, and to carry on systematically seasonal observations on botanical phenomena.

The intention is to stimulate, with the least possible paraphernalia of constitution or rules, increased activity among botanists in each locality, to create a corps of collecting botanists wherever there may be few or none at present, to encourage the formation of field clubs, to publish lists of local floras in the local press, to conduct from year to year exact phenological observations, etc.; for which purposes the secretaries for the provinces may appoint secretaries for counties or districts, who will be expected, in like manner, to transmit the same impetus to as many as possible in their own spheres of action.

Members and secretaries, while carrying out plans of operation which they may find to be promising of success in their particular districts, will report as frequently as convenient to the officer under whom they may be immediately acting.

Before the end of January, at the latest, reports of the work done within the various provinces during the year ended December the 31st previous, should be made by the secretaries for the provinces to the general secretary, from which the annual report to the Royal Society shall be principally compiled. By the first of January, therefore, the annual reports of county secretaries and members should be sent in to the secretaries for the provinces.

To cover the expenses of official printing and postage, a nominal fee of twenty-five cents per annum is expected for membership (or one dollar for five years in advance, or five dollars for life membership). Secretaries for the provinces, when remitting the amount of fees from members to the general treasurer, are authorized to deduct the necessary expenses for provincial office work, transmitting vouchers for the same with the balance.

The names of those reporting any kind of valuable botanical work during the year will be published in the list of active members, even should the payment of fees be forgotten. All payments are credited to the current year and the future. Lapsed active membership can, therefore, be restored at any time without the payment of arrears—for there are no arrears recorded in the Botanical Club of Canada.

OFFICERS ELECTED ON THE 24TH JUNE, 1897.

President, John Macoun, M.A., F.L.S., Ottawa, Ontario.

General Secretary-Treasurer, A. H. MacKay, LL.D., Halifax, Nova Scotia.

Secretaries for the Provinces.

Newfoundland.—Rev. A. C. Waghorne, Bay of Islands.

Prince Edward Island.—Principal John MacSwain, Charlottetown.

Nova Scotia.—Dr. A. H. MacKay (Gen. Sec.-Treas.), Halifax.

New Brunswick.—George U. Hay, M.A., Ph.B., St. John.

Quebec.—Prof. D. P. Penhallow, B.Sc., McGill University, Montreal.

Ontario.—Vice-Prin. William Scott, B.A., Normal School, Toronto.

Manitoba.—Rev. W. A. Burman, B.D., Winnipeg.

Assiniboia.—Thomas R. Donnelly, Esq., Pheasant Forks.

Alberta.—T. N. Willing, Esq., Olds.

Saskatchewan.—Rev. C. W. Bryden, Willoughby.

British Columbia.—J. K. Henry, B.A., High School, Vancouver City (for Mainland); A. J. Pineo, B.A., High School, Victoria City (for Vancouver Island).

ADDRESSES OF ACTIVE MEMBERS, 1897.

Addresses of active members, with acknowledgments of receipts since the report to the Royal Society of date 19th May, 1896, up to the 24th June, 1897. County and local secretaries, as a general rule, stand first.

Newfoundland.

Bay of Islands.—Rev. A. C. Waghorne (life), Prov. Sec. St. John's.—A. T. W. McNeilly, Q.C. (1898); Dr. I. S. Tait, M.A.; Principal Holloway, Methodist College; Arthur White, Survey Office. Five members.

Prince Edward Island.

Queen's County.—John MacSwain, Bishop Street, Charlottetown, Prov. Sec.; J. D. Seaman, Principal Prince Street School, Charlottetown, 25c.; Charles Kiely, Stanley Bridge; Thomas Crafer, Alberton. Prince County.—James Landrigan, Principal Kensington School. King's County.—Ambrose Fraser, Murray Harbour, South; John A. Murphy, Gaspereaux. Seven members. 25c.

Nova Scotia.

Halifax City.—A. H. MacKay (life), Gen. Sec.-Treas. and Prov. Sec.; Dr. A. W. H. Lindsay; Florence A. Peters, County Academy (1898); Harry Piers, Stanyan; G. R. Marshall, Principal Richmond School;

Richard Power, Manager Public Gardens ; D. P. Doherty, St. Patrick's School. Halifax County.—Rev. James Rosborough, Musquodoboit Harbour ; T. C. McKay, B.A., Dartmouth. Lunenburg County.—B. MacKittrick, B.A., Principal Academy (1898). Shelburne County.—C. Stanley Bruce, Principal Academy, Shelburne, 25c. Yarmouth County.—Mrs. A. J. MacCallum, 25c. ; Mary Lovitt, Beth Lovitt, Theodosia Goudey, Florence Brown, Charles E. Brown, Mabel Cann, all of Yarmouth Town. Queen's County.—A. C. McLeod, Milton, 25c. Annapolis.—William MacVicar, M.A., Principal Academy, Annapolis. King's County.—Prof. A. E. Coldwell, M.A., Acadia College, Wolfville ; Ida Parker, Berwick, 25c. ; Bertha B. Hebb, B.A., Kentville. Hants County.—J. A. Smith, M.A., Principal Academy, Windsor ; Antoinette Forbes, B.A., Windsor (1901). Cumberland County.—E. J. Lay, Principal Academy ; I. C. Craig, Inspector of Public Schools ; N. D. MacTavish, Academy, all of Amherst ; Mary E. Charman, Wallace, 25c. ; Jean E. MacLeod, River Philip ; Kate Bernard, Spencer's Island, 25c. Colchester County.—W. R. Campbell, M.A., Principal Academy, Truro. Pictou County.—C. B. Robinson, B.A., Academy ; C. L. Moore, B.A., Academy, all of Pictou Town ; Maria Cavanagh, New Glasgow, 25c. ; Rev. E. N. Ball, Westville ; Janie Munro, Hopewell. Antigonish County.—Professor MacAdam, St. Francois Xavier College, Antigonish. Inverness County.—Louise Paint Forsyth, Port Hawkesbury, 25c. Cape Breton County.—Louise MacMillan, North Sydney, 25c. Forty-one members, \$2.25.

New Brunswick.

St. John.—Geo. U. Hay, M.A., Ph.B., Prov. Sec. ; T. Gordon Leavitt. Geo. J. Truceman, St. Martins. Charlotte County.—J. Vroom, St. Stephens, 25c. ; H. F. Perkins, MacAdam Junction. King's County.—Edith Darling, Nauwigewauk, 25c. ; Annie S. Whittaker, Hampton. Queen's County.—W. S. Butler, Grand Lake. Sunbury County.—James A. Edmunds, Lauvina. York County.—Geo. A. Inch, B.Sc., Fredericton ; Professor John Brittain, Fredericton, \$1.00 (1901). Albert County.—Mrs. C. J. Osman, Hillsboro. Westmoreland County.—Geo. J. Oulton, Principal Public Schools, Moncton (1899) ; Mary Fawcett, Moncton. Kent County.—Isabella J. Caie, Richibucto. Northumberland County.—Philip Cox, Ph.D., Chatham ; F. C. Yorston, B.A., Newcastle. Seventeen members, \$1.50.

Ontario.

Toronto.—William Scott, B.A., Vice-Principal Normal School ; H. B. Spotton, M.A., Principal Collegiate Institute, Harbord Street ; John E. Wilson, 408 Delaware Avenue. Ottawa.—John Macoun, M.A., President ; James M. Macoun, Curator Herbarium, Geological Survey of Canada ; Dr. W. Saunders, Director Dominion Experimental Farms, \$1.00

(1901); Dr. James Fletcher, Experimental Farm; J. A. Morton, Wingham; Rev. Prof. James Fowler, Queen's University, Kingston; J. Dearness, Public School Inspector, London (1898); James Goldie, Guelph (1901); R. S. Muir, Walkerton; James White, Snelgrove, 25c.; Roderick Cameron, Niagara Falls, South (1898); Principal F. Sharen, Niagara Falls, South, 25c.; Alice Hollingworth, 25c., Beatrice P. O., Muskoka. Sixteen members, \$1.75.

Quebec.

Prof. D. P. Penhallow, B.Sc., McGill University, Montreal; Dr. J. T. W. Burgess, Superintendent Protestant Hospital for Insane, Montreal (1898); Rev. Dr. Robert Campbell, Montreal; Rev. Robert Hamilton, Grenville; Miss C. M. Derick, Clarenceville; S. W. Mack, Salinas, California, U.S.A. Six members.

Manitoba.

Rev. W. A. Burman, B.D., 383 Selkirk Avenue, Winnipeg; Miss Mary Walker, 25c., 64 Aikins Street, Winnipeg; H. B. MacGregor, Reston; W. P. Argue, Portage la Prairie; Rev. S. McMorine, Portage la Prairie; Arthur Perry, B.A., Lippentott P. O.; E. M. Carr, Virden P. O.; Mrs. A. M. Morrison, Bandochy, St. Francois Xavier (1898). Eight members, 25c.

Assiniboia.

Thomas Donnelly, Prov. Sec., Pheasant Forks; Miss J. Traquair, Welwyn. Two members.

Saskatchewan.

Rev. C. W. Bryden, Prov. Sec., Willoughby, \$1.00 (1901); Dr. L. A. Paré, P. G. Laurie, H. Richardson, Mrs. G. H. Storer, Battleford; Rev. E. K. Matheson, Prince Albert; Rev. George Arthur, B.Sc., Kistino, \$1.00 (1901). Seven members, \$2.00.

Alberta.

T. N. Willing, Prov. Sec., Olds; H. L. Briggs, Olds; G. Batho, Olds; Dr. George, Innisfail; H. H. Gaetz, 25c., Red Deer; Alf. E. Lee, Edmonton. Six members, 25c.

British Columbia.

New Westminster.—Albert I. Hill, C.E.; A. B. Buchanan, F. Canfield, T. Lieth, each 25c. Vancouver City.—J. K. Henry, B.A., High School, 75c. (1899); Geo. E. Robinson, Principal High School; Miss M. E. Spiers, each 25c. Langley.—A. H. Hawkins, B.Sc., President Local Club; A. H. P. Matthew, Box 56, Secretary Local Club; Rev. H. J. Robertson, O. B. Wilkie, W. Wilkie, Geo. Simpson, William Blizzard, H.

Carter, Miss L. Mavis, Miss Green, James Mavis, Thomas Ormrod, Guy Johnston, Henry Johnston, Lynton Harris, each 25c. Victoria.—A. J. Pineo, B. A., High School (life) ; Cora H. Loat, 9 Vining Street ; Chris. J. Loat, 9 Vining Street ; R. S. Sherman, Port Moody, 50c. ; M. L. Kendall, Ladners, 25c. ; Norton Stropole, Sapperton, 25c. ; Mrs. W. J. Curry, Box 222, Nanaimo, 25c. ; A. D. Campbell, Granite Creek, 25c. ; J. R. Anderson, Department of Agriculture, Victoria, 25c. ; F. J. Watson, Okanagan Mission, 25c. ; Gertie Loat, Little Qualicum, French Creek P. O. ; Lily Knight, Mount Tohnie P. G., Victoria. Thirty-four members, \$8.00, less 50c., expenses, Vancouver Island, \$7.50.

GENERAL FINANCIAL STATEMENT,

From the 19th May, 1896, to the 24th June, 1897. Dates of reports to the Royal Society of Canada :—

1897.		1896.	
May 19.—Balance (previous report).\$0 81		Dec. 22.—Postage, 250 Circulars 10	
1897.		and 11	\$2 50
June 24.—Dues, P. E. I.....	0 25	Large Envelopes	1 00
“ Nova Scotia.....	2 25	1897.	
“ New Brunswick... ..	1 50	April 16.—Postage, 300 and 500 Cir-	
“ Ontario	1 75	culars 12 and 13.....	3 50
“ Manitoba	0 25	May 27.—Expense, Vancouver I... ..	0 25
“ Saskatchewan	2 00	Gen. Post. & Stationery. 1 50	
“ Alberta	0 25	June 24.—Paid T. C. Allen & Co.,	
“ B. C. (Mainland)... ..	7 25	account Printing 250	
“ “ (Vancouver I.) 0 75		Circulars No. 10	7 50
		Expense, Vancouver I... ..	0 25
		Balance, Cash on hand.. ..	0 56
	\$17 06		\$17 06

NOTE.—In Circular No. 10, the statement that “Circulars Nos. 7 and 10” were donated to the Club, should have read “Circulars 7 and 9.” This year, Circular No. 11 was donated by the Nova Scotia Institute of Science, No. 12 by the Royal Society of Canada, and No. 13 by the Education Department of Nova Scotia, which allowed the balance to fall on the right side of the account above.

XVII.—From *The Literary and Historical Society of Quebec*, through Sir J. M. LEMOINE.

The president has to express his regret that the society has been compelled (he hopes only temporarily) to suspend the publication of its transactions during the year, as well as the continuation of the publication of the priceless historical documents contained in its archives since its formation.

This regrettable result was brought about through the withdrawal by the Provincial Government, on the score of economy, of all grants to literary and historical societies in the province.

In the case of this association, the subsidy at one time reached as high a figure as \$750 per annum.

It must, however, be remembered that it fulfils a double function ; it is a reading-room for the public and a historical society for students.

As a reading-room, it offers all that a general reader can fairly expect in the department of newspapers and periodicals—in addition to a library of some 12,000 volumes—on subjects scientific, historical or literary.

A hopeful feature in its recent proceedings is the starting of an endowment fund, which is expected shortly to reach \$5,000.

An interesting course of lectures was delivered during the past winter, in which the society has succeeded in enlisting the willing and stimulating assistance of the professional staff of Morrin College, at Quebec.

The following are the names of the official staff of the society :

- President—Very Rev. Dean Norman, D.D.
 1st Vice-President—P. B. Casgrain, Esq.
 2nd Vice-President—J. T. Ross, Esq.
 3rd Vice-President—G. G. Stuart, Esq.
 4th Vice-President—Sir James Lemoine.
 Treasurer—James Geggie, Esq.
 Recording Secretary—Alex. Robertson, Esq.
 Corresponding Secretary—J. F. Dumontier, Esq.
 Council Secretary—W. C. H. Wood, Esq.
 Librarian—P. Johnston, Esq.
 Curator of Museum—F. D. Tims, Esq.
 Curator of Apparatus—Wm. Clint, Esq.
 Additional Members of Council—G. R. Renfrew, Esq.; T. Tessier, Esq.; Théo. Ledroit, Esq.; Jas. Morgan, Esq.

XVIII.—From *The Ottawa Field Naturalists' Club*, through
 Dr. H. M. AMI, F.G.S.

The council of the Ottawa Field Naturalists' Club has the honour to present the following brief summary of the work done during the past year.

Last year's report shows that it was the most successful in the history of the club, and it is therefore specially gratifying to state that there has been a continued increase in the number of members, viz., fifteen ;

the total membership for the year 1896-97 being 248, as compared with 233 in the preceding year.

The attendance at the evening lectures has been most gratifying, and the three field excursions, to Chelsea on May 23rd, 1896, to Rockland on June 20th, and to Galetta and Marshall's Bay on September 26th of the same year, were eminently successful. A number of sub-excursions for field work on Saturday afternoons were also carried out with success.

Lecture Course.

Jointly with the Literary and Scientific Society, the club held seven *soirées* during the winter months, and by the kind permission of the Ottawa Teachers' Association, a lecture by Professor Cox, of McGill University, entitled, "Electrical Discharges in High Vacua," was incorporated in the series.

The seven *soirées* in their course were as follows :

1896.

Nov. 19—*Conversazione*. Exhibition of microscopical objects, specimens of natural history and lantern slides.

Short addresses were delivered by Mr. Shutt, president of the club; Mr. Klotz, president of the Literary and Scientific Society; Dr. MacCabe, principal of the Normal School, and Mr. MacDougall, president of the Ottawa Teachers' Association.

Dec. 17—"Goethe," by Professor L. R. Gregor, B.A., of McGill University.

1897.

Jan. 14—"Under the Midnight Sun—A Trip to Iceland" (with original stereopticon views), by Professor J. Mavor, of Toronto University.

Jan. 21—Addresses on "Recent Explorations in Canada," by Dr. G. M. Dawson, Dr. Robert Bell, Mr. J. B. Tyrrell, and Mr. A. P. Low.

Feb. 4—"The Lyrical Poetry of the Elizabethans," by Mr. D. C. Scott, F.R.S.C.

March 4—"Weather," by Otto J. Klotz, Esq.

March 11—"Fruit and Fruit Districts of Canada" (illustrated), by Mr. John Craig.

March 18—"The American Lobster," by Dr. Macphail, of the University of Bishop's College, Montreal. The lecture was illustrated with lantern slides and specimens.

The library of the club continues to grow, and embraces a large series of publications of scientific interest and value. The club is indebted to scientific societies and authors in various lands for additions to the volumes on its shelves.

The club has a scheme of popular scientific instruction before it, and, if carried out, opportunity will be offered in the city of Ottawa and vicinity for beginners to commence natural history studies under the direction of the club.

The finances of the club are in a satisfactory condition.

The Ottawa Naturalist.

The publication of the "Ottawa Naturalist," the monthly periodical of the club, has been carried on under the editorship of Dr. Ami, assisted by a staff of colleagues, and its pages have contained many original articles on various branches of science, the aim being to sustain a thoroughly scientific tone and method, with a sufficiently popular style of exposition to arouse the interest of beginners in science studies. Many improvements are contemplated during the coming year. The volume for 1896-97 contains 236 pages of reading matter, amongst which we note a very interesting series of reviews on current geological and biological literature of great value to Canadians, besides the following papers or contributions :

In Zoology.

"Electrical Fishes," by Prof. E. E. Prince, B.A., F.L.S., Commissioner of Fisheries for Canada ; "Remarkable Points in the Life-history of Phyllopod," by the same author ; "How Whales Breathe," by the same author ; "The Living Chimæra and Its Egg," by Prof. Prince also ; "A Naturalist's Journey Westward," by Andrew Halkett, Esq. ; "The Evolution and Development of Animal Intelligence," by Prof. T. Wesley Mills, F.R.S.C. ; *Stephanoceros*, a Beautiful Rotifer at Ottawa," by W. S. Odell, Esq. ; "Ottawa Hydrachnida," etc., etc.

In Geology.

"Petrographical Notes on Some Archæan Rocks from Chelsea, Que.," by Principal J. A. Dresser, B.A. (Richmond, Que.) ; "Pleistocene Fossils found at Chelsea, Que.," by Dr. H. M. Ami ; "The Geology of the Ottawa & Parry Sound Railway," by Dr. R. W. Ells, M.A., F.R.S.C. ; The Genesis of Lake Agassiz," by J. B. Tyrrell, B.A., F.G.S. ; "Note on *Cardinia subangulata*, Dawson, and *Arca punctifer*, Dn." by Dr. H. M. Ami ; "New Species of Graptolites from Canada," by the same author.

In Entomology.

"Ottawa Spiders," by W. H. Harrington, F.R.S.C. ; "Ottawa Spiders and Mites," by the same author in another article ; "Fauna Ottawaënsis—Hymenoptera Parasitica-Proctotrypidæ," by W. H. Harrington ; "Annotated List of Noctuids taken at Olds, N.W.T.," by

Prof. John B. Smith, of Rutgers College, New Brunswick, N.J.; "A Butterfly-Catching Spider," by Dr. James Fletcher, F.R.S.C.; "Notes on *Sphaeridium scarabaeoides*," by the same author.

In Ornithology.

"Notes on Bird Life in Autumn," by Miss A. C. Tyndall; "Ornithological Notes," by the same author; "A Little Wood and Some of Its Feathered Denizens," by the same author; "Notes on *Porzana Nova-boracense*," by G. R. White, Esq.; "Winter Birds Eating Apple Blossoms," by John Craig, Esq.; "The Brown Pelican," by A. G. Kingston, Esq.

In Chemistry.

"Soil Inoculation by Nitragin," by Mr. F. T. Shutt, M.A., F.C.S.; "Chemical Work in Canadian Agriculture," by the same author; "Viscosity in Liquids," by Anthony McGill, B.A.; "Popular Chemistry," by the same author.

In Botany.

"Note on the occurrence of *Pinus Banksiana* at Aylmer, Que.," by H. O. Honeyman, B. A. (Aylmer, Que.); "Notes on the fruiting of trees at the Central Experimental Farm, Ottawa," by W. T. Macoun, Esq.; "Notes on *Camelina sativa*," by Dr. James Fletcher, F.R.S.C.; "Note on *Cyperus esculentus*," by the same author.

In Geography.

"Recent explorations in Canada," by Dr. G. M. Dawson, C.M.G., LL.D., F.R.S.; "Recent explorations in Labrador," by A. P. Low, B.A.Sc.; "Recent explorations in the Barren Lands," by J. B. Tyrrell, B.A., B.Sc., F.G.S.

General.

"Clouds," a very attractive article by Principal J. A. Dresser, M.A., St. Francis College, Richmond, Que.; "The National Museum," by Dr. H. M. Ami; "Note on survey of Tides and Currents in Canadian Waters," by Colonel W. P. Anderson, Marine Department, Ottawa. There are also notes of work done by the club at the excursions, sub excursions, and at the monthly meetings of the council, records of earthquakes in the Ottawa Valley, besides other notes and comments of interest to the members and readers of *The Ottawa Naturalist*.

Last year, Mr. Shutt reported to the Royal Society that more money was required to further extend the usefulness of the club and that the Ontario Government had been asked to assist. The council are pleased to state that the Ontario Government has granted the sum of \$200.

At the annual meeting of the club held in March last the following officers were elected for the season of 1896-97.

Patron, His Excellency the Earl of Aberdeen, governor-general of Canada.

President, Prof. Edward E. Prince, B.A., F.L.S.

Vice-Presidents, H. M. Ami, M.A., F.G.S. ; W. Hague Harrington, F.R.S.C.

Librarian, S. B. Sinclair, B.A., Normal School.

Secretary, Andrew Halkett, Esq., Marine and Fisheries Department.

Treasurer, John Craig, Esq., Central Experimental Farm.

Committee, James Fletcher, LL.D., F.R.S.C. ; Frank T. Shutt, Esq., M.A., F.C.S. ; W. T. Macoun, Esq. ; Miss A. M. Living ; Miss G. Harmer ; Miss Marion Whyte.

Standing Committees of Council.

Publishing, H. M. Ami, W. H. Harrington, F. T. Shutt, J. Craig, W. T. Macoun, Miss Whyte.

Excursions, J. Fletcher, J. Craig, A. Halkett, Miss Living, Miss Harmer.

Soirées, H. M. Ami, J. Fletcher, J. Craig, W. H. Harrington, Miss Whyte.

Leaders.

Geology, Dr. Ells, Mr. Ferrier, Dr. H. M. Ami.

Botany, Mr. J. Craig, Mr. J. M. Macoun, Mr. R. B. Whyte.

Entomology, Dr. Fletcher, Mr. Harrington, Mr. W. Simpson.

Conchology, Mr. Latchford, Mr. Halkett, Mr. O'Brien.

Ornithology, Mr. A. G. Kingston, Mr. W. T. Macoun, Miss Harmer.

Zoology, Prof. Prince, Prof. Macoun, Mr. H. B. Small.

The following comprise the editorial staff of *The Ottawa Naturalist* :

Editor, Henry M. Ami, M.A., D.Sc., F.G.S.

Associate Editors.

Mr. A. E. Barlow, M.A., F.G.S.A., Geological Survey of Canada, Department of Geology.

Mr. W. F. Ferrier, B.A.Sc., F.G.S., Geological Survey of Canada, Department of Mineralogy and Lithology.

Prof. John Macoun, M.A., F.L.S., Dominion botanist, Geological Survey of Canada, Department of Botany.

Dr. James Fletcher, Central Experimental Farm, Department of Conchology.

Mr. W. H. Harrington, Post Office Department, Department of Entomology.

Mr. W. T. Macoun, Central Experimental Farm, Department of Ornithology.

Prof. E. E. Prince, B.A., F.L.S., Commissioner of Fisheries for Canada, Department of Biology and General Zoology.

The society then adjourned until Friday, June 25th, at 10.15 a.m.

THE CABOT CELEBRATION.

The account of the proceedings in unveiling the tablet and the presidential address, as well as papers on the Cabot Landfall, will be found at the end of the minutes, as a special part of this volume.

CONCLUDING SESSION (June 25th).

The society resumed its deliberations on Friday morning at 10.15 a.m., the president in the chair.

ANSWER FROM THE QUEEN.

The President read the following telegram, which had been received in answer to the message to the Queen :

"BUCKINGHAM PALACE, LONDON,
"June 22nd, 1897.

"Queen desires me to thank Royal Society of Canada for their kind and loyal congratulations.

"BIGGE."

OFFICERS OF SOCIETY FOR 1897-8.

The acting Secretary communicated to the society the report of the committee appointed to recommend names of officers of the society for 1897-98 :

"June 25th, 1897.

"The nominating committee recommends to the council that the following be the officers of the Royal Society for the ensuing year :

For President, Hon. F. G. Marchand.

Vice-President, T. C. Keefer, C.M.G., C.E.

Honorary Secretary, Dr. Bourinot, C.M.G.

Honorary Treasurer, Dr. Fletcher, F.L.S.

C. O'BRIEN.

GEORGE STEWART.

B. SULTE.

G. M. DAWSON.

S. FLEMING.

The report of the foregoing committee was unanimously adopted, and the gentlemen named therein were declared duly elected officers of the society for 1897-98.

REPORTS OF SECTIONS.

The four sections then made their usual reports, which are as follow :

Rapport de la Section I.

La section I était composée de MM. Gosselin, Marchand, LeMoine, Roy, Sulte, et des délégués R.-P. Duclos (Cercle littéraire de Montréal) et N.-N. Ollivier (Institut Canadien de Québec).

Travaux lus et approuvés pour le prochain volume : M. l'abbé Gosselin : Hommage à la mémoire de feu Narcisse Faucher de Saint-Maurice.

M. Roy, *Le Roy de la Potherie*, auteur de l'Histoire de l'Amérique Septentrionale.

M. l'abbé Gosselin, *Le Père de Bonnécamp*.

M. Léon Gérin, 1°, *L'Habitant de Saint-Justin* ; 2°, *L'Ancêtre de l'Habitant*.

Placide P. Gaudet, 1°, *Les curés de Port-Royal, 1676-1755* ; 2°, *Le Borgne de Belleisle*, famille acadienne.

M. Sulte, 1°, *La guerre des Iroquois, 1647-1664* ; 2°, *Extraits historiques des lettres de la Mère de l'Incarnation*.

Les officiers élus pour la section sont : Jos.-Edmond Roy, président ; A.-D. DeCelles, vice-président ; Benjamin Sulte, secrétaire.

A. H. GOSSELIN,

Président.

BENJAMIN SULTE,

Secrétaire.

Report of Section II.

The following papers were read before the section :

1.—“Canada during the Victorian Era : Sixty Years of Progress,” by Dr. Bourinot, C.M.G.

Illustrated by engravings of important epochs of Canadian history.

2.—“Historical and Miscellaneous Literature in the Province of Quebec, 1764-1830,” by Mr. Benjamin Sulte.

Here are mentioned the first newspapers and what they did ; the old libraries then in existence amongst us ; the books published, also pamphlets, and why ; the literary circles or societies formed from time to time ; the amateur theatricals ; first attempts to write a history of Canada—showing altogether many more essays in the field of literature and studies than we generally attribute to that period.

3.—“Notes on the Cosmogony and History of the Squamish Indians of British Columbia,” by Professor Charles Hill-Tout, of Buckland College, Vancouver, B.C. Presented by Dr. G. M. Dawson, F.R.S.

4.—“The Origin of the Haidahs of the Queen Charlotte Islands,” by John Campbell, LL.D.

This paper professes to set forth, by a comparison of grammatical forms and of over two hundred different parts of speech, the connection of the Haidahs with the Melanesian population of the Pacific Ocean as distinguished from the Malay and Polynesian populations of the same insular area. In the Philippine Islands, the ancestors of the Haidahs submitted to Malay influences in blood and in language, modifying considerably the Melanesian type best known in Papua and in Australia. The arrival of the Haidahs in the region now occupied by their descendants cannot be placed earlier than the eleventh century, A. D., nor later than the fifteenth. Of the same Melanesian stock on American soil are the Tupi-Guarani tribes of Brazil, but they must have been the outcome of a far earlier migration dating back to the ninth century at least. The Haidahs represent the extreme northern limit of Melanesian or Papuan distribution.

5.—“The Cabotian Voyages,” by Hon. J. Boyd Thacher, Mayor of Albany, N. Y., and author of “The Continent of America, its Discovery and its Baptism, etc.” Presented by Dr. Bourinot, C.M.G.

The author leans towards a land-fall near Hudson’s Strait, and treats the whole subject from the standpoint of proving England’s right to territory from English discoveries. Mr. Thacher will exhibit an autograph letter of Henry VII. and other documents of historic interest.

6.—“Nicolas Denys, First French Governor of Cape Breton: His Life and Book — ‘Historical Account of the Coasts of North America,’” with Bibliographical Notes, by Dr. Bourinot, C.M.G.

It is proposed to republish the first volume of one of the rarest works on America, and reproduce the map which is only found in some copies. A translation will be given opposite each page of the original, which will be reproduced verbatim et literatim. A sketch of the life of the author will be added, and such historical, geographical and bibliographical notes appended to the text as will make the monograph useful to all students of Canadian history. The work by Denys is in two volumes, but it is proposed to reprint at present only the first, which deals with the history and geography of northeastern America.

7.—“How Best to Learn to Speak or Teach a Language,” by Mr. Charles Baillaingé, C. E., Quebec.

8.—“The Latest Conclusions on the Subject of the Voyages of Cabot,” by S. E. Dawson, Lit. D.

9.—“A Monograph of the Cartography of the Province of New Brunswick,” (Contributions to the History of New Brunswick, No. 3.) by William F. Ganong, M.A., Ph.D. Presented by Dr. Bourinot, C.M.G.

This paper contains an attempt at the exhaustive study of the cartography of a limited region from the point of view of its evolution and the causes controlling it. The historical value of maps, sources of error in their making and their interpretation, and the principles of their evolution are briefly discussed. It is shown that the maps of a limited region do not form a continuous and constantly-improving series, but they fall into a few marked types, each of which is a great advance over its predecessors, and the intermediate forms, which outnumber the types many to one, are but copies and alterations of the types. The types, eight in number, are then taken up for New Brunswick, and the sources for new information in each is discussed. Sketches of each of the types are given, and of several important MS. maps hitherto unpublished, which bear upon them, and also a synoptical list of the maps of the province arranged under their types.

10.—“Cabot,” a Poem, by W. Wilfred Campbell.

11.—“Ingir and Alf,” an Ode to the Hills, by A. Lampman.

12.—“Supplementary Notes on Sable Island,” by the Rev. George Patterson, D.D., LL.D.

13.—“The Termination of Sir Humphrey Gilbert’s Voyage,” by the Rev. Dr. G. Patterson.

Four meetings of the section were held. The attendance of members was fair.

The printing committee is composed of Dr. Bourinot, Dr. S. E. Dawson and Dr. George Stewart.

Dr. Stewart was elected the representative of this section for the nomination of officers of the Royal Society, for the coming year.

At least one effort has been made to honour worthily the memory of John Cabot by applying his name to the country he discovered. In 1814 there was published in London an excellent map with this title :

A map of Cabotia comprehending the provinces of Upper and Lower Canada, New Brunswick, etc., compiled from a great variety of original documents, by John Purdy. Scale 20 miles to one inch, with insets.

A second edition was issued in 1821.

The map is well engraved, and was carefully compiled ; in at least some parts it is better than any published map which preceded it. In the notes engraved upon it, the author makes it clear that he uses the name Cabotia in honour of John Cabot. This praiseworthy though fruitless effort of John Purdy to introduce so appropriate and pleasing a name deserves mention at this time.

The Hon. J. D. Edgar of Toronto, was unanimously elected a Fellow of the Royal Society, by this section, on motion of Drs. Stewart and Dawson to fill the vacancy caused by the death of the late Horatio Hale.

The office-bearers for the ensuing year are :

President, Dr. S. E. Dawson.

Vice-President, Dr. Douglas Brymner.

Secretary, Dr. George Stewart.

GEORGE STEWART,

Secretary.

Report of Section III.

The section has held five meetings.

The following members have been present, viz., Prof. Dupuis, president of the section ; Mr. Keefer, vice-president ; Mr. Baillaigé, Prof. Bovey, Mr. W. B. Dawson, Sir Sandford Fleming, Prof. Johnson, Prof. McLeod and Prof. MacGregor.

In the absence of Captain Deville, Prof. MacGregor was appointed secretary *pro tem*.

Letters were received from Prof. Harrington, Dr. Girdwood and Prof. Goodwin expressing their regret at their inability to attend.

The following papers have been read either in full, in abstract or by title :

1.—“ On the Transcendental Geometry,” by Prof. N. F. Dupuis, *presidential address*.

2.—“ The Character and Progress of the Tides in the Gulf and River St. Lawrence, as ascertained by simultaneous observations with self-registering tide-gauges,” by Mr. W. B. Dawson.

3.—“ The Abstract and Concrete in Education: the word, the image, the reality,” by Mr. C. Baillaigé.

4.—“ A Dominion Hydrographic Survey,” by Prof. A. Johnson.

5.—“ On some measurements of the temperature of the Lachine Rapids, made during the winter of 1896-7, with a differential platinum thermometer,” by Mr. H. T. Barnes, M.A.Sc., demonstrator of physics, in McGill University; Communicated by Prof. Callendar.

6.—“ On Measurements of Soil Temperatures,” by Prof. H. L. Callendar and Prof. C. H. McLeod.

7.—“ Secondary Undulations at St. John, N.B.,” by Prof. A. W. Duff, D.Sc., Purdue University, Indiana, delegate from the New Brunswick Natural History Society.

8.—“ On the relation of the Specific Gravity of dilute aqueous solutions of certain electrolytes to their state of ionization,” by Prof. J. G. MacGregor.

9.—“ On the calculation of the conductivity of dilute aqueous solutions containing two electrolytes with no common ion,” by Mr. E. H. Archibald, B.A., Dalhousie College, Halifax; Communicated by Prof. MacGregor.

10.—“ Some experiments on the Determination of Temperature,” by Mr. Alex. MacPhail; Communicated by Prof. Bovey.

11.—“ A simplification of Des Cartes' method of solving the general quartic equation,” by S. W. Matthews; Communicated by Prof. Dupuis.

The following were elected office bearers for the session of 1897-8 :

President, Mr. T. C. Keefer, C.M.G.

Vice-President, Prof. C. H. McLeod, M.E.

Secretary—Capt. E. Deville.

The following were appointed members of the publication committee: The officers of the section, for the present year, with power to add to their number.

In the matter of the election of Prof. J. Cox, to membership in this section, which was referred by the society to this section for consideration and report, on the ground that while the election circular stated that it was an “additional” member who was to be elected, opportunity had not been afforded members to vote on the general question of holding such an election in the present year, as provided by rule 6: it was found on inquiry that owing to the retirement of M. de Foville, a “vacancy”

had existed in the section, and that the difficulty which had arisen was therefore due to the erroneous information furnished in the circular. The section therefore unanimously resolved to recommend the society to confirm the election of Prof. Cox.

In connection with his paper on a Dominion Hydrographic Survey, Prof. Johnson brought before the section the draft of a petition which he intends to propose that the Royal Society shall lay before the Canadian government. The section unanimously expressed its approval both of the proposal itself and of the draft of the petition submitted.

The report of the council on the subject of the unification of time at sea having been considered by Section III., the section unanimously agreed to make the following recommendation :

That as there is a reasonable prospect of the United States government accepting the recommendations set forth in the sixth resolution of the Washington Prime Meridian Conference of 1884, the council be authorized and requested to take such farther steps as may seem best calculated to secure unity of time-reckoning at sea as on land ; and that, with this end in view, a special request be made to the British Association, when it meets at Toronto, to coöperate with the Royal Society of Canada and other Canadian societies in influencing Her Majesty's government to adopt the proposed change on the first day of the new century and to make such alterations as may be necessary in the Nautical Almanac as soon as practicable.

All of which is respectfully submitted.

N. F. DUPUIS,

President.

J. G. MACGREGOR,

Secretary pro tem.

Report of Section IV.

Section four has the honour to report a series of five successful sessions. The attendance was fair, a majority of members of the section being in attendance. Eight papers were read, illustrated and discussed, together with the report of the Botanical Club of Canada, which is specially affiliated to the section.

The publication committee report a recommendation to publish the following papers submitted to them :

1.—“The Presidential Address : a review of Canadian Botany from 1800 to 1896,” by Professor D. P. Penhallow.

2.—“On the Genus *Lepidophloios* as illustrated by Specimens from the Coal Formation of Nova Scotia and New Brunswick,” by Sir William Dawson, LL.D., F.R.S., etc.

3.—“The Bay of Fundy Trough in American Geological History,” by Professor L. W. Bailey.

4.—“Description of a New Sub-Fauna of the Paradoxides Beds of the St. John Group,” by G. F. Matthew, M.A., D.Sc.

5.—“Upon Raised Peat-Bogs in the Province of New Brunswick,” by Professor W. F. Ganong, of Northampton, Mass., U.S.A.

6.—“On some interesting Hybrids produced between different Species of Ribes, and also of Berberis,” by Dr. Saunders, director of the Experimental Farms of Canada.

7.—“Notes on the Archæan of Eastern Canada,” by Dr. R. W. Ells, F.G.S.A.

8.—“Memoir of John Goldie, botanist,” by George U. Hay, M.A., Ph.B.
The officers elected for the ensuing year are :

President, Dr. T. J. W. Burgess.

Vice-President, Dr. R. W. Ells.

Secretary, Dr. A. H. MacKay.

A. H. MacKAY,
Secretary.

GENERAL BUSINESS.

The following motions were agreed to :

(1) “*Resolved*, That Rule 6 be suspended and that the Honourable J. D. Edgar, of Toronto, be elected a fellow of Section II. in the place of the late Horatio Hale, in accordance with the unanimous recommendation of said section.” (On motion of Dr. Stewart, seconded by Dr. S. E. Dawson.)

(2) “*Resolved*, That, in accordance with the recommendation of Section III., the election of Professor J. Cox of McGill University to a fellowship in said section be confirmed.” (On motion of Professor J. G. MacGregor, seconded by Sir S. Fleming.)

(3) “*Resolved*, That the recommendation of Section III. with respect to the report of Council on the unification of time at sea be adopted.” (On motion of Dr. Johnson, seconded by Professor McLeod.)

(4) “*Resolved*, That the following gentlemen compose the deputation to wait on the Minister of Marine and Fisheries with respect to ‘Tidal Currents’ and a ‘Hydrographic Survey for the Dominion :’ The officers of the society, Dr. Johnson, Dr. MacGregor, Dr. Bovey, and Mr. Keefer, with power to add to their number.” (On motion of Dr. Johnson, seconded by Mr. Keefer.)

(5) “*Resolved*, That the Council be instructed to distribute, either before the first general meeting of the society in each session, or at such meeting, printed copies of the recommendations made in the annual report of such session, so far as this may be possible, in order that members of the society may be enabled to give such recommendations more adequate consideration before they are brought forward for discussion.” (On motion of Professor MacGregor, seconded by Dr. Johnson.)

(6) “*Resolved*, That the attention of the Dominion Government be again directed by the President of the Royal Society to the advisability

of reserving in any government building, hereafter erected at Ottawa, adequate accommodation for the storing and preservation of its archives." (On motion of Sir James LeMoine, seconded by Mr. Sulte.)

The following notices of motions, to be considered at the next general meeting, were submitted by Professor J. G. MacGregor :

(1) That Rule 6 be amended by inserting after the words "who shall make a record of them," the following sentence : "Such nomination papers shall contain a list of the original works or memoirs published by candidates with sufficient information as to dates and places of publication to enable members readily to obtain access to them, as well as a statement of other services rendered to literature or science."

(2) That Rule 6 be amended by striking out the sentence beginning : "When the vacancy occurs" and ending : "separate vote for each vacancy," and substituting therefor the following :

"When one or more vacancies occur, the honorary secretary shall notify the members of the section in which they have taken place. At the end of at least six weeks from the date of such notification, he shall transmit to each of such members a voting paper or list of the candidates nominated, together with copies of the nomination papers and a copy of this rule. Each member who wishes to take part in the election shall strike out from said list the names of candidates whom he may not consider qualified for fellowship in the society ; he shall also insert in said list the numeral 1 opposite the name of the candidate whom he prefers to all others ; he shall similarly insert the numerals 2, 3, 4, etc., opposite the names of the other candidates, so as to indicate the order in which they stand in his opinion as candidates for fellowship ; and he shall finally send the voting paper filled up in this way and signed by himself to the honorary secretary, so that it may reach the hon. secretary within six weeks from the date at which said paper was transmitted to said member by the hon. secretary. The voting papers shall be submitted by the hon. secretary to a committee of scrutineers appointed by the president. They shall first exclude from candidature all candidates whose names have been stricken out from the list by one-third or more of the members of the section, and they shall next determine from the voting papers what the result of the vote of the section is in the case of all combinations of the remaining candidates taken two together. If any candidate is thus shown to be preferred to all other candidates, i. e., to have gained a majority of the votes cast over each of the other candidates, he is thereby elected to the first vacancy ; if any one of the remaining candidates is thus shown to be preferred to all the other remaining candidates, he is thereby elected to the second vacancy ; and so on, until all the vacancies are filled. If at any stage any two or more of the candidates remaining at that stage are shown to be preferred to the others, while the voting papers do not show which of these two

or more candidates is preferred to the others of said two or more candidates, then if the number of such preferred candidates is equal to or less than the number of vacancies, such preferred candidates are thereby elected to fill a corresponding number of the vacancies. If in such case the number of such preferred candidates is greater than the number of vacancies, the names of such preferred candidates shall be submitted by the council to the section concerned, and such section shall elect a sufficient number of such preferred candidates and fill the remaining vacancies. If at any stage there should be no candidate or candidates who are shown by the voting papers to be preferred to all others, the names of the candidates remaining at that stage shall be submitted to the section concerned, and such section shall elect a sufficient number of such candidates to fill the remaining vacancies.

“In any case in which the election is thus referred to the section concerned, the election shall be conducted by the section during the first subsequent annual meeting of the society, at such time as the section may see fit to appoint, provided that at least one day shall intervene between the appointment of the time and the conducting of the election. The election shall be by ballot, a majority of the votes cast being required for the election of a candidate, and the chairman of the section having for this purpose a second or casting vote.”

(3) That Rule 6 be amended by the addition of the following sentence at the end :

“The election to an additional fellowship shall be carried out in all respects as if it were a vacancy.”

VOTES OF THANKS.

The following motions were agreed to :

(1) “*Resolved*, That the cordial thanks of the Royal Society be conveyed to His Excellency the Governor-General, Honorary President of the society, for coming to Halifax to assist in the Cabot celebration and other proceedings of the society.” (On motion of Sir James M. LeMoine, seconded by Sir S. Fleming.)

(2) “*Resolved*, That the Royal Society of Canada express their obligations to the Government of Nova Scotia for the facilities given to members and delegates for meeting in the Province Building, and for the hospitalities extended to them during their visit to Halifax.” (On motion of Sir S. Fleming, seconded by Sir J. M. LeMoine.)

(3) “*Resolved*, That the Royal Society of Canada desire to express their thanks to the mayor, corporation and citizens of Halifax for the hospitality extended to members and delegates during this week.” (On motion of Mr. Lampman, seconded by Mr. J. F. Whiteaves.)

(4) "*Resolved*, That the thanks of the Royal Society of Canada be given to the president and members of the Nova Scotia Historical Society for courtesies extended to fellows and delegates during their visit to Halifax." (On motion of Mr. B. Sulte, seconded by Dr. Stewart.)

(5) "*Resolved*, That the thanks of the Royal Society be conveyed to the mayor and corporation of the city of Bristol for having so cordially responded to the invitation of the society to assist in the Cabot commemoration at Halifax, and that an expression of gratitude be offered to the delegates of that historic city, Messrs. W. R. Barker and W. H. Davies, ex-mayors, for having consented to act as its representatives and for having contributed so largely by their addresses and papers to the success of this meeting." (On motion of Sir S. Fleming, seconded by Hon. F. G. Marchand.)

(6) "*Resolved*, That the thanks of the Royal Society be given to His Grace, the Archbishop of Halifax and the local committee for the kind and effective manner in which the society has been received at Halifax." (On motion of Dr. Johnson, seconded by Dr. Stewart.)

The sixteenth general meeting of the Royal Society of Canada then adjourned.

THE CABOT CELEBRATION

THE CABOT CELEBRATION.

UNVEILING OF THE TABLET IN HONOUR OF THE ITALIAN NAVIGATOR.

(From the *Halifax Herald*, June 25.)

The scene on the Hollis street front of the Province Building yesterday afternoon is one which will long be remembered by those who saw it. Grouped on the landing leading to the corridor where the tablet in memory of John Cabot was unveiled, were the heads of our Civic, Provincial and Federal Governments, and the heads of the Military and Naval branches of the British service. Not only did this company include the Governor-General and the Countess of Aberdeen, Vice-Admiral Sir J. E. Erskine, General Montgomery Moore, Governor Daly, Premier Murray, and Mayor Stephen in his official robes, but besides these were two ex-Mayors of the city of Bristol—W. R. Barker, J.P., and W. Howell Davies, J.P.; Signore G. Solimbergo, of Montreal, Consul-General of Italy, on this occasion representing the city of Venice. Archbishop O'Brien, President of the Royal Society of Canada, was directing the exercises, and with him were other members of the Royal Society of Canada. Hon. J. Boyd Thacher, of Albany, N. Y., Consul-General Ingraham, of the United States, and other distinguished gentlemen representing universities and societies in the United States and Canada, were in the group. Such were the leading men in the company gathered to do honour to the memory of him who, four hundred years ago, set sail from Bristol on a voyage which ended in the discovery of the mainland of this continent. A picturesque feature of this scene was the presence of three or four Indians—well-dressed—representing the aborigines.

The proceedings were to have begun at three o'clock, but it was some minutes after when their Excellencies Lord and Lady Aberdeen arrived. A detachment of men from the Royal Navy was drawn up, and there was a great crowd of spectators on Hollis street and in the Province Building eastern area.

The Countess of Aberdeen is an enthusiastic photographer, in addition to her many interests, and her first act on alighting from the carriage was to take a snap shot of the gathering. Then the sailors, headed by the band of the flagship "Crescent," marched off, taking their route through the principal streets for home.

The tablet was mounted on an easel at the left of the Province Building portal. It is of brass in a handsome frame, the lettering being red and black. The tablet was draped with the Union Jack. The

Archbishop made his opening address and the Governor-General was asked to throw the flag aside, revealing the brass memorial that will mark for future generations the fact that John Cabot and his glorious voyage were not forgotten either by the people of Halifax, the people of Bristol, the Government of the country or the Royal Society of Canada. The unveiling proceedings lasted more than an hour, and were exceedingly interesting, even to those on the noisy thoroughfare beyond the reach of the speakers' voices. The gathering was called to order by His Grace Archbishop O'Brien, President of the Royal Society of Canada, the body under whose auspices the unveiling was taking place.


Archbishop O'Brien, in opening the proceedings, said :

Your Excellencies, Ladies and Gentlemen,—Four hundred years ago to-day the flag of England was first raised on these western shores, and we have met to-day to celebrate that event. The man who discovered this country and raised the English flag thereon has been for a long time forgotten. Lately, however, his memory has been revived, and many useful articles have been written concerning his voyages and discoveries. Two years ago the Royal Society of Canada resolved to hold its annual meeting in Halifax in order to commemorate the 400th anniversary of the discovery of North America by John Cabot, and it was intended to erect some small memorial of that great event, something which would recall the memory of the distinguished voyager who gave us our title to this country. It was determined by the society to erect a small brass tablet in the Provincial Building of these provinces, and the nearest to the place where Cabot landed. The tablet in itself is not of much importance, but it will serve as a reminder to future generations of the debt that they owe to this man, and perhaps it may be the means of causing them to erect some fitting monument to his memory. His Excellency the Governor-General has kindly consented to come here to-day to assist at this ceremony, and other distinguished personages have also arranged to grace the occasion with their presence. I shall not take up your time longer, but will ask His Excellency to add to his many acts of kindness, not only to the Royal Society, but to this country, by kindly unveiling this small tablet. (Applause.)

His Excellency, who on rising was greeted with cheers, said :


Your Grace, General Montgomery Moore, Admiral Erskine, Your Honour, Ladies and Gentlemen,—I am sure we shall all join in celebrating the fame of the grand old navigator, John Cabot. His Grace the Archbishop spoke of the tablet as a small one. It may not be very much in dimension, but it is a very handsome piece of work, and will very fitly commemorate in this good old city by the sea the name and the memory of John Cabot. From the inscription on this tablet you will observe that John Cabot was directed to conquer and possess for England all lands he might find in whatever part of the world they might be. I think you

will agree with me that there is a fine comprehensiveness in that direction—(laughter)—and on the whole I think that we and his successors have done our best, and with no small success, to fill that mission. At any rate, as we are very conscious at the present moment, the British



THIS TABLET IS IN HONOUR OF THE FAMOUS NAVIGATOR

JOHN CABOT



Who under authority of letters-patent of HENRY VII directing him to conquer occupy and possess for ENGLAND all lands he might find *in whatever part of the world they be*, sailed in a BRISTOL Ship THE MATTHEW, and first planted the flags of ENGLAND and VENICE on the 24th of June 1497 on the north eastern seaboard of NORTH AMERICA and by his discoveries in this and the following year gave to ENGLAND a claim upon the Continent which the colonizing spirit of her sons made good in later times.

This tablet was placed in this hall by the ROYAL SOCIETY OF CANADA in JUNE 1897 when the BRITISH EMPIRE was celebrating the SIXTIETH Anniversary of the Accession of Her Majesty QUEEN VICTORIA during whose beneficent reign the Dominion of CANADA has extended from the shores first seen by CABOT and English sailors four hundred years before, to the far Pacific coast


C. LINDENB. PRES. R.S.C. (Archimedes & HALIX)

J. G. BOURNOR. C.M.G. Hon. Sec. R.S.C.


City of BRISTOL, DELEGATES
 WILLIAM ROBERT BARKER, J.P.
 WILLIAM HOWELL DAVIES, J.P.

HIS EXCELLENCY THE EARL OF ABERDEEN
 Governor-General of Canada.

HIS HONOUR M.B. DALY, Lieutenant Governor
 of Nova Scotia



THIS TABLET IS IN HONOUR OF THE FAMOUS NAVIGATOR



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empire and its various portions are to be found in every part of the globe. It seems to be a happy combination of circumstances that the meeting of this Royal Society of Canada, representing literature, science

and art in every part of the country, should be holding its annual gathering in Halifax almost simultaneously with the celebration of the diamond jubilee of Her Most Gracious Majesty the Queen—(applause)—for among the many features of this ever-to-be-remembered occasion there is this, that we are reminded of the unity as well as the majesty of the British empire. And therefore, although many centuries have passed since John Cabot discovered British North America, we may say that it is only after the lapse of such a period as this that we have been able to understand the significance and the importance of his discovery. He himself could scarcely have anticipated its vast significance. In any case, we do well to remember him, and although only the name of John Cabot appears on this tablet, I think we should not forget Sebastian Cabot, whose name is surely also to be associated with—that of his father. Your Grace, I consider myself fortunate to be able to assist at this ceremony, all the more because I have only succeeded in so doing by a great rush, having travelled over 1,600 miles in the last four days to fulfil my engagements at the seat of government, but losing no time in returning to Halifax where, without disrespect to any other portion of the Dominion, I may say that I have much pleasure in finding myself. (Laughter and applause.) I think we may congratulate the Royal Society of Canada, first, upon the fact of their meeting here, and, secondly, upon the auspicious and interesting circumstances under which their meeting has been held. We are indebted to them for the arrangements by which this public state building, with so many associations, shall have upon its walls this record of a great national and historic event. (Applause.)

Before concluding may I say one word (I am not now speaking of the Royal Society) of appreciation regarding the admirable dispositions in connection with the celebration of the Queen's Jubilee in your city. (Applause.) I am sure those who had the advantage of being present this morning, when the mass meeting of the school children was held, must have been delighted not only with the singing, but also with the excellent organization, discipline and attention displayed by the children. (Applause.) Some people say that if we have a fault in Canada (I do not say that there is any fault in Canada) that it may be found in this, that in some instances the children are not so subdued; they do not keep themselves out of sight as much as some might desire. If that be the case, all the more credit and gratitude to those who succeeded in carrying out the arrangements regarding the children so excellently to-day. Perhaps it is because the Nova Scotian children are superior to other children. (Laughter and cheers.) However that may be, I hope others will take note of what has been done and follow the good example shown.

His Excellency concluded by expressing his regret that Dr. Bourinot could not be present, and by expressing his hearty good wishes for the

Royal Society, as well as his hearty congratulations on the manner in which the arrangements in connection with this memorial had been carried out.

Vice-Admiral Sir J. E. Erskine, commanding the North American and West Indian squadron, was next called upon. There was an unusual noise on the street during the Vice-Admiral's address, and it was impossible for the press to catch all he said. He spoke, in beginning, of the pleasure it gave him to represent the British navy at these ceremonies in honour of the four hundredth anniversary of the first voyage across the Atlantic to the mainland of this continent. Sir James then went on to say that he had heard Principal Grant make a remark, which he thoroughly endorsed, to the effect that he only wished we had Her Majesty in Halifax to-day. He would transfer that remark to John Cabot. He only wished we had that illustrious navigator with us, and that to-day he could take good old John Cabot by the hand and escort him aboard the ship that carries his flag. Vice-Admiral Erskine made a good point when he recalled the fact that this is really the anniversary of another event of the greatest magnitude. It is not the four hundredth anniversary of the event to which he alluded, but the thousandth, for in the year 897 the British navy was founded by Alfred the Great. It could therefore truly be said that Britain's naval flag a thousand years has braved the battle and the breeze. (Applause.) The admiral felicitously drew a comparison between himself and John Cabot in the matter of proclaiming the sovereignty of England over lands new to the British crown, alluding to the time, years ago, when he was ordered to proceed to the extremity of the Australian station, on which he was then serving, and proclaim the protectorate of Her Majesty over the northern part of New Guinea. In this way he had been enabled to become a humble follower of the great Bristol navigator. (Loud applause.)

Lieutenant-Governor Daly was greeted with applause. He said :

Ladies and Gentlemen,—I have received an archiepiscopal command, and I am now about to obey that command, to say two or three words to you. These words shall be, first, that we have here His Excellency the Governor-General, who seems to have been on a voyage of discovery until he at last struck Nova Scotia and Halifax and found himself happy. (Laughter.) I am unable to understand why His Grace the Archbishop, the President of the Society, should ask a landlubber like myself to speak on the present occasion unless it be that I have the honour to be the Lieutenant-Governor of Nova Scotia (applause), an honour that I esteem most highly, an honour that I trust I shall always be able to do justice to. If I had been John Cabot, long before I discovered this vast continent I should have been uncommonly seasick. (Laughter.) Now, ladies and gentlemen, I do not intend to say one word more to you except to rejoice in the fact that I have been able to participate in the ceremonies of

to day, and to know that my name has been honoured by being placed on that tablet. We rejoice to-day in the knowledge that our forefathers really found out this continent, and that we are living to-day a happy, contented people, under the rule of the most beneficent sovereign that ever adorned a throne, and one to whom during the whole week we have been endeavouring to show forth our love, our fealty, our devotion. (Loud cheers and applause).

W. Howell Davies, ex-Mayor of Bristol, having occupied that position last year, was called upon as the first speaker representing the ancient City of Bristol from which the Cabots set forth 400 years ago. He began by saying that he had received a cable stating that the foundation stone of Bristol's Cabot monument had been laid by the Marquis of Dufferin amid great enthusiasm, in the presence of 50,000 people. Mr. Davies said he thought the world did not sufficiently recognize the merit of Cabot's great work, his discovery being the greatest event of the Christian era. Cabot belongs to the English speaking people. Statues had been erected to men who had done incomparably less than this great navigator. He threw out a suggestion that monuments in memory of John Cabot might be erected in the form of lighthouses along our coast. It was gratifying that Halifax people were taking part in these commemorative ceremonies as were the people of Bristol. Mr. Davies contrasted the Bristol of Cabot's time with the Bristol of to-day, with its population of 350,000 people. (Applause.)

W. R. Barker, J.P., ex-Mayor of Bristol, was the next speaker. Mr. Barker said :

We who have come as a deputation from the historic city of Bristol have felt during our brief stay in your interesting city of Halifax that there has been a three-fold significance in the gatherings of the week. First, in receiving the courteous invitation of the Royal Society to send representatives on this occasion, the corporation of Bristol recognized a kindly desire on the part of the authorities of Halifax to recognize the community of interest, feeling and allegiance which exist between these widely separated parts of our great empire ; it is in that spirit that they cheerfully responded, and it is in that spirit that we have come amongst you and have taken part in your proceedings. I have found it difficult to realize that I am so far from home, because everywhere I have met with those who speak my own English tongue and acknowledge my own state obligations. In this sense we have simply come to pay a visit, and a very pleasant one it is, to our kindred beyond the sea.

It is also evident that taking Halifax as representing Nova Scotia, there is a link connecting the two cities on account of all that stands related to the great discovery made by John Cabot four hundred years ago this day. We are proud to be known and recognized as citizens of the Bristol which then sent forth the expedition which had such far-

reaching results, and which laid the foundation of that extension of empire which is now the wonder of the world.

Last, but not least, there is the celebration of the Diamond Jubilee of our Gracious Queen-Empress, in which we have joined hands and hearts with you. It is true that in coming to Halifax just now we have lost something in being unable to take part in what has been going on in the mother land, but we have gained something also in coming into contact with the unbounded loyalty of Canada, and in being received with the utmost kindness by those who have made us feel that we are not strangers to them, but near relations.

These three elements are not separate constituents, but are intimately related, inasmuch as Cabot's discovery of this great continent led the way in the development of the vast empire throughout the length and breadth of which Queen Victoria has this week been honoured, while the Royal Society is doing a noble work in carrying on its researches concerning the history and all the possibilities of this important part of the empire.

We have observed with the greatest pleasure that you have been good enough to attach our names to the inscription on the memorial which your Excellency has now unveiled, and that not because it is our names that are recorded, but because for all time it will be seen that it is our connection with Bristol that causes us thus to be recognized. It is a graceful act on the part of the citizens of Halifax thus to link their city with ours, and I can assure your Excellency that not only the corporation of Bristol but the city generally, will appreciate the partnership and good-will that is thereby expressed.

I should like it to be remembered to-day that although John Cabot's was the first successful voyage of discovery, it was by no means the first that Bristol sent forth. In 1480 certainly John Jay, a Bristol citizen, fitted out a ship of 80 tons burthen, which went forth on the same quest, while it is on record that during seven years preceding Cabot's time an expedition was annually sent forth to settle if possible that mysterious problem as to what lay beyond the western horizon. This is an example of courage and pertinacity worthy of any community, for it showed that then as now Englishmen do not know when they are beaten.

It is curious also to remember to-day that when Cabot made his discovery he did not realize its importance. He found what he did not seek. He sought only a new way to well-known regions. He found what was far more important, a new continent which the peoples of the Old World have been developing for four hundred years. To take a Scriptural illustration, Saul went forth seeking his father's asses and found a kingdom. Cabot sought a short cut to known regions and found a new world.

We who now travel between England and North America in one or other of the greyhounds of the Atlantic ought to remember to-day the

difficulties John Cabot contended with and overcame, and we who are always searching after historic accuracy ought to rejoice to-day that recent research has so far enabled us to clear up this mysterious story as to enable us without a misgiving at least to give honour where honour is due.

I have purposely refrained from alluding to what is being done in Bristol in commemorating this great event to-day, because my honoured friend and co-delegate, Mr. Davies, is the chairman of the Bristol committee who have had charge of the undertaking, and he has told you all about it.

I will only add that when we return to our home it will be with the remembrance of all the kindness we have received, and with the hope that our coming here will help in some small measure to cement the good feeling existing between these distant parts. Our coming and going as individuals will be a matter of little moment, but if you will accept us as representing the many thousands of our fellow-citizens in Bristol our visit will have abiding results.

Signore G. Solimbergo, consul-general of Italy, representing on this occasion the city of Venice, was received with cheers. He said :

It is not without feelings of heartfelt emotion that on the present auspicious occasion I offer to your Excellency the Governor-General of the Dominion, to the members of the Royal Society of Canada, who have assembled in numbers to honour the memories of John and Sebastian Caboto, and to delegates of affiliated societies, as well as to other distinguished guests, I offer, I say, the greetings of Italy, a nation bound to England by intimate ties of friendship ; and also the congratulations of Venice in particular, on this the shore which was first discovered and visited by her sons.

This is not merely a form of speech suggested by the occasion—it is more—it is, as it were, a homage rendered to all of you, who to-day, dwelling in a country which is prosperous and great, call to mind the humble labourers of days gone by, from whatsoever corner of the earth they came, and with due solemnity fully recognize their claims to enduring fame.

You come yourselves from a powerful race of illustrious navigators, bold explorers and conquerors of many lands and many seas—and in the plentitude of glory—with a history alive with glorious traditions you make yourselves just distributors indeed, and without any jealous discrimination you glory still more in tendering a solemn recognition, of the fame of others. Your presence here to-day shows that you are desirous of doing honour to a daring Italian navigator, who, four centuries ago, led by some mysterious intuition, that I may be allowed to call the polarization of genius, and confidently relying on the guidance and protection of God, was the first to set foot on these shores, after perilous wanderings on the face of the deep. (Applause.)

The history of Italian maritime republics contains numerous records of adventurous seamen who sought to discover new continents across unknown oceans, and not the least celebrated among these explorers were the Cabotos, who, like feathers of the winged Lion of St. Mark, centuries ago landed on these northern shores, then desolate, now swarming with restless life and activity. The history of your friends and kinsmen of Old England is filled with names of similar heroes, and proves to the world that they have taken the place and inheritance of those republics to which I have referred. The grand record of events of British history seems destined never to be closed. When we look at the map of the world, the impress of Britain's footstep may be traced almost everywhere. Wherever her sons are scattered, under any sky or in any climate, on the shores of the sacred Ganges or in the plains or forests of Australia, in darkest Africa or among the Polar icebergs, the British flag waves proudly triumphant, always in the van of progress and civilization. The wondrous history of that flag teaches us in what way empires are founded, built up and firmly established. In truth, it seems as if to the Anglo-Saxon race were confided by Heaven the genius of colonization possessed by the ancient Phœnicians, as well as the science of pushing new countries into the current of modern life, holding them by ties of liberty, and effectively attaching them to the mother country by all the humanizing agencies of civilization.

Personally—and I am proud of the fact—I have had the good fortune of seeing and studying the British colonies of the far east, and I have now the greater good fortune of studying with unfeigned admiration the Dominion of Canada. Emigrants from certain countries in old times abandoned Canada, fearing to encounter hardships and difficulties which are naturally met with in a new land; but England and you Canadian citizens have demonstrated to the world how such a country can be raised to the highest degree of civilization and prosperity. (Applause.)

The present ceremonial, to which you have cordially invited us, and for which invitation I personally, as an Italian, heartily thank you, must have a highly educational significance in the eyes of every thinker. And that is the reason why Venice, the fall of whose republic took place exactly one hundred years ago—Venice, whose city, in the words of Byron, resembles a dream, and her history a romance—that is the reason, I repeat, why Venice could not miss the honours which you are now bestowing upon her sons, and, accordingly, the Italian Geographical Society, always ready to initiate or aid any useful enterprise, wished to be here represented, while the Italian Ministry of Public Instruction also desires to be present in spirit.

To attract the minds of the rising generation to striking examples of self-denying heroism, tenacious will, and civil virtues—to elevate public

sentiment and mould the plastic character of the youth of this great Dominion — such, I take it, is the meaning and object of to-day's ceremony.

And now, not to weary you with my Italian English, long live the Gracious Sovereign who for sixty years has occupied the most conspicuous position in the history of the British empire. May a large increase of prosperity be added to this already prosperous Dominion, which to-day, in memory of the Caboto, unites the British colours with those of my beloved fatherland, Italy. (Applause.)

Following the speech of the Consul-General, Hon. Mr. Justice Sedgewick called for three cheers for the King of Italy, which were given with a will.

United States Consul-General Ingraham was then called on. He expressed thanks for the opportunity to speak, laughingly remarking in passing that such an occasion as this would not be complete without a representative from the democracy among so much royalty. The United States people had always considered Queen Victoria a good friend of theirs, promoting peace and good-will. Her message in response to that of the President, in which she referred to the people of the United States as a great nation of kinsmen, touched the hearts of the people of the republic, a people who claim part of the honour of the great name of John Cabot. (Applause). Mr. Ingraham spoke of the mutual interests of the three great Anglo-Saxon peoples in the British Isles, in the United States and Canada. When we look, he said, at the figures representing the trade of Canada with the United Kingdom and that of the United States with both, the mind becomes bewildered in endeavouring to grasp the magnitude and realize the significance. Four-fifths of Canada's total trade of \$239,000,000 in value is divided between the United Kingdom and the United States; \$99,000,000 between Canada and Great Britain and Ireland; \$103,000,000 is between Canada and the United States, and \$581,000,000 is the total between the United Kingdom and the United States, aggregating \$783,000,000 as the fabulous total values of trade and commerce among the three kindred nations during the single year preceding the 400th anniversary of Cabot's discovery. The Consul-General concluded by expressing the happy opinion that such a thing as war between Britain and the United States was an impossibility. When any question of disagreement arises it will pay to send the bellicose politicians to some hotel at the nation's expense and settle the matter in peaceful arbitration. (Applause.)

Hon. J. Boyd Thacher, of Albany, N.Y., referred to the happy coincidence of the jubilee of Queen Victoria and the celebration of the 400th anniversary of the Cabot voyage. His personal business was to take part in the exercises of to-day, but it was his great pleasure on Tuesday to lift his hat and voice in homage to the royal woman who taught the

useful lesson that it is the greatest greatness to be good. When she received her crown and sceptre, and when the golden ball was placed in her hand by the Archbishop of Canterbury, Victoria's question regarding her queenly power was, "What shall I do with it?" Not England, not the Primate, can answer the question alone, but the whole world replies: "She hath done well." Each age has its own star, its own spirit; the spirit of this age was that there should be unity of mankind, and the object to be gained the happiness of the entire world. (Applause.) The significance of the great power of the British people, a power dominating one-fifth of the world's population, was not that God had sought out the British people to give them this great power, but that He sought a great woman and a great people competent to wield so world-wide a power. The spirits dominating this age are the spirit of peace and arbitration, the great spirit of the unification of mankind. (Applause.)

The gathering then broke up with cheers for the Governor-General and Countess of Aberdeen and the Queen.

Immediately after the proceedings the Royal Society authorized the sending of the following cablegram:

HALIFAX, June 24.

J. W. ARROWSMITH,
Belgrave Road, Clifton, Bristol.

Cabot tablet unveiled by the Governor-General. Large and enthusiastic gathering. This greeting to Bristol.

ARCHBISHOP OF HALIFAX,
President R. S. C.

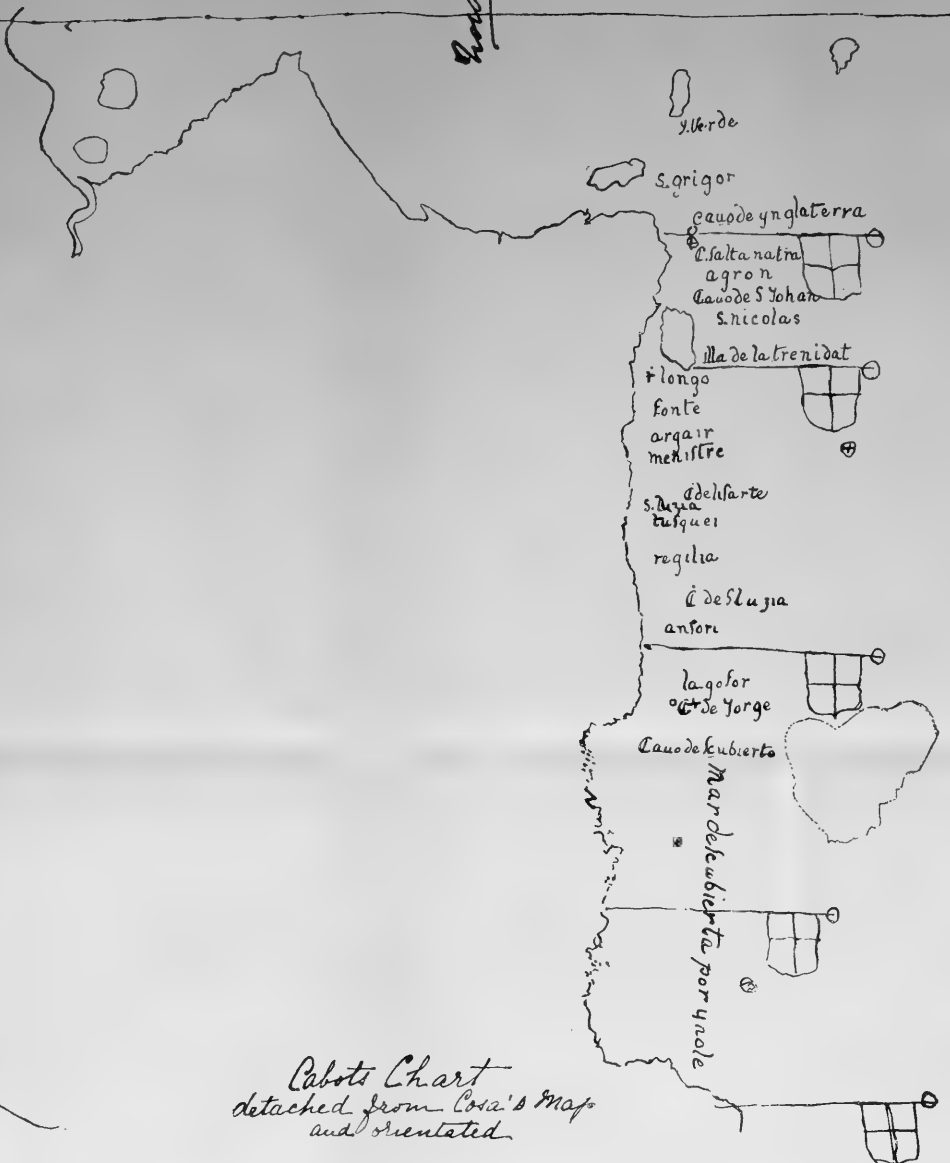
The presidential address was delivered in the evening, in Orpheus Hall. His Excellency the Governor-General presided, and on the platform were also seated the Countess of Aberdeen, several members of the Royal Society, the representatives of the city of Bristol and others.

The presidential address, as well as the papers presented by Messrs. Barker and Davies are printed in their order in the following pages.

Votes of thanks were tendered to Messrs. Barker and Davies for their presence in Halifax, and to the Governor-General for presiding at this meeting.

The meeting broke up with cheers for the President of the Royal Society and the Bristol delegates.

~~North~~



Caboto Chart
detached from Cosa's Map
and orientated



PRESIDENTIAL ADDRESS ON CABOT'S LANDFALL.

By MOST REV. ARCHBISHOP O'BRIEN, D.D.

Whilst there is no fact more certain than the activity of the human intelligence in the various epochs of which we have knowledge, and whilst it is admitted that it is essentially active, still there is an increasing tendency to belittle, or even ignore its achievements in the past. To confine ourselves as seems fitting on this occasion, to geography, we see how in our own day, men have been proclaimed wonderful discoverers for finding places in almost the exact spot in which they had been laid down on maps, for centuries. It would be well if institutions of learning, which call themselves universities, instituted a chair of Ancient, and especially Mediæval Cartography.

We know, indeed, that some men of certain scientific attainments, would as soon think of swallowing poison as of reading a mediæval book. And yet, no one can be a scholar who has not studied not only classic and modern literature, but also the wonderfully rich one of the Middle Ages. It is to modern discovery, progress and invention, what those ranges of elevated ground called "watersheds" are to the rivers which fertilize the plains, and bear the country's commerce to the seas. A very slight acquaintance with the cartography and literature of the Middle Ages, would be a revelation to the average university graduate. The source and course of the Nile were as well known as those of the Tiber; the Northern lands, such as Iceland and Greenland, with the numerous islands of the Arctic Ocean, had regular communication with various parts of Europe.

Greenland was known in Europe early in the eleventh century; the Gospel was preached in it before the year 1100; and the Episcopal See of Gardar founded shortly after. In the archives of the Vatican, I saw and had copied, a Bull of Pope Innocent III. of date 1205, addressed to the Metropolitan of Norway, in which he recites how his predecessor Eugene (who was Pope from 1145 to 1153) had sent Nicholas, Bishop of Albano, as his legate to "those parts." This legate bore the pallium to the Metropolitan of Norway, and appointed amongst other things, that the bishopric of Greenland should be subject to said metropolitan. It is quite possible, in fact the Bull seems to imply, that the legate visited Greenland. In any case, there was a continuous succession of bishops from 1145 to

1492, the year in which the last one was consecrated in Europe for Greenland. The sad fate which overtook the country was then hemming it in, for the bishop never reached his diocese. In the archives, too, I saw and had copied the minutes of the consecration of a certain Bartholemew, as Bishop of Greenland, on the 24th of September, 1434. I refer to these facts to show beyond all doubt that both Columbus and Cabot, and all scholars of the period, were well aware of the position of Greenland; the voyages to it were not "vague traditions" but facts of their own time. Tarducci thinks Cabot ran along the east coast of Greenland to the $66\frac{1}{2}$ degree, without recognizing it; that might have happened to a navigator 150 years later, when Greenland had been forgotten, but it could not have happened to Cabot.

No doubt the religious disruption of the sixteenth century, by which Norway was separated from communion with Rome, following after the invasion of Greenland by pirates, is the reason this latter country was lost sight of for many years.

Discoveries went on during all the ages; gradually the horizon of human intelligence, as well as that of the visible world, was broadened, and made more clear. We are met to-night to celebrate a discovery of surpassing interest to us. It is the basic fact on which our charter of rights, our title deeds to this land rests. The man, or rather the two men who gave England a vast colonial empire, are worthy of consideration both in themselves and because of their achievements.

In commemorating the discovery made by John Cabot on these shores, the Royal Society has not committed itself to any conclusion as to the precise spot of the landfall; neither has it denied or affirmed the proposition held by some, that the discovery was made in 1494. We commemorate the four hundredth anniversary of the setting up of the English flag on these western shores, and the formal act of taking possession of the country in the king's name. Beyond question this was done in 1497. We associate with this, the discoveries of 1498, which may be looked upon as the complement of the voyage of 1497. It is necessary to make this explanation lest the action of the Royal Society should be misinterpreted or misunderstood. Individual members have our views as to the exact site of the land first seen; like a patient mother in the midst of her children, the society will listen to our arguments, perhaps smiling approval at our cleverness, but committing herself to none of our theories. She will be as silent, but less soulless than the Sphinx.

Whilst comparatively little is known of the history of John Cabot, very much has been written concerning his landfall. In this way there is no dearth of Cabotian literature. It is not my purpose to review it in detail. Each writer (we speak of studied works, not of hastily written sketches) has contributed his share towards the elucidation of the question. The archives in London, Madrid, Venice, Milan and elsewhere

have been ransacked, their hidden treasures brought to light, and have now become common property. These documents, together with extracts from Peter Martyr, Ramusio, and other writers, bearing on the subject, may be consulted in various works, especially in Tarducci's "John and Sebastian Cabot," by those who have not time or opportunity for original investigation. A judicious use of the material supplied by writers contemporary and almost contemporary with the Cabots should determine the point at issue.

Of those who have written on the site of the landfall, some have been intent on making a hero of the father; others, of the son; others again have set out with a preconceived theory as to the point discovered; whilst still others have, no doubt unconsciously, allowed national prejudice to bias their judgment regarding the trustworthiness of writers not open to suspicion. Now, we are not warranted in drawing any conclusion not contained in authentic documents; our predilections, or wishes, or aversions are not to be wrought out into concrete historical facts.

On what part of these western shores did John Cabot land in 1497? Some say on the Labrador coast; a few maintain that it was on the north of Newfoundland, say Cape St. John or Bona Vista; whilst others assert that the Island of Cape Breton is the spot. Were the parties equally armed with evidence, there would be an interesting literary tournament, for there be brave knights in each list. Our society can claim a very conspicuous one in the person of Dr. S. E. Dawson, a champion of Cape Breton's right to the honour of being the first land discovered. That on the 5th of March, 1496, John Cabot asked of King Henry VII. letters-patent for himself and his three sons empowering them to carry the English flag and to search all seas, and to plant the flag on such islands or regions as they should find, and which had hitherto been unknown to Christians; and that on the same day the king granted these letters is proved from papers still preserved in the Public Record Office, London.¹

As Cabot did not sail until May, 1497, some have conjectured that the delay was owing to remonstrances on the part of the Spanish Government. The theory is ingenious, but not required to account for the delay. Cabot was a poor man; it was no easy matter for him to procure a ship and the necessary outfit by the beginning of summer. As he was to sail to the north of the Spanish possessions, on an unknown sea, he would scarcely venture to leave later than that. Hence he was obliged to defer his departure until the following year.

Early in May, 1497, he sailed from the port of Bristol on his epoch-making voyage in a small vessel called the "Matthew," carrying eighteen persons, nearly all of whom belonged to that place.² Regarding the

¹ We do not consider it necessary to give them in full.

² Raimondo da Soncino's letter, Appendix B.

success of this voyage, we have most precise information from very competent authorities. The first is Lorenzo Pasqualigo, a Venetian merchant living in Bristol. For centuries his countrymen had been the greatest navigators of Europe, and his native city the chief centre of nautical learning. We may be well assured that the expedition of Cabot had for him a special interest. As a shrewd merchant, he was thoroughly conversant with the business enterprises of the day, and keenly alive to all opportunities of extending his trading operations. It requires no effort of the imagination to realize the excitement created in mercantile circles especially, on the return of Cabot from an expedition, the object of which had been to open up new sources for commerce, and to establish a trade between England and the country of the Grand Kham. The business habits of Pasqualigo would lead him to seek accurate information regarding the results of the voyage, and as a countryman of John Cabot he would have special facilities of acquiring it. His letter, from which we shall quote, is dated at London, 23rd August, 1497, and is addressed to his brothers in Venice. It would seem from the letter that he had previously informed them of Cabot's departure, for he says, "That Venetian of ours who went with a ship from Bristol to find new islands has returned, and says that at a distance of seven hundred leagues he found land, the country of the Grand Kham, and that he coasted along it for three hundred leagues, and that having landed he saw no one. But he has brought back certain snares that had been set to catch game, and a needle for making nets, and he found trees cut down, whence he concludes that the place is inhabited. * * * The discoverer of these things set up a large cross on the land he found, together with the English flag, and one of St. Mark, as he is himself a Venetian, and thus our banner has been carried afar."¹

The next authority is equally unexceptional, viz., Raimondo da Soncino, ambassador of the Duke of Milan to England. He was an educated man, a keen observer, and in a position that required he should transmit a full and reliable account of an event of such importance as was this new discovery. Duty, as well as self-interest, would spur him on to this. On August 24th, 1497, he wrote a hurried note informing his master of Cabot's return, and that he had found "two new islands very large and fruitful, and also had found the Seven Cities distant from England four hundred leagues."² It is to be observed he does not assert, as some have imagined, that the two islands were distant only four hundred leagues. The text forbids that reading, for after having stated that Cabot had found two islands, etc., which may be any distance away, he adds "and he has also found the Seven Cities distant four hundred leagues from England."³ This distinction should be borne in mind,

¹ Appendix A.

² Appendix B.

³ See original Italian appendix B, "*Et etiam ha trovato le sette citta,*" etc.

otherwise difficulties will be created, not by da Soncino's letter, but by our misinterpretation of his words. This hurried note containing the first wild rumours was followed later on by a lengthy and minute account of the voyage, the course taken, and the results achieved. This letter was not written from hearsay, he had his information from John Cabot himself. Bearing this in mind, and remembering who and what da Soncino was, and to whom he is writing, the conviction will be forced upon us that his narrative is perfectly accurate. The whole letter is most interesting, and we would search the archives of history in vain to find a more luminous or a more sincere document on any question. It is dated 18th December, 1497, and sets forth who and what sort of a man Cabot is. He then tells the conditions on which he had secured the royal privileges, and how he set out from Bristol in a small ship with eighteen men. The course taken is given as follows: "Having passed to the west of Ireland, and having gone higher up towards the north, they began to sail to the eastern parts, leaving, after a few days, the north on their right hand, and having wandered much, they at length reached land, on which they raised the royal flag, and took possession of it for the king, and having secured certain evidences (or proofs of the reality of his discovery—no doubt the snares and needles of which Pasqualigo speaks), he returned." We learn from this that after a slight deflection to the north, the course steered was due west. We are told that the land was excellent (*optima*), the climate temperate, and they thought both silk and the prized Brazil wood grew there. This agrees with Pasqualigo's statement that the islands were "most fruitful," and supplies an unanswerable argument for localizing the place. The writer then tells us that John Cabot intends on his next voyage to seek a passage, by the northwest, to the eastern countries, explaining how this was to be accomplished. Now we know that this is precisely what was attempted in 1498 by the Cabots; hence da Soncino's knowledge of it in December, 1497, must have been derived, as he asserts it was, from John Cabot; this is an additional proof of the reliability of his narrative. His bit of pleasantry at the end has been variously interpreted by those whose brains are impervious to a joke. It is a delightful ending to a charming epistle, and piquantly summarizes the popular excitement.

The question now arises: Do the letters of Pasqualigo and da Soncino furnish sufficient data to enable us to locate the site of the landfall? All who have hitherto treated the subject think not; theories are advanced, the variation of the compass is discussed, and almost invariably the testimony of writers who recount the incidents of the second voyage is adduced in support of a special line of argument.¹ Now, theories have no place in a discussion of facts; learned dissertations on the variation of the compass have, no doubt, an academic interest, but they are not germane

¹ Even Mr. HARRISSE does this in his latest work.

to this controversy: and it is surely evident that accounts of the second voyage should not be invoked when writing of the first. We must never forget that, apart from a casual mention of the first voyage by the Spanish Ambassador, the only writers who treat of it are Pasqualigo and da Soncino.¹ It is a matter for rejoicing that their testimony is unimpeachable, and that a careful study of their text enables us to locate the landfall with the precision almost of a mathematical demonstration.

From Pasqualigo we learn that the land discovered was about seven hundred leagues distant from England; da Soncino tells us the direction taken by Cabot. Confined to these two data, and mixing, as many have done, accounts and incidents of the second voyage with the clear story of this one, we need not wonder that Labrador, Newfoundland and Cape Breton should find champions of their claims. The distance can be reconciled with any of them, and each theorist is able to argue ingeniously in favour of his chosen site. Dr. S. E. Dawson's argument from La Cosa's map would be strong were the map interpreted aright, but by making Cavo de Inghlaterra, Cape Race, Cavo Descubierta must be near New York. It seems strange that a passage in da Soncino's letter, which settles beyond yea or nay, the approximate position of the landfall, should have been overlooked or ignored. The clever Italian knew whereof he was speaking, and used no vague expressions, and referred to no indefinite or undetermined places. The mediæval writer is too readily accused of lack of "critical method," or of some childish unmeaning vagueness, when his reader fails to grasp his meaning. Now, da Soncino tells us that "this Mr. John (Cabot) has a map of the world on a plane, and also on a solid globe, which he has made, and he points out where he landed, and going to the east (that is by way of the west), he passed considerably the country of Tanais."² This passage is analogous to the one in Peter Martyr's account of the second voyage, in which he says Sebastian Cabot sailed south almost to the same degree of latitude as the Straits of Gibraltar. It was most natural that in giving an idea of the positions they had reached on unknown shores, the early navigators should compare them with well known places in the old world. As we shall see, Tanais is no indefinite or general name for eastern lands, but a very definitely marked country, and one well known to educated men in da Soncino's time. Now, Cabot went considerably past it, either longitudinally or latitudinally. It could not have been the former, for Tanais was east of England, whilst Cabot had gone west, and he knew he had not circumnavigated the globe and come between Tanais and the furthest

¹ All subsequent narratives relate to the second voyage, or fuse the two into one. It is only by a careful collation of them with Pasqualigo's and da Soncino's accounts that we can elucidate them.

² "Ha passato assai el paese del Tanais." Assai like the French *assez* means, somewhat, considerably, or to some extent.

east. Hence he had passed its latitude, and he had gone either north or south of it, according as we shall find Tanais above or below the latitude of Bristol. Once we have located the "country of Tanais," we shall have a clew that would have saved reams of MSS. had it been picked up years ago.

The River Don was formerly called Tanais, and was looked upon as the dividing line between Europe and Asia.

Qua Vertice lapsus
Rhiphæo Tanais diversi nomina mundi
Imposuit ripis, Asiæque et terminus idem
Europæ, et mediæ dirimens confinia terræ.—*Lucan.*

On its devious way southward, it takes at one point a sharp bend to the east, then sweeps to the south, and finally runs back westward, forming an irregular crescent, from the lower corner of which it flows south to the Sea of Azov, formerly Palus Moeotis. On Ptolemy's map¹ the country of Tanais is marked in this crescent, and in the letter-press he tells us that the Tanaitæ dwell in the region included in that bend of the river. The City of Tanais² was lower down, at the mouth almost of the river, and not precisely in the country of Tanais, being rather on what was then called the Asiatic side. Early in its history the town of Tanais had, by reason of its commercial importance, risen to such power that it freed itself from the domination of the kings of the Bosphorous, and remained a great trading emporium for many centuries. Doubtless Cabot had gone thither in his youth.³ This great commercial mart had made the country of Tanais well known throughout Europe. Hence we are able to appreciate the appositeness of Cabot's or da Soncino's illustration. If, now, we look on the map, we see that the Don begins its great bend just above the fiftieth degree, and the lower corner of the crescent is in the forty-eighth; hence the country of Tanais lies between the fiftieth and forty-eighth degrees. The town of Azov is the successor of the city of Tanais, but it is somewhat southeast of the ancient site. Bristol is above the fifty-first degree, consequently Cabot on his historic voyage must have gone south of the latitude of the country of Tanais, since he "passed it." We have thus a third known quantity which enables us to solve the problem. The landfall is seven hundred leagues distant from Bristol; it is west of that city, and it is somewhat (assai) south of the forty-eighth degree. The premises rest on unimpeachable authority; the conclusion therefrom emphatically and inexorably excludes Labrador, Cape St. John and Bona Vista. The only place which fulfils all the conditions, viz., west of Bristol, distant seven hun-

¹ Bertius' edition.

² See Mercator's and Blaeu's maps, as well as Bertius' Ptolemy.

³ A collection of voyages by Venetians to Tanais, Persia, India and Constantinople was published at Venice in 1544.

dred leagues, and south of the country of Tanais, is a point on Cape Breton Island, either on the Atlantic coast, or within the gulf, to the southwest of Cape North. Of this there can no longer be a reasonable doubt, since we have shown that the landfall must be south of a definite latitude, viz., that of the country of Tanais. We may add that this established conclusion confirms the accuracy of some, at least, of the legends on the map of 1544, and inferentially establishes that Sebastian Cabot supplied the information they contain. We have no need to invoke its assistance, we give it ours.

Now that we have established beyond question that the landfall was on Cape Breton Island, those interested in the Cabotian voyages can concentrate their efforts on still further localizing the position. A careful and dispassionate study of Pasqualigo and da Soncino's letters will enable us to unerringly identify the two islands first seen. We must accept as trustworthy all their statements and reconcile them with known facts. It is illogical, uncritical, and unscientific to accept a portion because it suits our theory, and reject or try to explain away the rest. This is only justifiable when the statements involve an impossibility, or a wild improbability. In the present case, this cannot be maintained. Where then was the landfall? It could not have been on the Atlantic seaboard of Cape Breton Island. Da Soncino in his first letter says the "Islands are very large and fruitful". And in his second one, that the "Soil is excellent." They even think that silk and the precious Brazil wood grow there. This could not be said of any island on the seaboard, least of all of Scatari, which is a dreary waste of bog and rock. Nor could it be said of the iron-bound coast line around the cape called Cape Breton. So desolate is the place that it remains to this day undisturbed in its sombre grandeur, actually unvisited, so far as can be ascertained, by any one. Mr. Harrisse thinks da Soncino's description applicable to any part of America. Possibly, if one sailed by, at a distance from the shore, but Cabot landed on the islands. He would not mistake rocks for "excellent soil," nor would he think morasses particularly "fruitful." We shall also see that Pasqualigo's testimony to the effect that Cabot coasted for three hundred leagues—and we must take him to mean leagues in this connection, as well as when he speaks of the distance of the islands from Bristol—cannot be reconciled with the theory of a landfall on the seaboard. Therefore we must seek it within the gulf. There we find verified all the minute particulars related by Pasqualigo and da Soncino, particulars which they, without doubt, had from John Cabot. We are aware of the many arguments made use of by learned men to show the improbability, nay, even the impossibility, of a landfall within the gulf. Too much erudition in discussing a plain matter of fact and evidence is, at times, more hurtful than beneficial to the cause of truth. We must enter a decided protest against mapping out John Cabot's course on a

chart, as if he had sailed in a modern ocean greyhound, supplied with the most recent nautical apparatus, aware of the various Atlantic currents, able to take the correct longitude of his position every day, and making for a well-known goal. If we read the log kept by a navigator many years later, we shall realize how immensely different was the fact from the fancy picture painted by nearly every writer who has treated of the voyage of 1497. And the strange thing is, each writer has been able so to manipulate the compass, or to turn the tiller at an opportune moment, or to find some new angle of variation, which enables him to triumphantly land Cabot at the spot desired. Authentic descriptions of the places discovered are of very minor importance to the learned theorizer. The reality, however, is this: we are to see a little schooner buffeted about for six or seven weeks on an unknown ocean, making, as well as it can, towards the west, but with no objective point in view, and no accurate means of knowing the longitude. The master is a valiant seaman, but he is on untried waters, without a chart, and consequently, ignorant of currents, both on the deep and near the shore. Now we have the fact that this schooner, after "having wandered much," finally approached the shores of Cape Breton. Could it have wandered into the gulf? What more easy or more probable? Having been carried to the southeast of Cape Race by the Arctic Current, perhaps, also, by the wind, Cabot resumed, as soon as a favourable breeze sprang up, his westward or, for a time, a northwest course. Soon he would be caught by the current which sets inward in a north-northwest direction on the east side of Cabot's Straits. The resultant course would be necessarily some point between west and north. Unless the breeze were very strong it would be about northwest. Were he to continue this course he would run into the Magdalen Islands. But a strong current sets outward on the western side of the straits; caught in this the ship would fall off to the south whilst still advancing westward. We are not making unfounded assumptions. The currents are there, and their effects would be such as we have described. We have it on the authority of a captain of one of our ocean mail steamers, that it is quite possible even now, when the location of the land on each side is well known, and consequently looked for, to pass in the straits on a fairly clear day without sighting land; and also that a vessel steering west from near Cape Ray would sight land in the gulf, southwest of Cape North. Two other captains who know the gulf thoroughly, have informed me that you may pass in on what may be called a clear day without seeing land on either side. All this proves the reasonableness of our position; facts to be adduced establish its absolute correctness. Having wandered into the gulf they saw early in the morning, land, probably Mount Squirrel, 1230 feet high, to the southwest of Cape North. We know they landed and set up a cross and the English flag; but we know too, from Pasqualigo, that through fear or doubtful of their reception by

the natives, (*per dubito*), they remained ashore for a short time only. Hence they must have been back aboard by 8 o'clock a.m. Resuming their western course in the placid gulf, by 6 o'clock¹ they would be well abreast of the "large island" lying not opposite, nor "ex adverso," both of which are mistranslations of the original Spanish, but lying in the same direction, or parallel with the mainland. How exactly this describes the position of Prince Edward Island, a glance at a good chart will reveal. Here we find verified the descriptions of Pasqualigo and da Soncino. The appearance of Prince Edward Island, approached from any point, is most striking. The Micmacs knew it as *Abeigwit*, meaning a something lovely, floating on the water. Truly it does seem to rise and fall on the dark blue waters of the gulf. This fairy-like motion together with the beautiful red colour of its soil, overlaid with an emerald carpet of softest mosses and millets, and studded, as it was when Cabot saw it, with shapely beech and birch, maple and fir, in all the glory of their summer foliage, could not fail to impress the hardy mariners. They had good reason to say the islands were "very fruitful," for the gulf shore of Cape Breton differs widely from its Atlantic one; they might well report that the "soil was excellent and the climate temperate"; and considering the unique colouring of the clay and rock, the graceful headlands of Prince Edward Island, and the fascinating beauty of its bays, they may be excused for having thought that here grew both silk and the precious woods of Brazil. There is no island other than that of Prince Edward, either without or within the gulf, to which this description, preserved by da Soncino, is applicable.

Again, Pasqualigo tells us the "waters are sluggish, and the tides are not so high as here." The average tide at East Point, Prince Edward Island, and at Cape St. George, N.S., is two feet, whilst it is double that on the outer shore. But apart from the height of tide, we have it that Cabot reported the water as "sluggish." This could not possibly be said of the roaring waters of the Atlantic, that madly break on the seaboard of Cape Breton; but it accurately characterizes those of the gulf, especially in summer. It is just such casual and apparently unimportant remarks that supply the historian with the most convincing proof, and throw the clearest light on a question.

Another argument, and a most convincing one, is drawn from the fact that Cabot found "snares to catch game," and "needles for making nets." Now, the Indian did not fish in the ocean, but in the gulf; in his frail birch bark canoe he did not adventure the fierce Atlantic waves. In the quiet bays and inlets of the gulf he set his nets, or dipped for fish as he floated idly on the placid waters. We may be sure Cabot did not penetrate far inland. In fact, "through fear," he did not stay long on

¹ No doubt they saw it earlier than that when running to starboard as they beat their way.

shore. Hence the snares for game must have been near the strand. The Indian was not snaring gulls or sea-birds; he was seeking to catch the game that abounded on the shores of the gulf. Moreover, the Micmacs never lived on the sea-coast. It was too much exposed to the storms of the ocean; they frequented the shores of the gulf, where crystal streams were plentiful, game abundant, and their fishing grounds easily accessible. Here Cabot found the snares and needles. All this must be evident to those who know our coasts and have any familiarity with the habits of the Indians.

Finally, we must accept the statement that Cabot coasted for three hundred leagues along the shores of the discovered land. It is no longer a theory, it is now a settled fact, that the landfall was on Cape Breton Island. There is no possible reconciliation of these two facts unless we admit that the land first seen was within the gulf, and that Cabot sailed round Prince Edward Island, went north of Anticosti for some distance, then turned and passed out of the Straits of Belle Isle. The two large islands seen on his right were Anticosti and Newfoundland, of whose size he could have no idea. Some writers on this subject have expressed surprise that Humboldt should have held this theory. It is precisely because he knew and understood navigation, as well as cosmography, that he held it. Dr. S. E. Dawson admits that if there had been time to sail so far we should have to accept three hundred leagues as correct.¹ But because he thinks there was not time for this, he changes them to miles and supposes Cabot to have sailed along the coast to Cape Race without observing the great opening sixty miles wide into the gulf. As Cabot could not possibly see Cape Ray from Cape North, he could not mistake the opening for a bay. Dr. Deane admits if Pasqualigo's statement is true, that Cabot may have made this circuit of the gulf. Pasqualigo's statement is true; he had his information from Cabot. Moreover, we have proved that he entered the gulf. There was ample time to sail round it. Dr. Dawson's computation of Cabot's daily sailing requires elucidation.² It is true that he advanced in latitude only forty-four miles, on an average, a day; but any captain of a sailing vessel will tell you that instead of sailing only 2,200 miles, Cabot, by reason of "tacking," must have actually sailed more than 3,000 miles. We know from Adam, of Bremen, who wrote in the eleventh century, as well as from a log book of 1556, to be quoted later on, that the ships of those periods could sail more than one hundred miles a day. There is no doubt but Cabot's vessel was quite as speedy. Moreover, in a strong breeze the ships of an earlier period were as fast as those of to-day, tonnage being equal, although much slower in calmer weather. Again, in the smooth waters of the gulf, where south and southwest winds prevail all summer, the conditions were most favourable to Cabot.

¹Trans. R. S. C., 1894. ²Ibidem.

Bearing these facts in mind, let us consider the question calmly. On the 24th June he discovered land. Mr. HARRISSE thinks he delayed to catch and salt game. Well, PASQUALIGO says they remained ashore a very short time (*per dubito*), or for fear the natives might be on them. No doubt they caught some fish and took in wood and water. Dr. Dawson allows four days' delay. Let it be so. There is no reason to suppose they arrived home on the 28th July; but there are strong grounds for saying they arrived about the 4th or 5th of August, as the payment of ten pounds by the king, for the discovery, was made on the 10th. Allowing four days' delay, thirty-eight still remained. Now, with a vessel capable of making over one hundred miles a day on the Atlantic, we are quite safe in asserting that Cabot could easily sail nine hundred miles around the gulf in ten or eleven days. Both tide and southerly or south-west winds would be in his favour when passing through the narrowest part of the Straits of Northumberland; after having rounded West Cape, Prince Edward Island, he would have tide and current setting to the north, until well clear of that island. With the prevailing summer winds and smooth water, the rest of his voyage in the gulf and out the Straits of Belle Isle, would certainly be made in eight days. Twenty-seven or twenty-eight would still remain for the voyage from Belle Isle to Bristol. Captains of sailing vessels, the most competent authorities on this question, will tell you that, as a rule, the voyage to Europe is made in one-third less time than the return one. Now, Cabot was going eastward at a season of the year (July) when fine weather and westerly winds are almost a matter of certainty. Moreover, he knew exactly the point towards which he was steering. Under such circumstances there can be no reasonable doubt that twenty-seven days would amply suffice to carry him home.¹ In fact, it is almost certain that he made the trip from the "seven cities" in a considerably shorter time. For the report went abroad that the "seven cities," which had also been found, and which were quite distinct from the "two large and fertile islands," were distant only fifteen days' sail, now that they knew the place. Whatever we may think of the "seven cities" and their fabulous wealth, we must find a reasonable explanation for this part of the narrative. There are not, as many assume, any contradictory statements about the distance from Bristol to the first discovered land. The confusion and contradiction are on the part of those who jump at conclusions without analysing the evidence. Industry of research will procure many reliable documents; but the analytical faculty must be brought to bear on them in order to separate and co-ordinate the facts related. PASQUALIGO is the only one who speaks of the distance of the "two islands," and he gives it as seven

¹ In the log book referred to the voyage from Harwich, England, to the Gulf of Corpus Christi in the White Sea, a distance considerably greater than that from Belle Isle to Bristol, was made in twenty-six days.

hundred leagues. Da Soncino, in his first hurried note, speaks of the finding of the "two islands," says nothing about their distance, but adds that "they have also found the seven cities," which are thought to be about four hundred leagues distant. The Spanish ambassador, too, speaks of the "seven cities," and believes them to be distant four hundred leagues. We have nothing to show how far the islands first seen were from the supposed "seven cities," but they were not the same land. This is perfectly clear from the text of da Soncino. We can easily locate the "seven cities," and thus give an additional proof of our theory. As Cabot neared Belle Isle, Chateau Harbour, with its magnificent scenery, came in view. "It has two wall-sided and flat-topped hills, composed of basaltic columns, which cap the summits of Castle and Henly Islands, and are two hundred feet in height above the sea."¹ We can now readily understand why the crew of the "Matthew" should report that they had found "seven cities." Five centuries previously, as we learn from Adam of Bremen, some Norse adventurers driven thither thought they had found a city. Thirty-seven years after Cabot, Jacques Cartier recognized the likeness of this natural formation to the handicraft of man, and named the place Chateau Bay. We have thus a natural explanation of the report set afloat, no doubt by the crew, of the discovery of the "seven cities," and since they were thought to be so near Bristol, the voyage must have been a short one. After da Soncino had seen and talked with Cabot, he said nothing about these cities, but he gives us the priceless information regarding the soil, climate and richness of growth of the islands, as well as that of their latitude being lower than Tanais. The Spanish ambassador, hearing of the quick run from Belle Isle to Bristol, concluded that it was much nearer than it really is to England. Thus by taking the testimony as a whole, and giving equal credibility to all its parts, any apparent discrepancies are reconciled, and nothing is left unexplained. But, some may say, "Cabot could not have known of the gulf, for it does not appear on maps until many years later." This is merely negative and proves nothing. Moreover, whilst we have Cabot's chart, we have not his map. Again, a hundred difficulties do not make up one doubt, much less do they constitute a disproof. We may say, however, that Cabot had full knowledge of the existence of the gulf after the voyage of 1498, as we shall see. Thus the difficulty would remain even were we to say he did not sail round the gulf, but only out of it, in 1497.

Dr. S. E. Dawson, in his able paper on the voyages of the Cabots in 1497 and 1498,² labours strenuously to show that Cabot did not know of the existence of the gulf, much less of Prince Edward Island—in fact

¹ Newfoundland and Labrador Pilot, 2nd edition, page 361.

² Trans. R. S. C. 1894.

that this island does not appear on maps until more than 100 years later. As, however, he practically admits that he set out to prove Prince Edward Island was not Cabot's St. John, a very unfavourable mental attitude for a dispassionate consideration of historic evidence, we may be excused if we differ from his conclusion. Indeed, several of the maps which he has reproduced, notably Verrazano's (1529), Gaspar Viego's, one from Kretschmer, Rotz's and the Dauphin map, all clearly show Prince Edward Island, not always in its correct position, but as nearly so as numerous other places. Mercator's map (1569) has Prince Edward Island most accurately given. Many other maps, the authors whereof knew that the island of St. John was near the island of Cape Breton, but who had no certain knowledge of the gulf, place the island outside of it. It is extraordinary that men who, like Dr. S. E. Dawson, Pope, Ganong and Bishop Howley, know the gulf and know how it was frequented by fishermen from the time of Cabot's voyage, could think it possible Prince Edward Island should remain unknown. Every one entering the gulf naturally turned west or south, and would necessarily make it. What more secure fishing ground than the waters between East Point and the shores of Cape Breton and Nova Scotia? Shelter within easy reach from any wind, fuel and water in abundance, and excellent beaches for curing fish, would not the fishermen almost by instinct frequent such a place? The rocks of the Magdalen group could have no attraction for them. They were in a more stormy part of the gulf, afforded but indifferent shelter, and their approaches were dangerous. As Jacques Cartier first entered the gulf by the Straits of Belle Isle, and subsequently always steered for the north, he did not recognize St. John as an island. Hence the maps of the Cartier group, do not, as a rule, show it. The Dauphin map, however, does, but reverses its position. Dr. S. E. Dawson, Pope and Ganong say it is one of the Magdalen group; as though an island twenty miles long would be drawn such a size. Moreover, the Magdalens are seen elsewhere, and in their true proportions. But to bolster up a preconceived theory we have serious men identifying the island named Alezay, on the Dauphin map, to the north of what they call the "Greater Magdalen," but which is Prince Edward Island, with Deadmen's Island, a small rock scarcely visible a mile away. We can account for Alezay. I have before me a French map reprinted as late as 1755, on which Prince Edward Island, whilst correctly placed, bears a striking resemblance to the Sam Joam of Kretschmer, and shows the North Cape as an island. Its position to the main island and its relative size prove it to be the Alezay of the Dauphin map.

Lastly, we say it would be impossible for a vessel to enter the gulf through the Straits of Canso, and go north to the Magdalens, without sighting Prince Edward Island; in fact, a north course by the compass would inevitably wreck the ship on the East Point. To sail true north

Port Hood must be first rounded; even a steamer taking that course would sight the island. A sailing vessel "tacking," as in nine cases out of ten must happen, would run, when falling off to the left, quite close to its shores. By consulting an Admiralty chart it will be seen that the first fishermen of the gulf must have known the position and, consequently, the advantages of Prince Edward Island, as we know the Basques did before Cartier's time.

An Old Log Book.

Before treating of the voyage of 1493, a few words may be here inserted in reference to an old log book, which will serve to illustrate to some degree that voyage, as well as the remarks we shall have to make regarding the map of Juan de la Cosa. In volume second, of the fourth edition, of Ramusio's great collection of voyages, printed at Venice in 1606 by J. Giunti, we have what purports to be a log kept by Sebastian Cabot when attempting a passage to Cathay by the northeast in 1556-57. If this date be correct, the log cannot possibly be Cabot's, for we know he was living quietly in England during that period. Stephen Burroughs, however, made a second voyage to the northeast in those years. Whilst there are some indications that the log may be his, it must be plain to the careful reader that the tone, sentiments and general texture of ideas, are more like those of an Italian than those of an Englishman. Certainly Sebastian Cabot visited those northeastern seas, and it is quite possible that portions of his log are mixed up with the records of a later explorer. Apart from the question of authorship, the log is valuable to us, throwing, as it does, such vivid lights on voyages of exploration in the sixteenth century. We are not told the tonnage of the vessel, but as the log speaks of entering very shallow channels, it must have been as small as the "Matthew." We can glean from the log book that, in the boisterous northern sea, this little craft could sail more than one hundred miles a day. On one Saturday at noon they were in latitude $59^{\circ} 42'$ and on Monday at noon in $63^{\circ} 30'$, that is 228 miles in forty-eight hours. On some other occasions we find the rate of speed nearly five miles an hour. This proves that the Bristol schooners in Cabot's day could, under favourable conditions, such as the "Matthew" had in the Gulf of St. Lawrence and from Belle Isle to England, average fully one hundred miles a day. This is not theory; it is warranted by facts. We learn moreover, that, contrary to what Mr. HARRISSE asserts, these vessels did not come to anchor at night when coasting unknown shores, not even a dense fog stopped them, although they then proceeded cautiously and "with the lead in hand," as we are told. When a storm raged or closely packed ice drifted towards them, they sought shelter in a harbour, or to the leeward of an island, until the storm had abated its fury, or the ice

passed by. We find the custom still prevailed of naming islands after the Saint on whose feast day they were seen. Thus our log keeper named St. James' Island on the 25th of July, noting the fact that it was the feast of that Saint. He had also named another island St. Dunstan. It does not appear quite certain whether it was on the 19th of May or a day or two previously. Another point which will serve us when discussing the Cosa map must be noted. Any peculiar or prominent feature of the land was set down minutely in the log to serve, no doubt, as a landmark for future navigators. A few instances may be cited :

1. "We also made out towards the east a round and prominent mountain."

2. Speaking of an island the log says, "It has a certain elevated spot resembling a castle."

3. "The promontory is very pleasing in appearance, the land rising up in the shape of a huge tun."

4. "Coming from the east, Rhegor has the appearance of two mountains joined together in the form of a saddle, or like the hump of a camel."

These will suffice for our purpose of illustration. Soundings were continually taken; depth of water and nature of bottom carefully recorded, and very precise sailing directions for some intricate channels given; they frequently threaded their way during a fog, but "with the lead in hand." Owing to the smallness of their ships, which were easily tossed about, the early navigators had great difficulty in taking the correct latitude. Hence, we can readily account for their mistakes, sometimes only trifling, at other times, especially in rough seas, somewhat important; our wonder should be that, considering everything, they were so nearly correct. The log refers to this difficulty, and the writer, whenever feasible, landed on an island, or on the shore of the mainland, to ascertain more correctly his bearings.

The Voyage of 1498.

Writers who do not carefully discriminate between the accounts of the first and second voyages, naturally fall into an error regarding the object of Cabot's expedition in 1497. He was not seeking a passage by the northwest on that occasion. Hence, he only kept to the north as much as would insure him against encroachments on the Spanish possessions. Not realizing that there could be aught between Bristol and Cathay except islands, some of which might be rich in spices and gold, he had no thought, as he could not have had any, of the need of such a passage. Many of those who uphold the theory of a landfall at Labrador or Cape St. John overlook this, as well as the words of da Soncino, to be quoted later on. But the discovery of 1497 gave a new turn to

Cabot's thoughts. He had found land at $46^{\circ} 30'$, had skirted it northward to the 52nd degree, and he had seen that it stretched still further north. There must soon be an end to this land and then an open sea, down which he could sail behind his new found land, until he had reached the latitude of the coveted eastern isles. Reasoning in this way, John Cabot, first of all men, conceived and propounded the idea of a short route to the east by a northwest passage. This is no mere imagining on our part; we have the explicit testimony of da Soncino, to whom Cabot made known his thoughts and aspirations. After having told us about the location of the new islands, their fertility and the abundance of fish in the surrounding waters, with which his English companions appeared satisfied, Soncino adds: "But Mister John (Cabot) has set his mind on greater things (therefore he had not yet attempted a northwest passage), for he thinks that from that place already visited or occupied,¹ he can coast along, getting more towards the East until he shall be opposite to an island which he calls Cipango, lying in the equinoctial circle, where he says all the spices and jewels of the world grow." He affirms also (from what he had learned when at Mecca), that these things came from the north towards the west. Hence, he went north, not south.

Years later Sebastian Cabot, as related by Ramusio—"Della Navigazioni et Viaggi," Vol. 1—giving an account of this voyage to a Mantuan gentleman, said, "They steered to the northwest, thinking they would not find land until they had reached Cathay." This throws light on and explains the words of da Soncino. One small ship with eighteen men composed the expedition of 1497. But now that greater things were aimed at, amongst others the founding of a colony, as both Gomara² and da Soncino³ testify, five or six ships, with three hundred men, were deemed necessary.

The letters patent of Henry VII. to John Cabot, his deputy, or deputies, authorizing this expedition, are dated 3rd February, 1498, and give power to take six English ships in any port, by paying duly for them, and engaging such of his subjects as may choose to go to the "Lande and Iles of late founde."

From the letter of the Spanish Prothonotary Ayala to his sovereign, dated 25th July, 1498, we know that John Cabot left England as commander of this fleet; that one ship was wrecked on the Irish coast, but Cabot kept on his way. The exact date of departure is not material to our purpose. In the account given by Sebastian Cabot to Ramusio's unnamed informant, already cited, we are told that the expedition set out in the beginning of the summer, and "steered northwest." This is

¹ da quello loco occupato.

² Historia General de las Indias.

³ Appendix B.

the most authoritative account we have regarding time of departure and course taken. There is no reason to doubt its correctness. Gomara's assertion that he took the way of Iceland is only approximately correct, that is, he went to high latitudes.

Bearing in mind what we have shown when treating of the previous voyage, viz., that Cabot came out the Straits of Belle Isle, his reason for taking a northwest course is apparent. He had certain knowledge that the route to Cathay was barred against him up to the fifty-second degree at least. But to make quite sure of avoiding this land, he would naturally go high enough to escape jutting capes and smaller islands still further north. In Ramusio's narrative Sebastian Cabot is made to say he hoped to find no land until he should reach Cathay, but adds, "to his infinite disappointment," he came, after some days, to land that trended north: he followed along the coast, hoping to find an opening through which he might pass, but could not do so; and having reached the fifty-sixth degree, seeing that the land trended towards the east, despairing of success he turned back to reconnoitre the coast toward the south, always with a view of finding a passage to the Indies. There can be no doubt Ramusio's informant gave substantially the words of Sebastian Cabot. We must observe, however, that Ramusio distinctly tells us that whilst he has written down the gist of his narrator's story, he does not profess to give his precise words. Quite likely Sebastian Cabot said something about the fifty-sixth degree, and either the narrator, or Ramusio, took that to be the highest point attained. A very natural and pardonable mistake. But as the land does not trend eastward at the fifty-sixth degree on the Labrador coast, it cannot be the limit of the height reached. In all other particulars we feel assured we are listening to Cabot's own words, so direct and graphic are they, and so much in keeping with what we know to have been his hopes and aspirations.

All authorities agree that Cabot sailed far north on this voyage, and then went back south, carefully inspecting the coast, to see if he could find a channel or strait by which he might pass to reach Cathay. Sebastian Cabot tells us this himself in the foregoing quotation. Antonio Galvao¹ tells how that Cabot turned south investigating, "or exploring every bay and river and gulf to see if he could pass to the other side." The original is "descobindo toda a baya, rio, enseada, p'ra ver se passava da outra banda." Hakluyt translates it, "discovering all the bay and river named Deseado, to see if it passed on the other side." If this be the correct rendering of Galvao's words, and Hakluyt may have had reason to know that "Enseada" was the name of a bay and river, then we have the name given by Cabot to the Gulf of St. Lawrence and to our noble Canadian river, for no other bay or river could be possibly meant. A beautiful and appropriate name, in sooth, it is "The Desired," or "Desir-

¹ In a treatise on this voyage, published at Lisbon by Johann de Barriera, 1563.

able." If, however, we read "every bay and river and gulf," it will be evident that Cabot entered the Gulf of St. Lawrence, if he had not thoroughly searched it the preceding year. In the log already referred to, we see how the little ships crept along the shore, quite close to land, from the distance of half a league to the length of two cables; they did not sail from headland to headland. Cabot, looking for a means of passing "to the other side," most assuredly hugged the shore, and could not, on any reasonable hypothesis, have missed both the Straits of Belle Isle, which are nearly thirty miles wide, and the entrance to the gulf, which is over sixty. He could not fail to see this latter, nor would he fail to investigate such a promising opening for a passage by the northwest. When a preconceived theory can be upheld only by asking reasonable men to become unreasonable, it should be abandoned, like other puerile prejudices, and be replaced by one that may be discussed without undermining the basis of all scientific demonstration. The contention that Cabot did not know of our gulf, founded as it is upon a palpable absurdity, may be dismissed from serious consideration. Peter Martyr¹ who often had Sebastian Cabot a guest in his house, as he tells the Roman Pontiff to whom he is writing, says Cabot, after having gone far north, "went south along the winding course almost to the Straits of Gibraltar," and then returned to England. Ramusio's narrator, already cited, tells us in Sebastian Cabot's words, that they went to the place called Florida, and being short of provisions they returned to England. Although we have no record of their return, it must have been in 1499. They could not have gone over the 8,000 miles or more of ocean, and made the diligent search they did, in less than a year. Moreover, we know that in 1499 there were local disturbances of a somewhat serious nature in England, and danger of war with Scotland at one time. Now, Sebastian Cabot, in his report to Ramusio's Mantuan gentleman, says that "on his return (to England) he found great popular tumults and uprisings, and war in Scotland." Some recent writers, apparently more anxious to belittle Sebastian Cabot than to elucidate the story of his voyages, have accused him of untruthfulness in this statement; but we have historic evidence of its substantial accuracy.²

How far north did Cabot go on this voyage? The answer to this question has more than an academic interest for those who honour the brave old navigator, and who are desirous that he should reap, even at this late day, the glory of his achievements. There are some who say Sebastian Cabot made a third voyage to these regions during the reign of Henry VIII., and that it was then the latitude of $66^{\circ} 30'$ or $67^{\circ} 30'$ was reached. It is outside the scope of this paper to discuss whether or not

¹ De rebus Oceanicis et Orbe Novo. Dec. III., Lib. VI.
For elucidation of this interview see appendix D.

such a voyage took place. We shall cite authorities to prove that under Henry VII., and consequently in 1498, the Cabots went as far north as either $66^{\circ} 30'$ or $67^{\circ} 30'$.

1. Jerome Ramusio, in preface to third volume of "Viaggi," says Sebastian Cabot wrote him years ago that "at the expense of Henry VII. he had sailed as high as $67^{\circ} 30'$."
2. Frobisher, quoted by Hakluyt, III., 38, says, "I find Gabota was the first in King Henry VII.'s days that discovered this frozen land or seas from 67° towards the north, and from thence towards the south, along the coast of America to $36\frac{1}{2}^{\circ}$."

Frobisher, before undertaking his own expedition to the polar regions, had studied all available literature on the subject. Hence his words are quite decisive.

3. Francis Bacon, "The Historie of the Raigne of King Henry the Seventh," pages 196 to 197, speaking of this voyage, says, "He (Cabot) sailed, as he affirmed at his return (and made a card thereof), very far westward with a quarter of the north on the north side of Terra de Labrador, until he came to the latitude of sixty-seven degrees and a half."
4. André Thevet in *Gran Insulaire et Pilotage* (MSS. quoted by Tarducci in "John and Sebastian Cabot," page 341), "A Venetian undertook this voyage by the authority of Henry VII., King of England, and went as far as the sixty-seventh degree."
5. In the preface to Blaeu's great work on cosmography, now so rare, we are told that "by command of Henry VII. of England," a voyage to the north was undertaken by Sebastian Cabot and that "after having discovered the country of Bacalos, and having penetrated to the 67th degree of elevation, was obliged to retrace his steps, owing to the icebergs that blocked the narrow channels of the sea." These words must carry great weight, and are not derived from the same source as the others quoted.
6. Sir Humphrey Gilbert (*A Discourse of a Discoverie for a New Passage to Cataia*) has words similar to those of Bacon's. We may add to these the testimony of Peter Martyr¹ who had from Sebastian Cabot an account of this voyage. Not being a nautical man or a cosmographer he does not mention the degree attained, but says he went so far north that he had "almost continual light." This would require an altitude of sixty-six or sixty-seven degrees.²

¹ Loc. Cit.

² In latitude 66° N. on 31st July there are 18 hrs. 10 min. from sunrise to sunset, and the aurora begins almost as soon as the twilight has waned.

Hence, we can legitimately conclude that to John Cabot belongs the glory of having been the first to dare the mysteries and terrors of the polar seas. His chart confirms this, as we shall now proceed to prove.

Cabot's Chart.

From da Soncino's letter¹ we learn that Cabot had a "description of the world on a plane, and also on a solid globe which he himself had made, and on which he pointed out the place of his landing." The Spanish Prothonotary de Ayala, writing to his sovereign (25th July, 1498), speaks of a chart which Cabot had made. This, of course, refers to the first voyage. No doubt he made a more accurate one during the second expedition. It has been generally taken for granted that those charts have been lost, and many a student, endeavouring to reconcile the various accounts of these voyages, has often sighed "if only we had Cabot's charts." Now, I think I can say with all confidence, that the chart of the second voyage has not been lost. It has been hidden, like many prized paintings, under dust and rubbish, or, more aptly, like a beautiful fresco, distorted and partially veiled by a coat of whitewash, but we have it still. Its true proportions and, consequently, its value, can be readily recognized when restored to its proper position, and the scale on which it was drawn pointed out. Let us take the map of Juan de la Cosa issued in Spain in 1500, before any news of Cortereal's return had reached that country. It is admitted by all that the northern portion of that map, so far as our continent is concerned, must be founded on information derived in some way from Cabot. We have absolutely no historic evidence to broach a contrary opinion. An attentive consideration of Cosa's map will convince the student that he has before him a work made up of two pieces. As the Spaniards knew well, not only the latitude of Cuba, but its length and breadth in miles, or leagues, it is easy to find the scale on which the portion covered by the Spanish flags is drawn. Try that scale on the coast line over which the English flags wave, and you will find it has no possible application. The conclusion is irresistible, viz., that Cosa did not draw the northern portion from information received; had he done so, the scale would have been the same. He simply copied another man's work. Happily for us he did not attempt to reduce it to his own scale, or to tamper with its proportions. He had either the original, or a correct copy, of Cabot's chart, and has preserved it for us, with a translation of the English names thereon.

The next step is to discover the scale of Cabot's shore line. It is scarcely necessary to note that only the chart, properly so called, is Cabot's; the map is the offspring of Cosa's imagination. From what has been said regarding the lowest latitude reached by Cabot, and which, no

¹ Appendix B.

doubt, was known to Cosa, as well as from the configuration of the coast, we are safe in saying the most southern of the English flags is near Cape Henry, latitude $36^{\circ} 30'$. We have proved that the landfall was in Cape Breton Island, in latitude $46^{\circ} 30'$, at or near Mount Squirrel. The "*Cavo Descubierta*" of the map certainly marks the place first discovered. There are many other capes on the map, named either after some Saint, or on account of some natural feature of their formation. But *Cavo Descubierta*, the cape discovered, or rather the cape made or reached (for the expression, *descubrir la tierra*, means to make the land) stands out as something unique. It was the cape first made, as nautical phraseology has it; the point first reached, the landfall. Between the southernmost English flag and *Cavo Descubierta*, a distance of ten degrees, we have as nearly as possible $3\frac{3}{4}$ inches.¹ This gives us the scale of Cabot's chart, and it is a most natural one, viz., 160 geographical miles to the inch, or 20 to an eighth, and, consequently, $\frac{3}{8}$ ths of an inch constitutes a degree. This clue, which is not mere guess-work, but logically deduced from well established premises, enables us to restore Cabot's chart to its proper position, and to satisfactorily explain all its details. With this scale in view, the eye at once sees a distortion in Cosa's map. Cabot surveyed the coast from north to south, not from east to west. He certainly drew his chart to the same scale throughout; he did not place, as a schoolboy might, the body of a giant on the feet and legs of a pigmy. Hence, *Cavo de Ynglaterra* cannot be Cape Race, which, both as regards degree of latitude and length of coast line, is so much nearer any part of Cape Breton, than this latter is to Cape Henry. We say at once that Cosa, having secured a copy of Cabot's chart, joined it to his own, making it run east and west, instead of north and south. This explains not only the apparent incongruity of Cabot's tracings and the fruitless attempts of modern scholars to explain it, but also why Cosa's map was never reproduced and was quickly cast aside. Its merit, however, is that it has preserved to us Cabot's chart unmarred, and enables us, on this four hundredth anniversary, to bring it forth as an unimpeachable witness to its maker's daring, accuracy of observation, and title to glory. We are fully conscious of the responsibility incumbent on one making such assertions, to give satisfactory proof. This we proceed to do.

Let us detach Cabot's chart from Cosa's map and place it north and south, marking this latter as Cape Henry, latitude $36^{\circ} 30'$. Applying the scale already found to the chart, it is seen how accurately, in general, the latitudes are given. *Cavo de Ynglaterra* is slightly above 60° and becomes Cape Chidley; then instead of what was looked upon as imaginary curves in the shore line, or as representing the east shores of Asia, we have Ungava Bay very correctly outlined, then Hudson's

¹ This measurement refers to the original map by Cosa.

Straits and Hudson's Bay. By measuring we shall find that from Cape Henry to the highest point of the chart, where it curves towards the east, there are $11\frac{3}{8}$ inches, or ninety-one eighths. The scale being one degree for every three-eighths, we have thus $30^{\circ} 20'$. This added to the $36^{\circ} 30'$, the latitude of Cape Henry, gives $66^{\circ} 50'$, which is very nearly the exact latitude of the land at the northwest of Hudson's Bay where it commences to trend eastward. The point at Cape Henry may not be precisely $36^{\circ} 30'$, although it is sufficiently near it for practical purposes, and enables us to see how accurately Cabot laid down the limits of his navigation to the north. It must be borne in mind that he was not placing the coast line in its correct longitudinal position. Doubtless he did that on his map; as his object was to find a passage across it, he is concerned only with its latitude. He gives, however, a fair indication of the curvature of the shore. Immediately north of *Cavo Descubierta* we see the opening into the gulf, then the coast trends almost due east to Cabo de S. Jorge, which is Cape Race. The contour of Ungava and Hudson's Bays is more correct than that found on ordinary maps, even of a comparatively modern date.

Again, if Cavo de Ynglaterra be Cape Race, where shall we find those two well outlined islands lying to the east of it? They are not the conventionally formed islands often seen on maps, and set down at haphazard. They are quite distinctive in appearance and are, moreover, named. Cabot must have examined them. Shall we say that they have followed Atlantis to the bottom of the ocean? We cannot find them at or near Cape Race, but we can point them out to the northwest of Cape Chidley. One of them, Y. Verde, is known to-day by its English equivalent, Green Island. I do not maintain that the name has come down from Cabot, but the same natural features which led him to call it Y. Verde prompted subsequent navigators to name it Green Island. On a French map of the last century I find it called "Grass Island." It is to be observed that the latest admiralty chart does not pretend to give the exact, but only the approximate position of the island. Again, the Newfoundland and Labrador Pilot,¹ page 381, says, "The refraction and mirage off the coast of Northern Labrador, and especially off Davis Inlet, caused great difficulty in the attainment of correct sextant altitudes at sea." If we add to this the rolling of a small ship, we need feel no surprise that occasionally Cabot's latitudes are not severely correct in the north. Thus the Island S. Grigor, intended for Akpatok, is misplaced, being too far to the north and east. Yet, it is not further from its true position than it is on many maps of a more recent date. No more should be required. We are not to expect in Cabot's chart the accuracy of our admiralty ones; still, this island, whilst its indentations are not so deeply

¹ We shall refer to this work as "The Pilot," giving the page in brackets, second edition.

marked, in general contour agrees perfectly with the one on our latest chart.

Again, if we consider the Island of La Trenidat, we find a most convincing proof of the truth of our contention ; its shape is so peculiar, and its bearings towards the coast so unusual, that we are certain the man who sketched it must have seen and sailed around it. Now, there is only one such island on the whole coast of North America, and that is Ogua-Lik (Cod Island) in latitude $57^{\circ} 40'$. It may be seen on many good atlases and maps almost as it appears on this chart. The number and position of its indentations on its inner side correspond exactly with those that actually exist, whilst the bluff or peak where the flagstaff stands is unmistakable, as well as the inlets of its eastern coast. We shall learn from "The Pilot" [460] why Cabot named it Trinity Island. Referring to this island it says : "To the southward is a remarkable hill 2,000 feet high * * * The island has two other dome-shaped hills 1,500 feet high on the east side." Seeing these three remarkable hills Cabot, naturally enough, named it Trinity Island, and this appropriate name is an additional proof of the island's locality.

To the northeast of *Cavo de Ynglaterra* we see a large unnamed island. Applying our scale we find its latitude corresponds exactly with that of Iceland. That it is intended for Iceland there can be no reasonable doubt, just as there can be no reasonable explanation of it if *Cavo de Ynglaterra* be Cape Race. Ruysch's map of 1508, which has in a distorted way many of the features of this chart, shows and names Iceland in the position occupied by Cabot's unnamed island. When the chart is hung aright, there is no need to mark it Iceland, it cannot be any other island.

There are some small islands which deserve attention. It would appear that Cabot marked on his chart only such islands as were to seaward of him ; the innumerable little ones along the shore are, in places, suggested rather than noted by dots in and near the coast line. Using our scale¹ for the small island north of the second flag, we find its latitude $43^{\circ} 50'$, and identify it at once as Sable Island. Note, now, the shore line almost opposite, and the opening of the Bay of Fundy is clearly seen ; not merely is there a break in the coast, but it falls back to the left, and the line on the right is not intended as a resumption of it, for it projects out into the sea, showing it to be a cape and not connected with the shore on the left, as its inner line falls to the right. We can see from this how carefully Cabot scrutinized the shore in his search for a passage across to Cathay ; and yet, we are asked to believe that he did not perceive the wide opening into the Gulf of St. Lawrence.

If we take the latitude of the small island just north of *C. de Jorge*, we find it to be about 47° . Ordinary maps show no island there,

¹It is by this scale we shall take the latitudes of all places on this chart.

but the coast chart does, and "The Pilot" [208] calls the land Renewse Rocks. They are about one and a half mile from the shore. They are always from "six to ten feet above water * * * Vessels may go between them and the shore in fine weather." This Cabot did, hence they are laid down on his chart, and in their correct latitude, somewhat north of Cape Race.

Considerably south of the flag that stands on *Isla de la Trenidat* is another island. Its latitude is found to be $54^{\circ} 30'$. Turning to the Admiralty chart we find at $54^{\circ} 42'$ Bulldog Island, of which "The Pilot" [438] says: "Bulldog Island is an isolated barren rock, almost forty feet high * * * situated seventeen miles N. E. $2/3$ N. from East Rock." Thus our scale satisfactorily locates each island and renders the whole chart valuable, by making it intelligible.

There are two small islands near the northernmost flagstaff. Their position relative to each other, and to the shore, is peculiar. They are a little below the sixtieth degree. Now, if we take an Admiralty chart and scan the whole coast of Newfoundland and Labrador, we shall find no two islands laid down in this unmistakable position, except just north of Kamaktorvik Bay. There we see two small islands situated precisely as those on Cabot's chart, and their latitude is about $59^{\circ} 30'$. This is a proof impossible of rebuttal. It would, in view of all these tests of our scale, be mere childish wilfulness to maintain that Cabot intended this as a chart of the southern coast of Newfoundland. As such it is drawn out of all proportion, and is altogether unintelligible. As a chart of the whole shore line from Cape Henry to the north of Hudson's Bay it is found most correct and harmonious, and all its parts can be intelligently explained. On the mainland, almost midway between these two small islands, Cabot planted a flag. I believe a careful search of the shore, such as might be made under the direction of the Geological Survey Department, would result in the finding of some trace of the spot where the flag stood. Perhaps a hole drilled in the rock to receive the end of the staff, or a pile of stones that served to hold it in place, perhaps even a slab with some letters and a date rudely carved thereon, would be found, still attesting to the grandeur of John Cabot's achievements.

THE NOMENCLATURE OF CABOT'S CHART.

Our final proof is taken from the names on the chart. When treating of the old Log Book, we quoted some passages to show that peculiar or striking physical features of the shore were noted to serve as landmarks for future seamen. One place was said to resemble a "saddle" or the "hump of a camel," another was like a "huge tun." We find in the "Sailing Directions" accompanying the charts of to-day similar observations. It is probable Cabot wrote short descriptions of the land-

marks laid down, and Cosa, who was a classic scholar, imbued with the epigrammatic spirit of the age, condensed them into a word, generally a compound one. Instead, therefore, of Cabot's English phrases, we have Cosa's elegant condensations, according to the classic rule of the time. The stones of Egypt were silent for long centuries, but eventually they were given a tongue. They now tell us numberless interesting stories, and throw light on many hitherto obscure subjects. If we can give a tongue to all the names on the chart, they, too, will speak their message, and aid us to a knowledge of historic truth. Hitherto, so far as my reading goes, the important ones have been dumb.* It has been said they have no meaning in Spanish, Italian or Latin. I think I may say with every confidence that this opinion will no longer prevail.

Before interpreting the names, their latitude was taken by the discovered scale. We do not pretend that this measurement was perfectly accurate, as the name might not be exactly opposite the landmark: hence in each case the latitude is to be understood as approximate. Then we interpreted the names. Finally, with chart and "Sailings Directions" before us, we found how accurately Cabot must have described the objects, and how appropriately Cosa summed up the description. It is, of course, possible Cabot may have given the names which Cosa simply translated, but this does not appear probable.

Let us begin at the north. *Cavo de Ynglaterra* or Cape England, was fittingly given to the cape that forms the huge elbow of the land, north and south, which Cabot had added to the domains of England's king.

Next comes *Cavo Saltanatre* (in appendix "C," will be found the derivation and component parts of the various words. I shall here merely state their meaning). Its latitude is that of the southeast cape of Kamaktorvik Bay. Its meaning is "Cape of the Saltant" or "up-leaping land." We find from "The Pilot" [465] that immediately north of Kamaktorvik Bay, four lofty peaks from five to six thousand feet shoot upward. It is the highest land on the Labrador coast. "Cape of the Saltant Land" graphically describes the place.

Agron, meaning a conspicuous, or remarkable peak, we find to be in latitude 58° 30'. Turning to the chart we see at 58° 40' slightly north of Saglek Bay, Mount Blow-me down, of which "The Pilot" [462] says, "It is a remarkable square-topped hill, not less than 3,000 feet high, and may be seen from a distance of fifty or sixty miles from the northward on a clear day." There can be no mistake in identifying this "remarkable square-topped hill" with Cabot's conspicuous peak or Cosa's *Agron*.

The next two names are not significant of any physical features. *Cavo de S. Joham* is, I think, Finger Hill, whilst *S. Nicholas* is Cape

* Mr. HARRISSE says many of them "convey no meaning to us." As a rule other writers do not refer to them.

Mugford. We have already seen how appropriately the oblong island has been named Trinity Island. *Riolongo*, Long River, has no special significance. *Fonte*, or *forte*, is the next word. This is at or near Hopedale, where "The Pilot" [447] reports that "water is abundant." Now, *fonte* means a plentiful source of water. This, however, is not very distinctive. It would, nevertheless, show Cabot had carefully examined the coast. If *forte* be the word, it is more suggestive. Literally it means "avast": thus it would express that caution should be exercised on account of dangers to navigation. We find that for several miles in the vicinity of Hopedale there is a labyrinth of rocks and islets that "should not be navigated without local knowledge." "The Pilot," [445]. This is below Hopedale; above it [447] we read, "Navigation among them (viz.: rocks, etc.) must be attended with great danger." This is an echo of Cabot's warning—"Be cautious here."

Argair, a gorgeous altar, lat. $55^{\circ} 10'$, is Cape Strawberry. "The Pilot" [443] says: "The Cape is faced by terrace-like cliffs, with deep ravines at the extreme of each." Here we have steps leading up to the altar, the top of the cliff forming its table. To make it still more like the grand high altars Cabot had seen both in Italy and in England, "The Pilot" tells us the Cape, which is 1,235 feet high, "is the east end of a high range extending inland, and terminating in a conspicuous cone * * * 2,170 feet high." This lofty background forms a fitting reredos for the huge altar, the cone in the centre completing the picture. A man like Cabot could not fail to see and remark this striking resemblance to a magnificent altar.

Menistre, a walled country, in latitude 54° , is between Hamilton Inlet and Sandwich Bay. Here we find the Mealy Mountains which "The Pilot" [427] calls "a conspicuous range about 1,500 feet high," and which "extend from the north shore of Sandwich Bay to the south shore of Hamilton Inlet, and show prominently from all directions." What better description could be given than *menistre*, a walled land or country?

Cavo delisarte, Cape of smoothed land or surface, about latitude 53° . Here we find on the chart, Cape Bluff, the idiomatic translation of *Cavo delisarte*. Of it "The Pilot" [395] says: "One of the most prominent headlands on the north-east coast of Labrador."

S. Luzia is probably Cape St. Michael.

The next name, *Jusquei*, is a very significant one. Its latitude is about 52° , that is, at the mouth of the Straits of Belle Isle. It means "the jousting of the waters," or "the meeting in tournament of the waters." We know not whether the memory of Cabot's apt appellation lingered down the centuries, but we have to-day, in that same latitude, Battle Islands, just south of St. Louis Sound. That there is a battle of the waters there we learn from "The Pilot" [350] the sea, at times,

“breaking with fury over islets 30 feet high,” and, “the roar of the surf, on a calm night, can be compared to nothing less than the Falls of Niagara.” Now, Cabot was an experienced seaman, and he knew there could be no such wild fight if the waters were the straits only a bay. He said the waters met as in a tournament—that is, rushing at each other from opposite directions. His picturesque description not only makes us certain of the locality, but also proves he knew of the great Gulf, whence came forth one of the combatants to enter the lists.

Almost equally suggestive is the name *Regilia*, a barred way, or a row of prisons. Its latitude is that of Fogo Harbour. “In front of Fogo Harbour,” says “The Pilot” [222] are “several islands from 50 to 100 feet high, forming narrow entrances difficult of access at all times to a sailing vessel.” These would certainly bear a weird resemblance to a row of prisons, or to a barred way. Again, off the north coast of Fogo there is a “belt of islands and rocks, which, with an average width of 2 miles, run east and west for about 13 miles.” [223.]

Cavo de S. Luzia is Freel’s Head. The name, *Ansoii*, or *Ansori*, signifying a place of geese, is not a distinctive mark on these northern coasts. It may be mentioned, however, that we find Goose Bay, Duck Island, and Gull Island very nearly in its latitude. The flag to the south of Ansoii is on Cape Bonavista.

Lagofor, or *Lagofori*, Royal Courtyard Lake coincides with St. John’s, and is a remarkably good description of its beautiful harbour, nestling as peacefully as a lake in the bosom of the majestic hills, which rise up like castle walls around about. All who have seen that harbour will recognize the appositeness of the name.

Cavo de Jorge, Cape St. George, is Cape Race, and fittingly named after England’s patron saint, since it was to keep watch and ward over the *Cavo Descubierta*, or the discovered land.

Here we rest our case, in the firm conviction that a conscientious study of the proofs adduced will ensure a favourable verdict in our behalf, and add new glory to the name of John Cabot. Four hundred years ago he planted the English flag on Cape Breton Island, named Prince Edward Island, St. John, sailed round the Gulf and out the Straits of Belle Isle. The following year he went north, sailed through Hudson’s Straits and round the bay of that name during the month of August. Coming back he was in Ungava Bay on the 3rd September, the feast of the ordination of St. Gregory, when he named the island St. Grigor. Coming south he named *Cavo de S. Joham* on 7th September in honour of St. John of Nicomedia, and on the 10th of the month S. Nicholas for St. Nicholas of Tolentino. We are told by Gomara¹ that he made a stop at the Baccalhaôs, probably to refit his vessels. It was customary in those days to caulk and otherwise repair the ships on some suitable

² Loc Cit.

beach. This Cabot would find at Hamilton Inlet. It is somewhat of a coincidence that we have at the entrance of Indian Harbour, hard by the mouth of Hamilton Inlet, Bacalhaô Island. It was this vicinity Cortereal's expedition of 1501 visited, and we learn from Pietro Pasqualigo's letters of October 19th, 1501, that one of the natives brought to Portugal on its return, had a piece of "broken gilt sword which certainly appears to have been made in Italy; one of the boys had in his ears two silver rings which seem without doubt to have been made at Venice."¹ This is strong proof of Cabot's delay on that shore. Further we cannot follow him. He had dared the terrors of the northern seas, and discovered the declination or dip of the compass.² He was the pioneer of polar navigation. Hudson, Davis and Frobisher simply followed in his footsteps, and were guided by his charts. They were guided by this chart which has now been restored and made intelligible, and which, without doubt, is the one referred to by Sir Humphrey Gilbert as yet "to be seen in the Queen's Majesty's Privie Gallerie at Whitehall."³ To us it should be valuable, for it constitutes our title deeds to our vast and glorious inheritance. Although Hudson, Davis and Frobisher followed in his leading, they did not intend to steal the honour due him; in fact, as we have seen, Frobisher asserts that Cabot was the first to discover the frozen land and seas as far as the 67th degree. Despite this, past generations have immortalized their names, whilst that of John Cabot was left not only unsung, but unrecorded. Let us hope that the scientific world will now do him justice. As yet we know not where, or how, he died. That he did not die during this expedition seems clear from the words in the preface to Ramusio's Collection of 1606. Speaking of Sebastian Cabot's dream of a passage by the northeast, he says that by the "northwest had been sought in vain both by him and his father." This would scarcely be said had John Cabot not returned unsuccessful. He must have been an old man in 1499: broken down by age, and more, perhaps, by the blasting of his long cherished hopes, he bowed his head, and bore his cross to the quiet of his humble home. Sebastian drops out of notice, too, for some years, but again comes to the front. Men forget the achievements of the father in contemplating those of the son. He succeeded. The father, in the eyes of the commercial world, had failed. Hence the former lived in its chronicles; the latter was forgotten. Some day, when the crypt and dark nooks of St. Mary's Church Redcliffe, Bristol, shall have been thoroughly explored, a slab will surely be found which will tell us **WHERE**, and **HOW**, JOHN CABOT died.

¹ Quoted by Tarducci.

² It was the "dip" and not the "variation" of the compass S. Cabot claimed and justly so, to have discovered.

³ Hakluyt, vol. 3, p. 33.

APPENDIX A.

Copia de uno capitolo scrive in una lettera Sier Lorenzo Pasqualigo di Sier Filippo, di Londra adi 23 agosto, a Sier Alvise e Francesco Pasqualigo suo fradeli Venetia, ricevuta adi 23 settembre 1497.

“L'e venuto sto nostro Venetiano che ando con uno navilio de Bristo a trovar ixole nove, e dice haver trovato lige 700 lontam de qui Teraferma, ze el paexe del gram cam, e che andato per la costa liga 300, e che desmontato e non a visto persona alguna, ma a portato qui al re certi lazi ch'era tesi per prender salvadexine, e uno ago da far rede e a trovato certi albori tagliati, si che per questo iudicha che ze persone. Vene in mare per dubito, et e stato mexi tri sul viazo e questo e certo, e al tornar aldreto a visto do ixole ma non ha voluto desender per non perder tempo che la vituaria li mancava. Sto re ne habuto grande piacer e dise che le aque e stanche e non hano corso come qui. El re li ha promesso a tempo novo navil X e armati come lui vora ed ali dato tutti i presonieri da traditori in fuora che vadano con lui come lui a richiesto e ali dato danari fazi bona ziera fino a quel tempo e con so moier venetiana e con so fioli a Bristo. El qual se chiama Zuam Talbot,¹ e chiamasi el gran ammirante e vienli fato grande honore va vestido de seda a sti Inglexi li vano driedo a mo pazi e pur ne volese tanti quanti navrebbe con lui e etiam molti de nostri furfanti. Sto inventor de queste cose a impiantato sul terreni a trovato una gran² con una bandiera de Ingeltera e una de san Marcho per essere lui Venetiano, si che el nostro confalone se stese molto in qua.”

APPENDIX B.

LONDRA, 24 Agosto, 1497.—Item la Majesta de Re sono mesi passate havia mandato uno Veneciano el qual e molto bono marinare e a bona scientia de trovare insule nove, e ritornato a salvamento et a ritrovato due insule nove grandissime et fructiffere et etiam trovato le septe citade lontane da l'insula de Ingilterra lege 400 per lo camino de ponente; la Maesta de Re questo primo bono tempo gli vole mandare XV. in XX. navili.

Second letter of Raimondo da Soncino (Archivio di Stato in Milano, Potenze Estere, Inghilterra, 1497, Dicembre).

18 Dicembre, 1497.—Illustrissimo et excellentissimo Signor mio. Forsi che tra tante occupatione V. Ex. non li sara moleste intendere come

¹ No doubt a clerical error; should be Caboto.

² (Marin Sanudo. *Diarii*, vol. i, p. 806 Venezia, 1879).
H. HARRISSE “Jean et Sébastien Cabot.”

questa Maesta ha guadagnato una parte de Asia senza colpo de spada. In questo regno e uno popolare Venetiano chiamato messer Zoanne Caboto de gentile ingenio, peritissima della navigatione, el qual visto che li Serenissimi Re primma del Portugallo poi de Spagna hanno occupato isole incognite, delibera fare uno simile acquisto per dicta Maesta. Ed impetrato privilegj regij, che l'utile dominio de quanto el trovasse fosse suo, purehe lo diretto se reserva all Corona, cum uno piccolo naviglio e XVIII. persone se posa ala fortuna, et partitosi da Bristo porto occidentale de questo regno et passato Ibernia piu occidentale, e poi alzatosi verso el septentrione, comencio ad navigare ale parte orientale, lassandosi (fra qualche giorni) la tramontana ad mano drita, et havendo assai errato, infine capiteo in terra firma, dove posto la bandera regia, et tolto la possessione per questa Alteza, et preso certi segnali, se ne ritornato. Al ditto messer Zoanne, come alienigena et povero non saria creduto, se li compagni chi sono quasi tutti inglesi et da Bristo non testificassero cio che lui dice esser vero. Esso messer Zoanne ha la descriptione del mondo in una carta, et anche in una sphaera solida che lui ha fatto, et demonstra dove e capitato, et andando verso el levante ha passato assai el paese del Tanais. Et dicona che la e terra optima et temperata, et estimanno que vi nasca el brasilio et le sete, et affermanne che quello mare e coperto de pessi li quali se prendeno non solo com la rete, ma cum le ciste, essendoli alligato uno saxo ad cio che la cista se impozi in lagua, et questo io l'ho oldito narrare al dicto messer Joanne.

Et ditti Inglesi suoi compagni dicono che portaranno tanti pessi che questo regno no havera piu bisogno de Islanda, del quale paese viene una grandissima mercantia de pessi che si chiamano stockfisse. Ma messer Zoanne ha posto l'animo ad magior cosa perche pensa, da quello loco occupato andarsene sempre a Riva Riva piu verso el Levante, tanto chel sia al opposito de una Isola da lui chiamata Cipango, posta in la regione equinoctiale, dove crede che nascono tutte le speciarie del mundo et anche le gioie, et dice che altre volte esso e stato alla Meccha, dove per caravane de luntani paesi sono portate le speciarie, et domandati quelli che le portano, dove nascono ditte speciarie, respondendo che non sanno, ma che venghono cum questa mercantia da luntani paesi ad casa sua altre caravane, le quale ancora dicono che ad loro sono portate da altre remote regioni. Et fa questo argumento che se li orientali affermano ali meridionali che questo cose venghono lontano da loro, et cosi da mano in mano, presupposta la rotundità della terra, è necessario che li ultimi le tolliano al septentrione verso l'occidente. Et dicello per modo che non me constando più como costa, ancora io lo credo. Et che è maggior cosa questa maestà che è savia et non prodiga, ancora lei li presta qualche fede, perche dà poi chel è tornato, li dà assai bona provisione come esso messer Zoanne me dice. Et a tempo novo se dice che la Maestà prefata armarà aleuni naviglij, et ultra li darà tutti li malfattori et anderano in

quello paese ad fare una colonia, mediante la quale sperano de fare in Londres maggior fondaco de speciarie che sia in Alexandria, et li principali dell'impresa sono de Bristo, grandi marinari li quali hora che sanno dove andare, dicono che la non è navigatione de più che XV. giorni, ne hanno mai fortuna come abandonano Ibernia. Ho ancora parlata cum uno Borgognone compagno di mess. Zoanne chi afferma tutto et vole tornaci perche lo ammirante (che gia messer Zoanne cosi se intitula) li ha donato una Isola; et ne ha donato una altra ad un suo barbiere da castione genovese, et intrambi se reputanno conti, ne monsignor L'Armirante se estima manco de principe. Credo ancora andarano cum questo passaggio alcum poveri frati Italiani li quali tutti hanno promissione de Vescovati. Et per essere io fatto amico de L'armirante, quando volessi andarvi, haverei uno Archivescovato, ma ho pensato chel sia piu sicura cosa li beneficij quali V. Ex. me ha reservati, et perho supplico che quando vacassero in mia absentia la me faccia dare la possessione, ordenando fra questo megio dove bisogna, che non me siano tolti da altri, li quali per essere presenti possono essere più diligenti di me, el quale sono ridotto in questo paese ad mangiare ogni pasto de x. o xii. vivande, et stare tre hore ad tavole per volta ogni giorno due volte per amore de' Vostra Excellentia. A la quale humilmente me recomando.

Londonie, xviii. Decem., 1497.

Excellentie Vestre,

Humillimus Servus,

RAIMUNDUS.

APPENDIX C.

The names on Cabot's chart as they appear on Cosa's map.

When Cabot drew the outline of the coast of North America from Fox Channel in latitude 66° 50' down to Cape Henry in the 36° 30' degree, he gave short descriptions in English of the more remarkable headlands, which should serve as guides to himself, or future navigators along the strange, wild shores of the north. Cosa, who was learned in the classicism of the renaissance, condensed a description into a compound word, adapting Spanish or Latin terms. Some of these words have long been a puzzle to writers; some, even persons learned in the Spanish tongue, have declared they have no meaning in that language. We begin at the north and read downward.

Y. Verde
S. Grigor
Cavo de Ynglaterra

Green Island
St. Gregory
Cape England

C. Sallanatra or *Saltanatre*, a compound of Saltante-Saltant, and terra, land, meaning the upleaping land, or land that shoots rapidly upwards. Compare English "salient" and "saltant," Latin "salire," and Italian "saltare." Hence "Cape of the Saltant" or "very high, upleaping land."

Agron, a remarkable peak or summit. In Greek *ακρων*, Latin acron rarely used, the ordinary form being arx by metonymy: taking the Latin acron, and making the usual change of the Latin C, into G in Spanish we have Agron. This standing alone denotes not merely a peak but a remarkable one.

Cavo de S. Johan	Cape St. John
S. Nicolas	St. Nicholas
Isla de la Trenidat	Trinity Island
R. Longo	Long River
Fonte or Forte	Fount, or source of sweet water if we read Fonte; if Forte be read, then <i>avast</i> or <i>caution</i> .

Argair, from Ara, an altar, and gayar, gaily, or gorgeously decorated. Compare French gai, Italian gaio, English garish, gay. Hence, Argair, a gorgeous or magnificently prepared altar.

Menistre, compound of Moenia, walls, and terra, land or country, or the land that has a great wall.

C. delisarte; Lisarte is from lisar, to smooth, and qualifies faz, or face understood. Hence, Cape of the Smooth or flat face. Or more precisely, Cape Bluff.

S. Luzia	St. Luey
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Jusquei, compound of *justar*, to joust, and *aquei* waters, or waves, meaning the meeting in fray, or the jousting of the waters, and is a picturesque and appropriate description of the northern entrance to the Straits of Belle Isle.

Regilia, compound of *red* strong barred prisons, and *hilla* a row or line. Hence, a row of prisons, a striking description of the environs and entrance to Fogo Harbour. Instead of Redhilla, "dh" are changed into "g," and "i" inserted for euphony.

<i>C. de Luzia</i>	Cape St. Luey
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Ansori, the place of geese, or Goose Bay.

Lagofori, compound of Lago, lake, and foro or forum, a royal courtyard. Hence Royal Courtyard Lake. Anyone who has seen the Harbour of St. John's will recognize how peculiarly appropriate it is.

<i>C. de Jorge</i>	Cape St. George
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Cavo descubierta the Cape discovered, or, in nautical phraseology, the Cape made. First is either understood, or was written where the hole in the map now is.

APPENDIX D.

Some recent writers have endeavoured to belittle the attainments of Sebastian Cabot, to prove him a liar and guilty of ingratitude and a want of generosity towards the memory of his father. In their disappointment at not being able to learn enough about the life and death of John Cabot, they inveigh against his son for not having written, we must suppose, a history for their benefit. It is the old story: if arguments are lacking, blame some one, any one except yourself.

We need not waste time in enumerating the facts which establish, beyond cavil, the eminent abilities of Sebastian Cabot. For nearly fifty years Spain, England and Venice recognized him as the highest authority on nautical matters, and were anxious to secure his services. The man who to-day will assert that the great men of those countries were deceived during all that period by a cheap impostor, places himself outside the lists of serious controversy.

The charge of untruthfulness regarding his father seems, at first sight, to have some foundation, but a careful study of the case will vindicate him. We must bear in mind we have no writings of Sebastian Cabot; not a sentence that can be proved to be as he spoke it. The conversation had with him by the Mantuan gentleman, narrated by Ramusio (Vol. 1, 2nd Edition, Giunti, 1554, pp. 414, 415), is, no doubt, substantially correct, but it is not a consecutive and chronological narrative. It is a synopsis of a synopsis; the first made by the Mantuan gentleman, the second by Ramusio. The latter tells us expressly that he is giving only a summary of what he had heard. Now, whilst every assertion in a synoptic narrative may be true, we are not to construe the facts in a chronological sequence; we must analyse the account and co-ordinate the events. We have a familiar and striking example of the necessity of this exegetic method in construing many of Gospel narratives.

Let us examine the passages in Ramusio which are supposed to tell against Sebastian Cabot. We are told by him that his father came to England from Venice "to engage in business" (*a far mercantia*) many years previously, bringing him (Sebastian), then a youth, yet not so young but that he had studied both humanities and the use of the globes. This is a very clear and straightforward account of the coming to England of John Cabot and proves that Sebastian was born at Venice. Yet, some pretend to find in it a slur cast on John Cabot by his son, because he merely says his father came to England "to engage in business" or, as they render it, "to trade." Well, certainly, he did not come

with the intention of finding North America; yet this is what they think Sebastian should have said.

He then goes on to say that his father died at the time that news was received that Columbus had discovered "the Coast of the Indies," which event was much talked of at the Court of Henry VII., and was looked upon as something more divine than human, to have found this hitherto unknown way to the East, where the spices grow. We have in this sentence and the one following it, apparent contradictions owing to the synoptic character of the narrative. In an animated conversation facts are not stated in a chronological order; frequently, too, a listener thinks the narrator is speaking in his own name, when in fact he may be recounting the deeds of another. We know the Mantuan gentleman was charmed with Sebastian Cabot, the wonderful story of Columbus's discovery and the consequent excitement in naval circles enthralled him, and it was quite natural that when relating this conversation in after years, in the Villa Caphi, he should attribute to Sebastian Cabot all that had been said about the voyages of 1497-98. In Ramusio's edition of 1606 we are told that Sebastian Cabot was first instructed by his father as to the feasibility of a passage to the Indies, either by the northwest or northeast. And we are further told that Sebastian, late in life, advocated the route by the northeast, as that by the northwest had been tried in vain both by his father and himself.¹ This information must have been derived from Sebastian Cabot.

Can we believe, then, that in speaking to the Mantuan gentleman, he claimed all the honour of the voyages he described? Surely not, the more especially since an easy and natural explanation of the apparent contradiction can be given.

But the strong point with Sebastian's critics is his assertion regarding the time of his father's death. "Here," they say, "is a downright untruth by which John Cabot is consigned, by his son, to the grave before 1497, thus effectually denying him all part in the voyages of that and the subsequent years." This is bad,—for the critics of Sebastian. They should be sure of their interpretation before shouting "liar." When did the news reach England that Columbus had discovered "the Coast of the Indies"? Some time in 1499. Sebastian Cabot naturally spoke with accuracy on nautical subjects. Hence he was not referring to the discovery of 1492 when islands only were found, but to the one of 1498, when, in truth, the coast, or mainland, was discovered. Sebastian, therefore, tells us the year of his father's death.

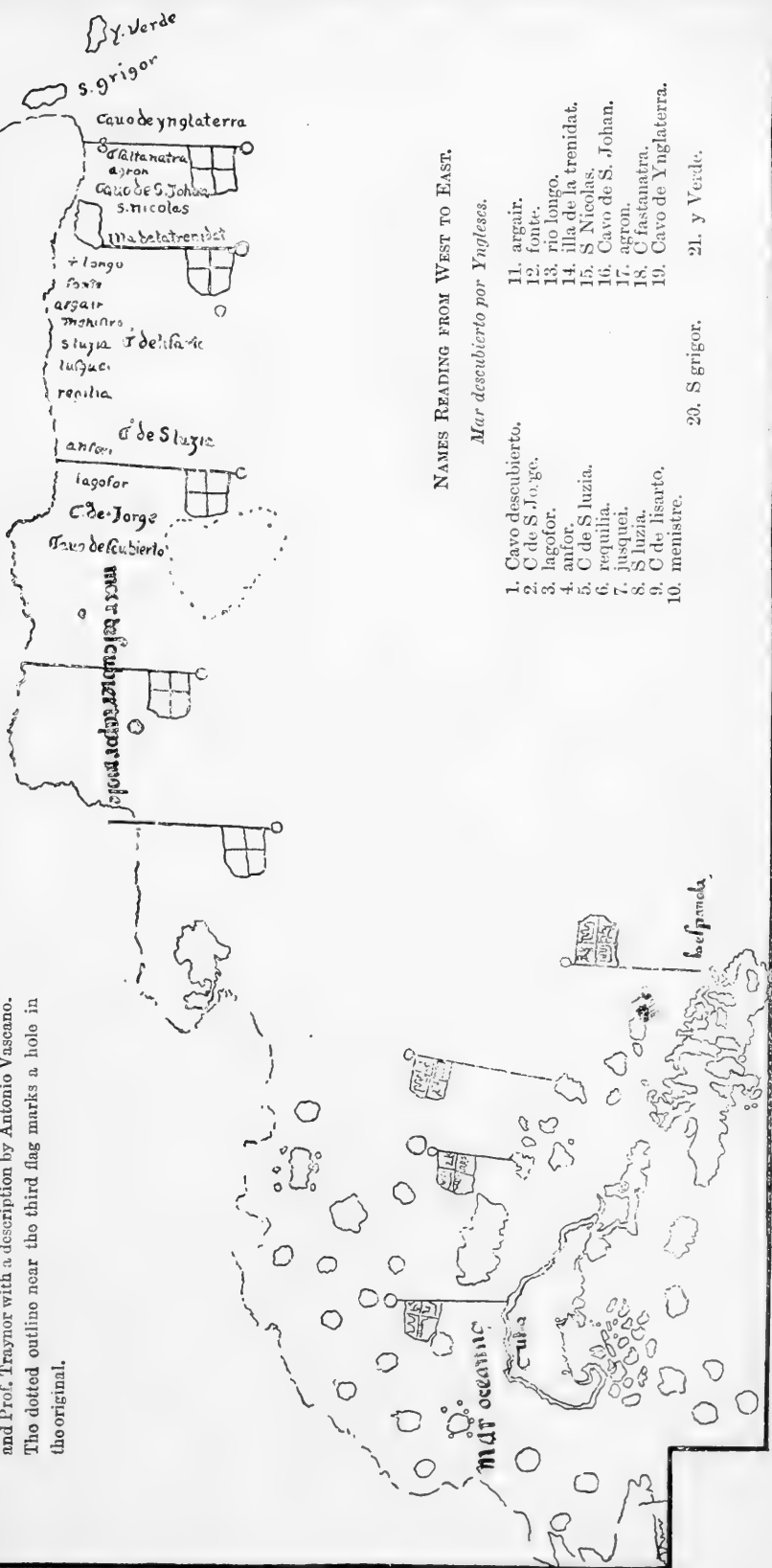
Without this testimony we should place it in the year of 1499, soon after his return from the second voyage.

Fatigue, exposure and disappointment, more than old age, brought on the end.

¹ In the preface of the so-called Log Book of Sebastian Cabot.

JUAN DE LA COSA'S MAP, A.D. 1500.

Note.—This sketch was traced, and reduced by photography from the facsimile in the original colours, published in 1892 at Madrid, by Signor Canovas Vallois and Prof. Traynor with a description by Antonio Vascano. The dotted outline near the third flag marks a hole in the original.



NAMES READING FROM WEST TO EAST.

Mar descubierta por Yngleses.

1. Cavo descubierta.
2. C de S. Jorge.
3. lagofoz.
4. anfoz.
5. C de S. luzia.
6. requilia.
7. jusquet.
8. S. luzia.
9. C de lisanto.
10. menestre.
11. argair.
12. fonte.
13. rio longo.
14. illa de la trinidad.
15. S. Nicolas.
16. Cavo de S. Johan.
17. agron.
18. C fastanatra.
19. Cavo de Ynglaterra.
20. S grigor.
21. y Verde.

MODERN BRISTOL.

By W. HOWELL DAVIES,

One of the Bristol Delegates to the Cabot Celebration.

I have been invited to address you this evening on the subject which has been announced. Great cities have so many features in common with each other, that it is difficult to say anything fresh or interesting; yet, of course, there are great cities and great cities, some of which have risen rapidly, as have many upon the American continent, in consequence of being favourably situated upon the lines through which great commerce flows—such are commercial only, and it will take centuries before they can present features of sufficient historical interest to make them attractive to tourists. Other cities have ancient traditions, long histories—parts of which are indissolubly bound up with that of their country; such a city is Bristol, and you cannot properly understand it unless you appreciate the forces which have been at work through many centuries, making it what it is. Its ancient importance was principally due to the fact that it was a convenient centre for the transmission of commerce. Its citizens were of an adventurous type—this has been abundantly illustrated by the spirit of enterprise which resulted in the discovery of the mainland of America by the Cabots 400 years ago. The two centuries following that of the Cabots were rich in adventure, and the merchants of those times were so successful that they were called “merchant princes.” The eighteenth century added to the wealth and importance of Bristol, when it stood without rival as the second city in shipping, trade, population and general importance in Great Britain.

Corporation.

Bristol has been a corporate city for many centuries; we have an unbroken chronicle of the mayors of the city since 1216. It is not within my province to follow the ancient history of our city, but I will content myself by merely saying that the opening years of the present century found Bristol in the hands of what is now known as an unreformed corporation. These unreformed corporations were affected by a spirit which throughout England retarded municipal development, and led to the introduction of the Local Government Act of 1835, which placed the government of Bristol (with many other large cities) upon a more satisfactory footing, and made the members who constituted the new councils representative of the ratepayers. Our city is now governed by a council

consisting of the mayor, sixteen aldermen, and forty-eight councillors; the aldermen are elected every six years, half their number retiring every three years, the remaining half having the power to vote for the re-election of the retiring aldermen. The city is divided into thirteen wards, three of which return six members each, and ten, three members each. An election takes place on the first of every November in each ward, for one-third of the number of councillors which the ward has the right of returning.

The mayor whilst presiding at all council meetings wears a robe and chain of office; at the quarterly meetings he wears the ancient scarlet robe, but at the ordinary monthly or special meetings, a black silk one.

The aldermen and councillors do not wear robes at the meetings of the council, but they wear them on the following occasions:

1. At the Mayor's chapel on Advent Sunday.
2. At St. Mary's Redcliff, on Whit Sunday.
3. At a Cathedral service, when specially invited to attend at the request of the mayor.

This leads me to briefly inform you that the Corporation of the city of Bristol possesses a civic chapel, known as St. Mark's church or the Mayor's chapel.

Each mayor appoints his own chaplain, who must be a clergyman of the Episcopal church, and whose salary is paid out of the corporate funds.

On Advent Sunday the mayor (having been appointed on the 9th of November) invites his colleagues on the council to join him in divine service at the Mayor's chapel, and to wear their robes of office.

He attends at the council house, there he receives his colleagues, and from thence, preceded by the sword bearer, the town clerk and treasurer in silk robes, the chief constable with eight stalwart members of the police force, bearing the silver maces, he proceeds to the church.

After the service all return to the council house, where cake and wine are provided; the toasts of the mayor and high sheriff's health are proposed, after which the company disperses.

The same procedure is adopted on Whit Sunday for St. Mary's Redcliff, and it may be interesting to note here that this special service began three years before Cabot sailed, and has gone on uninterruptedly for 403 years.

The Cathedral service is not so regularly held, but of late years the dean has endeavoured to secure one attendance in each mayoralty of the corporation.

In addition to these services, the attendance of the mayor and corporation is secured at three of the ancient parish churches, viz., Temple, St. Philip's, and St. James's churches, and when the mayor is

not a member of the Church of England, it is not unusual for him to ask the corporation to join him at one of the Free churches, but at all of these latter services only the mayor and high sheriff wear their distinctive dress, and the members of the corporation meet the mayor and high sheriff in the vestibule of the visited church.

I have given these incidents to show you old customs, which amongst many of a similar character, still abide in our old city life, and although I personally belong to what my friends would call "the progressive party," I had no wish during my tenure of office to make any departure from these century-old institutions.

Before leaving the mayor, I ought to say he is provided by the city with a state carriage, very similar to that of the Lord Mayor of London, but which he uses only for state occasions.

The mayor personally provides a handsome semi-state carriage for use on occasions of less importance. The livery of the servants differs according to whether the occasion is state or semi-state.

The mayor of Bristol is appointed on the commission for the assizes held three times per year in the city. He sits by the side of the judge, but naturally takes no part in the court.

The city is now promoting a bill in parliament for an extension of the municipal boundary (and there is every probability of the bill becoming law), which will make the population of Bristol about 330,000 instead of about 235,000, as it stands to-day; this will increase the number of representatives on the council to about 80, inclusive of aldermen. No extension of the boundary has been obtained by Bristol since 1835, whilst a population has grown outside our present municipal area, for the simple reason that there was no room for development within. When you compare the present city, grown populous and rich, with what it was 400 years ago, when its merchants fitted up the little ship "Matthew," what possibilities there may be laid up in its future history, provided the spirit of aggressiveness and enterprise be still alive! I hope, as well as believe, that the new and greater Bristol will yet establish a modern history worthy of its best record in the past.

The city is now divided, for parliamentary purposes, into four districts, each of which returns independently a member to Parliament.

Docks and Shipping.

The fortunes of Bristol for the past five centuries have been closely bound up with its docks and shipping. In order that you may appreciate the position of our docks to-day, I must explain to you that prior to the commencement of this century, we had no floating harbour, but simply a tidal dock, and the shipping was subjected to the great inconvenience of the very rapid flow and ebb of the tides. Notwithstanding

this difficulty, the port progressed rapidly ; ship-building was carried on with spirit and industry, and, with the opening of the present century, plans were projected to give Bristol extensive floating harbour accommodation. In 1803, a number of the leading merchants and citizens of Bristol formed themselves into "The Bristol Dock Co.," and obtained an Act of Parliament authorizing the conversion of the tidal river into a floating dock. Operations were commenced in 1804, and the works were completed in 1809. It was a bold engineering and financial effort for that period, but the securing of two and a half miles of floating harbour, or eighty-two acres of dock accommodation, even at the cost of £600,000, was worth all the energy which was devoted to the work. The completion of the works gave a great impetus to the trade of the port, and but for the short-sighted policy of maintaining the dock dues at too high a rate in comparison with some of the other ports in the Kingdom, the success attending their earlier enterprise would have been still greater. Early in the history of the reformed town council, which, as I have already stated, took place in 1835, the ratepayers advocated the control and management of the docks by the corporation, and an extensive reduction of port charges, with the object of attracting and developing the trade resorting to the port of Bristol.

In 1846, the Free Port Association was formed, amongst its members being men of all shades of politics. The agitation was conducted with discretion and determination, and attained success in 1848, when an Act of Parliament was passed, transferring the docks to the mayor, aldermen and burgesses of the city of Bristol. It was provided in the Act that in consideration of the corporation reducing the rates on vessels and goods, a sum of money for the purposes of the docks should be paid annually out of the rates of the borough ; thus setting forth clearly that the acquiring of the docks was not for the simple purpose of earning a revenue, but with the object of fostering, encouraging and developing the trade and commerce of the city, and this is the main principle that has governed the management of the docks by the corporation from that period up to the present time. The repeal of the Corn Laws in 1846, and the triumph of the free trade principles, gave a great stimulus to the people of Great Britain, in the direction of freedom of commerce, and Bristol, impressed by the same sentiment, abolished the dock dues on about 350 articles out of the 600 that were in the list, and also all dues on exports, and the remaining dues were considerably reduced.

In addition to the extensive trade of the port, Bristol was also an important ship-building centre. It was in the year that Her Majesty Queen Victoria ascended the throne that there was launched at Bristol a vessel destined to prove to the world that steam could be successfully applied to the requirements of the transatlantic trade. The "Great Western" designed by Brunel, and built by Paterson, at a cost of £63,-

000, made her first voyage to New York in fifteen days ten hours, and her return home, with sixty-six passengers on board, in fourteen days. In New York so great was the importance of the event, that 100,000 people were present at her departure for England. The enterprise of 400 years ago, when the ship "Matthew" made her memorable voyage, had a fitting sequel in the voyage of the "Great Western"—both ships were fitted out by the enterprise, daring and adventurousness of Bristol men—the first to discover a continent, the second to bring that continent into closer relationship with the mother country, for the benefit of both. Bristol can honourably claim these distinctions, and what is more, Bristol men are proud of them.

From 1865 to 1873 very extensive works were carried out in connection with the docks, in providing larger entrance locks, deep water-berths, and improving the navigation of the river.

In 1879 and 1880, docks suitable for ocean vessels of the largest dimensions, constructed by private companies, were opened at Avonmouth on the Gloucester side, and at Portishead, three miles from the entrance of the Avon, on the Somerset side. In 1883 the corporation agreed with the companies owning them, for the purchase of the Avonmouth and Portishead docks. An Act of Parliament having meanwhile been obtained on the 1st September, 1884, the whole of the docks within the port of Bristol were united as one undertaking, under the control of the corporation of the city of Bristol. They are now worked under the direction of a committee of the town council elected annually, consisting of nineteen members of that body. During the past twenty years the corporation has spent large sums of money in providing additional accommodation for the increasing traffic of the port—the equipment of the docks with the latest and most approved appliances for the efficient and rapid discharge and handling of the cargoes, erecting granaries for the storage of grain and provisions; extensive lairs and abattoirs for the inspection and slaughter of cattle, in accordance with the government regulations; long lines of sheds for the rapid transit of goods, and cold storage for dead meat, cheese, butter and provisions. At the present time they are engaged in heavy operations for further increasing the ability of the port, in order to deal with the rapid advances made in mercantile marine construction, and the transatlantic traffic.

A bill is now before Parliament to obtain powers for extending the railways round the docks, and after these works are completed, the three docks of the port of Bristol will be in communication with the railway system of the country. The citizens of Bristol have invested in their dock property $2\frac{1}{4}$ millions of capital, involving a payment of about £80,000 a year in interest on their dock stock.

The dock stock was raised at $3\frac{1}{2}$ per cent, which at the time was the value of money in sound investments; what money has been lately borrowed for additional works has been obtained at about $2\frac{5}{8}$ per cent.

As the rates of the city are responsible for the payment of the interest on these bonds, the managers of the dock property have found by the experience of the last few years that the revenue is more assured and the risk to the city lessened by the adoption of a generous policy to the trade resorting to the port, by which I mean making all port charges extremely low, and providing every modern convenience for the quick and economical handling of cargoes, by which means the Bristol merchants are able, and do, distribute their imports over as large, if not the largest area accomplished by any port in the United Kingdom.

I now give you just two or three brief tables of statistics, proving the result of an enlightened policy.

In 1848 the corporation acquired the docks as municipal property. It then had a very large coastwise trade, not far short of a million tons per year. The railway system of the country was then in its infancy, and water carriage was the principal source by which goods were transported. The quicker transit by railways in later years has killed much of this traffic, but that to Ireland, Scotland, and distant home ports has increased, with the result that the actual coastwise traffic to-day about equals that of 1848.

But the imports from foreign ports show a marvellous increase, the actual tonnage of goods in 1848 being very little over 100,000, whilst that of last year was nearly, if not quite, 1,400,000.

In 1848 the revenue was	£ 34,052
“ 1897 “ “	200,000
“ 1848 importations of corn	569,232 bushels
“ 1897 “ “	28,484,160 “

The provision trade, largely Canadian, and which began principally in the seventies, has increased from 9,247 tons in 1878 to 41,739 tons in 1897, and for some branches of Canadian provisions I believe Bristol is assuming a premier position.

Municipal Matters.

The electric-lighting works are owned by the corporation and are yielding very satisfactory results. Whilst giving very favourable terms to the consumers, there appears to be every prospect of the city deriving, within a very few years, a considerable margin, which will go to the relief of the general rating. Most of the main thoroughfares are lighted by electricity; the less important streets and suburban roads are still lighted with gas. Both gas and water are in the hands of private companies, although there is a committee of the corporation appointed for the purpose of advising as to the propriety of negotiating for the purchase of the water-works.

All the paving and cleansing work is undertaken by the corporation directly, and not let out to contractors, as was formerly the case;

the city finds the work is done more satisfactorily, and quite as economically under the present arrangement.

The refuse of the city is all burned up in the destructors, and the ash is very largely used in the manufacture of concrete pavements.

The Free Libraries Act was adopted by the city in 1874. There are now six large libraries with reading-rooms in different parts of the city, but prior to the adoption of this act, Bristol possessed a free library which was the oldest in the kingdom, and was founded in 1613. This old library is now the headquarters of our free library system. The museum is also municipal property. For the maintenance of the former we are limited to 1d. in the pound rate, and for the latter $\frac{1}{2}$ d. in the pound; the contributions for these two purposes, out of the rates, amount to about \$35,000 a year.

In order to encourage the art of swimming and to add to the general healthfulness of the rising generation, the city possesses six public swimming baths, municipally owned and worked. At some of these baths, departments for laundry purposes are attached, so that the poorer people may have convenient facilities for washing and drying their clothes.

The city owns considerable property in real estate, which has been acquired in various ways—by gifts, by bequests, and by leases falling in on corporation land, which yields a revenue of \$130,000 a year, but will probably be very largely increased within the next generation, as many valuable leases will be falling in.

Manufactures.

Although Bristol does not take rank as one of the first of the English manufacturing towns in any of the great staple industries of the country, yet its position on the Bristol and Somerset coal field has enabled it to carry on not a few very important manufacturing concerns, and in spite of the great competition of the larger manufacturing centres, to develop some of them to such an extent as to make them known in almost all parts of the world—thanks to the skill, energy, and business shrewdness and capacity of both masters and men. Among the most widely known of these manufactured goods I may mention “Bristol Bird’s Eye” tobacco and Fry’s Cocoa, as well as the galvanized and corrugated iron of the St. Vincent’s Iron Works. All these are exported in vast bulk and, I may be permitted to say, are as greatly appreciated all over the world as they are largely consumed. The city is also an important centre for the leather trade, being one of three great leather marts of the country, the two others being Bermondsey and Leeds. It has long been known for its tanning industry, which has been extensively developed in later years, whilst the excellence of its productions in sole leather, together with the convenience of the port for the importa-

tion of American leather, both from Canada and the States, has built up within and around it a very extensive manufacture of boots and shoes, now probably finding employment for about 10,000 people—perhaps a larger number than engaged in any other single industry in the city.

Engineering works, cabinet works, clothing factories, brush manufactories, collieries, and many other branches of industrial occupation, are all represented in our city, and it is generally acknowledged that an old Bristol firm produces the finest oil cloth in the world.

Printing is also carried on at a high pitch of perfection, and it may be interesting to state in passing that the head of one of the publishing houses in the city is one of the honorary secretaries of the Cabot Memorial Committee in Bristol, and was the printer and publisher of two volumes, "Called Back" and "Dark Days," which, to use an Americanism, "caught on," and resulted in an issue practically without rival in the last half century—I refer to J. W. Arrowsmith. The diversity of the industrial pursuits of Bristol is a great advantage to the city in this respect, that it prevents the population from experiencing in its greatest intensity those difficulties which occasionally arise in those districts dependent on merely a staple industry.

Philanthropy and Education.

It might be convenient at this point to refer very briefly to three or four of the Bristol philanthropists, in order to make you acquainted with some of the sights which you might see in the streets of Bristol to-day.

John Carr founded Queen Elizabeth's Hospital—now, and for a long time past popularly known as the City School. The boys who are boarded in this school wear long blue coats, short trousers, yellow stockings, shoes with buckles, and a cloth hat with a yellow band. The custom is, we presume, that of the period of the founder, and is similar to that worn by the boys of Christ's Hospital in London. In the next century there were two other distinguished Bristol citizens who founded schools, viz., Alderman John Whitson, who founded a school for forty women children, to be under the care of a serious matron—these girls wear red cloth dresses, and are known as "the Red Maids School." This good alderman desired to do for girls what the previous alderman had done for boys.

The next was Edward Colston; the bequests made by this the greatest philanthropist of Bristol were many and various—he founded alms houses, and made large gifts for the poor of Bristol—in addition to the different schools which he established for the education of the children. His name was revered in the city to such an extent that societies were formed for perpetuating his memory. In the beginning the societies were entirely of a non-political character, but as politics became more mixed in the life of the people, there were off-shoots from the parent society,

and now on the 13th November, four different societies dine separately, at each of which a toast is introduced to "the pious memory of Edward Colston," which is always received in solemn silence. At these different societies collections are made for the poor of the city, which are distributed in the following ways :

Largely in annuities of 5s. per week to persons of 60 years and upwards, who are in destitute circumstances. To a large extent also in gifts of 10s. to relieve immediate distress. And in one society for the relief of women in child-birth.

The total amount of about £4,000 per year is being subscribed by the respective societies. At the annual banquets of the two political societies—the Dolphin (which represents the Conservative party), and the Anchor (which represents the Liberal party)—there are always, as the principal speakers, members of the government of the day, or ex-ministers of the Crown. These annual meetings therefore have become amongst the most important of the country.

It is a peculiarity of the schools to which we have specially referred in the previous remarks, that the children are required to dress in the style of the period of the founders, although the Colston boys have recently adopted a more modern uniform.

The number of boys and girls educated in these schools has very considerably increased since their foundation, and all of them are now administered by the municipal charity trustees, or by the Society of the Merchant Venturers. The latter body, which has so much in its history deeply interesting to the Bristol of the past, is still doing an exceedingly useful work in the city. The special work which the society formerly undertook in aiding adventures, has been abandoned, and its large funds are now largely used in providing technical education. The college which it has established in Bristol is one of the finest of its kind in England, and perhaps in the world. In addition to the first-class education which is here provided at a very nominal cost, it also affords the opportunity of technical training in numerous trades, and I believe that a society undertaking this work will leave its impress just as much upon the history of the Bristol of the 20th century, as it did upon the history of the 16th century, in the adventurous period of its earlier career.

The Bristol Grammar School—a very fine educational establishment—is very largely supported by the funds which were provided by Robert Thorne and his son Nicholas, nearly 400 years ago, and a large number of the principal merchants of Bristol of the present day received their education at this establishment.

The Clifton College is another educational establishment to which notice should be directed—it takes rank with the older schools of Rugby, Eton, Harrow and Winchester, and provides accommodation for about 650 boys. The school is open to all boys, without distinction of class,

who succeed in passing the entrance examinations ; but it is available only to the well-to-do classes, in consequence of the somewhat large fees which have to be charged. It is provided with a physical science school, a chemical laboratory, library, museum, lecture and school rooms, swimming baths, and a large acreage for cricket, football, and other sports, and these, with the main buildings, and the masters' houses for boarding the boys, form a very imposing establishment.

A university college was established in 1876, and has been most useful in promoting the higher education of the young people of the city.

In the elementary schools of Bristol free places are provided for about 50,000 children—the average attendance shows a percentage of about 84·5. Attendance is compulsory, and to effect this, attendance officers are employed—parents who do not send their children to school are brought before the magistrates, who make an order which, if disobeyed, subjects the offenders either to be fined, or, if persistent offenders, imprisoned. Truant children are sent to a truant school, which is under extremely strict regulations ; but it is exceedingly satisfactory to state that the attendance at this school keeps well under the accommodation.

Regularity of attendance has improved during the last twenty years by 13 per cent, and at the present time this greatly improved attendance is maintained with fewer prosecutions than at any time during the last twelve or fifteen years. The physical training of the boys is looked after by means of drill and swimming, whilst the girls are taught to be useful housewives by instruction in needlework, domestic economy and cookery lessons.

The city provides a considerable sum per annum for scholarships, by which clever boys and girls out of elementary schools may continue their education free of charge, at the grammar and other secondary schools, and in the case of boys a possibility is opened of entering one of the universities and taking a degree.

Under the school board there are three centres for children who are mentally deficient, and a day class for deaf children, and there are, in addition to these, under other management, residential institutions for blind and deaf children, maintained partly by endowments.

The elementary education is given under the Act of 1870, and in addition to the government grants, the city provides a rate of about 9d. in the pound, which is principally required to pay for the school buildings which have been erected, and for slightly supplementing the contribution from the imperial funds. Perhaps I can explain the educational rate more clearly if I say that a man living in a house worth about \$2,000 would contribute annually for educational purposes about \$3.75. But whilst this somewhat heavy charge is being made upon the citizens, it is also satisfactory to note that with the increase of the educational rate, there has been practically a corresponding decrease in the poor rate.

I can only thus, in the short time at my disposal, give you a bird's eye peep of the educational institutions of our city—they are now pretty complete, and every boy and girl is afforded an opportunity of being well equipped for the journey of life, without any cost to the parents, beyond what they may contribute as their quota of the local rates.

I have referred to some of the philanthropists who have endowed schools ; but time would fail me to tell of the numberless institutions of a philanthropic character which the city possesses—instances seem to meet you in every ancient street—alms-houses abound as residences for aged people, and under the direction of the charity trustees, many old people receive annuities to comfort their declining years.

At this point it may be convenient for me to refer to a remarkably extensive pile of buildings, situate on Ashley Hill, one of the highest points in the city. They are known as Muller's Orphanages. Mr. Muller is a minister of the Plymouth Brethren sect and came to Bristol in 1832 ; in 1835 he opened an orphanage for thirty girls, and although he never asked any one for money, he received all he required. From this humble beginning he has proceeded step by step until to-day he has accommodation for 2,050 boys and girls. His buildings have been erected in the plainest possible style, but still have cost £115,000, and the weekly cost of maintenance is now about £500. He has received for his orphans about £1,000,000 sterling. He has no endowment, but depends for the future, as in the past, entirely on the prayers of faith.

The sole conditions for the admission of an inmate, which have never varied from the outset, is that the child shall have been born in wedlock, shall have lost both parents and shall be destitute.

Speaking generally, I may safely assume that a no more remarkable or unique institution can be found anywhere.

Mr. Muller is still living and vigorous, is well over 90 years of age, and preaches regularly every Sunday.

The medical charities of the city are of a very first-class character. The five great institutions are : the Bristol Royal Infirmary, the Bristol General Hospital, the Bristol Children's Hospital, the Bristol Eye Hospital, and the Bristol General Dispensary.

At the first four named institutions persons are treated both as out and in-patients ; from the last named medical men visit the holders of tickets at their homes. In addition to this, the city is studded with smaller dispensaries, homes for cripple children and friendless girls, and has various other institutions too numerous to mention.

Any one who has occupied the position which my friend Mr. Barker and myself have occupied, and been made acquainted with the inner work of these philanthropic societies of our city life, has often had reason to be thankful that there is so much that is kind, sympathetic and thoughtful yet left in human nature.

Religious Life.

Bristol is a cathedral city. It was founded as the head of a diocese in 1542, and was known as one of the foundations of Henry VIII. In 1836 it was united with the See of Gloucester, but a recent act of parliament has been passed constituting the city once more as the head of a diocese, and a new bishop, known as the Bishop of Bristol, has just been appointed.

Many of the churches of Bristol are very ancient fabrics, having been built many centuries ago. This particularly refers to the ancient wards of the city. We can scarcely imagine that there was a population in the ancient city at any time sufficiently large to fill all the central churches; but I have reason to think that many of these churches were built in association with ancient guilds. With the growth of the city many fine structures have been erected nearer the outskirts. Bristol in the past was known as "a city of churches," and in its more extended form it has not belied its reputation. The religious instruction of the people is not by any means confined to the Church of England. There are many free churches in the city which have histories quite as interesting, in regard to their foundation, as some of the churches of the establishment, and there are records in some of the free churches to-day of men who have suffered martyrdom within the city boundaries for liberty of conscience. Those were the days of religious intolerance, but, happily, those days are long past, and we may safely prophesy, are never likely to return.

Before leaving this part of my subject I ought to say that one of your strongest Protestant churches in Canada and the United States is the Methodist Church: this had its home in Bristol; it was here the first Methodist chapel was built. It has now passed away from the original foundation, and is used by Welsh Calvinistic Methodists. In the suburbs of Bristol the old chapel still stands which was built by John Wesley in connection with the school which he established for the education of ministers' sons. The school has been pulled down, and the site is now used as a reformatory, but the old chapel still exists in its primitive form (as well as the pulpit from which Wesley preached) and is now used for devotional exercises in connection with the reformatory.

Both the Anglican and the free church communities of Bristol have possessed as their pastors some of the finest spirits of their age.

Bishop Butler, the writer of the well known "Analogy" upon which Mr. Gladstone has recently been writing—presided over the Cathedral for twelve years, and is buried within its precincts, whilst amongst the free churches I might mention such names as John Foster, Robert Hall, Dr. Gotch, Dr. Carpenter, and his daughter, Mary Carpenter—the zealous

worker for the outcast children of Great Britain and India—and many others. And in our own time, the recent Bishop of Gloucester and Bristol, to whom farewell has been said only within the last few days—Bishop Ellicot—is one of the most distinguished scholars of the English episcopate—whilst amongst the free churches there are men to-day in the front rank of the ministry.

Bristol is also the head of a Catholic diocese. The present bishop, who is a man of many scholarly attainments, throws himself intensely into the work of the city, in everything that is philanthropic and kind. He has taken a very deep interest in the relief fund which has been raised in the city for the persecuted Armenians, and has taken his full share of responsibility in helping to perfect the arrangements for the Jubilee celebrations, which have just been so successfully carried out in our city on Tuesday last.

Old City.

Now we might wend our way into the city proper, and when we get to the very centre we find many traces of what it was hundreds of years ago. The streets in the ancient wards are many of them very narrow, and whilst they may present to a newcomer an unfavourable impression when he compares them with the centre of a modern large city, I have to ask you to remember that Bristol was originally a walled city; that the streets were necessarily very narrow and contracted, and that their present width has only been accomplished by a vast expenditure of money.

Street improvements seriously commenced some thirty or forty years ago, and those who are still in the forties will remember the narrow old streets, with over-hanging gables, from the upper stories of which persons could shake hands across the roadway.

I was reminded of an incident just as I was leaving home, of a male resident in Maryleport street, of a somewhat amatory disposition, who was discovered risking his life by kissing a maiden across this street from the upper storeys. Men often do strange things for love, money, or fame.

These old streets, in this utilitarian age, are now memories. Here and there an old building has been left standing, connecting the present with many centuries ago, and it will require very great zeal on the part of our Archæological Society to preserve some of these ancient fabrics from destruction. Personally my sympathy is very largely with city improvements, but I confess to a feeling of very great reluctance in the destruction of these ancient landmarks; we do not want to make Bristol entirely modern, because if we succeeded in this, it would not be so beautiful a city as other cities which are entirely modern; but in retaining some of the old features of the ancient city, its want of special beauty is compensated for by the retention of its ancient buildings.

There is a great deal of picturesqueness in the centre of Bristol ; the fact that the docks come right into the very heart of the city gives it a special character of its own. In some of the busy streets the steamers and vessels receiving and discharging cargoes make very pretty views.

The city is not rich in statues. One of the oldest is that of Neptune in Victoria street, which, tradition says, was erected to commemorate the destruction of the Spanish Armada in 1588. There is a very fine equestrian statue of William III., which is said by connoisseurs to be one of the finest equestrian statues in the United Kingdom. It was set up in 1735, and towards its erection the corporation contributed £1,000. In these days of representative government, the citizens would scarcely consider it within their province, from public rates, to make a contribution towards the erection of a statue.

In the centre of the city there has been erected a statue to Samuel Morley, who represented Bristol for about seventeen years in Parliament, and who died about ten years ago, a great merchant, a great philanthropist, a worthy and esteemed member of Parliament.

There is a statue to the Queen in College Green, which was erected in commemoration of the Jubilee ten years ago.

In the Colston Avenue there is a statue to Bristol's greatest representative in Parliament, Edmund Burke, and another to Bristol's greatest philanthropist, Edward Colston.

Downs.

At the end of the last century the suburbs of Bristol, known as Clifton and the Hotwells, were extremely fashionable. People came from long distances to drink the mineral waters, which were supposed to exercise a healing property upon rheumatism and kindred complaints. At the same period Bath and Cheltenham were also fashionable centres of the same character ; these two latter places are beginning once more to assume their old importance as inland watering places, and an attempt is made to restore the popularity of Bristol and Clifton in the same respect, by the erection of a fine spa and baths, in which the mineral spring which was so popular a hundred years ago, is being re-introduced.

The beauty of our suburbs, I venture to say, is almost unparalleled. This you may assume to be a little pardonable egotism on the part of a Bristol man ; but this opinion is so often expressed by visitors, that we have little difficulty in persuading ourselves that it must be true.

Our splendid downs, comprising about 600 acres, form a table-land of about 300 feet above the sea level. It borders on the Avon Gorge. From it you get an uninterrupted view of the mouth of the Severn and the Welsh Hills, and upon it you feel the breezes of the Atlantic. It has

been acquired by the city, partly by purchase and partly by the generosity of the Society of the Merchant Venturers. This great natural park is used as a place of recreation for the citizens, as a play-ground for youths and young men, and upon a large portion of it, horse riding is permitted. The citizens are intensely jealous of their rights upon this property, and any attempt to put any erection, even upon the fringe of it, creates very considerable opposition. Very little money is expended upon these downs, as it is the wish of the citizens to retain this property as nearly as possible in its wild and natural state. The part of it known as Clifton Down is extremely picturesque, being beautifully wooded with hawthorns, which in the spring give to it a very pleasing appearance when they are in full bloom. The scenery at this point is exceptional in its beauty. It runs down with a precipitous bank to the water's edge, forming what is known as the Avon Gorge, and travellers and tourists in search of the beautiful may go far and wide before they can equal the scenery which here meets the view. Across this gorge stretches the Suspension Bridge, a structure which is visited by tourists from all parts, because of the beauty of its situation. The building of such a bridge was suggested as far back as 1753, when an alderman of the city left a sum of £1,000 as a nucleus for this purpose; nothing was done until 1830, when the original sum had accumulated to £8,000. Plans were drawn by Mr. I. K. Brunel, and the piers were built, but the great expense of completing the structure caused it to remain unfinished, but in 1861 a company was formed, and the money was raised for its completion. The height of the bridge above high water is 245 feet; the span is nearly 700 feet. As a bridge pure and simple, it does not compare with some of the bridges which have since been built, but for its beauty and general environment, there is no bridge which I know that is comparable with it.

Within and around the city are other parks which have been acquired by the corporation—these are of a remarkably beautiful character, in consequence of the extremely undulating nature of all the suburbs of Bristol; but they have much in common with the parks which may be seen in many of our large cities, either at home, or on this continent. In addition to the large parks there are many smaller open spaces, all adding to the healthfulness and picturesqueness of the city.

The city possesses an excellent record for health, even when compared with places absolutely regarded as health resorts. In former centuries few cities suffered more than ours from constantly recurring epidemics and plagues; now fortunately modern drainage and our tidal river which is used to convey our sewage into the Bristol channel has altered all this, and the thorough system of isolation required by the health department of our sanitary authority, as well as municipal fever hospitals which have been erected, have all tended to make as impossible as any human effort can provide, the spread of any infection.

In conclusion, allow me briefly to repeat that the wealth and reputation of Bristol in several bygone centuries, were due to the merchants of those times taking the fullest advantage of our geographical position as a convenient and economical centre for the distribution of commerce ; and all the more enlightened citizens of to-day realize that from this same source the prosperity of the future will be found. I have explained that our corporation has ungrudgingly spent its money to bring the port up to date, and at the same time has reduced all port charges to a very low level. The wisdom of this enlightened policy is shown in the rapid development and growth of our business, the last year of which was the largest the port has yet known.

This year we are making such alterations to the lock of the Avonmouth dock as will enable us to take in longer vessels. This is being done to accommodate the Canadian business, for which several new steamers of great size are being built.

We have had reports from our own engineers and from experts who have been called in to advise, that it is possible to accommodate in the port of Bristol the largest vessels yet built or that have been suggested, and when the citizens screw up their courage for the expenditure, ours will become the natural port for the transatlantic trade, it being several hours nearer to America than either Liverpool or Southampton ; whilst the Bristol Channel is easier to navigate and freer from fog than either the St. George's or the English channels.

Bristol is old, but yet young, and I hope that she who had the honour of fitting out the ship "Matthew," will yet in the centuries to come, have and hold the premier position in the trade with the great continent which John Cabot discovered.

I hope I have pointed out some items of sufficient interest to cause our Canadian friends, when they turn their attention to the "Olde Countrie," not to give the old city of Bristol the cold shoulder, and I will promise you that when you come to Bristol, if you make yourselves known, you will be well received.

BRISTOL IN THE DAYS OF THE CABOTS.

BY W. R. BARKER.

One of the Bristol Delegates.

The task which I have set myself is that of endeavouring to convey some idea of what Bristol was at the period made famous by the discovery of North America. I wish to include in this not merely the peculiarities of the material town of Bristol, but also some references to its government and condition, with such an interweaving of hints as to its social aspects, as will, I hope, enable you to understand something of its real life at that period.

My special object does not require that I should enter upon the doubtful question of the origin of the early settlement which afterwards became the organised and fortified town ; that is to say, whether it had anything to do with the British and Roman periods, and, if so, to what extent. But it will be expected of me that I should briefly indicate, how the Bristol of the fifteenth century became developed from the small beginnings of its settled existence as they probably shaped themselves in Saxon times.

Here we are on more solid ground, for there are undoubted historic evidences in the examples of a Bristol coinage, and in the references of early writers, showing that at that period there was an infant Bristol. There also exists a conjectural representation of the town at that time, showing its original limits, and how it became, as time went on, laid out in thoroughfares occupied with houses, and enriched by the erection of many churches. This earliest illustrative idea of the size and construction of the town forms an illumination in a MS. volume which was a production of the fifteenth century, and which is still in existence and in use, called "The Mayor's Kalendar." This was compiled about the year 1478, in the time of Edward IV., by the then Town Clerk, Robert Ricart, who by means of this volume performed the duties of a public chronicler. The plan which his own or another contemporary hand drew represents the town as it originally stood upon a small oval area of about nineteen acres. Here it occupied what was almost an island, the waters of the Avon, and its tributary the From, touching it on all sides except towards the east, where afterwards the famous Castle of Bristol completed the defences which nature had so well begun. Standing on this little mound,

which you still ascend on all sides to reach the centre, it was surrounded by a wall with four principal gateways, one of which remains to this day. Connected with these gateways and upon the wall itself, four churches were in course of time erected, and it is interesting to know that where the one gateway remains, the church is also still there above the gateway. The chief thoroughfares of this miniature town were four streets radiating from the centre and extending to the gateways I have mentioned. These four streets still remain the central thoroughfares of modern Bristol, along which, after all the centuries that have elapsed since the plan was laid down and amid all the changed conditions of life, the men, women and children of to-day still make their way, as so many generations have done before them. At the summit of the eminence, on the sides of which these four streets radiated, stood the High Cross, and as if to justify beforehand the name which Bristol afterwards acquired as the "City of Churches," at the upper end of each of these streets and therefore converging upon the cross stood a church. Two of these four still remain, or, to be more accurate, in the one case there is an entirely new church upon the old foundation (Christ church), and in the other a much altered structure which still retains its Norman features (All Saints).

A glance at another ancient plan of the town which represents its aspect up to about 1350 enables us to realize its development up to that period. An outer circuit of defensive walls is now erected. The districts of Redcliffe, Temple, and the Marsh have all been absorbed. Bristol Bridge now forms a connecting link, between the city's two great divisions on either side of the Avon. A semi-circle of religious houses stretching from St. Augustine's monastery on the west, to St. Phillip's church and priory on the east has come into existence; while, adjoining the latter stands the frowning castle with its inclosed precincts barring all access from the Gloucestershire side. This is practically the Bristol which William Wyrcestre described in his famous itinerary which he compiled between the years 1470-1480, and the map is constructed according to his measurements.

It is needful to refer to only one more of the ancient plans, because that one carries us well over the period that is being dealt with. It is known as Hoefnagle's map. This is said to have been constructed from actual survey, and is reputed to be the first engraved map of Bristol. Certainly it is the first of any size and with any pretensions to detail. It represents a town that has become compact and well covered, and one which has the beginnings of those suburban extensions that have practically been going on ever since. These three plans convey some idea of the process of expansion that has gone on up to the end of the fifteenth century, and also explain some of the physical characteristics of the place which occupied so important a position in history, when revolution knocked at its gates, and rival factions contended for its

possession. For our special purpose at the present time we may also by means of these early plans realize how, with its safeguarding river, and its waterways and quays coming up to the doors of its merchants, it was fitted by nature to become the home of commerce and discovery.

Of all that constituted mediæval Bristol little now remains beyond the solid ecclesiastical structures, which then, in their comparative freshness, adorned the city. These are still so numerous that I must not attempt to speak of them all; but must limit myself to a few that stand out either because of their representative importance or because of their special connection with the fifteenth century.

In Cabot's days, what we now know as the Bristol cathedral, existed, so far as it existed at all, as the Abbey Church of St. Augustine's monastery. The building was then in process of reconstruction, and if, in the course of Cabot's rambles about the city, his eyes had rested upon this monastic-looking structure, he would have found it even then an example of the old order changing. The old Norman choir with its north and south aisles had been destroyed, leaving the Norman chapter room and its vestibule standing on the south side, and the early English Lady chapel with its beautiful and pure details on the north side; while between these two remnants of the older building, and incorporated with them, Abbot Knowle and his successors had carried on their work of reconstruction in the subsequent decorated and perpendicular styles. All that it took two hundred years thus to accomplish, may be told in a few moments. From 1306 to 1332 Abbot Knowle was busily engaged in re-erecting the choir with its north and south aisles, and these he completed throughout, a very noble life's-work, with which his name will always be reverently associated. For a long period nothing more was done except the construction of the beautiful Berkeley chapel, the second Lady chapel, and the Newton chapel, all on the south side. Then from 1450 to 1470 the builders were occupied in remodelling the lower portions of the great central tower, including the carving of decorated mouldings upon the enormous Norman piers, which were not removed, and building afresh the upper stages of the tower. From 1481 to 1515 Abbot Newland, or Nailheart as he was called, because of the badge which he adopted,—a heart pierced with nails and bleeding,—was busy with the reconstruction of the vaults and windows of the transepts in the third-pointed or perpendicular style, and that was all. Soon after came the dissolution of the monastery, and the Abbey church was left only half completed, and with a ruinous and disused Norman nave still cumbering the ground. Such was the Abbey church in Cabot's time, and when it became the Cathedral church of the new diocese formed by Henry Eighth's Commissioners it was but half a building, ending abruptly with what should have been its central tower.

Thus it continued, an uncompleted structure for three hundred years,—from 1542 to 1866, when was commenced that long-sustained series of noble efforts, by means of which every missing part of the structure has been supplied, and the whole stands forth a monument to the patience, faith and generosity of the men of our own time. For three hundred years Bristol had only half a cathedral, for sixty years she has had only half a Bishop, having for so long had to share the honours with Gloucester. The completion of the cathedral and its surroundings, and the restoration of the bishopric, are almost simultaneous, and both have been accomplished within the past thirty years.

On all accounts it is fitting that some reference should next be made to the grandest of parish churches, our cherished St. Mary Redcliffe. Some idea of its magnitude and completeness may be gathered from a glance at its ground plan. Especially by this means may its peculiarity be realized as a church within a church; the spacious transepts being ecclesiastically complete in themselves by the addition of their own side aisles. Either from the transepts or the west end, the view obtained of the combinations of architectural features is exceedingly striking. But beyond the splendid architecture, it will be found that there are historical and biographical links which specially connect St. Mary Redcliffe with the Bristol of the fifteenth century. It appears that while the lower portion of the tower was probably the work of the elder William Canynge in 1376, the upper portion was not completed till the early part of the fifteenth century. If so, it occupied its exalted position only for a short time, as in 1445 the upper part, for about one-third of the entire height, or a hundred feet, was thrown down, and crashed through the nave and aisles below. There is an amusing reference to this event in an ancient parchment chronicle, to the following effect: "1445. This year Redcliff steeple was thrown down with thunder, and did much hurt in divers places;" while another chronicle varies the language but professes to record the same extraordinary phenomenon in these words: "This year Redcliffe steeple *fell down with a thunderclap*, and did much harm in many places." As far back as the period with which we are dealing, therefore, the spire of the church presented the truncated appearance which it retained until quite a recent date. After so remaining for four hundred years, in 1872, on May 10th, the upper stage of this magnificent spire was again completed.

Bristol is a place in which many ancient customs still survive, notwithstanding the utilitarian spirit of the age. One of the most interesting of these is the annual visit of the mayor and corporation to St. Mary Redcliffe church on Whit Sunday. The custom dates back to the very period we are dealing with, for it was in 1494 that one Wm. Mede gave a house, the rent of which was to pay for the Pentecostal sermon in the presence of the civic dignitaries, and for strewing the floor of the

church with rushes, and ornamenting it with flowers. For more than 400 years the custom has been observed. The day after I and Mr. Davies left the shores of England in the present lovely month of June, the civic procession, as of old, wended its way through the streets of Bristol to the music of many church bells. The rushes were there, and the flowers and the Pentecostal sermon, but no one asks what has become of the original endowment, and probably no one could now tell.

In connection with Redcliffe church I hasten to speak of one greater than the Medes, I mean William Canynge, not the elder of that name, who, in 1376, according to the chronicles, "built the body of the church from the cross-aisle downwards," but his grandson and namesake, who repaired the damage done by the great storm in 1445. This William Canynge is described as having with "others of the town of Bristol kept masons and workmen to repair and beautify, cover and glaze, the Church of St. Mary Redcliffe, which his grandfather had founded in the reign of Edward III." His was a commanding figure both in local and national affairs. Upon occasion he was both bailiff and sheriff of Bristol. Five times he filled the office of mayor, and twice he represented the town as its "Parliament-man." Canynge was the typical merchant-prince of the fifteenth century. His ships were found in all waters where trade was to be done. He was the king's host at the social board, and his banker in times of necessity. He was called "the richest and the wisest merchant." He supported his own alms-men in his lifetime, and remembered them in his death. He was a religious man, and the chapel attached to his house on the bank of the river, with its open-timbered roof, still remains. And, as in previous ages of the world's history, the warrior not unfrequently retired from the court and camp to the seclusion of the monastery, so did Canynge after the excitement of his commercial and political life, retire to the seclusion of the college at Westbury, of which he was first the founder and then the dean; and at last he found his resting place beneath the roof of his beloved church of St. Mary, in a beautiful recessed tomb which he had himself prepared.

We must not leave Redcliffe church until we have had a look at that wonderful whale's bone, which during the past few months has attracted more attention than was ever given it before. It is certainly a very ancient relic, around which popular legends have gathered. But there seems no reason to doubt the story which connects it with the voyage of Cabot, although at this distance of time the matter cannot be quite cleared up. It is reasonable to conclude that it is a Cabot relic, although I am not able to go into the grounds of that conclusion at the present time.

St. John's gateway was referred to at the commencement of this address, as the only one of the four original gateways now remaining, and the church above it, from which it takes its name, as the only one remaining of those that formerly stood upon the town wall.

As regards this gateway, it would to every stranger be a remarkable fact, that by turning from this point either to the right or left hand you may still follow the course of the greater part of the old wall. The narrow lanes which represent the ancient footways within the walls, are now overshadowed by tall warehouses ; nevertheless as they regularly curve round, they follow the course of the vanished wall ; so hard is it for long centuries of time to obliterate the vestiges of the past, even in the centre of a busy city. The gateway still represents in its depth the thickness of the town wall, as also does the width of the church above, which is a simple oblong building, and of course has no transept. On the northern side of the gateway may still be observed the grooves in which the portcullis originally ran. The footways on either side are modern, and you can imagine what a different place Bristol must have been in the old days, when all the traffic in this direction had to make its way through this one archway, to say nothing of the entrance to the church being then in the archway itself.¹

Temple, or Holy Cross church, claims to be included in our survey, and if I am unable to attempt anything like a description here, I can at least refer to the peculiarity of its famous tower. It is said that originally the tower extended only to the trefoil band, upon which rested the battlements ; and that about the middle of the fifteenth century the builders carried it up another stage to its present height. However that may be, the completion of the tower was followed by a result that has caused it to be the wonder of every beholder since that distant time. In Camden's "*Britannia*" there is a very graphic note upon the inclination of the tower, which had then begun to manifest itself. He says : "The lanterne or tower whereof (Temple church) when the bell rings shaketh to and fro as it hath cloven, and divided itself from the rest of the building, and made such a chink from the bottom to the top as that it gapeth the breadth of three fingers, and both shutteth and openeth whenever the bell is rung." In one of the chronicles it is mentioned that in 1576 the inclination of the tower was found to be three feet nine inches.

In 1586 it is gravely recorded that, "this yeaere the Ducke of Norffock came from Bath to Bristol the 23rd of Maie ; the morrow after, went to Redcliffe and heard a sermon, and from there to Temple church to hear the bells Rynge and see the shaking of the tower."²

The tower is now said to be five feet out of perpendicular, and though to the eye of the observer it looks threatening to the last degree as it inclines towards the neighbouring houses, the lapse of centuries has created a confidence that is never questioned.

¹ The present church and gateway were erected on the foundations of the earlier structures at quite the end of the fourteenth century, perhaps the beginning of the fifteenth. There is still an earlier crypt in existence. The original structure goes back to the days of William, Earl of Gloucester—1174.

² Bristol Museum Roll Calendar.

One more tower and that an ideal one, a structure that seems to satisfy the most fastidious seeker after majesty and grace in architecture. Here again in St. Stephen's tower is the work of the fifteenth century, and the outcome of the liberality of one of Bristol's citizens, John Shipward by name, and surely never did mortal man have nobler monument ! I shall not attempt either description or further eulogy. I will only quote a passage from John Ruskin and ask you to apply it to the Tower of St. Stephen's : " Your noble tower must need no help, must be sustained by no crutches, must give place to no suspicion of decrepitude. Its office may be to withstand war, look forth for tidings, or to point to heaven ; but it must have in its own walls the strength to do this ; it is to be itself a bulwark, not to be sustained by other bulwarks ; to rise and look forth, ' the tower of Lebanon that looketh towards Damascus ; ' like a stern sentinel, not like a child held up in its nurse's arms. A tower may indeed have a kind of buttress, a projection, or subordinate tower at each of its angles, but these are to its main body like the satellites to a shaft, joined with its strength and associated with its uprightness, part of the tower itself. Exactly in the proportion in which they lose their massive unity with its body, and assume the form of true buttress walls set on its angles, the tower loses its dignity." ¹ If one *could* add anything to Ruskin, more would not be needed.

Passing from the churches because I must, I should like to linger for a few moments amongst the memories and remains of the old religious houses, for which Bristol was famous in the middle ages. The ancient records refer to no less than sixteen of these houses, some of which existed for monastic and others more especially for benevolent purposes. Some were in the heart of the crowded town, and others stretched, as already stated, in a wide semi-circle on its northern fringe. Of only seven of these do any remains whatever exist, and in most cases these remains are only fragmentary.

St. Augustine's monastery and its abbey church have already been referred to, and three others must not be passed over. On the northern side of St. Augustine's Green, opposite the monastery, stood the Hospital of the Gaunts, the college chapel of which, dedicated to St. Mark, is still beautifully preserved. For nearly two hundred years past it has been known as the " mayor's chapel," it having been through that long period the official church of the mayor and corporation of Bristol. The object for which the hospital was founded in 1220 was the feeding of one hundred poor people daily, and this purpose it fulfilled under a succession of master-almoners. and with some intervals of irregularity, for more than three hundred years. The fifteenth century was perhaps the period of its greatest activity, judging by the additions made to the structure,

¹ Stones of Venice, i. p. 200.

and the rebuilding of the eastern end in the year 1500. It seems to have been practically an open house for the sick, sorrowful, and needy. Everything has been swept away except the college chapel, which is, no doubt, one of the most interesting and complete of the smaller mediæval structures now remaining. Its history, as revealed in its stones, shows that from time to time additions and alterations were made, so that the little church has become an epitome of all the three styles of pointed architecture. It is interesting to note that the tower was added in the fifteenth century, the exact date being in this case curiously preserved. Many years ago in the course of doing some repairs, a slate tablet was found embedded in the wall of the tower, upon which the following inscription was incised: "In the yere off our Lorde God MCCCCLXXXVIj the iij day off Novemb the masonry of thys Towr was fynshyd."

As part of the machinery which existed in the fifteenth century in connection with the religious houses, for the alleviation of poverty and suffering, long before the modern poor-house and hospital were known, the old Gaunts' hospital occupied a distinct position, in that which belongs to all ages, the cause of Christian charity.

In one of the lowest slums of Bristol, beyond a thoroughfare which, by a humorous contradiction, is called "Quakers' Friars," there may be found, after a sufficient search, all that remains of an ancient Dominican priory that was founded at the same time and by the same individual as the Gaunts' hospital—Maurice Berkeley de Gaunt. Little now remains of the priory buildings, but that little is deeply interesting. It includes the dormitory 86 feet in length, with its open-timbered roof divided into twelve bays, and its range of lancet windows still remaining. There are also the remains of the cloister, and of another range of buildings, the upper floor of which is supposed to have been the hall of the priory. This also retains its original thirteenth-century roof. The curious name "Quakers' Friars" is not without its justification, for about the year 1650 these premises, which had been so long the home of the Friars, passed into the hands of the Quakers, the names of George Fox and William Penn appearing in the records as having to do with them.

The only other relic of these ancient religious houses that I need refer to, is the gateway of St. Bartholomew's priory. This is still in existence, but, alas! so neglected and mutilated as to be almost past recognition. Few indeed know of its existence, although, it may be, they pass it every day. The buildings into which the gateway once led have entirely disappeared, and business premises now occupy their place. A while ago I saw advertised upon the wooden doors which now fill the archway the virtues of someone's nineteenth-century boots. Think of it! Nineteenth-century boots advertised on a thirteenth-century archway! On another occasion I peeped within the open door, and found the space between the double arches filled with coke, which was piled against the

once elegant trefoiled arcading on either side. This is all that remains of what in the fifteenth century was described as "St. Bartholomew's priory and hospital without Frome gate." After the dissolution of the priory the buildings became the home of Robert Thorne's free grammar school, and then of John Carr's city school, also known as Queen Elizabeth's hospital.

Passing from the religious to the secular life of fifteenth-century Bristol, the famous castle then stood, as it had stood for ages, a mighty stronghold, defending the city from hostile approach on the Gloucestershire side. It matters little now whether it was erected to protect the town in its infancy, or whether afterwards it was used to overawe it, when it had increased in wealth and power; or whether it was made to serve the double purpose of protecting both the city and the Gloucestershire estates of the great barons who held it. There it stood for five hundred years, and round it surged some of the fiercest struggles of rival princes and factions that England has ever known. William Wyrcestre, of course, refers to it in his "Itinerary," and gives the dimensions of its great keep and other parts, from which may be gathered some idea of its strength and importance. The earlier history of Bristol castle is better known than the later, in consequence of the prominent position it occupied in the early history of the country. If, however, the following chronicle entry under date 1546 is correct, it is evident that during the reign of the youthful king Edward VI. it must have been devoted to more peaceful uses than formerly: "Also this year the King begun to make a mint in the Castle, there to coin gold and silver, and also to print, which is followed daily to the Glory of God." The end came when Oliver Cromwell was in power, after the castle had played its part in the revolution. In truly Cromwellian style he issued his warrant for its destruction in the following terms, addressed to the mayor and commonalty: "These are to authorise you forthwith to demolish the castle within the city of Bristol, and for so doing this shall be your warrant. —28th day of Decr., 1654." So faithfully, although it would also appear unwillingly, were these orders carried out, that practically nothing has since remained beyond two chambers with groined roofs and other architectural features connecting them with the period of the castle's erection. These may still be explored, although, as unhappily they are not public property, they are not cared for as they should be. There are also interesting relics of the sieges of the castle preserved in the Bristol Museum.

Freeman, in his sketch memoir of William the Conqueror, writes: "Every season of anarchy is marked by the building of castles; every return of order brings with it their overthrow as a necessary condition of peace." How completely this has been realized will appear when I tell you that upon part of the site of the ancient Bristol castle now stands

a handsome board school in which hundreds of children receive a free education and are being trained for the peaceful pursuits of our modern city life.

The High Cross in Bristol was, in accordance with ordinary usage, the centre of all civic life, interest, and movement. It is constantly referred to in this way in old documents, and is therefore the memorial of many changes which, though they belong to ancient history, have had their influence in making Bristol what it is to-day. The cross which occupied the site in the fifteenth century was erected in the year 1373, and it is said upon the faith of an old chronicle to have been preceded by an earlier one, possibly constructed of wood. It had at the time of its erection, and continued to have for two hundred and sixty years, only the lower range of figures representing the kings, John, Henry III., Edward III., Edward IV. (?) Then, in 1633, it was raised by the addition of four other figures, representing Henry VI., Elizabeth, James I. and Charles I. A hundred years later, in 1733, upon the plea that it was a source of danger, it was removed from its distinguished position at the centre of the city and was re-erected in College Green. There it was deemed to be a nuisance, because it interfered with the promenading of the wives of the rich citizens, in the wide-spreading garments of the period; and in 1763 it was again ignominiously taken down and stowed away in some corner of the cathedral. The dean of the day, Dean Barton, did not want what he looked upon as rubbish laying about there, so without stopping to ask whether it was his to give, he gave it away to Sir Richard Hoare, who at least knew how to value it. He erected it in his beautiful grounds at Stourhead in Wiltshire, and there it stands to this day, not as of old, in the midst of the busy life of the town from which it might well have been deemed inseparable, but in the midst of the charms of nature, to which it is a beautiful but incongruous addition. Bristol to-day has to be content with an inferior copy of this original, which, like its predecessor, stands in College Green. How much would the once despised original now be valued by Bristol citizens!

I might tell you many interesting things about it; how it is supposed to have been erected to commemorate the granting of the charter of Edward III., by which, amongst many other things, Bristol was made a county in itself, a distinction which meant a good deal in those days; how, in 1399, Thomas Despencer was hurried to the cross, as the place of execution, by an angry populace, and there beheaded; how, at the frequent visits of the early English sovereigns, it was the custom for the High Cross to be newly painted and gilded, the cost on one occasion being carefully set down at 20 li.; how every proclamation of a new sovereign was made from within its canopy; and, therefore, how, when Elizabeth died and James ascended the throne, "first the trumpets sounded mournfully for Queen Elizabeth three times, and then they sounded joyfully thrice

for proclaiming the king, the mayor standing in the High Cross and his majesty's picture being placed over their heads upon the High Cross, in the sight of all beholders," and how, all through our nation's struggles with her enemies, now war and now peace, were alike proclaimed from this spot. There is only one thing more about the cross that I will refer to. It was towards the end of the fifteenth century (1499) that Henry VII., soon after he had ascended the throne, came to pay a visit to the loyal city of Bristol, the city which afterwards rendered distinguished service to the king, as the port which sent forth Cabot on his memorable voyage. The people determined to give him a hearty reception. The authorities and the guilds met him in procession, they filled the air with music, they sanded the streets, they spent £20 in money of the time in decking the High Cross, they put on their best apparel in honour of the king, and what did it all come to? That most generous and sympathetic of kings, before he left the city, levied a fine of 20s. upon every citizen who was worth £20,—and why?—because (to quote the chronicles) "*their wives went too sumptuously apparelled.*" Poor wives, whose vanity was thus the unintentional cause of their husbands being plundered!—poor husbands, who, upon such a plea, were made to minister to the needs of a rapacious monarch!

I shall naturally be expected to give you, if possible, some idea of what the domestic architecture of Bristol was at the period under review. There is, I think, only one building remaining from which a definite idea can be obtained, although there are still many quaint buildings of later periods. The one in question is, however, typical in its character and completeness. The range of buildings known as St. Peter's hospital stands under the shadow of St. Peter's church, which formerly abutted upon the castle wall. The structure has no doubt undergone many changes in the course of centuries, but its principal features remain in spite of "change and decay," in the overhanging upper floors, the massive carved wood-work, and the three picturesque gables. Historic references to this typical residence of well-to-do people go back as far as the end of the fourteenth century, for it is recorded that in the year 1400, Thomas Norton, who was then "parliament-man" for Bristol, lived in St. Peter's churchyard, and this house continued to be the residence of various Nortons after that period. After some earlier changes which need not be enumerated, there came a series of later changes, the last of which brings us to the present time. In 1666 it was converted into a sugar refinery; in 1696 at the time when the whole coinage of the country was renewed, it was used as a local mint; in 1698 it was purchased for poor-law purposes by the Bristol Incorporation of the Poor, and in their possession it has remained ever since.

There is a very interesting apartment still used as the board-room of the guardians, which is always sought out by those who are curious in

such matters. The dark oak panelling of the walls, the fire-place with mixed architectural features, and the elaborate ceiling, all harmonize with the quaint exterior of the building, and with the grotesque carvings found in various passages and doorways. From this example of the dwelling-houses of earlier times, we may judge what must have been the appearance of Bristol when such buildings gave their distinctive character to the streets.

This seems to be the right point at which to introduce you to a fifteenth-century mayor of Bristol. The scene depicted is the induction of the new mayor at the Guildhall. It is taken from the same manuscript volume called the "Mayor's Kalendar," which furnished us with the earliest plan of the city. This illumination represents what was familiar to the Bristol burgesses from the time of Edward III. down to the passing of the "Municipal Corporations Reform Act," sixty years ago. The modern procedure is shorn of almost every trace of mediæval usage, although the robes of office, the corporation officials, and the civic insignia are still much the same. This ceremony of the induction of the new mayor marks a great advance in the power and liberty of the community, as compared with the period when the barons exercised their despotic sway. In the charter of Edward III., which may be called the Magna Charta of Bristol, it was provided that the burgesses might elect their own mayor, and that his oath on taking office should be taken before his predecessor, instead of before the constable of the castle. Bristol was at the time sharing in the remarkable development which characterized town life at this period, and, as a growing seaport, it had become the more necessary that the king should stand well with a place from which so much might be expected. No longer, therefore, was the outward and visible sign of subordination to the castle allowed to exist, and it is no wonder that an event so important should have been thought worthy of being pictorially represented as well as verbally recorded. The incoming mayor is in the act of repeating the oath, which is preserved verbatim in the volume. The outgoing mayor holds the Bible, upon which the hand of the incoming mayor rests, while he repeats the form of oath which is read by the town clerk. Standing below on either hand of the chief actors in the scene are the "grave, sad, and worshipful aldermen." Below, on the left, is the chamberlain with his mace, and next him the sword-bearer, whose modern representative still continues to carry the sword and wear the cap of maintenance. On the table are seen the roll of parchment representing the chamberlain's accounts, the bag containing the common fund, and the ink horn. The case for preserving the Bible on which the oath is taken is also there. Below the table, stand the sergeants with their maces, and below these again the commonalty of the town, who have come to witness the ceremony which gives them a new mayor. In this fifteenth century the duties attached to

the office were widely different from those fulfilled by its modern incumbent. The mayor then exercised a personal, almost a paternal, influence in many directions, where now the duties are performed by elaborate state departments. In those days wills were proved before him, and he had the care of orphans and their estates. He exercised a supervision over the numerous crafts that then existed, maintained their privileges, and contributed to their enjoyment, at certain seasons, by generous gifts of wine. The scrutiny of weights and measures devolved upon him, and he tested not only the justness of the measures, but also the quality of the liquor. This was done by the aid of his "ale-conner," and woe betide the brewer, great or small, whose drink was found to be below the standard. The casks were unceremoniously broached and the liquor allowed to find its way—anywhere. The assize of bread was also of the utmost importance for the protection of the poor, and any one found "breaking the assize" was bundled into the lock-up without ceremony. In times of scarcity the mayor adopted strong measures to ensure food being within the reach of all. Such a year as that in which the "Matthew" sailed, for instance, was one in which special provision would have to be made, as the price of wheat then advanced to two shillings and sixpence per bushel, whereas in the year before and the year after it stood at sixpence. In the same way under the authority of the mayor, the supplies of wood for winter fuel were subject to strict regulations, it being provided that, "from spring to spring" this should be sold at a given public place "in pennyworths and half-pennyworths in the need season." In addition to all this and much more there was held the mayor's daily court, "at the place of justice called the Tolsey."

In connection with the office and duties of the mayor, some information will not be out of place concerning the fine collection of plate and insignia which has always been closely connected with the official life of the city. There is a history connected with each article, but many things were not acquired till after the period to which I am limited. The essential parts of the insignia are the chain of office, the state swords, and the seals. Of state swords there are four in existence, acquired at different times, and two of them are specially connected with the fifteenth century. The distinction of being the oldest of the four belongs to what is called the "mourning sword." This has undergone many changes as regards the external parts, but the blade belongs to the period of Edward III., and was probably provided when Bristol was made a county in itself. The second in point of date is the one known as the "pearl sword" and purports to be the gift of Sir John de Welles, who was lord mayor of London in 1431. This would, therefore, be about the date of the sword. The third, or, as it is called, the "Lent sword," so-called because it is carried during each Lent assize. It also has undergone many changes, so that its age has become obscured, but the blade bears evidences of be-

longing to a late mediæval period. Two of the MS. chronicles which have come under my notice refer to the fact that, in the year 1499, the king, Henry VII., granted a new charter to Bristol, and also that he presented his own sword to the mayor to be borne before him on all occasions of state. The origin of this sword has hitherto been spoken of as unknown. This seems to be a fitting occasion for throwing out the suggestion that in this "Lent sword" we have the one that was presented by Henry VII., just two years after John Cabot's great discovery, and that both charter and sword may be regarded as tokens of the king's gratitude for the success of the expedition which Bristol sent forth. Last, but by no means least, in point of size, there is the gigantic sword now commonly in use. In the Georgian days of extravagance and display, the corporation seem to have thought that the old historic swords were not "up to date," so they acquired by purchase a brand new one in 1753.

The present mayoral chain dates back only to 1828, the time of George IV., but previous chains of office were in use, as, in the language of an old chronicle, the civic procession which met Queen Anne, consort of James I., on the occasion of her visit to the city in 1612, was headed by the mayor, who "did ride bareheaded with a chain of gold about his neck." The use of this appendage to the office of mayor does not, however, seem to have extended back to the fifteenth century.

The ancient seals of the city of Bristol are also a most important part of its insignia. In these days a damp wafer and a lever press are deemed sufficient, but these ancient seals are real works of art. They represent the importance of the city in its early stages, and are in themselves the evidences of its exceptional privileges. It cannot be said when a seal first came into use; certainly there did exist a seal or seals before the oldest of those that now remain. The oldest of these dates from Edward I. Most of the seals relate only to the performance of the ordinary duties of the executive authority, such as the burgess and mayoral seals, but there are others that relate to the performance of special duties, and the enjoyment of privileges that belonged only to the favoured few among the towns of England in the fifteenth century. Of the latter class is the seal of the mayor of the Staple. In the exercise of the monopoly conferred upon the city at this period, the mayor controlled the extensive trade carried on in wool, wool-fells, skins, lead, and tin, wool being by far the most important. Such goods were examined and weighed on shipment, or arrival, and all questions arising from these transactions were settled at a court held by the mayor, called the Staple court. It will be readily understood how, in the exercise of the privileges of a staple town, the trade of Bristol at this early period very rapidly increased.

Another important seal is the one known as the Admiralty. It is made of lead and has the appearance of great antiquity. In 1462 under

Edward IV., and early in his reign, a series of charters was granted. One of these was intended to secure the privileges under which Bristol was exempted by land and water from the jurisdiction of the Admiral of England ; while to the mayor and recorder was given the power of inquiring into such matters relating to the town as would otherwise have been investigated by the Admiralty court. These privileges, also, must have given a great impetus to trade, by freeing the city from those vexatious interferences which were peculiar to the time.

There is also a seal that was formerly attached to the office of chamberlain of the city. This office was created in the fifteenth century by Henry VII., and continued in use until the passing of the Municipal Corporations' Reform Act.

All these evidences of the importance of Bristol, these symbols of its increase in wealth and power are still with us, carefully preserved ; and though at the caprice of princes, or to satisfy their greed, the old charters had sometimes to be resigned, Bristollians are proud of the fact that they have never had to part with their seals.

I incidentally referred just now to the Tolsey, or Tolsey court. This was a very ancient institution, so ancient that its origin is lost in the mists of the past, but it is thought to have extended back to Saxon times. It still survives among us as a court of record, with peculiar privileges, and presided over by the recorder of Bristol. The Tolsey, that is, the structure, whatever it may have been, was apparently the place where the king's tolls or dues were collected. It also shared with the High Cross, close to which it stood, the distinction of being resorted to as a place of general assembly whenever exciting matters were before the public. Its colonnade, at the period of which I am speaking, formed the exchange of the merchants, and those who had business with them, and, as you have already heard, it was the place in which the mayor administered justice. The last Tolsey was erected about 1500 or a little later, and there it stood until 1783, when, under the powers of an act of Parliament, it disappeared before the march of improvement in the streets of Bristol, which then began. At the present time our chief interest in the vanished Tolsey arises from the fact that it was always the place of resort of those who were concerned not only with the general commerce of the town, but also with those schemes of adventure to foreign parts, for which the town became so famous. Here the sedate merchants would confer about their past adventures, their future projects, their gains, their losses, their hopes, their fears. Here captains of vessels leaving would receive their final orders, or, returning, would make their reports ; and it will not be "adventuring" too much on my part when I suggest that, here at the Tolsey, the plans for Cabot's famous voyage were discussed, the crew engaged, the departure fixed. This would simply be in accordance with the recognized and every-day use of the place.

We have in Bristol a beautifully designed gothic doorway, with panelled side posts and carved spandrels, which is a relic of the fourteenth century. It is not only interesting as a fine specimen of the work of that distant period, but also on account of its associations, and when these are remembered, it becomes suggestive of many facts connected with the trade of Bristol about the fifteenth century. This doorway was originally the entrance to what is known as Spicer's hall, a building which stood on the "back," which has been frequently referred to, or, as we now know it, the Welsh back. The building, of which this was the entrance, was named after the Spicers, who were among the principal merchants of the period, and here in the middle of the fifteenth century Richard Spicer had his imposing residence, his warehouses and his cellars. Here, too, at that period, or a few years later, the Merchant Venturers' Society had its headquarters. The Spicers were notable people for several generations, and Richard Spicer takes his place with Canynge, Jay, Mead, Sturmys and others, who founded the greatness of the town by the energy and enterprise with which they developed its trade and commerce. The position of one of the earlier Spicers may be judged from the fact that the king, Richard II., was not above borrowing forty-five pounds from him. The mention of the name of Sturmys reminds one of the well-known story, which will bear repetition here, because it illustrates better than anything else could the position of power and influence to which the Bristol merchants had attained at this period. It appears that in 1457 a ship belonging to Robert Sturmys had been what is called "spoiled" by the Genoese, while prosecuting its business in the Levant and other parts of the east. Sturmys was on board, which made matters worse. It appears that the outrage of lying in wait for the ship and destroying it was owing to a false rumour as to the nature of the cargo on board, and it was followed by consequences little reckoned on by the guilty parties. Philip Mead, the mayor, went off to the king and his council, and sued all the Genoese merchants in London, and they were condemned to pay the enormous sum of six thousand marks (money of the period) as damages; one authority says nine thousand. It is evident that the Bristol merchant was not to be trifled with in those days. When Richard Spicer died he left the city the reversion of his property under certain conditions, and consequently Spicer's hall, or Back hall, passed into the possession of the authorities, and under the power of a grant from the king it was made "for ever a convenient place for keeping, selling, and weighing merchant-strangers' goods." This was at the time when the goods of the merchant-strangers could only be dealt with under the severe restrictions imposed by the merchants' guild. This Spicer's hall was evidently constituted the common hall, or public place, in which the goods were deposited when awaiting sale, the residence of the foreign merchants themselves being limited to forty days, and their proceedings jealously watched by the home merchants and their agents.

From the "Back of Avon" where, as we have seen, the shipping lay, and the merchants' residences and traders' warehouses stood, to the northern end of old Bristol bridge was but a step, inasmuch as there the one joined the other. Representations of the old bridge show a curious structure not unlike the old London bridge, so much better known. It was formed of four pointed arches with massive buttresses, and above towered the tall houses and shops with projecting bays, half-timbered fronts, and gabled roofs, overhanging the river below. Between the two rows of tenements ran the narrow roadway, which was still further contracted half-way across by an archway, above which rose the chapel of the Assumption of Our Lady, much resorted to by the mariners frequenting the port. This very old-world structure was erected as far back as 1247, when it became the link between the original town and the districts of Redcliff and Temple, which were then incorporated with it. For five hundred years it stood, with its immense superincumbent weight, until in 1761 it was taken down to make way for a modern structure. At the end of the fifteenth century, therefore, it was just about half-way through its long period of usefulness. The tall houses on the western side looked across a bend in the river, immediately on to the Back, with the mercantile surroundings which I have described.

We are left to conjecture respecting the precise locality in the port of Bristol, at which the "Matthew" lay moored on the morning of May 2, four hundred years ago. It may have been at the "Back of Avon," so often referred to, or at the "key" which ran up to Small street, where many of the merchants dwelt, or from a little creek or rill that ran inland close to St. Mary Redcliff church. This being a matter of conjecture, I must incline to the "Back" as the probable place of departure, and on that supposition one can, without any undue stretch of imagination, picture the scene when the "Matthew" emerged from amongst the other little vessels that lay there, and glided down the river on the ebbing tide of that ever memorable day. Groups of the merchant adventurers stand upon the "back" gravely discussing the chance of this new undertaking. Around the little vessel that was destined to accomplish so much, small boats are lingering with "Bristol boys" who wish they could change places with those on board. Upon the deck stand the Cabots, father and son (supposing them both to have been there), the one the soul and inspiration of the undertaking, the other wistful and waiting for developments. And now, as the vessel swings round, they take a last look at the old bridge, and see from above many hands waving a hearty farewell. The eighteen determined men who formed the crew are on the alert, and so away they go, down the narrow winding river, out upon the broad bosom of the Severn sea, and away westward into unknown depths of ocean, at last to reach that mysterious coast which many had sought but had not found.

At this point I leave to others all the debatable questions connected with Cabot's great achievement. I would not for one moment disparage, even by the implication of silence, the splendid courage and skill shown by the man who carried through successfully the enterprise around which so many threatening dangers gathered. I may not even dwell upon the mighty results which have flowed from what was certainly one of the most notable events in the world's history ; nor will I refer to the vexed question of the landfall of the expedition. This seems to be an occasion on which local patriotism may be indulged in without the least suspicion of a desire to dwarf any other aspect of this great event. I and my colleague who have come to Canada to represent our dear old city on this stirring occasion, feel a natural pride in the fact that it was from the heart of Bristol that Cabot and his companions went forth upon this quest, "not knowing whither they went," and that having reached their goal, to Bristol they returned with the news of the land which you now possess, and where you enjoy all that freedom, enlightenment, and enterprise can bestow.

On both sides of the ocean there has sprung up of late a desire to do honour to the great event of the fifteenth century, and to the central figure connected with it. What more suitable opportunity could be found than the anniversary of the event now returning for the four hundredth time ? I am glad to feel that what we are doing in Bristol and Canada respectively forms not two celebrations, but one, in which we have joined hands and have come closer together than ever we could have been brought by mere political and commercial relationship. The tie between us is now recognized as a matter of personal relationship, of reciprocal feeling, of more intimate knowledge ; and the memorial which the Bristol people are now erecting on the most commanding spot within their city will speak to future generations not only of the enterprise of an ancient but still vigorous community, the achievement of a great man, and the discovery of a vast continent ; it will speak also, in conjunction with your own proceedings, of a sympathetic interchange of feeling and utterance between the people of Halifax and the people of Bristol ; between loyal and warm-hearted Canada and the Mother Country ; it will speak of a union of hearts that will last, let us hope and pray, not for four hundred years only, but for many hundred years to come.

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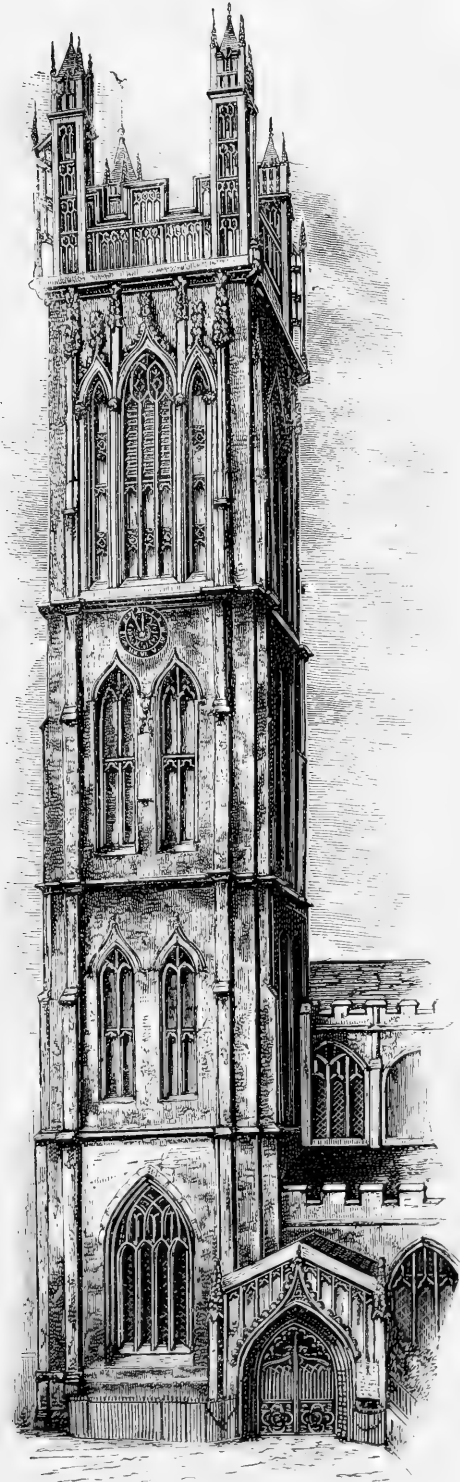
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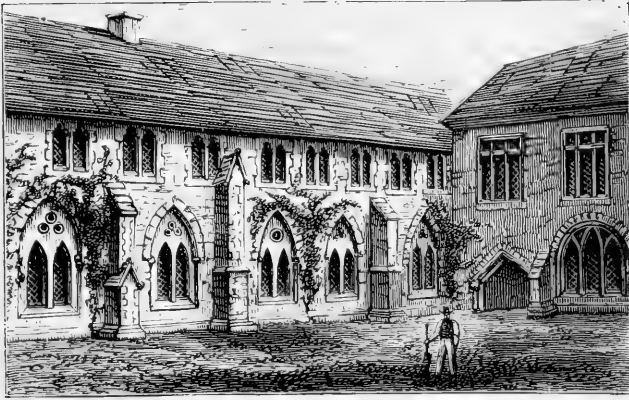
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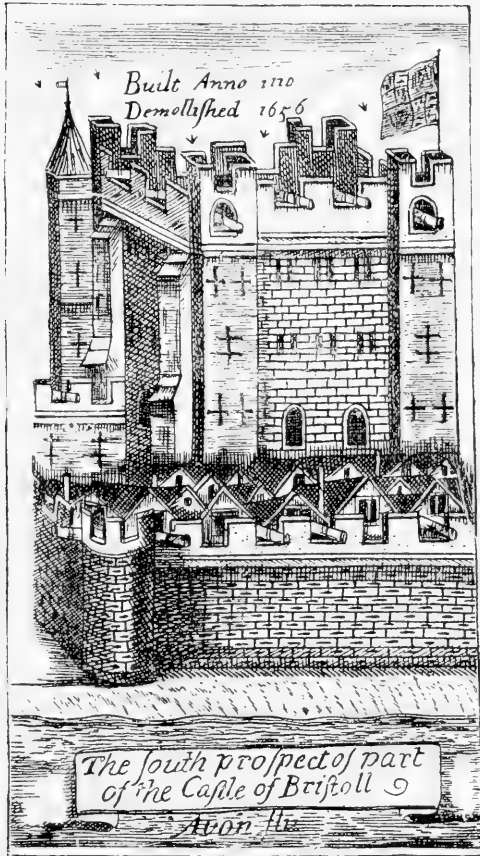
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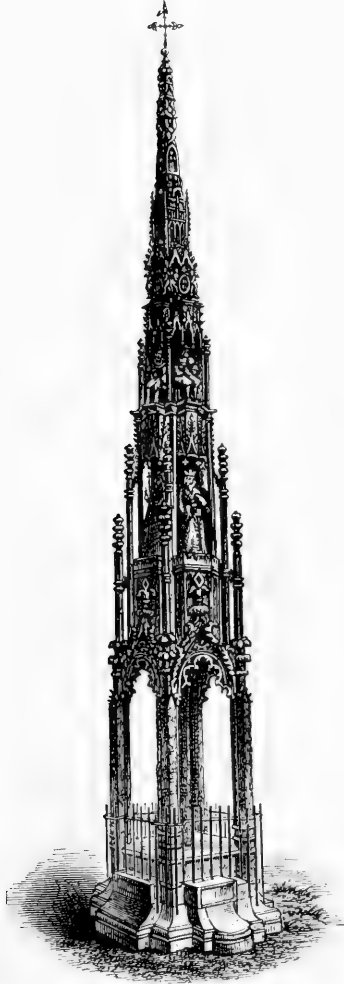
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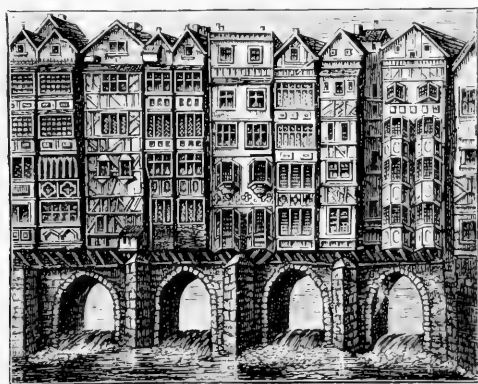
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SOCIÉTÉ ROYALE DU CANADA

MÉMOIRES

SECTION I

LITTÉRATURE FRANÇAISE, HISTOIRE, ARCHÉOLOGIE, ETC.

ANNÉE 1897

I.—*Claude-Charles Le Roy de la Potherie*,¹

Par M. J.-EDMOND ROY.

(Lu le 23 juin 1897.)

“ Il y a plus à faire, disait Montaigne, en parlant des commentateurs de son temps, à interpréter les interpréteurs qu'à interpréter les choses ; et plus de livres sur les livres que sur les autres sujets : nous ne faisons que nous *entregloser*. Tout fourmille de commentaires, d'auteurs il en est grande cherté.”

Je ne sais pourquoi ces lignes du grand moraliste me reviennent à la mémoire au moment où je commence à écrire cette étude biographique et bibliographique sur Claude-Charles Le Roy de la Potherie.

Tous ceux qui s'occupent des temps anciens du Canada connaissent l'*Histoire de l'Amérique septentrionale*, par M. de Bacqueville de la Potherie. Y en a-t-il beaucoup qui sachent quelque chose sur la vie de cet auteur ?

Pourtant, n'est-ce pas un des principaux éléments de la science historique que de s'assurer tout d'abord de la valeur des sources où l'on puise ? Et si la vie de l'auteur nous est inconnue, si l'on ignore sa naissance, le milieu où il s'est agité, les idées qui l'ont guidé, quel critérium aurons-nous pour nous assurer de la justesse de ses jugements ? L'historien emmagasine des faits pour la postérité. Cette postérité sent le besoin de savoir si l'auteur qu'elle consulte a été témoin oculaire ou auriculaire, ou s'il ne fait seulement que rapporter les dires des écrivains qui l'ont précédé.

Que l'on ouvre dix livres où sont relatés les mêmes événements. On trouvera souvent dix versions différentes, des dates qui ne concordent pas, des détails disparates, qui masquent la vérité que l'on cherche.

C'est pourquoi de nos jours, comme du temps de Montaigne, il y a plus de livres sur les livres que sur les autres sujets. “ Tout fourmille de commentaires, d'auteurs il en est grande cherté.”

La Potherie, qui est un des plus anciens historiens du Canada, est aussi un de ceux qui est le plus souvent cité. Il importe donc de connaître ce qu'il vaut et ce qu'il fut, et c'est le but de cette étude.

I

Les encyclopédistes et ceux qui ont traité de la biographie canadienne sont très sobres de renseignements sur la Potherie, et ce qu'ils donnent est erroné.

¹ J'adopte l'épellation *la Potherie* pour suivre la coutume, mais le sujet de cette étude signait le plus souvent *la Poterie*.

Larousse publie ces quelques lignes :

“ Bacqueville de la Potherie, historien né à la Guadeloupe, fut nommé en 1697 commissaire royal, et remplit ensuite les fonctions de sous-gouverneur de la Guadeloupe. Il a écrit une *Histoire de l'Amérique septentrionale*, qui a été publiée à Paris en 1772.”

La Potherie ne fut jamais sous-gouverneur de la Guadeloupe et son livre n'a pas été publié à Paris en 1772.

M. Bibaud, dans son *Panthéon canadien* (p. 227), dit :

“ Potherie (Leneuf, Bacqueville et Le Roy de la) tous trois seigneurs en Canada.

“ Jacques Leneuf de la Potherie, gouverneur des Trois-Rivières et lieutenant de M. de Mésy, fut commandant général du pays à sa mort, jusques à l'arrivée du marquis de Tracy et de M. de Courcelle, et eut de grandes difficultés avec le Conseil supérieur, qui voulut ne le regarder que comme commandant des troupes et non comme gouverneur *ad interim*.

“ Bacqueville de la Potherie, né aux Antilles, est bien connu comme historien de la Nouvelle-France.

“ Le Roy de la Potherie, commissaire-ordonnateur à Montréal, se distingua comme administrateur par deux mémoires au ministre de la marine au sujet du gouvernement et de l'industrie.”

Tout cela est confusion et erreur.

M. de la Potherie, que le gouverneur de Mésy, atteint d'une maladie mortelle, nommait son lieutenant au gouvernement de la Nouvelle-France, le 27 avril 1665¹, n'appartenait point à la famille de l'historien.

Bacqueville de la Potherie et Le Roy de la Potherie, dont M. Bibaud fait deux personnages différents, ne sont qu'un seul et même individu qui ne fut jamais seigneur au Canada, et c'est celui dont j'écris maintenant la biographie.²

Charlevoix, dans sa *Liste des Auteurs*³ et Faribault, dans son *Catalogue d'Ouvrages sur l'Histoire de l'Amérique*, ne donnent aucun renseignements biographiques sur la Potherie.

Le P. Labat,⁴ dans un voyage qu'il fit à la Guadeloupe en 1696, raconte qu'il visita au Gros-Morne, à la pointe septentrionale de cette île, une habitation considérable qui appartenait à un gentilhomme nommé le Roy de la Potherie, qui se disait parent d'un des ministres du roi de France⁵ et qui n'en était pas pour cela plus à son aise. “ Les fréquentes descentes

¹ *Reg. Ins. Cons. sup.* vol. I, p. 12.

² Dans son *Dictionnaire historique* (p. 265), M. Bibaud répète la même erreur en disant que l'historien de la Potherie fut lieutenant de M. de Mésy et seigneur canadien et qu'il eut des démêlés avec le Conseil supérieur, ayant succédé à M. de Mésy *ad interim* à sa mort.

³ Vol. VI, p. 314.

⁴ *Voyages du P. Labat aux Iles de l'Amérique*, t. I, p. 133.

⁵ La femme de Phélippeaux, comte de Pontchartrain, était une Le Roy.

des Anglais dans ce quartier-là, dit-il, où ils ont pillé deux ou trois fois ses nègres et ses meubles, l'ont obligé de l'abandonner et de se retirer au bourg de la Basse-Terre. Je vis sa maison, sa sucrerie et son moulin qui étaient encore sur pied, mais les poux de bois travaillaient de toutes leurs forces à les mettre par terre. Il y a un bon mouillage devant cette habitation, qui est à couvert des vents de la bande du nord par le Gros-Morne, de ceux de la bande de l'est par les hautes montagnes qui partagent l'île, et de ceux du sud par les bornes de Feri."

"M. le Roy de la Potherie, raconte encore le P. Labat¹, avait eu autrefois du bien considérablement, mais il avait eu le malheur de le perdre en jouant avec des gens qui en savaient plus que lui. Il était venu aux îles pour rétablir ses affaires, et il y aurait réussi, puisqu'il avait trouvé le moyen de faire une sucrerie à côté de Gros-Morne, si le jeu, la dépense et les Anglais n'avaient tellement achevé de le ruiner, qu'il subsistait avec beaucoup de peine longtemps avant de mourir."

Ce planteur ruiné, ce décavé, dont parle le P. Labat, s'appelait de son vrai nom Charles-Auguste Le Roy. Il était chevalier et seigneur de la Potherie et de Cossart. Il avait épousé dame Catherine-Françoise du Signet de Monville. C'est de ce mariage que naquit à la Guadeloupe, vers 1668, Claude-Charles Le Roy de la Potherie, le sujet de cette étude.²

Les détails sur l'enfance de la Potherie manquent totalement. Il dut cependant recevoir une bonne instruction, parce que ses écrits abondent de citations d'auteurs classiques.

La Potherie était allié aux Pontchartrain par les femmes, et le jeune créole, dont le père était ruiné, dut compter naturellement sur l'appui de cette famille. Il entra donc dans l'administration, et, en 1689, on le trouve à Roscoff, port de Bretagne, en France, où il exerce l'emploi de commissaire de la marine. Le célèbre corsaire Jean Doublet qui fit escale en cet endroit, en 1689, raconte qu'il y fut très bien reçu par M. Le Roy de la Potherie.³ De son côté, M. Bréard, qui a publié le *Journal de Doublet* dit que la Potherie fut nommé écrivain principal de la marine à Roscoff, le 20 juillet 1694, puis transféré à Port-Louis, en 1696.⁴

Au mois de mars 1697, la Potherie recevait du roi l'ordre de s'embarquer à la Rochelle comme commissaire à bord de l'escadre qui, sous les ordres de d'Iberville, devait aller chasser les Anglais de la baie d'Hudson.⁵

¹ T. II, p. 395.

² Cette date est approximative. Le P. Labat qui rencontra la Potherie en 1703, lui donne l'âge de trente-cinq ans, et c'est sur cette donnée que je m'appuie. (*Loc. cit.*, p. 395.) Le P. Labat dit encore "qu'il était un gentilhomme européen ou créole et qu'il ne savait pas trop bien où il était né". Mais la Potherie prend lui-même la peine de nous dire sur le titre de ses ouvrages qu'il était né à la Guadeloupe, et il parle toujours de cette île comme de sa chère patrie.

³ *Journal de Jean Doublet, corsaire*, publié par M. Bréard en 1883, p. 143.

⁴ *Loc. cit.*, en note.

⁵ *Hist. Am. sept.*, t. I, p. 2.

C'est de cette date que la Potherie touche à l'histoire du Canada. Il avait alors vingt-neuf ans.

La flotte, composée de cinq vaisseaux, *le Pélican*, *le Palmier*, *le Weespt*, *le Profond* et *le Violent*, partit de la Rochelle, le 8 avril 1697. M. de Sérigny, monté sur *le Palmier*, commandait l'expédition, en l'absence de son frère d'Iberville, capitaine de frégate, que l'on devait prendre à Plaisance. L'enseigne de vaisseau Chatrier commandait le *Weespt*, et Bigot, *le Violent*. La Potherie était à bord du *Pélican*.

Le 18 mai, après une traversée des plus orageuses pendant laquelle la plupart des vaisseaux furent désemparés, on arrivait en rade de Plaisance. D'Iberville y était déjà rendu. Pour se faire la main à l'expédition qu'il préparait, il avait passé l'hiver à ravager les établissements anglais de Terre-Neuve. A la tête de 124 Canadiens, il était parti de Plaisance le jour de la Toussaint 1696, marchant sur les neiges, les pieds chaussés de raquettes, à travers bois et rivières, et le 30 décembre, Saint-Jean lui ouvrait ses portes. Le long de son chemin, d'Iberville s'était emparé de tous les postes de pêcheurs. Il revint à Plaisance chargé de butin. Pendant cette expédition on avait fait 700 prisonniers et tué 200 hommes à l'ennemi. Les Français ne comptaient que 1 mort et 2 blessés. Dans l'espace de trois mois, la colonie anglaise de Terre-Neuve avait été complètement détruite, à l'exception de quelques petits postes isolés. La population de ces établissements comptait alors 2,163 habitants, qui fabriquaient, par an, 188,800 quintaux de morues, soit une valeur commerciale de dix-sept millions de livres.

La Potherie, pour la première fois en contact avec des Canadiens, ne peut chanter assez leur bravoure et leur dévouement. Ils ne respirent que la gloire, dit-il.¹

¹ L'expédition que fit d'Iberville à Terre-Neuve en 1696-97 est racontée au long dans le chapitre deuxième du premier volume de l'histoire de la Potherie.

Ce récit peut être contrôlé par les pièces manuscrites qui suivent :

Archives de la marine. *Canada, Correspondance générale*, vol. XIV, c. II.

1696, 18 déc. Duplicata de la relation écrite à M^{sr} de Pontchartrain sur la prise de Saint-Jean, p. 4.

1696, 24 sept. Plaisance. D'Iberville au Ministre. Rend compte de sa dernière expédition en Acadie et ailleurs, p. 238.

1696, 26 oct. Le même au même. Compte rendu de son expédition de Terre-Neuve. *Loc. cit.*, vol. XV, p. 250.

1697, 5 juillet. Plaisance. D'Iberville au Ministre. Rend compte de ses dernières opérations, p. 169. *Amérique du Nord, Acadie, Correspondance générale*, vol. III, c. II.

Du 26 juin 1691 au 2 septembre 1697. Journal, par M. Beaudoin, missionnaire, du voyage qu'il a fait de France en Acadie et d'Acadie à Terre-Neuve. Expédition de d'Iberville à Terre-Neuve, p. 27.

Voir aussi aux archives de Plaisance la correspondance du gouverneur Broullan.

A voir aussi dans le *Recueil des Voyages au Nord*, de Jean-Frédéric Bernard, Amsterdam, 1732, vol. III, p. 305, la *Relation du Détroit et de la Baie d'Hudson*, par Jérémie.

Jérémie accompagna d'Iberville dans son expédition à la baie d'Hudson en 1694. Parti de Québec, le 10 août 1694, il arriva au fort de Nelson le 24 septembre. Il assista

Le 8 juillet 1697, d'Iberville, à peine remis des fatigues de la rude campagne d'hiver qu'il venait de mener, prenait le commandement de l'escadre en rade de Plaisance et faisait voile vers les mystérieuses régions du nord. Le chef de l'expédition était monté à bord du *Pélican* et il avait avec lui le commissaire la Potherie. Ce dernier n'avait jamais vu le feu, mais il pouvait dire qu'il allait en recevoir le baptême sous les ordres d'un fier capitaine.

Après deux mois de navigation à travers les glaces et la brume, le 3 septembre la vigie du *Pélican* signalait le fort de Nelson dit Bourbon. D'Iberville fit mouiller à 3 lieues et demie de terre pour attendre le reste de l'escadre qui avait été retardé par des vents contraires. Le 5, à la pointe du jour, on aperçut trois vaisseaux sous le vent. Sur les 7 heures du matin, d'Iberville fit lever l'ancre et chassa sur eux. Ils ne répondirent point aux signaux de reconnaissance, et l'on vit bientôt que l'on avait affaire à trois vaisseaux anglais : le *Hampshire* de 56 canons, monté de 250 hommes d'équipage, le *Dering* de 36, et le *Hudsonbaye* de 32.

La partie n'était pas égale. *Le Pélican* était seul contre trois avec 150 combattants et 44 pièces montées.

D'Iberville accepte le combat quand même.

Il s'engage alors une de ces luttes homériques comme seul cet illustre marin savait les mener. *Le Pélican*, toutes voiles dehors, pousse droit sur le *Hampshire*, qui croyant qu'on veut l'aborder, laisse tomber sa grande voile et recule. D'Iberville se tourne alors vers le *Dering*, crible sa voilure et ses cordages de mitraille et envoie le reste de sa bordée au *Hudsonbaye* qui venait au secours. *Le Hampshire* revient à la charge et pendant 3 heures et demie essaye en vain d'embosser *le Pélican* entre des récifs et ses deux autres vaisseaux. Les Français répondent au feu qui est dirigé sur eux. Leurs batteries sont pointées si à propos que chaque coup porte. Une dernière bordée déchire les flancs du *Hampshire*, qui descend dans les flots, ses voiles toutes hautes.

Ce fut la fin du combat.

Le Hudsonbaye amena son pavillon et le *Dering* prit la fuite.

à la prise du fort et y passa l'hiver avec d'Iberville. Ce dernier partit du fort Bourbon pour la France, le 20 juillet 1695, y laissant soixante-sept hommes sous le commandement de M. de la Forest, avec M. de Martigny, comme lieutenant. Jérémie demeura comme enseigne, interprète des langues et directeur du commerce. En septembre 1696, le fort capitule aux Anglais, Jérémie est fait prisonnier et conduit en Angleterre, où il demeure quatre mois. De là, il passe en France et s'embarque de nouveau en 1697 pour l'expédition dont forme partie la Potherie. Il demeure au fort Bourbon jusqu'en 1707 comme lieutenant et interprète. En 1708, il obtient un congé, se dirige sur la France et est de suite appelé à rallier son poste pour remplacer le commandant, M. Delisle. Jérémie fut gouverneur du fort Bourbon de 1709 à 1714, jusqu'au jour où il dut remettre son commandement aux Anglais, en conformité des stipulations du traité d'Utrecht.

Le P. de Charlevoix (*Liste des Auteurs*, p. 414), parlant de Jérémie, dit : "J'ai connu l'auteur, qui était un fort honnête homme et un habile voyageur. ...Sa relation est fort instructive, et judicieusement écrite."

On s'était approché de si près pendant la lutte que l'on se tirait de bord à bord à portée de pistolet. Pour sa part, la Potherie eut son justaucorps tout haché et son tapabord percé d'une balle. Quel plaisir s'il eût pu se montrer à M. de Pontchartrain avec une écharpe au bras !

Deux jours après cette glorieuse rencontre, le *Pélican* faisait naufrage au milieu d'une affreuse tempête. D'Iberville put cependant sauver presque tout son monde et gagner terre. Sur ces entrefaites, le *Palmier*, le *Weespt* et le *Profond* arrivèrent à l'embouchure de la rivière de Sainte-Thérèse. C'était la délivrance. Quelques jours après, le fort Nelson capitulait presque sans coup férir. A son départ de la Rochelle, la Potherie avait reçu ordre de M. Begon d'agir de concert avec d'Iberville dans les entreprises de terre. Lorsque le commandant du fort se rendit, il envoya un ministre écossais pour parlementer. La Potherie voulut servir d'interprète, mais il y perdit son latin avec le ministre qui pouvait à peine décliner *Musa*.

L'escadre appareilla le 24 septembre pour retourner en France. Le 8 novembre, elle était à Belle-Isle, où on dirigea sur l'hôpital de Port-Louis les malades de l'expédition. Le désarmement se fit à la Rochelle, et la Potherie prit le chemin de Versailles. "Grâces au Seigneur, écrivait-il alors, je sors du plus affreux pays du monde. Je ne crois pas que l'on m'y rattrape, moi surtout qui suis né sous la zone torride. Il est juste que chacun fasse son noviciat.

"*Hic labor extremus, longarum haec meta viarum.*"

II

Le premier mai 1698, la Potherie, était nommé contrôleur général de la marine et des fortifications au Canada.¹ Après neuf mois de séjour à la cour,² ce créole des pays torrides, parent d'un ministre en faveur, dut donc s'embarquer pour les régions du nord, pour y vivre au milieu des peuplades sauvages, dans l'exercice d'un modeste emploi.

C'est lui qui, vraisemblablement, apporta à Québec, dans l'été de 1698, la nouvelle de la conclusion du traité de paix de Ryswick.³

La charge que venait exercer la Potherie était nouvelle dans la colonie, et il semble qu'elle fut créée tout exprès pour lui. Ses devoirs consistaient à inspecter le service administratif des troupes de la marine stationnées dans le pays. Il avait encore pour mission de surveiller et de vérifier les opérations des officiers chargés des travaux du gouvernement, et la comptabilité de toutes sortes.

¹ *Journal de Doublet*, p. 143. Note de M. Bréard.

² *Hist. Am. sept.*, vol. I, lettre x.

³ Le 15 septembre 1698, le Conseil supérieur de Québec assistait en corps à la cathédrale au *Te Deum* qui fut chanté en actions de grâce pour la conclusion du traité de Ryswick.

L'intendant ne pouvait signer aucun contrat d'entreprise concernant le militaire, la marine ou la défense, sans qu'il fût assisté du contrôleur. C'est ainsi que lorsque, le 14 janvier 1700, l'intendant Champigny fait construire une allonge à la maison du fort à Québec, on voit le nom de la Potherie au pied du contrat.¹

Le nouveau contrôleur arriva à Québec pour être témoin de la mort du gouverneur Frontenac, le 28 novembre 1698. Il fut vivement impressionné de la douleur qui semblait peinte sur les figures. "Jamais, dit-il, père de la patrie n'a été plus regretté. L'état ecclésiastique l'honorait pour sa vertu et la noblesse l'estimait pour sa valeur. Le marchand le respectait pour son équité et le peuple l'aimait pour sa bonté."

La mort de Frontenac dut affecter d'autant plus la Potherie qu'il lui était quelque peu allié par la famille des Phélippeaux.²

C'est M. de Callières, gouverneur de Montréal, qui prit le commandement intérimaire de la colonie en attendant la nomination du successeur de Frontenac. Au printemps de 1699, il donna des ordres pour que toutes les troupes vinssent camper à Montréal, pour en faire une revue générale. Les troupes, étant en bataille, il fit savoir qu'il voulait les voir défiler devant lui, et ordonna que les officiers le saluassent de la pique. Les officiers lui firent connaître que ce salut n'était dû qu'aux princes ou maréchaux de France, mais comme il insistait, il fallut bien se soumettre.

Cette querelle d'étiquette n'était au fond qu'un prétexte pour donner l'occasion aux deux factions qui se partageaient alors la colonie de se rallier des partisans. M. de Callières avait sa cour et M. de Vaudreuil, la sienne.

La Potherie se trouva très involontairement mêlé à ces chicanes oiseuses. Comme contrôleur de la marine, il fut naturellement obligé de se prononcer sur cette question de discipline. Il en prit bravement son parti et se rangea du côté des officiers.

Voici la lettre qu'il écrivait de Montréal le dernier jour de mai 1699 conjointement avec M. de Vaudreuil, commandant des troupes.³

"MONTRÉAL, ce dernier mai 1699.

"Monseigneur,

"Les troupes étant au champ de bataille toutes prêtes à être passées en revue par MM. de La Touche et Le Roy de la Potherie, commissaire et contrôleur de la marine et moi avons été surpris que M. de Callières voulait

¹ Etude Rageot. Ce contrat fut donné à l'architecte de la Joue. Cette allonge devait avoir 21½ pieds de long entre le bâtiment neuf et l'ancienne cuisine, et être construite sur un vieux bâtiment que l'on démolissait. La façade était en pierre de Beauport. L'entrepreneur pouvait aussi prendre la pierre entre le jardin et la plate-forme. Les démolitions devaient être mises dans la cour du fort.

² La mère de Frontenac était une Phélippeaux, nièce et fille de deux secrétaires d'Etat.

³ Ce document inédit est tiré des archives coloniales de France. *Canada, Correspondance générale*, vol. XVII, p. 110.

exiger à cette occasion un honneur qui n'est dû qu'à un maréchal de France malgré les ordonnances de S. M.

“ Nous de Vaudreuil lui avons montré l'article de l'ordonnance de la marine, page 62, titre II, au sujet des honneurs qui sont dûs aux officiers généraux de la marine, comme il est porté à l'art. 2 en ces termes :—“ Il sera fait pour le lieutenant général commandant d'un port un simple appel de deux ou trois coups de baguette, et les soldats prendront pareillement les armes”.

“ Comme nous n'avons pas trouvé dans les ordonnances qu'il lui soit dû d'autres honneurs que ceux que S. M. nous prescrit de rendre, et voulant exiger de nous, officiers de la marine, que l'on battit aux champs pour lui, et qu'il fût salué comme un maréchal de France, nous avons prié en même temps M. de la Poterie en qualité de contrôleur de la marine qui doit entrer dans le fort et le faible des affaires du Canada de lire encore les livres des réglemens et ordonnances du Roy pour les gens de guerre, tome I, p. 122, art. IX, qui porte : “ Quand ledit gouverneur et lieutenant général passera aux portes d'une place et devant les corps de garde établis en icelle, les officiers et soldats prendront les armes et se mettront en haie sans faire battre le tambour si ce n'est que led. gouverneur et lieutenant général soit maréchal de France”.

“ Sur ces deux réglemens nous lui avons représenté que si l'on avait souffert à M. le comte de Frontenac de tels honneurs, ils ne lui étaient pas dus.

“ D'ailleurs, Monseigneur, si nous les lui avons accordés, nous savions qu'il avait l'honneur de vous appartenir, et nous croyons ne pouvoir trop lui en rendre.

“ M. de la Poterie, en qualité de contrôleur de la marine et des fortifications du Canada, voulant nous conformer aux réglemens de S. M., principalement à l'Edit du Roy de 1691, portant création des charges de trésorier et contrôleurs généraux de la marine, galères et fortifications des places maritimes, qui porte ces paroles : “ Qu'ensemble les provisions, commissions et brevets qui seront, par nous accordés aux officiers de la marine, galères et fortifications des places maritimes seront contrôlées”, avons cru de notre devoir dans une pareille conjoncture, de connaître si effectivement M. de Callières n'avait pas quelque ordre particulier pour tels honneurs, nous l'avons supplié, en qualité de contrôleur de la marine, de vouloir nous communiquer ses provisions, parce que les troupes du Canada étant de la marine, il était juste du moins qu'on lui déférât tous les honneurs qui lui pourraient être dus dans cette occasion ; il nous a fait réponse que nous n'étions pas de la marine.

“ Je demande, Monseigneur, si nous avons d'autre ministre que Votre Grandeur, si tous lesd. emplois que S. M. accorde ne viennent pas par votre canal et si nous pouvons nous adresser à d'autres qu'à vous. Pour moi, Monseigneur, je ne reconnais que Votre Grandeur. Ainsi quand

quelque officier ou celui même qui en sera le chef par accident sera honoré d'une provision particulière, j'espère que vous me ferez la grâce de me maintenir dans le droit que l'emploi que vous m'avez accordé me donne de les enregistrer à moins que nous puissions unanimement tous contribuer au bien du service, éviter les contestations qui peuvent y préjudicier.

“Cependant, Nous de Vaudreuil, avons prié M. de Callières de nous donner par écrit un ordre comme il voulait absolument qu'on lui rendit ces honneurs, et sur le premier qu'il nous a donné nous avons refusé le faire en voulant un pur et simple; sur quoi il nous a obligés de lui donner un refus par écrit après lequel il nous a donné un second ordre. Nous y avons obéi et après la revue les troupes ont défilé devant lui et nous l'avons salué de la pique quoique nous eussions pu ne pas le faire étant resté dans son carrosse sans daigner mettre pied à terre.

“Nous sommes avec infiniment de respect, Monseigneur, de Votre Grandeur, les très humbles, très obéissants et très obligés serviteurs.

“Signé,

“VAUDREUIL,

“LE ROY DE LA POTERIE.”

“P.-S. Nous soussignés, Commissaire Ordinaire de la Marine, et Lieutenant d'une Compagnie détachée de la Marine, faisant fonctions de Major des Troupes en Canada, certifions que nous étant trouvés dans la conversation qui s'est tenue entre MM. de Callières, de Vaudreuil et de la Poterie, avons entendu et été témoins du contenu en la présente lettre.

“A Montréal, ce dernier mai 1699.

“Signé: DE LA TOUCHE, D'ESGLY.”

Dans l'opinion des officiers, le concours de la Poterie, allié d'un ministre, devait sans doute être d'un grand poids. Ce dernier se laissa-t-il monter la tête par l'encens de la flatterie, ou voulut-il simplement appuyer la prétention de ses compagnons d'armes? Le 2 juin 1699, il écrivait de nouveau au ministre une lettre particulière sur le même sujet. Chose assez curieuse, on retrouve dans cette lettre plusieurs des expressions dont s'était servi l'intendant Champigny dans une communication écrite quelques jours auparavant, le 26 mai. Voici ce qu'écrivait la Poterie pour son compte personnel: ¹

“à MONTRÉAL, ce 2 juin 1699.

“Monseigneur,

“Il est bien fâcheux de se voir spectateur de discorde dans un pays éloigné de son Prince pendant que l'on agit de concert dans le cœur du Royaume.

“M. le Comte de Frontenac n'a pas été plus tôt mort que la zizanie s'est répandue dans ce pays. On a vu M. de Callières prendre tout à

¹ *Loc. cit.*, p. 112.

coup un empire si despotique qu'il semblait que M. l'Intendant même devait lui obéir aveuglement.

“ Vous aurez sans doute vu M. de Courtemanche apporter la nouvelle de la mort de M. de Frontenac de la part seule de M. de Callières. M. de Champigny qui l'avait envoyé exprès à Montréal pour lui en faire part, fut si surpris de ne lui avoir pas demandé les mesures qu'ils devaient prendre tous deux, que n'ayant reçu aucune de ses réponses fut contraint lui-même de vous dépêcher Vincelot un mois après pour vous rendre un compte de l'état des affaires. M. Callières le traita avec tant de mépris par une lettre, que l'on eût dit que ce n'était pas son affaire de vous donner avis de l'état d'un pays. Je ne sais pas si M. de Champigny vous en envoie une copie. C'est pourtant une chose à voir. M. de Callières se trouve donc si rempli de lui-même par l'honneur qu'il avait de maîtriser par intérim, qu'il prétendait que la provision dût être enregistrée en plein Conseil souverain, comme s'il eût été effectivement général. Ce fut encore un sujet de plaisanterie aux Conseillers auxquels il en envoyait seulement une copie, grande invective encore qu'il fit à M. de Champigny sur ce que cet hiver il avait fait mettre à couvert un buste du Roy que la neige avait miné avec la même force pour ainsi dire que ferait le vitriol, sans faire réflexion que Monsieur l'Intendant ayant lui-même fait présent de cet ornement à la ville, il voulait la conserver pendant la mauvaise saison pour l'exposer cet été dans un endroit plus auguste qui pût le mettre dorénavant à l'abri des injures du temps. Ce jour ici a-t-il encore voulu forcer qu'on lui rendit des honneurs, *honneurs* que nos lieutenants généraux n'oseraient afficher, se contentant seulement de les recevoir quand on les leur donne de bonne grâce, et lors qu'on ne leur accorde point ils se rendent justice à eux-mêmes puisque l'on observe en cela la loi du Prince.

“ Si M. de Callières était regardé comme le père de la Patrie l'amour et les délices des Nations, nos alliées, tel qu'a été M. de Frontenac, je me serais fait un plaisir d'engager M. de Vaudreuil de ne pas tout à fait s'arrêter à la lettre. On l'aurait prévenu. Nous eussions été ravis de trouver une occasion comme celle de notre revue, de lui marquer qu'en perdant le soutien et l'appui des gens de guerre, il nous demeurerait encore une espèce de consolation dans l'affliction publique par les vœux que l'on pouvait offrir en faveur d'un homme qui pourrait mériter la grâce du Prince ; mais bien loin que l'on ait ici ces sentiments je vois que l'on ne fait pas beaucoup d'état de sa personne.

“ Persuadez-vous donc, Monseigneur, que M. de Callières ne veut point entendre parler du tout que lesdites troupes soient du corps de la marine. Il n'en a pas l'esprit et ne veut pas même goûter cette pensée, à peu près comme ces philosophes attachés à leur Aristote, ou à de vieux médecins entêtés à leurs premiers sentiments qu'ils ont tirés des anciens auteurs.

“ Je me trouve donc à la contestation qu'il a avec M. de Vaudreuil sur le fait des honneurs qu'il a voulu exiger comme nous vous le mandons plus amplement. Je me trouve comme dans un équilibre. Je vois d'un côté des réglemens de terre et de mer qui le défendent, et de l'autre, moi qui crois qu'il est bien fondé d'ailleurs, il me fait refus de me communiquer sa commission. Ils sont une heure et demie à se débattre, à écrire papier sur papier à cinquante pas du champ de bataille. Au bout du compte obéissance vaut mieux que sacrifice. Nous n'aimons pas de même l'esprit de dissension. On le repait cependant de cette fumée qu'on lui donne après notre revue dans son carrosse qu'il reçut d'un flegme et d'une tranquillité aussi particulière que si c'eût été quelque divinité de ce nouveau monde. Pour moi, je crois être en droit de demander à tous les Officiers leurs brevets, commissions ou provisions. Quand je suis arrivé en Canada j'ai reconnu les états-majors des Gouvernemens de Québec, Trois Rivières et Montréal. Comme je n'ai point vu qu'il y eût Lieutenant de Roy de Province, comme est le Chevalier de Guitaud à nos isles, j'ai bien jugé que la Cour avait pourvu quelqu'un par intérim au défaut de M. de Frontenac. Je ne suis pas obligé de deviner qui c'est, parce que je sais qu'un Lieutenant de Roy de Québec commande naturellement dans sa place quand il n'y a point de Gouverneur. Le Gouverneur des Trois Rivières est maître chez lui ; M. de Callières l'est aussi à Montréal : ils sont tous trois indépendants les uns des autres, mais la Cour qui est sage et judicieuse remédie aux inconvéniens qui peuvent arriver au sujet de ces indépendances par les commissions qu'elle accorde à un homme pour être au dessus d'eux. Je dois donc savoir qui est celui là, parce que les mouvemens de guerre qu'il peut faire faire aux troupes, les dépenses extraordinaires, les présens pour les sauvages qui peuvent venir faire des alliances avec nous, les nouvelles fortifications, toutes ces choses, dis-je, passent à la fin de l'année sur des états, et on me les fera signer aveuglément au départ de nos vaisseaux sans que je sache qui a le pouvoir de faire tout cela, c'est l'éclaircissement que je vous supplie très humblement de me donner. Il en est de même de M. de Vaudreuil comme de M. de Callières : aujourd'hui pour demain que celui-ci meure, naturellement le Marquis de Crisacy est maître de la place, cependant on dit que M. de Vaudreuil a une même commission que M. de Callières. Ne tiendra-t-il qu'à M. de Vaudreuil de me dire qu'il est commandant général, pour causer ensuite des troubles publics faute que l'on aie la communication de sa commission. M. de Callières trouve donc que c'est au dessous de lui d'en agir de la sorte. Cependant quand nos Capitaines de Vaisseaux deviennent chefs d'escadres, ils ne tiennent point leurs brevets ou commissions dans leur poche. Ce sont les contrôleurs généraux ou du moins les contrôleurs des ports de mer qui les enregistrent.

“ Tout ce que je prends la liberté de vous mander c'est que je me suis fait une loi de vous donner insensiblement une idée du fort et du faible

du Canada afin que, quand vous y trouverez de l'abus vous puissiez y remédier.

“ M. de la Touche et moi ne nous amusons point à la bagatelle. Nous savons que les ordres de la marine disent que l'on *portera l'ordre* tous les jours aux commissaires et aux contrôleurs, on ne veut pas le faire. Pourquoi ? c'est que l'on ne veut point entendre parler de la marine. Tous ces honneurs au reste ne sont que fumée, nous nous en consolons aisément. Vous voyez néanmoins, Monseigneur, que ces Messieurs exigent des honneurs qui ne leur sont même pas dûs. Je suis témoin depuis trois jours de tant d'ivrognerie en cette ville : ce ne sont que combats entre les sauvages qui se mangent le nez, les oreilles, le visage. Le peu de police qu'un Gouverneur fait observer dans tous les petits cabarets est cause de tous ces dérèglements.

“ Je suis avec infiniment de respect, Monseigneur, de Votre Grandeur,
 “ Votre très humble, très obéissant et très obligé serviteur.

“ Signé : . . . LE ROY DE LA POTHERIE”.¹

Toutes ces correspondances allèrent mourir dans les casiers des ministères, et, au printemps de 1700, on apprit que M. de Callières avait été nommé Gouverneur général.

III

La Potherie, qui se trouvait dans la colonie au moment où se traitaient avec les nations sauvages les importantes négociations qui devaient se terminer par la paix générale de 1701, aurait bien voulu jouer un rôle dans ce mémorable événement. En sa qualité de contrôleur il se croyait justifiable d'être appelé dans les conseils du gouverneur, tout comme les autres officiers. Pourquoi des capitaines, des lieutenants, des missionnaires même, prenaient-ils le pas sur lui, chargé spécialement par le Ministre de contrôler la dépense et de reviser les comptes en dernier ressort ? Il se plaint de ce manquement avec assez d'amertume dans une lettre qu'il écrivait au Ministre dans l'été de 1700.²

Le Roy de la Potherie

AUTOGRAPHE DE LE ROY DE LA POTHERIE (1700).

¹ Voir la lettre de l'intendant Champigny au Ministre, du 26 mai 1699.

² Archives coloniales de la Marine, vol. XVIII, p. 146. Cette lettre est inédite.

“ à QUÉBEC, le 11 août 1700.

“ Monseigneur,

“ Je vous suis trop dévoué pour souffrir que vous ne soyez pas informé le premier de la paix que font les Iroquois. Je mande à ma sœur qui est à Paris de vous présenter de ma part ou à Monseigneur le Chancelier une semblable lettre pour plus grande sûreté.

“ Les Iroquois sont venus à Montréal en ambassade le mois de juillet au nom de leurs nations pour demander la paix. Ces ambassadeurs viennent principalement de la part des Ounontagais et des Tsomontouans qui se disent les pères des Cinq Nations. Voici en substance ce que portent huit colliers qu'ils ont présentés à M. de Callières au nombre de sept ambassadeurs.

“ Le premier pour essayer le sang de 58 Iroquois tués par les Miamis.

“ Le second pour renverser la chaudière de guerre et abattre la hache.

“ Le troisième pour planter l'arbre de paix et si haut qu'il soit vu de toutes les nations.

“ Le quatrième pour M. de Maricourt.

“ Le cinquième pour le père Bruyard.

“ Les sixième et septième pour Jonquaire.

“ Et le huitième pour le fils d'un de ces ambassadeurs esclave parmi nos Algonquins.

“ Il a été répondu par six colliers

“ 1° Qu'on leur enverrait les personnes qu'ils demandent.

“ 2° Qu'on demandait des ôtages.

“ 3° Qu'on voulait la paix avec tous nos alliés.

“ 4° Qu'on voulait des Députés des Quatre Nations.

“ 5° Qu'on leur donnait trente six jours pour répondre.

“ Il faut présentement, Monseigneur, vous expliquer tout ceci au plus long.

“ Les Iroquois toujours insatiables de sang humain et par conséquent ennemis irréconciliables de toutes les nations de ce vaste pays, avaient été en grand nombre il y a peu chez les Miameds auxquels ils firent à eroire qu'ils venaient seulement pour chasser, mais ceux-ci connaissant bien que c'était un faux prétexte pour faire un coup sur eux les prévinrent et donnèrent sur eux dont ils en tuèrent un, prirent cinquante huit, et c'est le sujet du premier collier, ce qui a été cause que quand ces ambassadeurs ont voulu d'abord faire leur entrée chez M. de Callières qui demeure environ à quatre ou cinq cents pas de la Ville, Maricourt et Jonquaire étant à leur tête ils sont sortis de la porte de Montréal faisant des cris de mort jusque chez lui.

“ Le second et le troisième colliers portent d'eux-mêmes leurs explications puisque la hache est le symbole de la guerre et cet arbre de paix vu de toutes lesd. nations marque une paix éternelle.

“ Pour le quatrième Collier ils ont demandé Maricourt qui est Capitaine comme le fils d'un père nommé le Moine qui a été adopté autrefois des Iroquois par l'estime qu'ils avaient pour lui ayant encore dans un de leurs villages une cabane qui lui est consacrée et à sa famille. Ainsi par la confiance qu'ils ont au fils ils ont prié M. de Callières de le leur donner pour venir quérir nos prisonniers français qu'ils sont tout prêts de rendre.

“ Pour le huitième collier le père Bruyard, Jésuite, étant en grande vénération chez eux, ils l'ont demandé aussi pour venir quérir nos français. Par ce moyen il pourra tenter à un établissement de religion parmi ceux qui ont déjà ici quelque teinture de christianisme.

“ Pour le sixième et le septième collier, Jonquaire, cidevant maréchal des Logis de M. de Frontenac, interprète de la langue iroquoise avait été pris pendant cette dernière guerre des Iroquois où il fut adopté. Il s'y maria à l'Iroquoise, son père l'Iroquois est mort depuis peu. On le redemande chez ces peuples par l'estime particulière qu'ils ont de sa valeur. Je dirai en passant que ce qui l'empêcha d'être brûlé fut que devant être mis au Conseil de guerre un vieux chef lui ayant voulu brûler les doigts, Jonquaire lui cassa le nez d'un coup de poing. Les Iroquois ayant vu cette action jugèrent en même temps qu'il fallait qu'il fût un homme de cœur, c'est ce qui lui sauva la vie, fut adopté et on lui donna une femme. Ce beau père étant mort la nation lui en a substitué un autre qui est un de ces ambassadeurs et comme M. de Callières a eu peur que le renvoyant chez eux ils ne le fissent peut être brûler il a retenu pour otage ce beau-père.

“ Par le huitième collier M. de Callières n'a pas voulu rendre ce fils prisonnier entre les mains desd. Algonquins jusqu'à l'arrivée de nos français.

“ Quant aux otages qui sont restés à Montréal au nombre de quatre, voici le sens.

“ Ces ambassadeurs viennent directement de la part des Onontaguais et des Tsonnontuans les deux nations les plus considérables pour demander la paix. Quand M. de Callières leur a demandé d'où vient qu'il n'était pas venu des Députés de toutes les nations comme ils lui avaient promis, ils lui ont répondu qu'ayant assemblé les Nations pour envoyer tous les Députés que l'on souhaiterait les Anglais sont venus à la traverse leur faire de grands reproches de ce qu'ils voulaient conclure la paix avec nous. Mais comme ils sont maîtres de leur actions ils n'ont pas voulu les écouter, les Onoystes et les Joyogouins n'ont pas à la vérité envoyé de députés chacun de leurs villages par ce que se regardant comme les enfants des Onontagués et des Tsonnontuans ils les ont priés comme leurs pères de porter conjointement la parole à M. de Callières lequel a voulu les obliger encore de faire venir des Députés de ces deux nations comme une preuve plus authentique et a gardé ces dits otages en partie pour cela et en partie comme caution pour les français esclaves chez eux

qu'ils n'ont pas amenés parce qu'ils ont dit que la plupart ayant été pris tout jeunes sont comme naturalisés et à moins que nous les fassions sortir nous mêmes de leur pays il leur était impossible de le faire eux-mêmes.

“ On ne s'embarrasse pas d'exiger un député de la part des Agniés qui sont la cinquième nation, parce que, outre qu'elle est la plus faible, c'est qu'ils sont si proches de l'Anglais qu'il est moralement impossible de les contraindre d'en envoyer, et il suffit que les quatre autres nations soient nos amies pour que celle là ne fasse aucun mouvement.

“ À l'égard de la paix avec nos alliés ils ont eu bien de la peine à se déterminer de les comprendre avec nous. Je ne vous dirai point que nos alliés qui se trouvaient pour lors à Montréal demandèrent une audience particulière à M. de Callières pour lui remontrer tous leurs griefs contre les Iroquois les ayant assurés qu'il seraient compris dans la paix.

“ Pour les trente six jours qu'on leur donne à répondre, il y a lieu d'espérer qu'ils concluront tout de bon la paix.¹

“ Voilà, Monseigneur, l'idée la plus juste que je puisse vous donner, ce qui m'a été confirmé par un Jésuite, témoin oculaire de toutes choses. Si j'avais été à Montréal je vous aurais encore parlé plus au long de quantité de circonstances que je suis persuadé que quelque personne telle quelle puisse être ne vous mandera pas mais il n'y a pas d'apparence qu'ayant un mandat tel que celui dont vous m'avez honoré qui doit me faire entrer naturellement dans des assemblées publiques préférablement à des lieutenants et des capitaines et autres, il n'y a pas d'apparence dis-je que je me trouve à Montréal pour avoir le chagrin que ni M. l'Intendant, encore moins M. de Callières me prient d'y entrer. Ce sont des déboires que j'ai eu l'année passée à Québec, principalement M. Noël quand les députés iroquois sont venus parler de paix. Soyez persuadé, Monseigneur, que l'on ne veut point goûter ici l'esprit de la marine. Mais comme je suis aussi politique qu'eux je développe tous leurs mystères et je sais au fond bien des choses dont ils croient que je n'ai aucune connaissance. Je ne veux point parler ici en homme intéressé par rapport à moi-même, je ne regarde que le service et votre gloire que je voudrais qu'elle fut mieux établie qu'elle n'est. N'est-il pas naturel qu'un contrôleur de la marine par les mains duquel passent toutes les affaires du Canada ait du moins le droit d'entrer dans des Conseils généraux où il s'agit du service du Prince. Car enfin, Monseigneur, voilà une audience publique. Que M. de Callières qui est déjà fort valétudinaire et M. de Champigny, aujourd'hui pour demain viennent à mourrir, je le suppose, qui est-ce qui vous rendrait compte des délibérations? Serait-ce un moine flamand, un prêtre, un lieutenant ou un capitaine que l'on aura appelé dans cette audience. Toutes ces conjonctures m'obligent de vous représenter très humblement de donner ordre que le Contrôleur et le Commissaire soient appelés dans

¹ La première partie de cette lettre est publiée avec quelque variantes au tome IV de l'*Histoire de la Potherie*, pp. 135-148, éd. de 1753.

les Conseils et audiences qui regardent les intérêts du Roi. De plus toutes les dépenses qui regardent ces sept ambassadeurs, les otages et les personnes que l'on envoie chez eux passeront par mes mains pour être arêtées est-il juste que je confirme ce que l'on a de la peine que je connaisse !

“ Je vous donne avis, Monseigneur, qu'il s'est fait un commerce secret de pelleteries au fort Frontenac, que M.M. de Callières et de Champigny ont confisqué environ pour vingt mille francs, monnaie du pays, ils ont fait de grands procès verbaux. Je ne doute pas qu'on ne vous les envoie. Je n'oserais vous supplier, de vous ressouvenir de moi dans cette occasion en cas que vous fassiez confisquer tous ces effets. Vous m'avez fait espérer à mon retour de la baie d'Hudson que vous songeriez à moi par quelques gratifications que vous me feriez au sujet de notre naufrage. Cette occasion pourrait suppléer. Je ne vous la demande que pour moi seul. Ma sœur et moi ne faisant dans notre éloignement qu'un cœur et un même esprit vous la demandons conjointement. Elle pourrait nous servir à retirer un fief proche Paris qui s'est trouvé engagé à des créanciers de mon père ou vous nous accorderiez ce que vous jugerez à propos.

“ Je continuerai toujours à exécuter les ordres que vous m'avez prescrits de Vous faire savoir tout ce qui se passera et vous en ferai un ample détail par la “ Seine ” qui n'est pas encore arrivée. Il y a des choses qui ne laisseront pas de vous surprendre.

“ Je suis, etc.

“ Signé : LE ROY DE LA POTERIE.”

Le 16 octobre 1700, la Potherie étant toujours à Québec, écrivait encore au Ministre pour lui donner des nouvelles de l'ambassade qui avait été envoyée chez la nation iroquoise. Il lui raconte avec un grand luxe de détails le voyage des ambassadeurs, le P. Bruyart, Joncaire et Maricourt, les discours qui furent prononcés, puis il décrit la grande assemblée tenue à Montréal et pendant laquelle la paix fut enfin conclue avec les Iroquois.

Toute cette lettre a été imprimée dans l'ouvrage de la Potherie ¹ et ce serait charger inutilement le récit que de la reproduire ici. Il y a, cependant, une finale confidentielle que le correspondant n'a pas osé rendre publique, mais qu'il communique en toute intimité au Ministre. Comme elle est de nature à nous faire connaître le caractère de la Potherie, nous la reproduirons d'après la copie faite sur l'original qui est conservée aux archives coloniales de la Marine à Paris ².

“ Comme j'ai extrêmement de lumières du Canada par l'exacte recherche que j'ai faite de tout ce qui s'y est passé depuis 25 à 30 ans, soit par les entretiens particuliers que j'ai eus avec des personnes d'expérience, soit par tous les mémoires que j'ai tirés à droite et à gauche vous me permet-

¹ *Hist. Am.*, t. IV, pp. 148-170.

² *Arch. col. Mar.*, vol. XVIII, p. 150.

trez, Monseigneur, que je vous dise ma pensée au sujet de cette hache qu'a rendue le Rat à M. de Callières.

“ Tous ces colliers que vous venez de voir que j'ai eus d'un homme qu'il ne m'est pas permis de citer, quoiqu'il y manque quelque mots que l'on aura ajoutés, en vous les mettant bien au net n'ont pas cette grâce que méritait une affaire de cet éclat avec une nation fière et pleine d'esprit.

“ Mettre la hache en terre, faire passer une rivière dessus, pleurer les morts, affermir l'arbre de paix, cela, dis-je, ne touche pas vivement des gens qui n'aiment que les métaphores, mais que les ceintures et tous les instruments de guerre eussent été mis avec cet hache, que cette terre eut été aplanié, que toutes les rivières deviennent belles et nettes, que le sang des morts de part et d'autre soit au fond de l'eau et de la terre ; que les branches et les feuilles de cet arbre de paix fassent un ombrage si épais que ceux qui se mettent à couvert dessous seront non seulement rafraîchis mais même à l'abri de tous les orages qui les pourraient menacer, qu'Onontio eût construit la Cabane du Conseil, mis la natte et allumé le feu de la paix pour échauffer tous ces enfants qui se seront unis à leur Père avec lequel ils ne feront qu'un corps et fumeront paisiblement : quand ceci aurait été énoncé à la vue de tant de chefs il n'y a point de doute qu'un chacun eût été sensiblement touché, mais ce n'est pas là l'essentiel.

“ Il était à propos que l'on eût représenté que ça été le Tsonnontouan qui a voulu le premier la guerre, que pendant la paix générale qui était il y a environ trente un ans il a ravi à Onontio leur père et mangé les Illinois ensuite des Miamis, des Massoutechs, un village entier de Miamis, qu'ils n'ont pas épargné les Outaouaks et les Hurons qui étaient leurs amis qu'ils tiennent encore esclaves chez eux ; que M. de Denonville voyant la cruauté de son fils le Tsonontouan il avait à la vérité levé un parti pour obvier à tant de ravages qu'il faisait sur ses frères, n'ayant pas eu dessein de le châtier comme il a fait, il croyait que le voyant en personne il serait venu au devant de lui et serait rentré en lui-même ; au contraire Tsonontouan ne se promettant que l'entière destruction du français et ne voulant même épargner son père qu'il voulait mettre le premier à la Chaudière (puisqu'un Iroquois avait menacé M. de Frontenac de boire son sang dans son crâne), il s'était précipité sur lui et l'avait le premier frappé, mais qu'il avait bientôt senti les verges piquantes de ce Père indigné avec sujet, qu'il a été néanmoins touché d'un si rude châtement qu'il s'était attiré, que s'il avait fait comme l'Onéjout il ne se serait pas attiré tant de disgrâce.

“ Que si l'on eût remontré dans cette conjoncture présente que l'Onontagué ayant de l'esprit comme il en a, Il n'aurait pas dû embrasser le parti des Tsonontouans qu'il aurait dû en être le médiateur et donner un juste tempéramment aux affaires, il aurait dû aussi s'ennuyer des fatigues de la guerre et rentrer en lui-même devant aimer plutôt son repos que d'augmenter les malheurs qu'il s'était attirés.

“ Qu'est-il arrivé d'avoir eu la complaisance de taire ces circonstances. Un de ces Ambassadeurs iroquois ne put s'empêcher de nous reprocher

après le discours du Rat qu'il ne reconnaissait que trop qu'Onontio avait été l'auteur de la guerre (en parlant en général des gouverneurs précédents du Canada). Il dit avec adresse : Onontio avait jeté la hache dans le Ciel, tout ce qui est là haut n'en revient jamais, cependant il y avait un petit cordon attaché à cette hache qu'il a retirée dont il nous a frappés.

“ Ce reproche avec esprit devait sans doute nous être sensible. On voulut replâtrer les choses en rappelant ce que je viens de dire de sorte qu'ayant voulu ménager ces Iroquois ils nous ont mis dans notre tort, et le Chef des Hurons s'est tiré d'affaire en faisant connaître à la face des nations par la hache qu'il a rendue à Onontio (pour un collier qu'il lui présenta) que ce n'était pas lui qui leur avait fait la guerre le premier.

“ Ce même Ambassadeur reprit plaisamment le quatrième collier de M. de Callières par lequel il bouchait ce trou avec un gros rocher sur lequel il faisait passer une rivière afin que la hache ne parut plus du tout. Il est vrai, dit-il, que tu couvres la fosse où est cette hache en y mettant un rocher et faisant passer dessus un fleuve, mais cette rapidité pourra la faire changer de place et tu la trouveras encore pour nous frapper.

“ On avait encore matière à ce Conseil à bien faire rentrer les Iroquois en eux-mêmes, si l'on eut tenu à peu près ce discours.

“ Je m'étonne que votre frère Corlar vous traite si inhumainement vous qui lui avez été si fidèles. Vous avez perdu dans cette guerre la plus grande partie de vos guerriers en soutenant son parti. Vos villages ont été brûlés. Il devait se souvenir de tous les prompts secours que vous lui avez donnés. Il ne devait pas vous menacer comme il vient de faire pendant que vous cherchez la paix et le repos. Lorsque vous êtes venus demander la paix vos mains étaient tout ensanglantées de celui de mes enfants. Vous avez encore leur chair entre vos dents, et vos lèvres en étaient toutes bordées. Je connaissais votre cœur dissimulé qui ne cherchait que des faux-fuyants. Je devais être persuadé que vous ne cherchiez point la lumière et que vous marchiez dans les ténèbres de la guerre. C'est dans cette vue que je ne vous ai point écoutés. Vous êtes vous jamais aperçus que je vous ai arrêtés quand vous êtes venus nous trouver. La porte a toujours été ouverte pour reprendre votre chemin, et aujourd'hui que le Soleil a dissipé tous ces nuages, qui va faire voir ce bel arbre de paix que je plante sur la montagne la plus élevée de la terre, votre frère Corlar veut cependant faire naître des vapeurs qui puissent vous l'offusquer. Je suis donc la volonté de notre *Grand Onontio* qui après avoir donné le repos à toute la terre souhaite que ses enfants ne soient pas frustrés d'un tel avantage.

“ Voilà mon sentiment et tandis que l'on ne fera pas connaître aux Iroquois de l'intrépidité ils se persuaderont toujours que nous cherchons plus à les ménager qu'ils le feraient à notre égard. Ils disaient bien il y a quelques années qu'il n'y avait qu'à descendre pour y recevoir des présents parce qu'au sortir de leurs députations pleines de fourberies on les

en comblait. Il est à souhaiter que tous nos alliés veuillent faire la paix avec eux nous en saurons le dénouement l'année qui vient à l'arrivée de Courtemanche et du père Angelran qui sont allés porter la nouvelle de cette paix.

“ Je suis, etc..

“ (*Signé*)

“ LE ROY DE LAPOTHERIE.”

Le correspondant était mécontent, c'est certain, de n'avoir pas été appelé à prendre part aux délibérations et d'être demeuré à Québec pendant qu'un si grand événement se passait à Montréal. Le confident de la Potherie, celui qui lui a donné d'aussi amples détails sur le résultat de l'ambassade n'est autre que le P. Bruyart, et la Potherie n'est pas fâché de laisser voir qu'il a des intelligences dans la place qui le renseignent sur ce qui s'y passe.

M. Pierre Margry cite encore, dans ses *Mémoires et Documents pour servir à l'Histoire des Origines françaises des Pays d'outre-mer*,¹ l'extrait d'un mémoire sur le Canada adressé à Pontchartrain par Le Roy de la Potherie. Il y est surtout question des plaintes que faisaient les habitants de Montréal contre l'établissement du Détroit ainsi que de la jalousie de Leber.

IV

Le 11 mars 1700, M. de la Potherie épousait Elisabeth de Saint-Ours, fille du seigneur de ce nom qui était premier capitaine du détachement de la marine au Canada et chevalier de Saint-Louis.² Pierre de Saint-Ours, le père de madame de la Potherie, pouvait faire preuve de cinq cents ans de noblesse, mais c'était la seule dot qu'il lui était possible de placer dans la corbeille de noces.³ Par son mariage, la Potherie devint le beau-frère de

¹ Cette correspondance intime de la Potherie nous laisse entrevoir un homme quelque peu naïf et méticuleux. C'est l'officier d'administration grincheux qui s'imagine que, sans les chiffres, les formules et les rapports, rien ne peut aller, à la guerre comme en politique.

² Tanguay (*Dict. général.*, t. I, pp. 170, 554) donne la date de 1699, mais nous suivons la version de M. Daniel (*Grandes Familles*, 344), qui cite un extrait de l'acte de mariage : “ Le 11 mars 1700, aucun empêchement ne s'étant présenté, a été célébré le mariage entre Claude-Charles Leroy, conseiller du roi, contrôleur de la marine et des fortifications en Canada, fils de Charles-Auguste Leroy, chevalier, seigneur de la Potherie, de Cossart, et de feu dame Catherine-Françoise du Signet de Monville, de la Guadeloupe, d'une part ; et demoiselle Elisabeth de St-Ours, fille de Pierre de St-Ours, sieur d'Eschaillons, capitaine d'une compagnie franche, et de dame Marie Mullois, de l'autre part.”

³ *Hist. Am. sept.*, t. I, p. 324.

Le 10 novembre 1686, le gouverneur de Denonville écrit au Ministre : “ A ce sujet je dois rendre compte à Monseigneur de l'extrême pauvreté de plusieurs nombreuses familles qui sont à la mendicité, et toutes nobles ou vivant comme telles. La famille de Saint-Ours est à la tête. Il est bien gentilhomme de Dauphiné, chargé d'une

Jean-Baptiste d'Eschaillons, de René le Gardeur de Beauvais, de Pécody de Contrecœur et du chevalier de Mines.¹ Il s'attachait ainsi aux plus anciennes et aux plus illustres familles de la colonie.

Dans les courses qu'il était obligé de faire sans cesse de Montréal à Québec, le contrôleur avait remarqué un endroit enchanteur entre tous les autres, c'étaient les îles de Sorel. "Il n'y a pas d'endroits dans tout le Canada, dit-il, où l'on puisse vivre avec plus d'agrément, si l'on n'y était point troublé en temps de guerre. Si l'on y pouvait goûter avec sûreté les plaisirs d'une vie champêtre, on trouverait tout ce qui peut la rendre heureuse, et il n'y a point de si puissants seigneurs en Europe qui ne voulassent avoir une pareille situation pour y faire leur demeure, un des plus agréables et des plus délicieux endroits du monde."²

C'est sans doute dans le desscin de s'établir un jour dans la colonie près de ce lieu délicieux, que la Potherie, le 5 juillet 1700, faisait l'acquisition d'une terre et habitation dans la seigneurie de Saint Ours sur les bords du fleuve Saint-Laurent.³

Le 12 novembre 1700, la femme de la Potherie, Elisabeth de Saint-Ours, lui donnait un fils qui fut baptisé le même jour à Québec sous le nom de Louis. Le parrain fut très haut et très puissant seigneur, Monseigneur Louis Phélippeaux, grand chevalier et garde des sceaux de France, tenant pour lui messire Louis Rouer de Villeray, premier conseiller au Conseil souverain de Québec, et la marraine très haute et très puissante dame Le Roye, comtesse de Pontchartrain, épouse du très haut et très puissant seigneur et monseigneur Phélippeaux, comte de Pontchartrain, ministre et secrétaire d'État, tenant pour elle Marie-Magdelaine, damoiselle Chartier de Lotbinière.⁴

femme et dix enfants, il n'y a que deux jours qu'il me vint faire un compliment, pour avoir la permission de passer en France l'an prochain avec sa femme et ses enfants pour y chercher du pain et mettre ses enfants à servir de côté et d'autre chez ceux qui les voudraient nourrir et pour lui d'essayer de se mettre dans les troupes." Et ailleurs, il écrit encore : "Le père et la mère me paraissaient dans un véritable désespoir de leur pauvreté. Cependant, les enfants ne s'épargnent pas, car j'ai vu deux grandes filles couper des blés et tenir la charrue." (Garneau, *Hist. du Canada*, t. I, 284.)

¹ M. de Mines, gentilhomme provincial, servit avec distinction dans la troupe de la marine au Canada, en qualité de capitaine. Passé en France, il fut tué au siège de Gibraltar alors qu'il servait comme lieutenant de vaisseau. (*Hist. Am. sept.*, t. III, pp. 91-94.) Voir *Appendice*.

² *Hist. Am. sept.*, t. I, p. 307.

³ Etude Rageot. Vente par Pierre Bon, habitant de St-Romain, et Michelle Duval, sa femme, à Messire Claude-Charles Roy, chevalier, seigneur de la Potterie, conseiller du roi, contrôleur général de la marine en ce pays, d'une terre et habitation de 2 arpents de front sur le fleuve St-Laurent, sur 30 de profondeur en la seigneurie de St-Ours, bornée d'un côté à Raimbeault et de l'autre à la Fresné. Les vendeurs avaient acquis cette terre du seigneur de Saint-Ours, le 11 août 1678, par acte de concession devant Ménard dit Saint-Onge, notaire du lieu. Cette terre devait se trouver sur l'emplacement même de la ville actuelle de Sorel.

⁴ Archives de la cure de Québec.

Un second enfant naquit de cette union le 2 janvier 1702. L'acte de baptême se lit comme suit aux registres paroissiaux de Québec :

“ Le troisième jour du mois de janvier de l'an mil sept cent deux a esté baptisé par moi prestre curé de Québec, Charles né le jour d'hier, fils de messire Claude-Charles le Roy, chevalier, seigneur de la Potherie, conseiller du roy, contrôleur de la marine et des fortifications en la Nouvelle-France, et dame Elisabeth de Saint-Ours, sa femme. Le parrain a esté messire Begon, intendant de Rochefort conseiller du roy justice police et finance, la marraine dame Elisabeth Rose Daudet femme de messire Louis Dargouge, conseiller du roy en ses conseils d'état et privé, tenant en la place des dits susnommés monsieur de Grandville, procureur du roi, et dame Geneviève Macard femme de monsieur Provost gouverneur des Trois Rivières lesquels ont signé.”

M. de la Potherie, qui s'intéressait à la colonie du Canada et qui venait d'y prendre femme et terre, songeait sérieusement à s'y établir lorsqu'un événement soudain changea le cours de sa destinée.

Le contrôleur avait un frère cadet qui exerçait la charge de major de l'île de la Guadeloupe, et qui promettait d'être un bon officier. Il apprit sa mort, dans l'été de 1701, en même temps que celle de son père.

Espérant que l'honneur qu'il avait d'appartenir à un ministre du côté des femmes lui procurerait tout au moins la charge, et peut-être les moyens de rétablir sa maison, la Potherie quitta aussitôt sa femme et l'emploi qu'il avait d'inspecteur ou contrôleur de fortifications et partit pour la France.¹ Cependant, le pauvre solliciteur fut déçu dans ses démarches. La parenté et les sollicitations ne purent lui faire avoir autre chose qu'un brevet d'aide-major qui, au dire du P. Labat, était très peu de chose, pour ne pas dire moins que rien.²

En 1703, on retrouve donc l'ancien contrôleur du Canada occupant la charge d'aide-major à l'île de Guadeloupe. C'est là que le rencontra pour la première fois l'historien Labat. Ce capucin, très mordant, et qui aimait à médire un peu de tout, nous a laissé de la Potherie un curieux portrait.

“ Il avait, dit-il, demeuré longtemps en Canada ; et selon la coutume incommode du pays qui ne permet pas d'entrer trois fois dans une maison où il y a des filles sans parler mariage, il s'y était marié.

“ C'était un homme de trente-cinq ans, d'une petite taille assez bien prise ; il avait la physionomie d'un homme simple et sans malice, et sa physionomie n'était point trompeuse ; il était meilleur chrétien que sol-

¹ Labat, *loc. cit.*

² Ce fut Charles de Monseignat qui remplaça la Potherie comme contrôleur de la marine au Canada. (*Ord. des Int.*, vol. VI, 25 fév. 1713.) Le 8 novembre 1714, Monseignat, nommé greffier du Conseil supérieur, demandait au ministre le rétablissement de la charge de contrôleur de la marine pour son fils. (*Cor. gén. du Canada*, vol. XXXIV, p. 374.) Cf. Mémoires sur le remplacement des employés civils et militaires avec des notes sur chacun d'eux. (*Loc. cit.* f. 426.)

dat, et quoiqu'il eût demeuré longtemps en Canada, où l'on dit que la valeur est à très bon marché, il n'en avait fait aucune provision ; il ne laissait pas de nous conter une infinité d'histoires extraordinaires du courage des créoles de ce pays-là, dans les guerres que l'on avait eues contre les Anglais et contre les Iroquois ; mais comme il ne s'y était pas trouvé en personne, on se dispensait de croire tout ce qu'il en rapportait sur le rapport d'autrui, et c'est pour cela que je n'en dirai rien.

“Cependant, à l'exemple de ces messieurs les Canadiens, il avait fait faire une petite hachette qui s'emmanchait dans une canne de trois pieds de long, qu'il appelait un casse-tête, on jugea aisément que cet instrument était trop court pour qu'il s'en pût servir.”¹

C'est en 1703 que les Anglais firent une descente à la Guadeloupe. L'historien Labat qui raconte avec force détails les combats qui eurent lieu alors, ne nous dit pas si la Potherie eut l'occasion d'y déployer quelque valeur.

A compter de cette date, la carrière et la vie intime de la Potherie sont peu connues. Il n'est pas homme à parler beaucoup de lui dans son ouvrage. C'est à peine s'il rappelle quelquefois un événement de sa vie en passant, et souvent ce n'est que pour mieux dérouter le lecteur. Ainsi, dans un certain endroit,² parlant de Montréal, il dit : “Depuis 1701 jusqu'en 1714 que j'en suis sorti elle a augmenté de moitié, avec une belle enceinte qui la met à l'abri des Iroquois.” A quoi attribuer cette erreur de date ? A une faute typographique ou à une distraction de l'auteur ? Un peu plus loin,³ parlant de la colonie, il ajoute : “Depuis deux ans que j'en suis sorti...” Comme son livre parut pour la première fois en 1716, on devient de plus en plus convaincu que c'est bien en 1714 que la Potherie partit du Canada. Pourtant, on a le témoignage bien authentique du père Labat que c'est en 1701 qu'il partit du Canada et qu'il le rencontra à la Guadeloupe en 1703. La Potherie n'assistait pas non plus au baptême de son deuxième enfant qui avait lieu à Québec en janvier 1702. Revint-il au Canada en 1714 ? La chose est peu probable, car une ordonnance rendue à Québec, le premier juillet 1714, par l'intendant Begon, le déclare absent, de même que toutes les pièces de cette même année où il est intéressé à titre d'allié de la famille de Saint-Ours.⁴

Dans cette ordonnance de 1714 dont il vient d'être mention, il s'agissait d'en arriver au partage définitif des biens dépendant de la communauté qui avait existé entre Pierre de Saint-Ours et sa femme Marie Mullois. M. de Saint-Ours avait épousé en deuxième mariage Marguerite le Gardeur, veuve de Louis-Joseph Le Goues de Grais depuis tantôt six ans,⁵

¹ *Loc. cit.*, t. II, p. 395.

² T. I, p. 339.

³ P. 358.

⁴ *Reg. Ord. Int.*, vol. VI, p. 100.

⁵ Reg. de Batiscan, 29 juillet, 1708.

et il n'avait pas encore rendu compte à ses enfants du premier lit. Ceux-ci en appelaient à l'intendant Begon.

Entrons un peu dans les détails intimes de cette famille aux mœurs patriarcales que tous les anciens auteurs donnent comme une des plus illustres entre celles qui vinrent s'établir au Canada.

Les parties demandereses à l'instance étaient Jean-Baptiste de Saint-Ours, écuyer, sieur d'Eschaillons, le fils aîné, marié à une le Gardeur, Pierre de Saint-Ours et René le Gardeur, sieur de Beauvais, veuf de Marie-Barbe de Saint-Ours, représentés par le sieur de Tonty, François-Antoine de Pécody de Contrecoeur, époux de Jeanne de Saint-Ours, tant en son nom qu'en qualité de curateur élu en justice au sieur de la Potherie, époux d'Elisabeth de Saint-Ours et à Marie-Anne de Saint-Ours, veuve de Jean de Mines.

Il fut démontré par inventaire ¹ que l'actif des effets mobiliers s'élevait à une somme de 1681 livres sur laquelle il fallait déduire 365 livres de dettes, de sorte qu'il ne restait plus que 1315 livres à partager. Comme en vertu de son contrat de mariage avec Marie Mullois, ² M. de Saint-Ours avait droit à un préciput de 3000 livres, on peut juger qu'il ne resta pas grand'chose aux gendres qui avaient épousé des membres de cette illustre famille. Tel était du reste alors l'état de fortune de la plupart des nobles de la colonie. Le P. Labat avait donc raison, à ce point de vue du moins, de se moquer du pauvre mariage que la Potherie avait fait. Le revenu annuel de M. de Saint-Ours pouvait se monter alors à 300 livres, en ne comprenant pas ses appointements comme premier capitaine des troupes.

Madame de Saint-Ours avait hérité, de son vivant, d'une de ses tantes qui habitait la France, madame Sébastienne Mullois de la Borde, d'une rente de 200 livres au capital de 4000 livres à prendre sur l'hôtel de ville de Paris. Il fallut attendre l'opinion des avocats pour savoir si M. de

s n'avait pas droit à la moitié de ce capital. Les héritiers durent se rabattre sur le partage de la seigneurie de Saint-Ours qui ne valait pas grand'chose alors. Après que M. de Saint-Ours eût prélevé sa moitié, il ne resta plus à ses enfants qu'un dixième chacun dans cet apunage. Telle fut, en définitive, la dot qu'apporta M^{me} de la Potherie.

En 1738, Claude-Charles le Roy de la Potherie était mort ainsi que son épouse Elisabeth de Saint-Ours. En effet, cette même année, ses trois enfants envoyaient une procuration au notaire Hiché, de Québec, pour porter foi et hommage en leurs noms pour la seigneurie de Saint-Ours dont ils possédaient un dixième. Charles-Augustin, chevalier, seigneur de Bacqueville et de la Touche, en Touraine, et co-seigneur de Saint-Ours, capitaine aide-major pour le roi de l'île de la Guadeloupe, demeurait alors au quartier du Bailly, paroisse Saint-Dominique, île de la Guadeloupe. Des deux

¹ Greffe Tetro, 29 juin 1714.

² Etude de Larue, à Champlain, 8 janvier 1668.

frères du précédent, l'un, Marc-René, conseiller du roi au conseil supérieur de la Guadeloupe, demeurait au quartier des Vieux-Habitants, paroisse de Saint-Joseph de la Guadeloupe ; l'autre, Pierre-Denis le Roy de la Potherie des Manvilles, chevalier, ancien lieutenant de la marine, résidait au quartier de Deshayes, paroisse Saint-Pierre, île de la Guadeloupe.¹

En 1745, d'après l'acte de foi et hommage, la seigneurie de Saint-Ours était divisée comme suit :²

Jean-Baptiste de Saint Ours, seigneur d'Eschaillons et de Saint-Ours, fils aîné du propriétaire originaire, possédait la moitié provenant de son père, plus un dixième du chef de sa mère ; Gaspard de Léry, veuf de Marie-René le Gardeur de Beauvais, fille et héritière de Barbe de Saint-Ours réclamait un dixième ;³ Charles-Auguste le Roy de la Potherie, seigneur de Bacqueville, Pierre-Denis le Roy de la Potherie et Marc-René-Augustin le Roy des Manvilles, sieur de la Potherie, tous les trois fils d'Elisabeth de Saint-Ours, rendaient hommage pour un dixième ; Pierre de Saint-Ours, fils puisné et héritier de Pierre de Saint-Ours, en faisait autant. Il ne restait plus que les héritiers de Marie-Anne de Saint-Ours, mariée à Jean de Mines, qui habitaient alors la France et qui n'avaient pas alors accompli leur devoir de vassaux.

En 1781, il n'y avait plus qu'un seul propriétaire de la seigneurie de Saint-Ours, c'était Roch de Saint-Ours, fils aîné de Jean-Baptiste, dont il avait hérité. Il avait acheté les autres parts en 1769 de Paul Perreault, acquéreur en 1758 de Chaussegros de Léry, de Louise Martel de Brouague, de Michel Chartier de Lotbinière et de Louise Chaussegros de Léry. Les autres co-héritiers, M. de Courtemanche, la veuve de François de Saint-Ours, les de Mines et les de la Potherie avaient de même vendu leurs parts.

Ainsi disparut du Canada cette famille de la Potherie, dont l'un des membres avait joué un rôle assez effacé, mais qui, cependant, a laissé au milieu de nous un souvenir durable, grâce à un livre que nous allons maintenant étudier.⁴

¹ *Registre des actes de foi et hommage*, vol. II, pp. 119-123.

² *Loc. cit.*, vol. III.

³ Barbe était morte en août 1745.

⁴ Le 20 mars 1769, M. de Landriève écrivait de Paris à M. J.-G. de Léry : " M. de la Potherie vient de nous écrire ; il est arrivé en parfaite santé à la Guadeloupe." (Daniel, *La Famille de Léry*, pp. 81-82.)

A la page 145 du même ouvrage, on trouve une lettre de M. de Léry écrite de Tabago, au mois de juin 1786, après qu'il eût passé quelque temps à la Guadeloupe. Il y est dit : " J'ai beaucoup entendu parler de M. de la Potherie au capitaine de Saint-Ours."

Les Léry étaient alliés par les Saint-Ours à la famille de la Potherie.

V

Le critique Sainte-Beuve, parlant du duc de Lauzun, a écrit : Il a laissé des Mémoires, et par là il appartient à la littérature.¹ On peut en dire autant de la Potherie, qui n'a pourtant aucune des qualités de l'écrivain.

C'est en 1702, à son retour du Canada, que la Potherie, soumit son œuvre au censeur royal. Fontenelle, secrétaire perpétuel de l'Académie des Sciences depuis 1697, passait alors pour le juste interprète et l'arbitre du goût aux yeux de tous. Il préludait au rôle que Voltaire devait jouer plus tard. C'est donc lui qui lut le manuscrit de l'ancien contrôleur par ordre du chancelier. Dans un certificat daté à Paris le 9 juin 1702, il déclare croire que l'impression en serait agréable et utile au public.

Fontenelle était le grand ami du duc d'Orléans, régent du Royaume, et c'est à ce dernier que la Potherie dédia son premier volume.

“Ce serait ici, dit-il dans cette dédicace, le lieu de m'étendre sur les vertus héroïques qui brillent dans votre Altesse royale ; mais ce n'est pas à un Américain comme moi à prendre un essort si haut : je laisse donc aux plumes délicates des Français à traiter une matière si relevée.”

Quoique l'approbation donnée par Fontenelle fût datée du mois de juin 1702, on ne voit pas que l'ouvrage ait été imprimé avant 1716. C'est la plus ancienne édition que signale, dans tous les cas, M. Fevret de Fontette. Elle parut à Paris, en 4 volumes in-12, sous le titre de *Nouveau Voyage du Canada, ou de la Nouvelle France et les Guerres des Français avec les Anglais et les originaires du pays*, sous la signature de le Roy de la Potherie.

A quoi faut-il attribuer ce délai entre l'imprimatur de 1702 et l'impression de 1716 ? Vraisemblablement, à la guerre de la succession d'Espagne qui éclata sur les entrefaites (1701-1713). On ne tenait pas sans doute en France à donner de nouveaux renseignements sur un pays où les Anglais pouvaient diriger leurs coups à tout instant. Le traité d'Utrecht vint et la Potherie put enfin donner son livre à l'imprimeur.

Il est à noter qu'il n'y a que M. de Fontette qui signale cette édition de 1716. M. Faribault² dit ne l'avoir vue citée nulle part ailleurs.

Nous admettons nous-même n'avoir jamais vu cette édition mentionnée dans aucun catalogue, mais devant l'assertion du savant bibliophile Fontette il n'y a pas hésiter. Du reste, nous avons une preuve bien certaine que cette première édition a existé puisque dans le privilège d'imprimer du roi daté à Paris le 2 mai 1721, on voit que François Didot, libraire à Paris, ayant fait remonter qu'il souhaiterait continuer à faire imprimer l'ouvrage qui a pour titre *Histoire de l'Amérique septentrionale*,

¹ *Causeries*, t. 4, p. 287.

² *Catalogue*, p. 78.

permis lui est accordé pour huit ans consécutifs. Didot associa à son privilège Jean-Luc Nion, libraire à Paris, et Jean-Baptiste Michuel, libraire imprimeur à Rouen.¹

C'est cette dernière édition, parue en 1722, qui est particulièrement connue des bibliophiles. Elle fut imprimée à Paris chez Nion et Didot. La bibliothèque du parlement à Ottawa en possède un exemplaire en 4 volumes in-12.² De son côté la bibliothèque de l'université Laval possède un exemplaire en 4 volumes in-12 de la même édition de 1722, imprimée à Rouen. La bibliothèque de l'ancienne chambre d'assemblée du Bas-Canada possédait un exemplaire d'une troisième édition parue en 1723, chez Desbordes, à Amsterdam.³

¹ M. Faribault (*loc. cit.*, p. 78) soupçonne avec raison que la publication de 1716 est la première édition de l'ouvrage signé M. Bacqueville de la Potherie, avec quelques changements au prénom de l'auteur ainsi qu'au reste du titre. M. Fevret de Fontette signale encore sous le titre original de 1716 une édition à Amsterdam (Rouen) en 1723.

Bacqueville est un bourg de France (Seine-inférieure), chef-lieu de canton de l'arrondissement de Dieppe. Au greffe de l'arpenteur Noël Beaupré à Québec, sous la date du 2 avril 1721, on trouve un procès-verbal du sieur Tailla Bacqueville.

² Faribault, *loc. cit.*, n° 368.

³ Voici la description de l'édition de 1722, d'après les exemplaires déposés à la bibliothèque du parlement d'Ottawa :

Histoire | de | l'Amérique | septentrionale, | divisée en quatre tomes. | Tome premier,—contenant les voyages du fort de Nelson, dans | la baie d'Hudson, à l'extrémité de l'Amé- | rique. Le premier établissement des Fran- | çois dans ce vaste pays, la prise du dit fort | de Nelson, la description du fleuve de Saint | Laurent, le gouvernement de Québec, des | Trois Rivières et de Montréal, depuis 1534 | jusqu'à 1701. |

Par M. de Bacqueville de la Potherie, | né à la Guadeloupe, dans l'Amérique Mé- | ridionale, aide major de la dite isle. | Enrichie de figures. | Fleuron. | A Paris, | chez Jean-Luc Nion, au premier pavil- | lon des quatre Nations, à Ste-Monique. | Et | François Didot, à l'entrée du quai des Augustins, à la Bible d'or. | M.DCC. XXII, | avec approbation et privilège du roi. | In-12. Epitre et avertissement. Pri- | vilège du roy. 10 fcn, 1-370. Table des lettres, 4 fcn., 1, 3, 6, 15, 16, 17, 19, 25, lignes rouges.

Histoire | de | l'Amérique | septentrionale, | contenant | l'histoire des peuples alliez de la Nouvelle | France, leurs mœurs et leur maximes, | leur religion, et leurs intérêts avec tou- | tes les nations des lacs supérieurs, tels | que sont les Hurons et les Irlinois, l'al- | liance faite avec les Français et ces peuples, | la possession de tous ces pays au nom du | roi, et tout ce qui s'est passé de plus re- | marquable sous mes- | sieurs de Tracy, de | Frontenac, de la Barre et de Denonville. | Par M. de la Potherie, etc. | Tome II, | enrichie de figures. | Fleuron. | A Paris, | chez Jean-Luc Nion, au premier pavil- | lon des quatre Nations, à Ste-Monique, | Et | François Didot, à l'entrée du | quai des Augustins, à la Bible d'or, | M.DCC.XXII, | avec appro- | bation et privilège du roi. | 1-356 pp. Table des chapitres, 7 fcn. Titre, 1, 3, 5, 16, 19, 25, lignes rouges.

Histoire | de | l'Amérique | septentrionale, | qui contient | l'histoire des Iroquois, leurs mœurs, leurs | maximes, leurs coutumes, leur gouver- | nement, leurs intérêts avec les Anglais leurs | alliez, tous les mouvements de guerre de- | puis 1689 jusqu'en 1701, leurs négociations, leurs ambassades pour la paix géné- | rale avec les Français,

Avant de livrer définitivement son manuscrit à l'impression, la Potherie le soumit à Jacques Raudot, qui avait été autrefois intendant de la Nouvelle-France et qui exerçait alors l'emploi d'intendant général des classes de la marine. Ce dernier voulut connaître le sentiment de M. Bobé, un missionnaire qui s'occupait beaucoup alors de toutes les questions qui intéressaient le Canada.

M. Bobé, après avoir lu le livre avec grande attention, en fit beaucoup d'éloges à Raudot. "Il faut, dit-il, que l'auteur se soit donné bien de la peine de s'instruire de tout ce qui était nécessaire pour débrouiller tant d'intrigues d'un si grand nombre de nations sauvages.

"..... J'y ai appris ce que je n'avais vu ni dans Lahontan, ni dans Hennepin, ni dans les autres qui ont écrit sur la Nouvelle-France.

"..... Ce livre sera agréable au public et ne sera pas inutile à ceux qui sous les ordres du roi ont soin de ce qui regarde la Nouvelle-France, puisqu'il leur fera connaître qu'il est de la dernière importance de prendre toutes les mesures pour empêcher que les Anglais et les Iroquois ne débouchent les nations alliées des Français, ou les engagent à se faire la guerre les unes avec les autres que pour ruiner par ce moyen notre commerce et nous obliger d'abandonner le pays, afin de s'emparer de l'un et de l'autre."¹

et les peuples | alliez de la Nouvelle-France. | Par M. de la Potherie, etc. | Tome III, | enrichie de figures. | Fleuron. | A Paris, | chez Jean-Luc Nion, au premier pavil- | lon des quatre Nations, à Ste-Monique. | Et | François Didot, à l'entrée du | quai des Augustins, à la Bible d'or, | M.DCC.XXII, | avec approbation et privilège du roi. | Préface, 4 fen. Termes et expressions des sauvages, 6 fen, 1-310. Table des lettres, 6 fen. Titre, 1, 3, 5, 14, 17, 23, lignes rouges.

Histoire | de | l'Amérique | septentrionale, | contenant l'histoire des Abénaquis, la paix générale dans toute l'Amérique septentrionale, sous | le gouvernement de monsieur le comte de | Frontenac et monsieur le chevalier de Cal- | lières, pendant laquelle des nations éloi- | gnées de six cens lieux de Québec s'assem- | blèrent à Montréal. | Par M. de la Potherie, etc. | Tome IV, | enrichie de figures. | Fleuron. | A Paris, chez Jean-Luc Nion, au premier pavil- | lon des quatre Nations, à Ste-Monique. Et François Didot, à l'entrée du quai des Augustins, à la Bible d'or, | M.DCC.XXII, | avec approbation et privilège du roi. 1-271. Table des lettres, 4 fen., approbation 1 fen. Titre, 1, 3, 5, 13, 16, 22, lignes rouges.

¹ La vie intime du missionnaire Bobé n'est guère connue et les détails biographiques sur son compte manquent totalement. Tout ce que l'on sait, c'est qu'il s'occupait activement de la Nouvelle-France. On possède dans les archives de nombreux mémoires signés de son nom.

Archives de la Marine. *Postes des pays de l'ouest*, vol. XVI, c. II, 1718, avril. Mémoire pour la découverte de la mer de l'ouest, dressé et présenté par M. Bobé, prêtre, pp. 40 à 73.

Ministère des affaires étrangères, vol. IV, *Amérique*, 1720. Mémoire concernant les limites de l'Acadie et du Canada, par le S Bobé, ptre. Résumé de l'histoire de l'Acadie jusqu'en 1720, fol. 81.

1723, mars, Québec. Autre mémoire concernant les limites de la Nouvelle-France Acadie, etc., par le S^r Bobé, envoyé par Bigot, fol. 154.

Archives de la Marine, Carton K, 1232. *Colonies, le Canada*, 1720, second mé-

Dans son avertissement au lecteur, la Potherie dit qu'il se propose d'instruire plutôt que de plaire. Il veut suivre avec la dernière fidélité les deux caractères essentiels de l'histoire : qui sont de ne rien dire de faux et de ne point taire la vérité. *Nec falsa dicere, nec vera reticere* Il aurait pu "sans beaucoup de peine" donner à son ouvrage un tour de gaieté et d'enjouement : "mais comme les combats et les naufrages ont quelque chose de trop triste et de trop affreux pour leur devoir donner un air riant et enjoué il n'a pas cru dans une histoire où l'on ne parle que de précipices cachés sous des banes de neige, de montagnes de glaces, de banes de sable, de rochers affreux, de sauvages inhumains, souffrir de semblables ornements".

L'ouvrage de la Potherie est divisé sous forme de lettres adressées à divers personnages dont on ne peut pas toujours retracer les noms. Il y en a pour l'intendant Begon qui l'a protégé au commencement de sa carrière; il y en a pour le ministre de Pontchartrain, son parent; il y en a pour le marquis de Duquesne, gouverneur des îles de l'Amérique, pour des ambassadeurs, des prélats ou des magistrats. Tantôt, encore, il s'adresse à des dames de la cour qui ont employé leur crédit pour lui, à M^{me} de Denonville, à M^{me} de Vertillac, sa cousine, au marquis de Courtenvaux, à M. de Livry, à un de ses cousins dont le père a été seigneur et gouverneur de la Guadeloupe, sa patrie.

A tous il fait un doigt de cour, et il les prie de croire que ce n'est pas à un Iroquois comme lui de faire des éloges. "Il a perdu depuis plusieurs années le goût, la délicatesse et la politesse de la France. Il ne sait plus la méthode de s'énoncer avec grâce."

La Potherie, dans toute sa carrière, n'a fait qu'une vraie campagne, à bien dire: c'est celle de la baie d'Hudson, en 1697, sous les ordres de d'Iberville; et cette campagne, c'est son titre de gloire. Aussi c'est par elle que commence son premier volume. Sur douze lettres il y en consacre huit.

L'auteur observe bien. C'est d'abord Plaisance qu'il décrit avec ses graves couvertes de morues, les opérations des décolleurs, des trancheurs, des saleurs. Il examine les bois, le sol, la chasse, la pêche, et il se demande pourquoi les pêcheurs de cette ville ne vont pas s'établir au Cap-Breton, beaucoup plus fertile et plus propice à la navigation. C'est ainsi qu'il préconise seize ans à l'avance l'établissement de Louisbourg. L'expédition hivernale d'Iberville sur Terre-Neuve en 1696 est décrite avec enthousiasme. Le voyage de Plaisance à la baie d'Hudson est plus langoureux. A tout instant il intermêle son récit de vers latins. C'est Virgile et Horace qu'il préfère. Les vents contraires retardent-ils le vaisseau, il lui

moire concernant la limite des colonies, présenté en 1720, par M. Bobé, prêtre de la congrégation de la mission. Etat général de la colonie Canada, Acadie, etc.

Règlement des limites, vol. III, c. II, 1723, mars. Mémoires concernant les limites présentés par le Sr Bobé, pp. 140-147.

semble suivre la mauvaise destinée d'Enée, après l'incendie de Troie ; il se trouve dans un accablement à peu près comme celui des dames troyennes qui souffraient tant de peines et de fatigues de ne pouvoir se rendre au pays latin.

*“ Heu ? tot vada fessis
Et tantum superesse maris, vox omnibus una
Urbem orant.”*

Voit-il une terre déserte, stérile, ou s'il s'élève une brise et que l'on tende les voiles, aussitôt arrive un nouveau souvenir classique. Veut-il donner une idée des dangers de la navigation de la baie d'Hudson, il emprunte la description que fait Pomponius Mela de la mer Caspienne.

Arrive-t-il un naufrage, il s'écrie avec Horace :

“ Illi robur et aes triplex... ”,

et une fois rendu au rivage il se console avec quatre autres vers latins.

Tout cela sent le pédant, le novice dans l'art d'écrire, et le lecteur vient à s'en fatiguer. Cependant, cette partie de l'œuvre de la Potherie est importante, car l'écrivain assiste comme acteur à une expédition glorieuse et il la décrit avec fidélité.

Après avoir parlé des mœurs des sauvages qui vont faire la traite au fort Nelson, et décrit les castors et le scorbut, la Potherie entame l'histoire des établissements du Nord dits baie d'Hudson et des démêlés entre Français et Anglais. Il raconte les navigations de Jacques Cartier, Roberval, Jean Alphonse, Jean Bourdon, les expéditions par terre de Dablon, la Vallière, Couture, les trahisons de Des Groseillers et de Radisson, la formation de la Compagnie du Nord, les diverses campagnes de Troyes et de d'Iberville en 1686, 1690 et 1694.

Avant que l'on eût accès aux archives de la Marine, cette partie de l'ouvrage de la Potherie était beaucoup citée par nos historiens. Le premier, il avait recueilli les légendes, et naturellement on avait recours à cet ancien témoin auriculaire. Les documents découverts depuis dix ans ont mis fin à bien des erreurs courantes. Ainsi il n'est pas vrai que Jean Bourdon se soit rendu à la baie d'Hudson. Les voyages de Dablon et de Couture sont plus que douteux. Des pièces dont la Potherie avaient eu communication ont été reconnues comme apocryphes. Les mémoires de Des Groseillers et de Radisson, publiés par une société savante américaine, sont venus jeter tout un jour nouveau sur la carrière de ces deux hommes.

Du récit de la Potherie il ne reste plus debout que l'expédition de 1697, dont il fut le témoin et l'un des acteurs, et qui est corroborée par la relation de Jérémie. Ce qu'il dit des expéditions de 1686, 1690 et 1694 est aussi digne de foi et précieux, car la Potherie était le compagnon de voyage de d'Iberville sur *le Pélican* en 1697, et il a dû lui en entendre raconter bien souvent tous les détails.

En 1698, la Potherie, nommé contrôleur de la colonie, arrive au Canada. Il consacre les quatre dernières lettres de son premier volume à décrire les gouvernements de Québec, de Trois-Rivières et de Montréal et les divers établissements échelonnés le long du grand fleuve Saint-Laurent. Cette dernière partie sera toujours lue avec intérêt, et c'est celle que l'on cite de préférence, lorsqu'on veut dépeindre la Nouvelle-France de la fin du dix-septième siècle. Ces quatre lettres ont sauvé et sauveront la Potherie de l'éternel oubli.

Avec quel pieux enthousiasme il salue les rives du fleuve majestueux, avec quels minutieux détails il nous décrit Percé et son rocher étrange, Manicouagan et ses longues battures où il faillit faire naufrage. Le Saguenay, les pinières de la baie Saint-Paul, l'île aux Oies, le cap Tourmente, l'île d'Orléans, la seigneurie de Beaupré, tout passe comme en un panorama. Québec apparaît. Il nous promène à travers ses rues tortueuses, il nous peint la situation, il nous dit ses édifices avec ceux qui les habitent et l'histoire de chacun et de chaque chose.

“Le temps où le commerce roule le plus à Québec, dit-il, est août, septembre et octobre. Alors les vaisseaux arrivent de France, et il se fait une foire dans la basse-ville. Sur la fin d'octobre les habitants viennent y faire leurs emplettes. Chacun essaye de régler ses affaires avant la partance des vaisseaux. En novembre la rade se trouve tout à coup sans vaisseaux. Rien de plus triste. Tout est mort et tous ne songent plus qu'à faire leurs provisions d'hiver.”

Ce petit tableau est suivi d'une belle description des amusements d'hiver. La Potherie commence à aimer les Canadiens.

“On parle ici parfaitement bien, dit-il. Quoiqu'il y ait un mélange de toutes les provinces de France, on ne saurait distinguer le parler d'aucune dans les Canadiennes. Elles ont de l'esprit et de la délicatesse, de la voix et beaucoup de disposition à danser. Comme elles sont sages naturellement elles ne s'amuse guères à la bagatelle, mais quand elles entreprennent un amant, il lui est difficile de ne pas venir à l'hyménée.”

C'est par un beau jour d'été que la Potherie partit de Québec pour Montréal, et il faut voir comme il parle de tous ces villages enchanteurs égrenés le long des deux rives : Lotbinière, Portneuf, Bécancour, Batiscau, le Cap-de-la-Madeleine, Trois-Rivières, Saint-François, Sorel, les îles du Richelieu, le plus beau pays du monde. A partir de Sorel, l'aspect change. Les maisons sont plus groupées. Tous les habitants sont renfermés dans des forts palissadés de pieux, pour être à l'abri des féroces Iroquois. Si la région de Québec est déjà pacifiée, il n'en est pas de même encore près de Montréal.

Verchères, Contrecoeur, Saint-Ours, Boucherville, Longueuil, la plus belle maison de campagne de la Nouvelle-France, la Prairie-de-la-Madeleine, sont des postes fortifiés.

La Potherie décrit Montréal avec autant de précision qu'il l'a fait de Québec. Sans lui, que de détails précieux auraient été perdus pour la

postérité ? Il n'a pas l'air d'y toucher, et souvent d'un trait de plume, il nous dessine tout un décor. Sous son air bonhomme et naïf, percent parfois un grand sens et la prévision de l'avenir. Le grand commerce de la Nouvelle-France, dit-il, se fait à Montréal où abordent des nations qui viennent de 500 à 600 lieues. C'est là que devrait être la capitale du pays. Et il revient à plusieurs reprises sur cette idée.

Au village des Iroquois du Sault-Saint-Louis, la Potherie parle de la pieuse Catherine Tekakouïta dont on fait maintenant le procès de béatification en cour de Rome. Il nous dit sa sainteté et sa vertu et chante sa louange en grands vers alexandrins. Comme le contrôleur était bon dessinateur, il nous a laissé un croquis à la plume qui représente les traits de cette femme vertueuse.¹

La Potherie ne traverse pas un endroit sans chercher à y rattacher un souvenir historique ou quelques épisodes guerrières, et c'est ce qui fait le charme de son récit. Que de détails intéressants aussi sur les familles des héros dont il parle ! Le chercheur les trouve jetés négligemment au courant de la plume, mais ces simples indications peuvent aider singulièrement. Il dira, par exemple, en parlant de Quincon de Saint-Ours qu'il était oncle à la mode de Bretagne de M^{me} la maréchale de Tallard. S'il met en scène le chevalier de Crizasi, il écrira : le marquis de Crizasi, seigneur de Messine, cousin germain du prince de Monaco. Ces petites notes généalogiques valent leur pesant d'or.

C'est lui encore qui nous raconte, pour la première fois, cet émouvant épisode de M^{lle} de Verchères, jeune fille de quatorze ans, qui, seule, pendant deux jours, défend un fort contre une troupe de Sauvages iroquois. Et il trouve ce trait si beau qu'il le rapporte à deux endroits différents de son ouvrage.² Il prend la peine d'écrire au comte de Pontchartrain pour lui dire cette héroïque action, et il obtient de la comtesse, pour M^{lle} de Verchères, une pension viagère. N'est-ce pas que tout cela est délicat ?

La Potherie n'est pas surpris du reste que les Canadiens aient tant de valeur, puisque, dit-il, la plupart viennent d'officiers et de soldats qui sortaient d'un des plus beaux régiments de France.

Le premier volume de l'*Histoire de l'Amérique septentrionale* se termine par ce sympathique éloge des Canadiens et des Canadiennes.

« Quoique les Canadiennes soient en quelque façon d'un Nouveau-Monde, leurs manières ne sont pas si bizarres ni si sauvages qu'on l'imaginerait. Au contraire ce sexe y est aussi poli qu'en aucun lieu du royaume. La marchande tient de la femme de qualité, et celle d'officier

¹ Cf. dans le XII^{me} volume des *Lettres édifiantes et curieuses*, imprimées en 1717, la lettre du P. le Cholenec, missionnaire parmi les Iroquois, sur la vie et la sainteté de Catherine Tekakouïta, vierge iroquoise, surnommée la *Bonne-Catherine*, dont le tombeau est devenu célèbre par un grand nombre de miracles.

² T. I, pp. 324-326 ; t. III, p. 152.

imite en tout le bon goût qu'on trouve en France. Il est difficile de trouver une plus grande union que celle qui est entre les femmes d'officiers.

“Les dames de Québec n'aiment pas tout à fait les manières des Montréalistes : les premières sont beaucoup sur la réserve, principalement les conseillères. Ces états qui sont différents, forment différents caractères d'esprit : les Montréalistes ont à la vérité des dehors plus libres, mais comme elles ont plus de franchise elles ont plus de bonne foi, et sont très sages et très judicieuses.

“Le Canadien a d'assez bonnes qualités, il aime la guerre plus que toute autre chose, il est brave de sa personne, il a de la disposition pour les arts, et pour peu qu'il soit instruit il apprend aisément ce qu'on lui enseigne ; mais il est un peu vain et présomptueux ; il aime le bien, il le dépense assez mal à propos.”

Ce premier volume est accompagné de seize dessins que la gravure a quelquefois reproduits.¹

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VI

La Potherie consacre le deuxième volume de son ouvrage à étudier l'histoire des peuplades sauvages alliées de la Nouvelle-France. Il nous dit leur opinion sur la création du monde, sur celle de l'homme et de la femme. Naïve genèse, dont on aime toujours à lire les légendes. C'est Michapous, le dieu qui a fait le ciel et la terre. Seul sur un radeau, avec tous les animaux, il envoie le castor, la loutre, et le rat-musqué chercher un peu de terre au fond de la mer. C'est Méchipisi, le dieu des eaux. C'est Meteomeh, le dieu des glaces.

Dans un chapitre, l'auteur décrit le calumet de paix ou de guerre, les mesures que les Sauvages prennent quand ils vont faire une campagne, la façon dont ils traitent les prisonniers. Dans un autre, il parle des mariages, de la manière d'élever les enfants, de la chasse à l'ours, des jon-

¹ T. I, pp. 266-267.

gleurs, des sépultures, du sentiment des sauvages sur l'immortalité de l'âme et le sort de celle-ci après la mort ; puis il donne le caractère particulier des peuples alliés des Français.

La Potherie, après avoir connu par lui-même le gouvernement du Canada en particulier, aurait voulu pénétrer à 600 lieues par delà, mais sa santé et ses emplois ne lui permirent pas de parcourir cette vaste étendue de pays. Il n'alla jamais plus loin que le saut Saint-Louis, près de Montréal. Il se lia d'amitié avec la plupart des principaux chefs des peuples alliés de la Nouvelle-France, qui descendaient tous les ans à Montréal pour leur traite de pelleteries. S'étant formé un plan de son histoire, il les faisait causer sur leurs mœurs, leurs lois, leurs coutumes, leurs maximes et tous les événements particuliers qui s'étaient passés chez eux. Il prenait aussitôt note de ce que les sauvages lui disaient, leur lisait ce qu'il avait écrit afin de faire les corrections convenables. C'est ainsi que la Potherie, malgré le court séjour qu'il fit dans le pays, put avoir connaissance d'un si grand nombre de faits. Mais on ne peut dire qu'il ait mis de l'ordre au milieu de tant de choses embrouillées. Son étude n'est pas suffisamment fouillée et manque de vie.

Le reste du volume traite de ce qui se passa de plus remarquable sous MM. de Tracy, de Frontenac, de la Barre et de Denonville. Là, encore, l'auteur recueille ce qu'on lui dit à la veillée, les légendes des voyageurs ou les récits des fonctionnaires, qui ne se souviennent plus ou qui racontent par à peu près.

Joliet, pendant les leçons de géométrie qu'il lui apprenait,¹ l'instruisit de tout ce qu'il avait vu et connu. Les PP. jésuites, qui étaient de ses amis, lui furent aussi très utiles. Enfin, le voyageur Nicolas Perrot, qui fut le principal acteur chez les peuples de l'ouest, l'informa de tout ce qu'il savait. Tout ce que la Potherie dit des tribus de l'ouest, de leurs guerres et de leurs intrigues, vient de Perrot.² Aussi, ne connaissant pas ces peuples par lui-même, n'ayant jamais visité leur pays, il ne fait pas de géographie et apporte à son récit une confusion qui finit par être ennuyeuse.

L'auteur ne cache pas, du reste, que son érudition soit de seconde main.

“Les entretiens particuliers que j'ai eus avec plusieurs voyageurs dans ces pays m'ont donné matière de parler de ces peuples ; tout ce qu'ils m'en ont dit m'a paru toujours si uniforme que j'ai cru être obligé de

¹ Joliet fut professeur d'hydrographie à Québec, de 1697 à 1700.

² Charlevoix profita pour son histoire d'un manuscrit qui lui fut communiqué par M. Begon, intendant de la Nouvelle-France (1722). “Il est, dit-il, d'un voyageur du Canada, nommé Nicolas Perrot, qui a parcouru longtemps presque toute la Nouvelle-France, qui y a été souvent employé par les gouverneurs généraux à cause de son habileté à manier l'esprit des sauvages dont il parlait toutes les langues et qui s'était instruit avec soin de leurs usages. Il était d'ailleurs homme de beaucoup d'esprit.” (*Liste des Auteurs*, p. 420.)

donner une idée de ce vaste pays. Le sieur Perrot a le plus connu ces nations ; les gouverneurs généraux se sont toujours servis de lui dans tous leurs propos ; l'usage qu'il avait des langues, son savoir et la bonté de son esprit, lui ont fait faire des découvertes qui donnèrent lieu à M. de la Salle à faire toutes les tentatives qui lui avaient réussi si heureusement.

“ C'est par son moyen que le Mississipi a été connu..... ”

On conçoit que, renseigné par Nicolas Perrot, la Potherie ait consacré la plus grande partie de son deuxième volume à raconter les faits et gestes de cet interprète.

Perrot avait tenu au jour le jour un journal de ses aventureuses expéditions depuis 1665, et la Potherie y puisa à volonté. Il n'a pas fait pis du reste que l'historien Charlevoix qui lui emprunte abondamment, ni que le P. Lafitau qui en cite des pages entières.

Le portrait que la Potherie nous fait du célèbre voyageur n'a du reste rien d'exagéré. Ses admirables qualités d'interprète, de négociateur, les succès qu'il a remportés durant près de quarante ans parmi les sauvages de l'Ouest sont reconnus sans conteste, aujourd'hui surtout que ses mémoires, demeurés en manuscrit pendant cent cinquante ans, ont été publiés.¹

Par sa bravoure et son éloquence, Perrot sut se faire aimer de toutes ces tribus farouches de l'Ouest dont nous parle la Potherie : les Poutouatamis, les Malhominis, les Illinois, les Outagamis, les Maskoutecks, les Kikabous, les Miamis.

Cet homme “ aux jambes de fer ”, ainsi que l'appelaient les sauvages, dévoré d'une activité incessante, a plus fait pendant quarante ans pour conserver à la France l'amitié de ces nations primitives que tous les officiers militaires maintenus à grands frais dans les postes lointains du pays des lacs.

La Potherie a contribué le premier à faire connaître les actes de dévouement de ce héros modeste, et la postérité doit lui en être reconnaissante.²

AUTOGRAPHE DE NICOLAS PERROT (1689).

Le deuxième volume de la Potherie, qui contient en réalité l'histoire de l'Ouest depuis 1666, n'a plus aujourd'hui le même intérêt, attendu que la source où il avait si largement puisé a été livrée au public.

¹ *Mémoire sur les Mœurs, Coutumes et Religion des Sauvages de l'Amérique septentrionale, publié pour la première fois, par le R. P. J. Tailhan, Leipzig et Paris, 1864, VIII-341-XXXIX, in-8.*

² Dans le *Courrier du Canada* du 31 décembre 1894, M. Benjamin Sulte a écrit une notice intéressante sur la vie privée et la famille de Nicolas Perrot.

Dans son troisième volume, la Potherie a eu l'heureuse idée de raconter l'histoire épisodique de la colonie entre les années 1686 et 1701. C'est l'anecdotier des quinze années qui précédèrent la grande paix conclue avec les barbares Iroquois, le mémorial des héroïsmes qu'elles ont comptés, le livre d'or de la bravoure et du devoir. Ce sont des pages vibrantes, malgré qu'elles soient écrites d'un style prolix par un écrivain peu exercé. Elles sont animées des plus nobles sentiments dont on puisse proposer l'exemple. L'intérêt en est soutenu. Les personnages se font connaître à nous par leurs actes ; vous ne verrez là ni analyses, ni paysages, mais ceux qui aiment l'histoire de leur pays, qui lisent surtout ces récits d'antan, n'y cherchent pas les enjolivements littéraires. L'auteur connaît bien toute cette période tourmentée, et il a su en tirer partie. Année par année, il nous raconte les traîtreuses et perfides attaques des Iroquois sur des forts perdus dans la campagne isolée et presque sans défense. Il nous dit la bravoure des paysans et comment les officiers qui étaient à leur tête savaient repousser l'ennemi. D'aucuns l'accuseront peut-être d'avoir mis une trop grande abondance de détails, mais la Potherie ne veut rien oublier, et il nous en donne la raison. "En diminuant cet ouvrage, dit-il, plusieurs officiers du Canada auraient pu se plaindre de les avoir mis en oubli. La guerre que nous avons eue avec cette terrible nation est trop cruelle pour ne pas citer jusques au dernier subalterne et habitant même qui y ont pris part. Il est juste de transmettre à la postérité ce qu'il ont tous fait et soutenu pour la gloire du Roi."

Ce sentiment honore la Potherie. Certes, on conserve aux archives du ministère de la guerre en France, avec un soin jaloux, les états de service de tous les officiers militaires qui ont servi depuis le règne de Louis XIV, mais ces dossiers ne contiennent pas les détails de ces escarmouches obscures où de braves gens versaient leur sang au milieu des forêts à des milliers de lieues de la patrie. Et, pourtant, ces héros ont mérité autant que leurs camarades qui combattirent sur les champs de bataille de Fleurus, de Steinkerque, de Stafarde et de Malplaquet.

Que de noms la Potherie a ainsi sauvés de l'oubli ! On voit défiler sous nos yeux, dans une rumeur glorieuse, Maricourt, Lemoine, Saint-Ours, la Durantaye, du Planté, Montour, de Mines, Charleville, Repentigny, Courtemanche, la Vallière, de Muy, La Mothe de Cadillac, Mantel, d'Argenteuil, de l'Isle, Vincennes, You de la Découverte, Perrot, la Gemmeraye, Joncaire. Ils sont partout, à Michillimakinac, au fort Frontenac, à la Prairie-de-la-Madeleine, au lac des Deux-Montagnes, sur le lac Champlain, sur les bords de l'Atlantique, dans les hameaux fortifiés de la Nouvelle-Angleterre.

La Potherie n'oublie pas non plus les chefs de guerre des tribus aborigènes : le Baron, Kondiaronk, Auriouai. Son histoire abonde en traits dignes des héros d'Homère et d'Eschyle.

Un guerrier iroquois converti se rencontre au milieu d'un combat face à face avec son père qui est demeuré infidèle et barbare. Il abaisse aussitôt

son tomakawk, et lui dit ces simples paroles : “ Tu m’as donné la vie, je te la donne aujourd’hui ; mais ne te trouve plus sous ma main, car je ne t’épargnerais pas.”

La Chaudière-Noire, autre chef iroquois, la terreur de toute l’Amérique, mortellement blessé par un jeune Algonquin de vingt ans, s’écrie : “ Faut-il que moi qui ai fait trembler toute la terre, meure de la main d’un enfant ” !

Auriouaï, chef ami des Français,¹ est mourant à Québec. On lui parle de Jésus-Christ que les Juifs ont crucifié, et il répond : “ Que n’étais-je là j’aurais vengé sa mort et je leur aurais enlevé la chevelure”.

Le quatrième volume de l’ouvrage de la Potherie, si l’on s’en tient à la simple lecture du titre, est supposé contenir l’histoire des Abénaquis. Mais l’auteur ne parle pas ou peu de cette brave nation, si dévouée, si fidèle aux Français. Il continue à traiter des mœurs et des maximes des Iroquois et de leurs mouvements de guerre. Il s’étend surtout sur les démarches qui furent faites pour arriver à la grande paix générale de 1701. Ici, la Potherie est un témoin oculaire et digne de foi. Il a vu, de ses yeux vu, et il aime à le dire. Cet homme, abondant en paroles comme certains des héros d’Homère, ne nous fait grâce d’aucune des nombreuses harangues qui furent alors prononcées par les chefs sauvages. Il nous décrit par le menu chacun des colliers qui furent présentés. A la longue tout cela devient fastidieux.

Cependant la Potherie sort du terre à terre et a de belles envolées lorsqu’il résume la large part que le gouverneur de Frontenac prit à ces négociations.

Après la grande assemblée tenue à Montréal au mois d’août 1701, où se trouvèrent réunis plus de mille sauvages appartenant à toutes les nations du pays, il s’écrie :

“ Tel fut le jour heureux qui fut l’accomplissement de tous les travaux de feu M. le comte de Frontenac, l’amour et les délices de la Nouvelle-France, le père des nations sauvages, ses alliées, et la terreur de cette redoutable nation qui faisait trembler l’Amérique septentrionale. Il avait porté le fer et le feu chez eux à l’âge de 74 ans, en 1695. Il les avait forcés de lui demander plusieurs fois la paix, mais comme il ne voulait pas abandonner ses alliés, il la leur refusa, il les força de consentir à la fin qu’ils y fussent compris. Ils cessèrent tous actes d’hostilité en 1698, et si la mort ne l’eût prévenu cette année, qu’il donnât le repos à ce vaste continent, il aurait eu la satisfaction de voir amener généralement tous les prisonniers ses alliés qui avaient toujours donné matière à différer la paix.”²

¹ Celui-là même que le gouverneur de Denonville avait fait saisir en 1687 au milieu d’un banquet et qui avait été envoyé sur les galères en France. Frontenac le ramena au pays en 1689.

² T. IV, pp. 253-254.

Jamais, en effet, Frontenac ne se montra si grand politique que pendant les huit dernières années de sa vie. C'est alors qu'il donna véritablement toute sa mesure.

Habilité à déjouer les intrigues et à parer les coups, sûreté du coup d'œil, fermeté du caractère, forte discipline, activité incessante dans les partis de guerre, choix des hommes, telles furent les qualités que Frontenac sut déployer. Lui seul pouvait démêler ce chaos qui existait depuis tantôt quinze ans et arriver à la paix.

Il est heureux qu'un scribe patient comme la Potherie ait pris le soin de nous rapporter comme le mot à mot de ces événements si pleins d'importance. La masse indifférente peut le trouver ennuyeux et prolix, mais le chercheur consciencieux et tenace qui veut toucher du doigt les détails les plus intimes n'en a jamais assez.

L'ouvrage de la Pothier se ferme après la description de la paix de 1701. L'année suivante, l'auteur disait adieu au Canada et s'embarquait pour la Guadeloupe.

Il est assez curieux que la Potherie, qui aimait à écrire, ait laissé tomber sa plume après ce grand effort.

Il nous dit, quelque part :² " Il y a peu de personnes qui ne se fasse un mérite de faire l'éloge de sa patrie. J'aurais eu assez de matière à décrire les mouvements des guerres des Caraïbes qui se sont faits dans la Guadeloupe, notre patrie, si la destinée ne m'en eût éloigné pendant plusieurs années."

Ce projet, la Potherie ne le mit pas à exécution, et il reste devant la postérité avec ses quatre volumes de *l'Histoire de l'Amérique septentrionale*.

VII

Il existe une dernière édition de l'histoire de Bacqueville de la Potherie qui porte le millésime de 1753. Elle est signalée par Faribault sous le numéro 369, dans son *Catalogue d'Ouvrages sur l'Histoire de l'Amérique*.² Les bibliothèques de l'université Laval et de la législature de Québec en possèdent chacune un exemplaire en quatre volumes. Cette édition porte pour marque d'imprimeur : *A Paris, quay des Augustins, chez Nyon fils à l'occasion*.

L'auteur de cette étude possède un exemplaire de l'édition de 1753 en quatre volumes, qui porte pour marque d'imprimeur : *A Paris, | chez Brocas, Quay de Conti, au Pavillon | du College des Quatre-Nations, aux | Armes de Mazarin*.

En comparant l'édition de 1722, que possède la bibliothèque du parlement d'Ottawa, avec l'édition de 1753 que nous avons sous les yeux, il est facile de voir que nous sommes là la victime d'un truc de librairie.

¹ Vol. I, p. 89.

² P. 78.

De nos jours, afin de créer autour d'un livre une renommée factice de succès et d'allécher ainsi le public, certains éditeurs changent le titre à chaque millier d'exemplaires (souvent même à chaque cinq cents ou même moins), pour y ajouter la mention mensongère de 2^e, 3^e, 4^e, etc., édition. Quelquefois même, une dixième prétendue édition est lancée dans le commerce avant que l'on ait touché à la seconde, et il ne manque pas de gens qui s'y laissent prendre.

Au xvii^e siècle, les libraires usaient d'une supercherie à peu près semblable. Pour faire écouler plus aisément les exemplaires non vendus d'un livre et leur redonner l'attrait de la nouveauté, ils en renouvelaient simplement le titre, et y ajoutaient la mention : *Edition nouvelle*. Cela était reconnu de bonne guerre dans le commerce et devint à la longue une habitude constante.

Comment reconnaître ces faux en librairie qui sont assez bien exécutés pour que les bibliophiles même ne puissent s'y retrouver qu'après un examen attentif ?

Il faut comparer les textes, étudier les caractères de typographie, la disposition de la matière, le nombre de pages, la coupure des mots. C'est surtout par la marque du papier et les traces que laisse l'onglet de la page du titre que l'on parvient à découvrir la vérité.

Dans l'espèce qui nous occupe, l'édition de 1753 est exactement semblable à celle de 1722. Même nombre de pages, mêmes caractères, mêmes coupures de mots, mêmes fautes de casse. L'édition de 1753 n'a de nouveau que le titre et le millésime. Il est facile de voir, du reste, que cette page du titre a été collée au premier in-12.

Dans l'édition de 1722, les lignes 1, 3, 6, 15, 16, 17, 19, 25 du titre du premier volume, les lignes 1, 3, 5, 16, 19, 25 du titre du deuxième volume, les lignes 1, 3, 5, 14, 17, 23 du titre du troisième volume, les lignes 1, 3, 5, 13, 16, 22 du titre du quatrième volume sont rouges. Dans l'édition de 1753, tout le texte du titre est noir. Dans l'édition de 1753, il y a, à la page 17 du premier volume, une estampe représentant un groupe de sauvages que l'on ne trouve pas dans l'édition de 1722. En revanche, il y a, à la page 24 du deuxième volume de l'édition de 1722, une estampe représentant le martyr d'un missionnaire qui est disparue de l'édition de 1753.

Je crois qu'avec ces indications le bibliophile amateur pourra facilement se retrouver et distinguer l'édition principale de celle qui est démarquée.¹

¹ M. Benjamin Sulte, dans ses *Pages d'Histoire du Canada*, p. 9, dit que l'ouvrage de la Potherie, bien que recommandé au roi pour l'impression dès le 9 juin 1702, par le censeur Fontenelle, ne parut que cinquante et un ans plus tard, en 1753. Le savant écrivain ne possédait pas alors (1891) les documents qui nous ont permis d'étudier plus à fond la bibliographie de la Potherie. Sur la bibliographie de la Potherie, Cf : Field, *Indian Bibliography*, n^o 66 ; Carter, *Brown Catalogue*, vol. III, n^o 319 ; *Brinley Catalogue*, n^o 63 ; Sabin, *Dictionary of Books relating to America, from its discovery to the present time*, vol. I, n^o 2692 ; Stevens, *Historical*

VIII

Lorsque le livre de la Potherie parut pour la première fois, en 1716, il n'y avait plus guère alors dans le commerce que des rééditions hollandaises des ouvrages de Hennepin et de Lahontan. La guerre d'Espagne avait empêché, du moins en France, toute impression de livres traitant des choses d'Amérique. C'est tout au plus si l'on trouve dans les *Lettres édifiantes*, en 1712 et 1715, deux lettres du P. Gabriel Marest, l'une sur l'expédition de d'Iberville à la baie d'Hudson en 1694, l'autre sur le pays des Illinois. En 1713, parut le *Journal* de Joutel, compagnon de la Salle dans son voyage au Mississipi. En 1715, le libraire Bernard commençait à Amsterdam la publication de son *Recueil des Voyages au Nord*.

Le livre de la Potherie, qui portait un titre ronflant, dut avoir l'attrait de la nouveauté. Il traitait du reste de matières que les auteurs n'avaient point encore attaquées. Chose assez curieuse les *Mémoires de Trévoux*, qui rendaient compte alors de tous les ouvrages parus en librairie et ayant quelque rapport avec l'Amérique, ne disent pas un mot de l'*Histoire* de la Potherie.

L'intérêt que l'on avait pu porter d'abord à l'ouvrage en raison des choses nouvelles qu'il pouvait contenir sur les mœurs aborigènes, dut diminuer considérablement, lorsque parut, en 1724, le livre si complet et si savant du P. Lafitau sur les mœurs des sauvages américains, comparées aux mœurs des premiers temps. La grande histoire de Charlevoix, publiée vingt ans après, devait reléguer dans l'oubli l'œuvre de l'ancien contrôleur.

L'historien la Nouvelle-France classa son devancier avec assez de justice. "Cet ouvrage, dit-il, renferme des mémoires assez peu digérés et mal écrits sur une bonne partie de l'histoire du Canada. On peut compter sur ce que l'auteur dit comme témoin oculaire, il paraît sincère et sans passion, mais il n'a pas toujours été bien instruit sur le reste."¹

La Bibliothèque des Voyages, citée par Faribault et Justin Winsor donne une appréciation moins mesurée :

"Bacqueville, dit-elle, a décrit le premier d'une manière exacte, l'établissement des Français à Québec, à Montréal, et aux Trois-Rivières : il a fait connaître surtout dans un grand détail, et en jetant, dans sa narration beaucoup d'intérêt, les mœurs, les usages, les maximes, la forme de gouvernement, la manière de faire la guerre et de contracter les alliances de la nation iroquoise, si célèbre dans cette contrée de l'Amérique septen-

Collections, vol. I, n. 1313 ; Justin Winsor, *Narrative and critical history of America*, IV, pp. 197, 299, 358. Il n'y a cependant dans ces différents auteurs aucuns renseignements nouveaux.

L'édition de 1722 vaut ordinairement 10 dollars dans le commerce ; celle de 1753, vaut un peu moins.

¹ *Liste des Auteurs*, vol. VI, p. 414, éd. de 1744.

trionale. Ces observations se sont étendues encore à quelques autres peuplades, telles que la nation des Abénaquis.”

Quoi qu'il en soit de ces divergences d'opinion, la Potherie a été beaucoup citée et les écrivains le consultent encore.

L'auteur a eu tort de donner à son livre le titre d'*Histoire de l'Amérique septentrionale*. Ce pavillon est trop grand pour la marchandise qu'il a à couvrir. C'était le sentiment de l'historien Garneau. “Il y a, dit-il, peu de pays en Amérique sur lesquels on ait tant écrit que sur le Canada, et il y en a peu qui soient, après tout, aussi pauvres que lui en histoires, car on ne doit pas prendre pour telles plusieurs ouvrages qui en portent le nom, et qui ne sont pas autre chose que des mémoires ou des narrations de voyageurs, comme l'*Histoire de l'Amérique septentrionale* de la Potherie.”

La Potherie n'est pas un historien, c'est un anecdotier. Le P. Labat, qui l'a connu à la Guadeloupe, nous le montre dans sa nature de créole un peu naïf et mou. Ce n'est pas un homme à caractère viril, ni de forte trempe, ni de beaucoup d'élévation. Sa correspondance privée nous le découvre, discutant avec le Ministre de questions futiles de cérémonial quand les plus graves événements viennent d'assaillir la colonie : la mort de Frontenac et la cessation éminente des négociations de paix.

Dans cette même correspondance privée, la Potherie raconte au Ministre les petites intrigues des gens en place. Il lui fait part des plaintes et des réclamations des négociants de Montréal contre l'établissement de Détroit. Dans son livre, il fait le silence sur tout cela, et il n'a jamais un mot désagréable pour personne. Il garde, devant le public, sur le gouvernement tant civil qu'ecclésiastique, une réserve de commande. Fonctionnaire de l'Etat, un peu besogneux, sentant la nécessité d'avoir des protecteurs, il veut évidemment avoir bonne place dans les papiers de tout le monde. Quelle différence entre cet esprit placide, le ton aigre de Lahontan et la morgue tranchante de La Mothe de Cadillac !

La Potherie a reçu des anciens auteurs un beau témoignage d'estime. Tous le considèrent comme un honnête homme et un témoin digne de foi lorsqu'il parle de choses qu'il a vues. Il est vrai qu'il se contente beaucoup trop d'à peu près dans la partie historique antérieure à son arrivée au Canada, mais aujourd'hui que les portes des dépôts d'archives sont si largement ouvertes aux chercheurs, on le peut contrôler aisément. Pour les trois années qui terminent le XVII^e siècle, la Potherie est une autorité que l'on peut invoquer en toute sûreté.

Disons à la louange de l'auteur qu'il est un des rares militaires français qui ait témoigné de la sympathie au colon canadien. Il est peut-être le seul qui lui ait rendu justice dans ses écrits. C'est une bonne note qu'il ne faut pas oublier, quand on se souvient comment nos ancêtres furent traités par l'armée des fonctionnaires que la métropole entretenait dans la colonie.

¹ *Histoire du Canada*, préface, pp. 5-6.

APPENDICE

NOTES SUR LA FAMILLE DE MINES.

Jean de Mines, capitaine d'un détachement de la marine, épousa à Montréal, le 9 septembre 1693, Marie-Anne de Saint-Ours, fille de Pierre de Saint-Ours, premier capitaine du détachement de la marine au Canada, chevalier de Saint-Louis.¹

De son mariage, Jean de Mines, lieutenant des vaisseaux du roi et capitaine d'une compagnie franche de la marine (Greffé Amiot, notaire royal à Toulon, le 23 avril 1739), eut :

1. Antoine de Mines, enseigne des vaisseaux du roi au département de Toulon ;

2. Thérèse-Marie de Mines, qui épousa à Toulon, le 2 janvier 1721, François de Joumart de Teson d'Argence, chevalier, seigneur et marquis de Changy et autres lieux, enseigne de vaisseau, fils de feu Messire Pierre-François de Joumart de Teson, chevalier, comte d'Argence, seigneur et baron de Saint-Pair, du Mont-Changy, de Vilene Saint-Loup et autres lieux, vivant lieutenant de roi de la province de Bourgogne, et de feu dame Charlotte-Elisabeth Demins. Le contrat de mariage n'eut lieu que le 12 octobre 1722 à cause du mal contagieux qui éclata parmi les troupes en janvier 1721. Thérèse-Marie de Mines y est assistée de sa mère et de son frère, Antoine de Mines, garde de pavillon amiral. M^{me} de Mines constitue à la marquise d'Argence une dot de 26,000 livres. (Greffé du notaire Arnaud à Toulon).

Lors de ce mariage, Jean de Mines était mort. Il s'était fait tuer au siège de Gibraltar (1704-5). Avant de partir pour cette expédition, Jean de Mines fit son testament devant M^e Martilly, notaire à Toulon, en 1703. Il y institue sa femme son héritière. M^{me} de Mines (Marie-Anne de Saint-Ours) mourut le 8 février 1738, laissant pour héritiers son fils Antoine de Mines, alors enseigne de vaisseau, et sa fille la marquise d'Argence, dont le mari était décédé.

J'ai sous les yeux quatre lettres de M. Antoine de Mines, datées de Toulon le 21 avril 1739, dans lesquelles il parle du règlement de la succession de Saint-Ours au Canada. J'en donne ici le résumé :

1. Lettre à M. Hiché : Sa tante d'Eschaillons lui a mandé d'envoyer une procuration en blanc. Sa sœur a renoncé aux successions de ses père et mère (7 sept. 1738), moyennant 6,000 livres. Il estime les biens de sa famille dont il a hérité à 100,000 livres. Il demande 1,000 livres pour les

¹ La Potherie (III, 91-94) raconte une aventure singulière qui arriva à la belle Marie-Anne de Saint-Ours alors qu'elle n'était âgée que de huit à neuf ans. Elle put échapper à un parti d'Iroquois qui la poursuivait en se jetant à la nage dans la rivière Chambly. L'anecdote est à lire et nous y renvoyons le lecteur.

biens de sa mère au Canada. Il veut garder les biens qu'elle peut avoir en France, provenant de sa famille.

2. Lettre à son oncle : Il a envoyé à sa tante d'Eschaillons tous ses papiers ; sa sœur a 6,000 livres de dot qu'il lui doit. Il a besoin de 1,000 livres. Il se plaint que les messieurs de robe du Canada ne connaissent pas les lois des successions *intestat*. Il demande à sa tante la galanterie d'un manchon. Il a vu à Toulon, M. Charest,¹ neveu de feu M. de Courtemanche, qui lui a dit être de ses alliés. Il était un peu indisposé et n'a pu boire avec lui, pour le peu de séjour qu'il y fit. Il lui a dit qu'il retournerait en Canada le printemps prochain. Il écrit à son oncle le chevalier de Saint-Ours, dont il n'est pas connu et lui demande son amitié. Il écrit aussi à l'intendant Hocquart.

3. Lettre à sa tante M^{me} d'Eschaillons : Il la remercie de la part sincère qu'elle a prise à sa perte.² Son oncle a bien fait de mettre l'administration de ses affaires entre ses mains. S'il avait idée de se marier, il serait charmé de trouver une dame qui fût aussi bien rusée dans les affaires.

Il parle de son droit de succession. Il regrette que les hommes de robe du Canada ne connaissent pas le droit coutumier. Il lui envoie des papiers qui coûtent cher. Cela ne rentre pas dans sa poche et sert à engraisser les notaires et les procureurs. Il demande un manchon. Cela ne coûte qu'un coup de fusil au Canada.

4. M^{me} d'Eschaillons, sa tante, lui a écrit pour régler ses affaires de famille. Il s'agit de la succession de son grand-père, M. de Saint-Ours. Sa sœur a reçu 20,000 livres dans son contrat de mariage. Sa dot est de 26,000 livres. M^{me} d'Eschaillons lui offre 1,000 livres pour la part de sa mère en Canada.

¹ Neuvième seigneur de Lauzon.

² La mort de sa mère, arrivée l'année précédente.

II.—*La Mère Marie de l'Incarnation,*

Par M. BENJAMIN SULTE.

(Lu le 23 juin 1897.)

Ceci n'est pas une étude des lettres de la mère de l'Incarnation, mais un choix de divers passages tirés de ses œuvres, concernant les sauvages, les missions des jésuites, le climat du pays, la nourriture des habitants, le logement des colons, le commerce, les communications avec la France, les ursulines de Québec—le tout allant de 1639 à 1651—et ce n'est que la trentième partie des deux volumes de ces lettres.

Comme celles-ci renferment, au hasard de la dictée de chaque jour, des nouvelles variées se rapportant à plusieurs genres d'événements qui se passaient alors, soit à Québec, soit dans les autres endroits du pays, il est difficile de les consulter sur un sujet quelconque, puisqu'il nous faudrait à chaque fois feuilleter l'œuvre entière. Nous avons fait, pour aujourd'hui, une levée, un recueil des passages qui concernent les sujets mentionnés plus haut, afin de donner sous une forme concise des renseignements trop dispersés dans les écrits originaux de cet auteur. Il serait aisé de réunir de la même manière ce qu'elle dit des guerres des sauvages, etc. Essayons d'abord de faire connaître la présente série et nous verrons s'il y a lieu de continuer.

La première lettre est de quelques jours après l'arrivée des ursulines à Québec, vers la fin de l'été de 1639, alors que la colonie renfermait à peu près 200 âmes, à part les sauvages.

1639, 1 septembre; à son beau-frère.—Je m'assure que l'affection que vous avez pour moi vous fait désirer d'apprendre le succès de notre voyage et de mon arrivée en Canada. En vous satisfaisant je veux aussi me satisfaire, et vous assurer que nous sommes au lieu où nous aspirions, dans une santé aussi parfaite que si nous n'étions point sorties de Tours; non que nous n'ayons souffert de grands travaux durant trois mois de navigation parmi les orages et les tempêtes, qui pour treize cents lieues que nous avons à faire, nous en ont fait faire plus de deux mille. Nous nous sommes vues à deux doigts du naufrage; mais celui qui commande aux vents et à la mer nous a préservées par son doigt tout-puissant; qu'il en soit loué et béni éternellement des anges et des hommes. Ce que nous avons vu en arrivant dans ce nouveau monde nous a fait oublier tous nos travaux; car entendre louer la Majesté divine en quatre langues différentes; voir baptiser quantité de sauvages; entendre les sauvages même prêcher la loi de Jésus-Christ à leurs compatriotes, et leur apprendre à bénir et à aimer notre Dieu; les voir rendre grâces au ciel de nous avoir envoyées dans leur pays barbare pour instruire leurs filles, et leur apprendre le chemin du ciel; tout cela, dis-je, n'est-il pas capable de nous faire oublier nos croix et nos fatigues, fussent-elles mille fois plus grandes

qu'elles n'ont été ? Il en a été baptisé cette année, tant aux Hurons qu'aux Montagnais, plus de cinq cents. Je vous supplie de prier pour la conversion des autres, qui sont en grand nombre, parce qu'il y a des nations presque infinies qui ne connaissent point Jésus-Christ. Nous sommes venues avec les ouvriers de l'Évangile, qui vont tâcher de les attirer à la connaissance de son nom et de sa sainte loi.

1640, 3 septembre ; à une dame de qualité.—Nous avons sujet de louer le Père des miséricordes de ce qu'il en répand de si grandes sur nos pauvres sauvages car, n'étant pas contents de se faire baptiser, ils commencent à se rendre sédentaires et à défricher la terre pour s'établir... Si la France leur donne un peu de secours pour se bâtir de petites loges dans la bourgade qu'on a commencée à Sillery, l'on verra en peu de temps un bien autre progrès... Le révérend père Vimond, supérieur de la mission, pour donner courage à ces pauvres sauvages, les mène lui-même au travail et travaille à la terre avec eux... Il y a une grande persécution aux Hurons où un père a pensé être martyrisé d'un coup de hache... La première séminariste sauvage qu'on nous donna, appelée Marie Negabamat était si accoutumée à courir dans les bois que l'on perdait toute espérance de la retenir. Le R. P. Le Jeune, qui avait porté son père à nous la donner, envoya avec elle deux grandes filles sauvages chrétiennes, qui demeurèrent quelque temps avec elle pour la fixer, mais ce fut en vain car elle s'enfuit quatre jours après dans les bois, ayant mis en pièces une robe que nous lui avions donnée. Son père qui est un excellent chrétien, et qui vit comme un saint, lui commanda de revenir au séminaire, ce qu'elle fit. Elle n'y fut pas deux jours qu'il y eut un changement admirable ; elle ne semblait plus être elle-même... En même temps on nous donna une grande fille âgée de dix-sept ans, appelée Marie Amiskouevan... Elle a un grand esprit pour retenir ce qu'on lui enseigne... Elle est recherchée en mariage par un Français, mais on a dessein de la donner à un de sa nation à cause de l'exemple qu'on espère qu'elle donnera aux sauvages. O ! si Dieu donnait la dévotion à quelque personne de France, d'aider à lui faire une petite maison !... Elle parle bien français... Marie-Ursule Gamitiens, filleule de mademoiselle de Chevreuse, n'est âgée que de cinq ou six ans... elle dit son chapelet durant la messe et chante des cantiques en sa langue sauvage.. Nous avons eu dix-huit séminaristes, sans parler des femmes et des filles sauvages qui ont permission d'entrer au lieu destiné à l'instruction des françaises et des sauvages¹, où elles ne manquent pas de se trouver... L'hiver, les vieilles gens ne peuvent suivre les sauvages à la chasse ; si l'on n'avait soin d'eux en ce temps là, ils mourraient de faim dans les cabanes. Dieu nous a fait la grâce de les pouvoir assister jusqu'au printemps... Nous avons apporté des habits pour deux ans ; tout a été employé dès cette année, de sorte même que, n'ayant plus de quoi les vêtir, nous avons été obligées de leur donner une partie des nôtres...

¹ Le mot *sauvagesse* était-il connu à cette époque dans le sens de femme sauvage ?

1640, 4 septembre.—L'été est ici aussi chaud qu'en Italie... On se dispose à aller prêcher aux Nipissiriniens et aux nations de la mer du nord, trois cents lieues, à ce qu'on dit, au delà des Hurons... Nous avons reçu vos lettres un mois et demi après l'arrivée des premiers vaisseaux, parce que on les a envoyées de la Rochelle, d'où l'on part plus tard que de Dieppe ; ce qui fait qu'à peine avons-nous du loisir pour faire nos réponses... Les habitants de Québec nous donnent des légumes et d'autres semblables rafraîchissements, en sorte que nous sommes trop à notre aise. Nous avons passé cet hiver aussi doucement qu'en France et, quoique nous soyons pressées dans un petit trou où il n'y a point d'air, nous n'y avons pas été malades, et jamais je ne me sentis si forte. Si, en France, on ne mangeait que du lard et du poisson salé, comme nous faisons ici ¹, on serait malade et on n'aurait point de voix ; nous nous portons fort bien et nous chantons mieux qu'on ne fait en France. L'air est excellent, aussi est-ce un paradis terrestre où les croix et les épines naissent si amoureusement que, plus on est piqué, plus le cœur est rempli de douceur... Bénissait le roi du ciel et de la terre qui, par sa bonté, a fait arriver les vaisseaux à notre port, après avoir connu les risques de l'armée navale des ennemis et s'être sauvés par le moyen d'une escorte de quarante vaisseaux que monseigneur le cardinal de Richelieu envoya à la prière de madame la duchesse d'Aiguillon... Lorsque nous faisons festin à nos sauvages et que, pour en traiter splendidement soixante ou quatre-vingts, on n'y emploie qu'environ un boisseau de pruneaux noirs, quatre pains de six livres pièce, quatre mesures de farine de pois ou de blé d'Inde, une douzaine de chandelles de suif fondues, deux ou trois livres de gros lard, afin que tous soit bien gras, car c'est ce qu'ils aiment, il me semble que l'on doit déplorer les grandes superfluités du monde, puisque si peu de chose est capable de contenter et de ravir d'aise ces pauvres gens...

1640, 7 septembre ; à une religieuse ursuline de Tours.—Je me suis mise en peine de vous faire chercher un pied d'élan ², mais vos lettres sont venues si tard que je n'ai encore rien d'assuré...

1640, 13 septembre.—Le retardement du vaisseau qui nous apportait vos lettres m'ôtait l'espérance d'en recevoir aucune de votre part, parce que nous le tenions perdu. Il est de la prudence de ne pas mettre tout ce que l'on a dans une même voiture parce que, si le vaisseau vient à se perdre, l'on perd tout à la fois tous ses rafraîchissements et l'espérance de rien recevoir que l'année suivante. Enfin il est arrivé sur la fin du mois d'août ³ chargé de vos bienfaits, sans lesquels nous eussions manqué de

¹ A qui la faute si les religieuses vivaient aussi misérablement au milieu de l'abondance que permettait le Canada lui-même ? Aux Cent-Associés qui nourrissaient les ursulines de provisions envoyées par les vaisseaux. Les marchands en question se gardaient bien d'encourager l'agriculture dans la colonie.

² Pour guérir l'épilepsie ? La croyance en ce remède existe encore.

³ Cette lettre étant adressée à la supérieure des ursulines de Tours, on doit supposer que les effets dont elle parle avait été embarqués de là pour la Rochelle d'où étaient partis cette année les derniers vaisseaux pour le Canada. Voir la lettre du 4 septembre ci-dessus.

beaucoup de choses... Une nuit de cet hiver, il y eut un froid si horrible que le serviteur de M. de Piseaux, qui traversait un chemin, en mourut... J'ai commission de monsieur le gouverneur et le R. P. Le Jeune de vous envoyer une certaine bave qui est comme du coton, afin de faire épreuve en plusieurs façons de ce que l'on en pourrait faire. Je crois qu'il la faudra battre et carder, pour voir si on la pourrait filer. Cela est plus délié que de la soie et du castor. Je vous supplie donc de la faire voir à quelqu'un qui ait de l'industrie et, si on la peut façonner et mettre en œuvre, de nous en faire voir des essais. Nous en pourrions affier (cultiver) ici, si l'on trouve qu'elle puisse être utile à quelque chose...

1641, 24 août.—Mon père, disait le bon chrétien Charles, de Tadoussac, au R. P. Le Jeune, je porte mon pistolet¹ pour te garder...

1641, 16 septembre.—Si vous voyez les révérends pères Le Jeune, Adam et Quentin qui passent en France pour les nécessités de la mission, ils vous diront que les affaires de la foi vont très bien à Sillery, Québec, Tadoussac et Saguenay, mais elles sont traversées aux Trois-Rivières où les Iroquois font une guerre mortelle à nos bons sauvages, comme aussi à tous ceux qui sont au delà jusqu'aux Hurons. S'ils osaient, ils viendraient jusqu'ici, mais il n'y ferait pas bon pour eux, c'est pourquoi ils s'en éloignent... Nous nous établissons à Québec comme au lieu le plus sûr pour nos personnes et le plus avantageux pour l'instruction. Les mères hospitalières y font aussi achever une maison. MM. de Mont-Réal y font faire une maison et un magasin, car il est nécessaire qu'ils aient ici un lieu de retraite, Mont-Réal n'étant pas encore en assurance à cause des incursions et des guerres continuelles des Hiroquois...

1642, 28 août.—J'ai reçu vos deux lettres par les mains du R. P. Le Jeune qui m'a assuré vous avoir rendu visite...

1642, 29 septembre.—Nous avons eu, cette année, les vaisseaux plus tôt qu'à l'ordinaire, n'ayant été que deux mois à leur voyage...

1643, 30 septembre.—Les Iroquois ferment les passages, de crainte que les nations plus éloignées ne viennent se faire instruire. La nation d'Hyroquet n'a pas laissé de traverser les terres de ces barbares, qui ont fait sur eux une décharge de plus de cent coups de fusils, mais Dieu les a si bien protégés, qu'il n'y en a pas eu un seul de blessé...

1644, 26 août.—Pour réponse à ce que vous désirez savoir touchant le pays, je vous dirai qu'il y a des maisons de pierres, de bois et d'écorce. La nôtre, qui est toute de pierres, a quatre-vingt-douze pieds de longueur et vingt-huit de largeur. C'est la plus belle et la plus grande qui soit en Canada, pour la façon d'y bâtir. En cela est comprise l'église, qui a sa longueur dans la largeur de la maison et dix-sept pieds de largeur. Vous penserez que cela est petit, mais le

¹ Les Français commençaient alors à confier des armes à feu à quelques sauvages éprouvés par leur fidélité envers eux.

trop grand froid ne permet pas qu'on fasse des lieux plus vastes. Il y a des temps auxquels les prêtres sont en danger d'avoir les doigts et les oreilles gelés. Le fort est de pierres, comme les maisons qui en dépendent. Celles des révérends pères, de madame la fondatrice, des mères hospitalières et des sauvages sédentaires sont aussi de pierres. Celles des habitants, excepté deux ou trois, sont en colombage pierrotté. Une partie des sauvages ont des maisons portatives d'écorce de bouleau, qu'ils dressent bien proprement avec des perches. Nous en avons une semblable au commencement pour nous servir de classe. Quand je dis que nos maisons sont de pierres, je ne veux pas dire qu'elles soient de pierres de taille, non, il n'y a que les encoignures, qui sont d'une espèce de marbre presque noir, qui se tire par coupeaux assez bien faits. Les encoignures étant de cette sorte de pierres, sont très-belles, mais elles coûtent à tailler à cause de la dureté. Un homme coûte trente sols par jour, encore le faut-il nourrir les fêtes et les dimanches et dans les mauvais temps. Nous faisons venir de France nos artisans qu'on loue pour trois ans ou plus. Nous en avons dix qui font toutes nos affaires, excepté que les habitants nous fournissent la chaux, le sable, la brique. Notre bâtiment a trois étages, dans le milieu desquels nous avons nos cellules faites comme celles de France. Notre cheminée¹ est au bout pour chauffer le dortoir et les cellules, dont les séparations ne sont que de bois de pin, car autrement on ne pourrait pas y échauffer ; encore ne croyez pas qu'on y puisse demeurer longtemps en hiver sans s'approcher du feu ; ce serait un excès d'y demeurer une heure, encore faut-il avoir les mains cachées et être bien couvert. Hors les observances, le lieu ordinaire pour lire, écrire et étudier est de nécessité auprès du feu, ce qui est un assujettissement fort incommode, particulièrement à moi qui ne me chauffais jamais en France. Nos couches sont de bois qui se ferment comme des armoires² et, quoiqu'elles soient doublées de couvertes³ ou de serge, à peine y peut-on échauffer. L'hiver, nos sauvages quittent leurs maisons de pierres et vont cabaner dans les bois où il ne fait pas si froid. A quatre cheminées que nous avons, nous brûlons par an cent soixante-quinze cordes de gros bois ; et, après tout, quoique le froid soit si grand, nous tenons le chaud tout l'hiver, mais l'on y souffre un peu. Notre clôture n'est que de gros pieux d'arbres entiers de dix pieds de haut et accommodés avec de la charpente. Les couvertures des maisons sont en planches doubles ou de bardeau contregarni de planches par le dessous. Nos sauvages sont habillés l'été et l'hiver. L'été ils ont une peau d'original grande comme celle d'un bœuf, carrée comme une couverture, qu'ils mettent sur leurs épaules. Ils l'attachent avec une petite courroie, en sorte que leurs bras sortent

¹ Les poêles étaient encore inconnus dans la colonie.

² Nous nous servons encore de ces bancs-lits dans nos campagnes.

³ Couvertes de laine, comme nous disons aujourd'hui. Le mot *couverte* pour *couverture* a toujours été employé au Canada en parlant de ces sortes de draps de lit.

tout nus; ils n'ont que cela et un brayer (vêtement autour des hanches) ayant les pieds et la tête nus. Chez eux à la campagne, et quand ils se battent avec leurs ennemis, ils sont nus comme la main, excepté le brayer qui les couvre assez modestement. Ils ont la peau comme minime¹ à cause du soleil et des graisses dont ils s'oignent par tout le corps.² Ils ont, pour la plupart, le visage matachié avec des raies rouges et bleues. L'hiver, ils ont pour robes des couvertes de lits accommodées comme celles dont je viens de parler, excepté qu'elles ont des manches de même. Ils ont des chausses de cuir ou de couvertes usées qui leur vont jusqu'à la ceinture. Ils ont par là-dessus une veste de castor avec son poil, en guise de manteau. Ceux qui se couvrent la tête traitent pour des bonnets de nuits rouges³ au magasin : ils ont aussi quelquefois des capots ou des tapaborts⁴. Voilà pour ceux qui sont bien habillés, mais il y en a qui sont presque nus en tout temps, par pauvreté. Les femmes sont fort modestement accommodées, ayant toujours des ceintures qui les serrent (car les hommes n'en ont quasi jamais, leurs robes allant au gré du vent). Leurs robes vont en bas jusqu'à mi-jambes, et en haut jusqu'au haut du col, ayant presque toujours les bras couverts. Elles se couvrent aussi la tête d'un bonnet de nuit d'homme, ou d'un castor, ou d'un tapabor. Leurs cheveux sont abattus sur le visage et liés par le derrière et, communément, elles sont fort modestes et pudiques. Nous faisons de petites simarres⁵ à nos séminaristes et les coiffons à la française. On aurait de la peine à distinguer un homme d'une femme sans cette différence d'ajustement dont je viens de parler, car leurs visages sont tous semblables. Leurs souliers sont de peau d'orignac préparée comme celle de buffle; ils enfoncent un morceau par le bout, mettent une pièce carrée au talon, passent une petite courroie comme à une bourse, et voilà leurs souliers faits. Les Français n'en portent point d'autres l'hiver, parce qu'on ne peut sortir pour marcher sur la neige qu'avec des raquettes, et pour cela on ne peut se servir de souliers français.

1644, 26 août.—Nous voyons dans les campagnes des lis sauvages et des martagons⁶. On y voit aussi quantité de cèdres dont les branches nous servent à faire des balais. Il y a encore beaucoup de pins, de sapins et d'épinettes⁷ qui demeurent verts tout l'hiver nonobstant les froidures.

¹ *Minime* : qui est d'une couleur tannée, très sombre, couleur de la robe des religieux minimes ou frères mineurs. (Dictionnaire de Trévoux.)

² Elle ne dit pas que ces Algonquins avaient des peaux rouges naturelles, et tout nous porte à croire que leur peau était blanche comme la nôtre.

³ Nos tuques actuelles.

⁴ *Tapabor* : bonnet dont les bords descendent sur les épaules pour garantir du vent et du hâle. Sur la mer on l'appelle *bourguignote*. (Dictionnaire de Trévoux.)

⁵ Habillement long et même traînant; espèce de robe de chambre. (Dictionnaire de Trévoux.)

⁶ Lis à petites fleurs. (Note de l'abbé Richaudeau.)

⁷ Espèce de sapin d'où découle le baume dit *du Canada*. (Note de l'abbé Richaudeau.)

1644, 26 août.—Vous demandez si nos sauvages sont aussi parfaits comme je le dis dans mes lettres. Je vous dirai qu'en matière de mœurs, je veux dire en leurs façons d'agir et de faire un compliment, on n'y a pas la politesse française. On ne s'est pas étudié à leur apprendre cela, mais bien à leur enseigner solidement les commandements de Dieu et de l'Église, les points et les mystères de notre foi, les prières et les pratiques de notre religion, comme sont le signe de la croix, l'examen de conscience, et autres semblables actions de piété. Un sauvage se confesse aussi bien qu'un religieux ; il est naïf au possible et il fait état des plus petites choses. Lorsqu'ils sont tombés, ils font des pénitences publiques avec une admirable humilité. En voici un exemple. Les sauvages n'ont point d'autres boisson que le bouillon de leur chaudière à sagamité, soit de chair ou de blé d'Inde, ou d'eau bouillie, ou d'eau pure. Les Français leur ont fait goûter du vin et de l'eau-de-vie ; ils ont trouvé cela tellement à leur goût, qu'ils le préfèrent à toute autre chose ; mais le mal est que, quand ils en peuvent avoir, il ne leur en faut boire qu'une seule fois pour devenir fous et furieux. On en attribue la cause à ce qu'ils ne mangent que des choses douces, n'ayant aucun usage ni connaissance du sel. Cette boisson les tue d'ordinaire, ce qui a porté monsieur le gouverneur (M. de Montmagny) à faire défense, sur peine de grosses amendes, de leur en donner ou traiter.¹ A l'arrivée néanmoins des vaisseaux, il n'est pas possible d'empêcher les matelots de leur en traiter en cachette. Les anciens sauvages chrétiens, ni leurs familles, ne tombent point dans ces excès ; ce sont les infidèles, avec quelques jeunes libertins. Il est néanmoins arrivé cette année que quelques-uns sont tombés dans cette faute et, pour les punir, les anciens, avec le père supérieur de cette mission, les ont condamnés à payer un grand nombre de peaux pour la décoration de la chapelle et, de plus, à demeurer trois jours sans entrer dans l'église, et d'aller seulement deux fois le jour faire leurs prières à la porte, accompagnés des innocents, afin de les aider à obtenir miséricorde et d'apaiser Celui qui a tout fait. D'autres font une déclaration publique de leurs péchés dans l'église des Français ; d'autres jeûnent trois jours au pain et à l'eau. Comme ils ne commettent pas souvent ces sortes d'excès, ces pénitences sont rares. Au reste, il en est des sauvages comme des Français, il y en a de plus et de moins dévôts mais, parlant généralement, les sauvages le sont plus que les Français et c'est pour cela qu'on ne les mêle pas, et qu'on les met dans une bourgade séparée (Sillery) de peur qu'ils n'imitent les mœurs de quelques-uns. Ce n'est pas que ceux-ci ne soient assez sages en ce pays, mais les sauvages ne sont pas capables de la liberté française, quoiqu'honnêtes.

Je ne vous saurais dire tout ce que je sais de la ferveur de ces nouvelles plantes. Quoique nous en soyons sensiblement touchés, nous commençons à ne nous en plus étonner ; mais les Français qui arrivent ici, et

¹ Vendre par échange. (Note de l'abbé Richaudeau.)

qui n'ont rien vu de semblable en France, pleurent de joie, voyant les loups devenus agneaux, et des bêtes changées en enfants de Dieu.

1644, 30 août.—Vous désirez savoir si notre communauté est grande. Non, elle est petite, n'étant encore que de huit religieuses de chœur et d'une converse. Pour l'étude de la langue, et en ce qui regarde l'instruction de nos sauvages, comme aussi à mes sœurs, ce que j'en ai pu apprendre, avec la grâce de Notre Seigneur, cela m'a été si délectable que j'ai plutôt péché en l'aimant trop, qu'envisagé s'il y avait de la peine.

1644, 15 septembre.—Il n'est pas possible de laisser passer aucune occasion sans me donner la satisfaction de vous écrire. En voici une d'un honnête gentilhomme, lieutenant de M. le gouverneur de la Nouvelle-France, et qui est l'un de nos meilleurs amis. Il m'a promis de vous voir, car il tâche de m'obliger en tout ce qu'il peut. Vous le prendrez pour un courtisan, mais sachez que c'est un homme d'une grande oraison, et d'une vertu bien épurée. Sa maison, qui est proche de la nôtre, est réglée comme une maison religieuse. Ses deux filles sont nos pensionnaires ; ce sont de jeunes demoiselles qui ont sucé la vertu avec le lait de leur bonne mère, qui est une âme des plus pures que j'aie jamais connue. Je vous dis tout cela, mon très cher fils, afin que vous honoriez M. de Repentigny, c'est ainsi qu'il se nomme, et pour vous faire voir qu'il y a de bonnes âmes en Canada. Il passe en France pour les affaires du pays et de la colonie française¹. Comme c'est de lui que nous prenons conseil en la plupart de nos affaires, il a eu, en une certaine rencontre, la permission d'entrer en notre maison ; il vous dira ce qu'il en a vu, si vous le désirez, comme aussi des nouvelles de tout ce pays.

1644, 15 septembre.—Voilà qu'on va lever l'ancre... je suis extrêmement fatiguée du grand nombre de lettres que j'ai écrites et qui montent comme je crois au nombre de plus de deux cents.

1645, 14 septembre.—Je souhaiterais que l'union fût aussi forte dans toutes les maisons de notre Ordre qu'elle l'est dans notre petite maison de Québec. Cela s'est encore remarqué, par la miséricorde de Dieu, dans l'élection que nous venons de faire d'une supérieure. Nous sommes neuf religieuses, de quatre maisons différentes, et néanmoins nous avons été si unies dans nos pensées, que ceux qui ont assisté et présidé à notre élection, ont dit hautement que Dieu régnait parmi nous. Nous avons élu ma révérende mère de Saint-Athanase, qui est du grand couvent des ursulines de Paris. C'est une très digne et vertueuse religieuse, qui passa en Canada la seconde année de notre établissement.

1645, 3 octobre.—Nous avons fait notre élection, après laquelle je soupirais il y a longtemps. Notre Seigneur nous a fait de grandes grâces en cette action, comme il fait en toutes celles d'importance que nous avons, car il semble que Dieu prenne nos cœurs pour n'en faire qu'un, afin de les

¹ Voir *Société royale*, 1896, pp. 15, 16, 30.

mettre où il veut ; cela est ravissant et nos pères en sont consolés jusqu'à verser des larmes. Cela est d'autant plus à remarquer que nous sommes de diverses congrégations, mais quelques différentes que nous ayons été dans notre origine, nous ne pouvons plus voir ni vouloir qu'une même chose... Encore que je ne sois plus supérieure, je n'en ai pas moins le soin de nos affaires.

1645, 3 octobre ; à son fils.—Nous avons fait cette année l'élection d'une supérieure, car il y avait six ans que j'étais dans la charge et nos règles ne nous permettent pas d'y être davantage sans une interruption. Or, nous avons élu une des mères de Paris, qui est une sage et vertueuse fille, pour témoigner que nous ne faisons plus de distinction des congrégations.

1645, 3 octobre.—La mère Marie de Saint-Joseph est toujours elle-même et elle croît visiblement en vertu. Elle a le soin des enfants où elle exerce son zèle d'une manière très édifiante. Savez-vous que si l'on pouvait briguer une charge, ce serait celle-là ? car il n'y a rien de si honorable en Canada que d'avoir des néophytes à instruire. Si cette chère mère eût été élu supérieure, comme on l'en avait menacée, je crois qu'elle fût morte de déplaisir de se voir privée d'un troupeau de sauvagesses qu'elle aime beaucoup mieux conduire que des religieuses.

1645, 3 octobre ; à sa première supérieure des ursulines de Tours.—Je vous remercie de votre beau dais. Il pare merveilleusement notre chapelle et ce sera un monument perpétuel qui parlera pour vous à Celui à qui vous en avez fait présent, car en me le donnant, je sais que votre intention a été de le donner à Celui que nous adorons sur le saint autel.

1645, 3 octobre ; à son fils.—Qui peut vous avoir dit ¹ que j'ai eu de la peine en notre établissement ? Oui, j'en ai eu et, sans l'avoir expérimenté, il serait difficile de croire combien il se rencontre de difficultés dans un établissement qui se fait dans un pays nouveau et tout barbare, éloigné de la France et de tout secours, et dans un abandonnement si pur à la divine Providence qu'il ne le peut être davantage. Avec cela on dépend si absolument de la France que, sans son secours, on ne saurait rien faire.² Ajoutez à cela que, quelque pressées et importantes que soient les affaires, il faut attendre un an pour en avoir la résolution ; et si on ne le peut faire dans le temps que les vaisseaux sont en France, il en faut attendre deux. Les navires sont-ils repartis, ceux à qui l'on commet les affaires pensent à celles qui leur sont propres ; ainsi on ne peut presque jamais avoir de résolution nette d'aucune affaire. De plus on ne conçoit pas (on saisit mal) la plupart de nos intentions, ce qui fait que souvent les choses réussissent (tournent) tout autrement que nous ne le voulons. C'est ce qui oblige

¹ M. de Repentigny sans doute, qui passa l'hiver de 1644-45 en France.

² Les ursulines n'avaient pour se soutenir que les dons généreux recueillis en France d'année en année. Ainsi marchait tout le Canada, côté des religieux et religieuses. En un mot, rien n'était prévu ni organisé pour faire une colonie durable.

nos révérends pères d'envoyer quelquefois un des leurs pour leurs propres affaires, comme il y va des députés pour les affaires du pays.¹

Je ne parle point d'un nombre innombrable de difficultés très épineuses, tant générales que particulières, que le pays nous fait naître presque continuellement. Pour vous dire tout en un mot : la nature n'a nulle prise sur quoi elle se puisse appuyer, ni aucunes prétentions qui la puisse flatter ou satisfaire. Il faut que je vous avoue que j'ai tant souffert de croix, qu'à moins d'une grâce de Dieu fort extraordinaire, j'eusse succombé sous leur pesanteur.

1646, 10 septembre ; à son fils.—Les sauvages qui paraissent les plus zélés (pour se convertir) sont ceux du côté du nord, dont la mission est à Tadoussac. Je vous en parlai l'an passé. Comme les nations de cette côte, qui résident avant dans les terres, entre des montagnes² affreuses et des rochers inaccessibles, viennent se rendre chaque année au printemps en ce lieu là, les pères sont aussi exacts à s'y trouver pour les instruire l'espace de trois ou quatre mois, que le temps est plus tempéré ; car le reste de l'année il y fait un froid nonpareil, y ayant encore des neiges et des glaces au mois de juin. Il y a quelques jours que j'en demandais des nouvelles au père qui a le soin de cette mission, ayant une association spirituelle avec lui pour la conversion de ces peuples : car encore que nous embrassions toutes les nations en Celui qui les a créées, nous en tirons néanmoins tous les ans chacune une au sort, afin d'exciter plus particulièrement nos dévotions pour leur conversion. Or, comme cette mission m'est tombée en partage, j'ai voulu savoir du père les bénédictions que Dieu y verse, afin de lui en rendre grâces. Voici la réponse qu'il m'a faite : " Je ne puis rien mander de ces quartiers de meilleur que l'amplification du royaume de Jesus-Christ. En un jour j'ai baptisé trente Betsamites, et confessé soixante chrétiens. Je suis sur le point de faire six mariages en face d'église. Je pris avant-hier tous les diables des sorciers, leurs pierres, leurs tambours et semblables badineries (objets frivoles et ridicules), que j'ai fait bouillir, pour leur faire voir combien c'est peu de chose, et afin que ce malin esprit ne paraisse plus dans le pays de ces pauvres gens.

" Les sauvages de Tadoussac font des harangues qui n'ont point de prix, tant à leurs gens qu'aux nations étrangères, pour les encourager à croire et à embrasser la Foi. Vous les concevriez mieux par les oreilles que par les yeux. Remerciez le grand Maître de ce qu'il illumine toutes les nations du nord, car il y en a ici de plus de dix sortes, qui sont de plus de douze journées de Tadoussac. Je ne sais si la fin du monde est proche, mais la Foi s'étend beaucoup. Je n'ai qu'un regret, de voir un si mauvais

¹ Pour la traite des pelleteries, mais jamais dans l'intérêt de l'agriculture, de la colonisation ou d'aucune industrie. Le "pays" cela signifiait quelques marchands de fourrures et voilà tout. Le *Journal* des jésuites note plusieurs de ces voyages.

² Les Montagnais et les Attikamègues.

instrument que moi entre les mains de Dieu, mais priez sa bonté, je vous en supplie, de me rendre plus digne en me faisant miséricorde. Les dévotions de nos paroissiens sont fort réglées. Il y en a environ soixante qui se sont confessés deux ou trois fois, et comme ils se disposent à communier, ils jeûnent le samedi à ce dessein. Il y en a trente qui ont communiqué pour la première fois, le reste communiera en son temps. Ce m'a été une consolation bien sensible de les voir recevoir ce saint Sacrement avec tant de dévotion et de ferveur, que les Français des deux barques qui sont arrivés, ayant assisté à la messe, à l'eau bénite, et à l'instruction qu'on leur a faite, les ont admirés. Leur police continue dans une obéissance exacte. Ils ont première, seconde et troisième table. Les personnes de considération mangent à la première ; les officiers qui ont servi mangent à la seconde, et les femmes et les enfants à la dernière. Ils ont fait une allée pour se promener après le repas, pour traiter de leurs affaires et pour prier en se promenant. Ils souhaitent passionnément une petite maison à la française pour y loger l'été et serrer leurs hardes l'hiver, pendant qu'ils sont à la chasse." Jusqu'ici sont les paroles de la lettre du père.

1646, 10 septembre ; à son fils.—C'est une chose ravissante de voir nos bons sauvages de Sillery, et le grand soin qu'ils apportent à ce que Dieu soit servi comme il faut dans leur bourgade ; que les lois de l'Eglise soient inviolablement gardées, et que les fautes y soient châtiées pour apaiser Dieu. L'une des principales attentions des capitaines est d'éloigner tout ce qui peut être occasion de péché, ou en général, ou en particulier. L'on ne va point à la chapelle que l'on n'y trouve quelque sauvage en prière, avec tant de dévotion que c'est une chose ravissante. S'il s'en trouve quelqu'un qui se démente de la foi ou des mœurs de chrétien, il s'éloigne et se bannit de lui-même, sachant bien que, bon gré mal gré, il lui faudrait faire pénitence ou être honteusement chassé de la bourgade. Il y a quelques jours qu'un jeune homme eut différent avec sa femme. Ils furent menés devant les capitaines, qui condamnèrent l'homme à être mis à la chaîne dans une cave du fort, et là jeûner trois jours au pain et à l'eau ; et la femme fut condamnée à la même peine, qui fut exécutée en notre monastère. Ces pauvres gens firent leur pénitence avec tant de dévotion, que je crois que leur faute leur fut remise dès le moment que la sentence leur fut prononcée. La femme ne voulut pas seulement une poignée de paille sous elle car, disait elle, je veux payer Dieu que j'ai fâché.

1646, 10 septembre ; à son fils.—Les Attikamek, qui sont aussi du côté du nord, sont convertis et vivent d'une vie extraordinairement innocente. Il y a quatre ans qu'une trentaine descendit ici, où ils furent instruits et baptisés, après quoi ils s'en retournèrent en leur pays, annonçant avec une ferveur apostolique à ceux de leur nation le bien qu'ils avaient rencontré. Ils leur expliquèrent les points de la Foi, comme ils les avaient appris, en sorte qu'ils en convertirent un grand nombre qu'ils amenèrent aux Trois-Rivières pour y être baptisés, ce qui leur fut accordé. Depuis

ce temps-là ils sont réglés comme s'ils avaient toujours des pères parmi eux, aussi viennent-ils de temps en temps, quoique fort éloignés, pour rendre compte de leur foi et recevoir de nouvelles lumières. On ne peut rien voir de plus zélé, même jusqu'aux enfants.

1646, 10 septembre ; à son fils.— Il me faut vous dire quelque chose de nos fonctions tant à nos parloirs que dans le séminaire. Les Hurons qui descendent ici sont presque continuellement à notre parloir, qui est le lieu destiné à leur instruction. C'est là la mission de la mère Marie de Saint-Joseph, qui sait la langue. Aussi ces bons néophytes et cathéchumènes la tiennent pour leur mère. L'an passé, un capitaine nommé Jean-Baptiste, descendit avec toute sa famille, pour assister au traité de paix avec les Iroquois. Tout l'hiver il nous a donné le moyen d'exercer les œuvres de miséricorde tant corporelles que spirituelles ; car bien qu'il fût capitaine et homme de considération parmi les sauvages, étant néanmoins hors de son pays, il avait besoin de tout : car ces gens-là ne se chargent de rien que de leur traite (provision de ce qu'ils ont à vendre), pour la grande difficulté des chemins. Je ne vous saurais dire le zèle qu'ils ont pour la foi et pour la pratique des actions de piété. Mais ce que nous avons le plus admiré en eux, c'est la tendresse de leur conscience, et le soin qu'ils ont d'éviter jusques aux moindres fautes, ou de s'en confesser au plus tôt quand ils les ont commises. Une fois la simplicité du bon Jean-Baptiste nous donna de la consolation, et nous fut tout ensemble un petit sujet de divertissement. Etant sur le point d'aller à la chasse, quelques personnes qui lui avaient promis de lui donner ce qui lui serait nécessaire pour son voyage, qui devait être de plusieurs jours, lui manquèrent de parole justement sur le point qu'il devait partir, ce qui lui fit bien de la peine, jusqu'à lâcher quelques paroles d'impatience. Etant revenu à soi, il en eut tant de douleur, qu'il s'en voulut confesser sur l'heure. Mais son confesseur étant absent, et n'y en ayant point d'autre pour l'entendre, il vint trouver celle qui avait coutume de l'instruire, pour lui dire son péché, et la prier de le dire à son confesseur, quand il serait de retour, l'assurant que de sa part il était extrêmement triste d'avoir péché, qu'il avait beaucoup demandé pardon à Dieu, et qu'il tâcherait d'être mieux sur ses gardes à l'avenir. La mère de Saint-Joseph le consola, et lui fit faire encore des actes de contrition, puis il partit en paix. Quand il eut fait deux lieues de chemin, il apprit que son confesseur était de retour ; il quitte la compagnie et revient à grands pas se confesser, disant qu'il n'aurait pas fait son voyage en repos si, sachant que son confesseur était à la maison, il ne se fut pas confessé de ses impatiences.

Un autre Huron, qui n'avait point encore été instruit, mais qui avait un extrême désir de l'être, fut donné à la mère de Saint-Joseph, qu'il regarda dès lors comme sa mère, à qui il rendait une obéissance si ponctuelle, qu'il n'y avait rien qu'il ne fit de ce qu'elle lui ordonnait ; et personne n'avait assez de crédit sur son esprit pour lui faire entreprendre

quelque chose qui dût interrompre le temps et l'heure de ses instructions, si elle ne l'agréait. Quelques raisons particulières l'obligèrent un jour d'aller à la chasse avec des Algonquins, mais il ne voulut point s'y engager sans la licence de sa mère. Attendez, leur dit-il, Marie ne m'a pas donné congé, je m'en vais le lui demander. Elle lui donna la permission, et il partit aussitôt. Il ne passa pas un jour, durant son absence, sans dire son chapelet et faire ses prières. Il repassait continuellement dans son esprit ce qu'on lui avait appris des mystères de notre sainte Foi, dans la crainte qu'il avait de les oublier, et que cela ne retardât son baptême. A son retour, il n'eut pas plus tôt mis le pied hors du canot, qu'il vint à notre grille avec des joies nonpareilles, demander celles qui le désiraient enfant de Dieu. Ah ! ma mère, dit-il à sa maîtresse, j'ai beaucoup péché depuis que je ne vous ai vue, car dans les désirs que j'avais de vous voir, et d'être instruit pour être baptisé, j'ai souvent demandé de m'en revenir, et cela m'étant refusé, j'étais triste, et je ne souffrais pas assez en paix de voir l'effet de mes désirs retardé. D'autres Hurons le voulant une autre fois mener à la chasse aux castors, l'en priaient avec instance, lui promettant qu'il ferait un grand gain en ce voyage. Il vint à son ordinaire demander congé à sa mère, qui lui dit que s'il ne désirait pas être sitôt baptisé, elle n'y voyait pas grand inconvénient ; mais que si ses désirs pour le baptême étaient tels qu'il lui avait fait entendre, elle ne croyait pas que ce fût une bonne disposition à cette grande grâce, d'aller ainsi se promener sous prétexte d'un gain temporel. Alors il lui répondit d'un courage ferme et résolu : Il est conclu que je n'y irai pas ; je n'ai point d'affaires plus pressées que celle de mon salut et de mon baptême ; je ne désire point emporter en mon pays d'autres richesses que celles de la Foi, et l'honneur d'être du nombre des enfants de Dieu. Depuis ce temps-là, il ne manqua pas un jour de venir à l'instruction, et Notre-Seigneur, bénissant sa bonne volonté, lui donna une mémoire si heureuse pour retenir tous nos mystères, qu'il était rare qu'on lui dit deux fois une chose, la retenant dès la première. Enfin, le jour de son baptême, qu'il avait tant désiré, étant venu, qui fut le lendemain de la Pentecôte, il ne se peut dire avec combien de joie il reçut cette insigne faveur : ses paroles, ses actions, tout son extérieur rendait témoignage du contentement de son cœur. Depuis ce temps-là, il s'est confessé deux fois la semaine, et aujourd'hui on l'instruit pour la communion, qu'on se réserve à lui faire faire pour la première fois en son pays avec solennité.

1646, 10 septembre ; à son fils.—Notre petit séminaire a eu cette année de l'emploi aussi bien que les précédentes. Notre plus grande moisson c'est l'hiver, que les sauvages, allant à leurs chasses de six mois, nous laissent leurs filles pour les instruire. Ce temps nous est précieux, car comme l'été les enfants ne peuvent quitter leurs mères, ni les mères leurs enfants, et qu'elles se servent d'eux dans leurs champs de blé d'Inde et à passer leur peaux de castors, nous n'en avons pas un si grand nombre. Nous en avons néanmoins toujours assez pour nous occuper.

La doyenne, et comme la capitainesse de cette troupe de jeunes néophytes, était une petite fille du premier chrétien de cette nouvelle Eglise, que son père et sa mère vouèrent dès sa naissance. Elle nous fut donnée dès l'âge de deux ans, à cause de la mort de sa mère, et nous l'avons élevée environ trois ans, dans le dessein de la faire religieuse, à cause du vœu de ses parents, au cas qu'elle en eût la volonté. C'était le meilleur et le plus joli esprit que nous eussions encore vu depuis que nous sommes en Canada. A peine savait-elle parler quelle disait toute seule les prières sauvages par cœur, et même celles que nous faisons faire aux filles françaises. Ce qu'elle entendait chanter en notre chœur, elle le savait quasi au même temps, et elle le chantait avec nous sans hésiter. Les personnes de dehors la demandaient pour la faire chanter, et elles étaient ravies de lui entendre chanter des psaumes entiers. Elle répondait parfaitement au catéchisme, en quoi elle était la maîtresse de ses compagnes ; et quoiqu'elle ne fût âgée que de cinq ans et demi, sa maîtresse l'avait établie pour déterminer des prières, et pour les commencer toute seule à haute voix, ce qu'elle faisait avec une grâce merveilleuse, et avec tant de ferveur qu'il y avait de la consolation à l'entendre. Mais notre joie a été bien courte, car une fluxion qui lui est tombée sur le poumon, lui a bientôt fait perdre la voix et la vie. Cette innocente a été six ou sept mois malade, durant lesquels elle a été si patiente, si obéissante et si raisonnable, que cela ne serait pas croyable à ceux qui ne l'auraient pas vue. Ayant demandé un père pour se confesser, on lui en fit venir un, qui fut tout surpris de voir l'attention, la dévotion, et la maturité, avec laquelle elle faisait cette action. Quelque pressée et abattue qu'elle fût du mal, elle n'a jamais refusé de prier Dieu qu'une heure ou deux devant sa mort, qu'elle eut une oppression fort inquiétante ; mais quand on lui eut dit que c'était le diable qui la tentait, afin qu'elle n'obéît pas, au même temps elle joignit les mains, et fit tout ce qu'on voulut. Lorsque nous la visitions, pour nous témoigner l'amour qu'elle nous portait, elle nous disait ce qu'elle demanderait à Dieu pour nous quand elle serait dans le ciel, où elle était bien aise d'aller. Etant sur le point d'expirer, on lui demanda si elle aimait Dieu, et elle répondit avec une aussi grande présence d'esprit qu'une personne âgée : Oui, je l'aime de tout mon cœur, et ce furent là ses dernières paroles. Son père ayant été blessé en trahison par quelque étranger, mourut un peu avant elle avec de grands indices de sainteté. Depuis la mort de son père, quand on lui parlait de ses parents, elle disait : Je n'ai plus d'autres parents que les filles vierges habillées de noir ; ce sont mes mères, mon père me l'a dit avant sa mort, et m'a commandé que je leur obéisse, et qu'il me donnât à elles, afin qu'elles fussent mes mères. Elle tirait un si grand avantage de la créance qu'elle avait que son père était au ciel, que quand elle avait quelque petit différend avec ses compagnes, elle leur disait par reproche : Mon père est dans le ciel, mais le vôtre n'y est pas. C'étaient là ses vengeances enfantines. Il faut vous avouer que la mort de cette innocente,

quoique nous la croyions au ciel, nous a touchées, comme aussi tous nos amis ; car elle était connue et aimée des Français et des sauvages, qui ne la regardaient que comme une petite ursuline, puisqu'elle en faisait déjà les fonctions dans un corps d'enfant.

Enfin Notre-Seigneur nous fait cette grâce, que notre séminaire est le refuge des affligés et des opprimés ; car s'il y a quelque fille qui soit en danger de perdre ou la vie, ou l'honneur, ou les bonnes grâces de ses parents, ou enfin qui soit en quelque peine que ce soit, les capitaines, qui ont l'œil à ce que leurs gens vivent en vrais chrétiens, nous les amènent, afin de les garder et de les instruire. Bénissez cette bonté souveraine de tous ces bienfaits, et intéressez-vous avec moi dans la cause de Jésus-Christ, et dans l'amplification de son royaume. Vivons et mourons pour ce sujet.

1646, 7 octobre ; à une dame de ses amies.—Nos nouveaux convertis nous ont donné cette année toute la satisfaction possible. Il faut avouer que l'esprit du christianisme est autant admirable qu'adorable, et il est aisé de voir qu'il est émané du sang de Jésus-Christ, puisqu'il produit en des peuples barbares des effets tels que nous en voyons en d'aucuns, qui étant touchés de cet esprit, sont changés en d'autres hommes tout nouveaux. Il y en a qui ne peuvent vivre que dans la prière, leurs cœurs parlent continuellement à Dieu, et dans la conversation ils sont simples comme des enfants. Si vous aviez vu la différence qu'il y a entre ceux qui ne veulent pas croire, et ceux qui croient, vous fondriez en larmes de douleur et de compassion pour ceux qui sont si misérablement retenus dans l'esclavage du diable ; et de joie et consolation pour ceux que vous jugeriez, à les voir seulement, qu'ils sont tout possédés de Dieu. Non que tous soient touchés de la sorte, car nous en voyons ici, comme vous en voyez en France, de fervents et de tièdes. Le cœur humain est une forte pièce ; Dieu le prend quand on le lui offre de bon cœur, mais il ne force personne. Pour ce qui me regarde, ma chère sœur, ceux qui vous ont dit que je vous aime ne se sont pas trompés : car vous êtes si proche de mon cœur, qu'il me semble que vous et moi ne soyons qu'une même personne. En effet soyons toutes deux une même chose en Jésus.

1646, 11 octobre ; à son fils.—Je vous ai écrit les nouvelles de ce que Dieu opère en ce pays, avant que j'eusse reçu aucune de vos lettres, car les vaisseaux sont arrivés tard, lorsqu'on les croyait perdus et qu'on commençait déjà à ressentir la famine. L'on parle de nous donner un évêché en Canada ; je ne sais si vous savez de quelle manière cela s'est passé en France. L'année dernière, M. Gauffre, personnage d'une éminente piété, donna par aumône une somme de trente mille livres pour fonder l'évêché. Ceux entre les mains de qui il mit cette somme, crurent qu'il n'y avait personne plus capable de cette dignité que lui. Ils en firent la proposition au conseil ecclésiastique du Roi, où M. le cardinal Mazarin qui en était le chef, dit qu'il ne fallait rien conclure sur ce point, sans savoir si

les révérends pères jésuites l'auraient agréable. Le révérend père Georges de La Haye, et deux autres de la compagnie furent appelés, et témoignèrent que M. Gauffre leur serait très-agréable. Ce grand serviteur de Dieu ne se doutait de rien, car c'était un homme extraordinairement humble, aussi ne voulut-il jamais consentir à la proposition qui lui en fut faite, qu'après une retraite pour se préparer à connaître la volonté de Dieu, et pour demander l'avis de son directeur. Dans le temps de cette préparation, il fut saisi d'une apoplexie qui l'emporta en trois jours; ainsi la volonté de Dieu fut connue et le dessein rompu. Pour moi, mon sentiment est que Dieu ne veut pas encore d'évêque en Canada; le pays n'étant pas encore assez fait; et nos révérends pères y ayant planté le christianisme, il semble qu'il y a de la nécessité qu'ils le cultivent encore quelque temps, sans qu'il y ait personne qui puisse être contraire à leurs desseins.

1646, 11 octobre; à son fils.—J'ai eu l'année dernière une grande maladie qui a pensé m'emporter, car comme, grâce à Notre-Seigneur, je ne suis point infirme, je n'ai pas grande expérience des maladies. Je me disposai néanmoins pour mourir, parce que mon mal, qui était une colique néphrétique accompagnée d'une grosse fièvre, était très-violent et dangereux. Pour le présent, je me porte mieux que jamais, et je suis prête d'aller en tous les endroits du monde où l'obéissance me voudra envoyer.

Je suis extrêmement consolée de vous voir si pauvre. Hé! ne sommes-nous pas assez riches de posséder Jésus? Je ne veux donc pas que vous vous mettiez en peine de me rien envoyer. Si vous êtes un homme de désirs, comme Daniel, ouvrez la bouche de votre cœur, et notre très-aimable Jésus la remplira. Je ne vous prie point de prier pour moi; vous y avez trop d'affection; faites donc en sorte auprès de Dieu que je sois fidèle à ses inspirations, et qu'il anéantisse en moi tout ce qui lui est désagréable.

1647; à son fils.—Je suis si enfoncée dans le tracas des affaires extérieures, que je ne vous écris qu'à de petits moments que je dérobe. Avec tout cela, je dois réponse comme je crois à plus de six vingt lettres, outre les expéditions des écritures de la Communauté pour la France. Voilà comme il faut passer cette vie en attendant l'Eternité qui ne passe point.

1647; à son fils.—Un autre sujet de consolation est la ferveur de nos néophytes, qui en vérité surpasse tout ce qui s'en peut dire. Ils sont quelquefois si transportés de zèle qu'ils éclatent pendant la prédication, interrompant le père qui la fait, afin de dire publiquement les sentiments dont leurs cœurs sont intérieurement pressés. Un jour le père qui a soin de la mission de Sillery invectivant fortement contre l'ivrognerie où tombent souvent les sauvages quand ils boivent du vin ou de l'eau-de-vie, un sauvage touché de ce qu'il avait dit, l'interrompt disant: Arrête-là, mon père, ce que tu dis est vrai, je me suis enivré, et par là je montre que je n'ai point d'esprit; prie Dieu qu'il me fasse miséricorde, souffre que je dise trois mots; je ne parlerai qu'à ceux de mon pays, car étant étranger, ce

n'est point à moi à haranguer en cette bourgade. Sus donc, jeunesse, c'est à vous que j'adresse mon discours ; prenez exemple, non sur mon péché, mais sur ma douleur, et souvenez-vous que si moi qui suis âgé, je reconnais et confesse mon crime, vous qui êtes jeunes ne devez point dissimuler les vôtres. Je condamne l'action que j'ai faite ; c'est un précipice où je me suis jeté, donnez-vous de garde d'y tomber. Ce pauvre homme avait un complice qui entendant ce discours, l'interrompit : Non, c'est moi qui n'ai point d'esprit, c'est moi qui suis un méchant ; j'ai fâché celui qui a tout fait. Jeunesse, soyez plus sages, et ne suivez pas le chemin où je me suis égaré ; marchez tout droit, et priez le père de prier celui qui a tout fait d'avoir de bonnes pensées pour moi.

1647, à son fils.—Les Attikameks, autrement les Poissons Blancs, continuent dans leur ferveur, et ceux qui ne sont pas chrétiens, témoignent un grand désir de l'être. Ces peuples sont bons, doux, traitables, et ils ne savent ce que c'est que de faire la guerre, sinon aux animaux. Cette bonté naturelle les porte jusqu'à la superstition ; ils ont des espèces de prophètes ou devins qui se mêlent de dire les choses à venir. Mais en effet, ce sont des sorciers et magiciens qui apparemment ont du commerce avec les démons. Ils se servent de petits tambours, de chansons, de sifflements, pour guérir les maladies. Ils se servent de petits tabernacles pour consulter les génies de l'air, et usent de pyromancie pour savoir l'issue des maladies, les lieux où il fera bon à la chasse, s'il n'y a point quelque ennemi caché dans leurs terres, et pour d'autres semblables occasions. Mais le fond de ces peuples étant docile et candide, ils reviennent facilement de ces folles superstitions quand on leur en fait voir la vanité et qu'on les instruit des vérités de notre sainte religion, qui portant avec elles l'onction dans le cœur, leur donnent un goût bien plus doux et plus innocent que ne font tous ces vains enchantements.

1649, 22 octobre ; à son fils.—Je suis une pauvre créature chargée d'affaires, tant pour la France que pour cette maison. Trois mois durant, ceux qui ont des expéditions à faire pour la France n'ont point de repos, et comme je suis chargée de tout le temporel de cette famille, qu'il me faut faire venir de France toutes nos nécessités (choses nécessaires), qu'il m'en faut faire le paiement par billets, n'y ayant pas d'argent en ce pays, qu'il me faut traiter avec des matelots pour retirer nos denrées, et enfin qu'il me faut prendre mille soins et faire mille choses qu'il serait inutile de vous dire, il ne se peut faire que tous les moments de mon temps ne soient remplis de quelque occupation, en sorte que je ne puis vous répondre avec tout le loisir que je désire. Ne laissez pas pourtant de m'écrire à l'ordinaire, mais envoyez vos lettres de bonne heure, afin que je puisse prendre mon temps pour y satisfaire.

1650, 17 mars ; à son fils.—Le révérend père Bressani, qui était parti au mois de septembre pour aller en mission, est revenu sur ses pas, n'ayant pas encore fait cinquante lieues de chemin. Il a passé ici l'hiver avec une

troupe de Hurons qu'il instruisait. Nos trois maisons religieuses, avec quelques personnes charitables, se sont cotisées pour nourrir ces pauvres exilés,¹ qui viennent pourtant de partir pour aller quérir en leur pays le reste de leurs familles, afin de s'établir proche de nous. Ces nouveaux habitants nous obligent d'étudier la langue huronne, à laquelle je ne m'étais point encore appliquée, m'étant contentée de savoir seulement celle des Algonquins et Montagnais qui sont toujours avec nous. Vous rirez peut-être de ce qu'à l'âge de cinquante ans je commence à étudier une nouvelle langue; mais il faut tout entreprendre pour le service de Dieu et le salut du prochain. J'ai commencé cette étude huit jours après l'octave de la Toussaint, en laquelle le révérend père Bressani a été mon maître jusqu'à présent avec une entière charité. Comme nous ne pouvons étudier les langues que l'hiver, j'espère que quelque autre descendra cet automne, qui nous rendra la même assistance. Priez Notre-Seigneur qu'il veuille m'ouvrir l'esprit pour sa gloire, et pour lui pouvoir rendre quelque petit service.

1650, 30 août; à son fils.—Vous voyez qu'en attendant le secours, nous sommes en la pure providence de Dieu.² Pour mon particulier, mon très cher fils, je m'y trouve si bien, et mon esprit et mon cœur y sont si contents, qu'ils ne le peuvent être davantage. S'il arrive qu'on vous porte l'année prochaine les nouvelles de ma mort, bénissez-en Dieu, et offrez-lui pour moi le saint sacrifice de la messe. J'ai répondu par une autre lettre aux moyens que vous me proposez d'élever quelques sauvages, afin qu'ils puissent gagner leurs compatriotes à la foi. Outre ce que je vous écris, entretenez-en le révérend père Daran, il vous dira qu'encore que le pays se rétablisse, il faudra toujours dépendre de l'Europe pour avoir des ouvriers de l'Évangile, le naturel des sauvages américains, même des plus saints et spirituels, n'étant nullement propre aux fonctions ecclésiastiques, mais seulement à être enseignés et conduits doucement dans la voie du ciel; ce qui fait soupçonner dans ce renversement d'affaires que peut-être Dieu ne veut ici qu'une Église passagère.³

1650, 30 août; à son fils.—Il y a trois choses que l'on doit fort considérer dans la conjoncture des affaires. La première, que ni nous ni tout le Canada ne pourrions subsister encore deux ans sans secours. La deuxième, que si ce secours manque, il nous faut ou mourir ou retourner en France, selon le sentiment des mieux sensés. Je crois néanmoins que si l'ennemi a la guerre avec la nation Neutre et à Andastoué, ce sera une

¹ Les Hurons chassés du Haut-Canada par les Iroquois.

² Montréal, Trois-Rivières et Québec s'attendaient à être détruits par les Iroquois.

³ Ce qui montre avec quelle perspicacité la mère de l'Incarnation se rendait compte du caractère des sauvages, c'est que, jusqu'ici, un seul a pu être élevé au sacerdoce. C'est M. l'abbé Prosper Vincent, du village huron de Lorette. Il a été ordonné en 1870. Il est le premier prêtre de race indigène dans l'Amérique du Nord. (Note de l'abbé Richaudeau.)

diversion d'armes qui nous fera subsister un peu davantage. Mais s'il poursuit ses conquêtes et ses victoires, il n'y a plus rien à faire ici pour les Français. Le commerce ne pourra pas s'y exercer ; le commerce ne s'y exerçant plus, il n'y viendra plus de navires ; les navires n'y venant plus, toutes les choses nécessaires à la vie nous manqueront, comme les étoffes, le linge ; la plus grande partie des vivres, comme les lards et les farines dont la garnison et les maisons religieuses ne peuvent se passer. Ce n'est pas qu'on ne travaille beaucoup et qu'on ne fasse des nourritures ; mais le pays ne donne pas encore ce qu'il faut pour s'entretenir. La troisième chose qui retarde nos affaires, est que si le commerce manque par la continuation de la guerre, les sauvages qui ne s'arrêtent ici que pour trafiquer, se dissiperont dans les bois ; ainsi nous n'aurons plus que faire de bulle, n'y ayant plus rien à faire pour nous qui ne sommes ici que pour les attirer à la foi, et pour les gagner à Dieu.

1651, 3 septembre ; à son fils.—Voici la troisième voie par laquelle nous faisons savoir en France les nouvelles de l'affliction dont il a plu à Notre-Seigneur de nous visiter.¹ La première a été par la Nouvelle-Angleterre, et la seconde par les pêcheurs. J'estime ces deux voies incertaines parce qu'il faut se servir de quelques particuliers, qui venant ici avec des canots détachés de leurs grands navires sont obligés de passer par des périls évidents, et avec les paquets dont ils sont les porteurs. Je n'ai pas laissé de les tenter, afin de ne laisser passer aucune occasion de vous donner des témoignages de ce que je suis. Je me sers donc encore de cette troisième pour vous dire de quelle manière la puissante main de Dieu nous a touchés.

¹ Incendie du monastère des ursulines à Québec.

III—*La Guerre des Iroquois—1600-1653,*

Par M. BENJAMIN SULTE.

(Lu le 23 juin.)

Avant de pouvoir expliquer les luttes que la colonie du Canada eut à supporter au XVII^e siècle contre les Iroquois, il faut se rendre compte des populations découvertes dans ces territoires par les premiers explorateurs. Ensuite le reste se présente facilement à notre intelligence ; les motifs des agressions des Iroquois viennent à la surface et rendent les événements plus compréhensibles, tandis qu'on a pris trop souvent l'habitude d'en parler sans chercher à voir clair dans la cause unique qui les a produites.

Une carte géographique sous les yeux, partons de la Pennsylvanie, et traversons le Connecticut, le Rhode-Island, le Massachusetts, le New-Hampshire, le Maine, le Nouveau-Brunswick, la Nouvelle-Ecosse, toute la province de Québec, la rivière Ottawa, le lac Nipigon, le saut Sainte-Marie, le lac Supérieur, le Wisconsin, le Michigan, l'Indiana et l'Ohio. Nous sommes, dans tout ce vaste cercle, parmi des tribus algonquines, peuples chasseurs et pêcheurs, sans habitations stables, sans gouvernement, sans caractère élevé. Imprévoyants de toutes manières, ces gens vivaient au jour le jour, souffrant des rigueurs du climat, qu'ils ne savaient pas combattre, de la famine qui résultait souvent de leur manque d'organisation, de l'abondance pareillement, dont ils faisaient abus lorsqu'elle se présentait. Quant à la langue, c'était bien la même dans toute l'étendue en question, mais elle se divisait et se subdivisait en une infinité de dialectes et de patois qui la rendaient presque méconnaissable de 100 lieues en 100 lieues. Le parler le plus pur se rencontrait sur l'Ottawa, à l'île Manitoualin, au Wisconsin, aux Illinois. Le type physique était plutôt celui des Européens que des Asiatiques. La peau était blanche et non pas rouge. Il paraît évident que ces peuples avaient une origine commune, peu différente de la nôtre. Ces hommes étaient des *sauvages*, des primitifs, n'ayant pas encore su comment s'élever au-dessus de la brute et ne le désirant pas. C'est le bas de l'échelle de l'humanité.

Examinons maintenant l'intérieur du cercle qui vient d'être tracé : le Haut-Canada, l'Etat de New-York et le nord de la Pennsylvanie. Il avait pour occupant la race huronne-iroquoise, composée de tribus sédentaires, ayant des villages fort bien bâtis, cultivant le sol, possédant une administration publique efficace, et des industries de beaucoup supérieures à celles des tribus algonquines. Très prévoyants en toutes saisons, ces gens vivaient confortablement et, de plus, le climat de leur pays les favorisait, de sorte qu'ils présentaient l'aspect d'un groupe quasi civilisé au milieu des bar-

bars qui les entouraient. Leur développement en ce sens ferait d'eux peut-être aujourd'hui un empire comme on en a vu au temps des anciens Grecs—si l'Amérique n'eût pas été découverte. Cette supposition ne signifie pas qu'ils se seraient défaits de leurs pratiques cruelles, car la cruauté est ce qui résiste le plus longtemps chez les hommes, témoin l'Égypte, la Grèce, Rome et l'Espagne ; mais, pour toutes fins, on les verrait, en 1900, approcher de l'état où nous avons trouvé le Mexique et le Pérou, sinon dans le luxe, du moins dans une position sociale avancée. La teinte rouge de leur peau indique une source autre que celle des Algonquins, dont ils diffèrent généralement sous les rapports essentiels. Il faut admettre qu'ils avaient fait quelques pas pour sortir de la condition du *sauvage*, et, par là même, ils tenaient une supériorité sur leurs voisins du grand cercle ci-dessus décrit. Comme les habitants de la Germanie, ils pouvaient se dire *allmenn* (allemands), les *hommes par excellence*. Leur langue était belle, pleine de ressources, et ne variait pas trop d'une tribu à une autre.

Vers l'année 1600, les Hurons-Iroquois étaient placés comme suit : dans le Haut-Canada ils occupaient la moitié sud-ouest de cette province où sont les meilleures terres, sous un ciel plus favorable que la partie nord-est. Ceux qui étaient rapprochés du lac Simcoe et de la baie Georgienne furent appelés Hurons par les Français, à cause de la mode qu'ils avaient de relever leur cheveux comme une hure de sanglier. Les autres se nommaient la nation Neutre, le peuple du Tabac. Ces derniers s'étendaient vers Goderich, sur le lac Huron ; les Neutres, vers Saint-Thomas, sur le lac Érié.

À l'est des deux grands lacs, à Buffalo, Rochester, Syracuse, Oswego, Utica, Albany, étaient cinq tribus que les Français nommèrent Iroquois parce que leurs orateurs terminaient leurs harangues, à la façon des Grecs d'Homère, en prononçant *Iro* ou plutôt *Hiro* : "J'ai dit". Une sixième famille habitait le nord de la Pennsylvanie et portait le nom d'Andastes. Une septième, les Ériés, occupait le sud-est du lac de ce nom ; la huitième s'étendait jusqu'à la Virginie ; c'étaient les Tuscaroras.

Les Hurons, vers 1600, se trouvaient nombreux et pouvaient mettre trois mille hommes sous les armes, si nous ne nous trompons. Les Iroquois ne comptaient guère "dans le monde", par suite, à ce qu'il paraîtrait, des défaites subies dans les combats ; mais nous verrons bientôt que "ce peu qui en restait, comme un germe généreux, poussa vigoureusement et remplit la terre", selon que s'exprimait un père jésuite cinquante ans plus tard.

Dans tous les pays d'Amérique nous avons trouvé les nations sauvages aux prises les unes avec les autres ; ainsi en a-t-il été partout sur le globe, depuis Adam et Eve.

Les Iroquois d'Albany, appelés Agniers (en anglais Mohawks) étaient les plus belliqueux des cinq groupes dont nous avons parlé. Ils descendaient par la rivière Chambly et ravageaient les campements des Algon-

quins sur le Saint-Laurent, entre Montréal et Québec. Telle était la situation lorsque Champlain arriva, en 1603. Comme cet explorateur fréquentait nécessairement les Algonquins, il finit par se battre de leur côté pour sa sauvegarde personnelle (1609). Les historiens ont tiré de ce fait des conclusions exagérées, jusqu'à dire que Champlain s'attaquait à la plus redoutable confédération indienne que l'histoire de l'Amérique du Nord nous fait connaître. Il n'attaquait pas, il se défendait ; de plus, la confédération n'existait pas encore, et ce ne sont pas les coups d'arquebuse de Champlain qui l'ont fait naître. Autant dire qu'Énée emportant son père en Italie prévoyait la conquête du monde par les Romains. Observons aussi que les Agniers ne firent point la guerre aux Français pour commencer, mais qu'ils en voulaient aux Algonquins et que les Français, survenant dans le pays pour la première fois, se trouvèrent mêlés au conflit. C'était un début assez malheureux, pourtant ils ne pouvaient l'éviter. Le pire, c'est qu'ils auraient dû s'y attendre et couper le mal dans la racine en allant écraser les Agniers chez eux. Québec étant gouverné de Paris, il fut impossible à Champlain d'obtenir main-forte. Toute la question est là.

En 1614, les Hollandais ou Flamands établirent le poste d'Orange, où est Albany à présent. L'année suivante, quelques-uns d'entre eux accompagnèrent les Iroquois qui allaient combattre une tribu quelconque, amie des Hurons. Trois Hollandais furent pris mais renvoyés aussitôt par ces Sauvages, qui les crurent Français d'après ce que les Hurons leur avaient dit des hommes blancs de Québec. Ces Européens supportaient donc les Iroquois à la guerre ?

En 1615, les Hurons poussèrent une expédition jusqu'à Syracuse, dans l'État de New-York, et retraitèrent sans succès ; Champlain était avec eux, ce qui est bien plus grave que l'affaire de 1609.

Nous voilà parfaitement certains que les Hurons et les Iroquois se comportaient dès lors comme deux puissances rivales. Il est impossible de savoir depuis combien de temps durait cet antagonisme ; en tous cas il ne finit qu'avec la dernière bourgade huronne, quarante ans plus tard. Étienne Brulé était en 1615 chez les Andastes (Pennsylvanie), et ce peuple de langue huronne-iroquoise faisait la guerre aux Iroquois d'Onnontagué.

La *Relation* de 1660 (p. 6) nous fournit une bonne entrée en matière au sujet de ces deux frères ennemis : “ Des cinq peuples qui composent toute la nation iroquoise, ceux que nous appelons Agnieronnons ont été tant de fois au haut et au bas de la roue en moins de soixante ans, que nous trouvons dans les histoires peu d'exemples de pareilles révolutions... Vers la fin du dernier siècle, ils ont été réduits si bas par les Algonquins qu'il n'en paraissait presque plus sur la terre, néanmoins ce peu qui restait, comme un germe généreux, avait tellement poussé en peu d'années, qu'il avait réduit réciproquement les Algonquins aux mêmes termes que lui. Mais cet état n'a pas duré longtemps, car les Andastogehronnons

leur firent si bonne guerre, pendant dix années, qu'ils furent renversés pour la seconde fois, et la nation en fut presque éteinte, du moins tellement humiliée que le nom seulement d'Algonquin les faisaient frémir et son ombre semblait les poursuivre jusque dans leurs foyers." Cet écrasement des Agniers par les Andastes, montre que la confédération iroquoise, si elle existait déjà (1620-1630), n'était pas encore assez bien formée pour secourir celui de ses membre qu'un danger sérieux menaçait. La *Relation* continue : " C'était au temps où les Hollandais s'emparèrent de ces côtes-là et qu'ils prirent goût au castor de ces peuples, il y a quelque trente ans". Les *Relations* de 1637 (p. 158) et 1647 (p. 8), ajoutent à ces renseignements : " Les sauvages d'Andastohé, que nous croyons être voisins de la Virginie, avaient autrefois de grandes alliances avec les Hurons, en sorte qu'il se trouve encore dans leur pays des gens de leurs contrées" (des Hurons). Les Andastes habitaient sur les bords de la Suquehana et se rendaient jusqu'à la mer d'où ils rapportaient des coquillages qui servaient de monnaie dans les échanges entre tribus—c'est pourquoi on les appelaient " le peuple de la porcelaine ".

Les cinq nations iroquoises étaient placées à peu près dans l'ordre suivant : Agniers (Mohawks), au nord d'Albany et de Schenectady ; Onneyouts (Oneida), derrière Oswego ; Onnontagués (Onondagos), vers Syracuse ; Goyogonins (Cayugas), près Rochester ; Tsonnontouans (Senecas), à l'est de Buffalo. Les Ériés venaient ensuite, le long d'une partie du lac Érié, près de Cleveland et de Sandusky.

Champlain écrit : Iroquois, Irocois, Yrocois ; les jésuites : Hiroquois, Iroquois. Les Hollandais appelaient les Agniers : Maquois ; les Anglais en ont fait Mohawks. Quand les Algonquins voyaient venir les Iroquois, ils s'écriaient : *Nattuoué!* les ennemis.

L'apparition des Français dans le Haut-Canada n'était pas de nature à intimider les Iroquois, puisqu'il ne s'agissait que de quelques hommes, les uns missionnaires, les autres courant à la recherche des pelleteries, mais en 1634 ce nombre augmenta, et bientôt toute une politique nouvelle et à longue portée fut conçue par les Cinq-Nations, comme on désignait les Iroquois. Eux-mêmes se qualifiaient d'*Onguehonwe* : hommes supérieurs ; et encore de *Hotinmonchiendis* : les cabanes ou maisons parfaites. La tendance à former une union entre les cinq branches se manifesta à mesure que les chefs comprirent les changements qui s'opéraient. Derrière eux, ils avaient les Anglais de la Virginie, les Suédois du New-Jersey, les Hollandais du Manhattan (New-York) et d'Orange, lesquels ne leur disaient rien de bon au cœur, mais cependant les incitaient à se procurer du castor, dont le commerce était profitable aux deux parties. Les plus belles peaux se rencontraient dans le Haut-Canada, et les Hurons et les Iroquets les livraient aux Français. Ces Iroquets, peuple de langue algonquine qui disait avoir possédé l'île de Montréal, occupaient le territoire compris entre Kingston, Vaudreuil et la rivière Rideau.

Les Iroquois avaient donc devant eux leurs anciens ennemis doublés d'Européens accapareurs, comme ils avaient derrière eux d'autres hommes de race blanche prêts à tout envahir. Ils décidèrent d'employer la diplomatie afin de n'être pas serrés entre ces deux influences et de les exploiter à leur profit. De ce plan, qui fut poursuivi avec une tenacité et une adresse rares, naquit la guerre permanente contre les Hurons et les Français, non pas la guerre de 1600 à 1630, consistant en une ou deux maraudes d'Agniers chaque année ou tous les deux ou trois ans, mais une suite d'opérations calculées d'avance et visant à un but unique à double effet : contenir les Européens, agrandir la domination des Iroquois. Cette conception "nationale" est digne du génie des Romains.

N'oublions pas les Sokokis, de la rivière Connecticut, et les Loups (Mahingans, Mohicans), des deux rives de l'Hudson, gens de langue algonquine, ennemis des Iroquois, mais que ceux-ci battirent complètement sous les yeux des Hollandais, de manière à tenir ces deux peuples sauvages sous leur dépendance. De fait, à partir de 1630, on trouve les Sokokis et les Loups naturalisés Iroquois.

En regardant autour d'eux, les Iroquois pouvaient voir dans le Maine les Abénakis, dans le Bas-Canada, les Algonquins, puis les Iroquets, les Hurons, les Neutres, les Petuneux, les Mascoutins, les Eriés, les Andastes. Il s'agissait, pour exécuter leur plan, de détruire toutes ces nations les unes après les autres ou les unes par les autres.

L'impéritie du gouvernement français ne mit que peu ou point d'obstacles à son exécution. Quant aux Anglais, Suédois et Hollandais, ils recueillaient des bénéfices du triomphe de nos ennemis, parce que le commerce des fourrures passait ainsi de leur côté sans sacrifice de leur part.

Les Français qui allaient faire la traite dans le Haut-Canada n'y séjournèrent pas longtemps chaque fois, et les Iroquois le savaient bien. Il n'y avait à craindre que les Hurons et, pour ce qui est des six ou huit "robes noires" qui demeuraient tout à fait dans la contrée, on les prenait pour les principaux commerçants français—les premiers qu'il fallait détruire. Ce fut là tout le mobile de l'Iroquois dans son acharnement à poursuivre les missionnaires, car d'idée de religion il n'eut jamais, et il n'a à cela absolument rien compris. On a prétendu que le diable inspirait à ces Sauvages la haine du christianisme ; cela est possible, mais nous n'avons aucun moyen de nous en assurer. L'Iroquois étant un être tout matériel ne se trompait pas sur ses intérêts immédiats en ce bas monde ; c'est pourquoi, voulant prendre du castor, il anéantit les Hurons qui le gênaient et enveloppa dans sa vengeance les hommes blancs qui favorisaient ses ennemis héréditaires. Les apôtres de Jésus-Christ n'eussent probablement pas été inquiétés si les commerçants de fourrures n'avaient pas vécu à leurs côtés.

Au mois d'août 1635, Champlain s'adressant au cardinal de Richelieu, insistait sur la nécessité de restreindre par la force les courses désastreuses

des Iroquois : " Il ne faut que cent vingt hommes, armés à la légère, dit-il, pour éviter les flèches, ce que ayant avec eux deux ou trois mille Sauvages de guerre, nos alliés, dans un an on se rendrait maître absolu de tous ces peuples, en y apportant l'ordre requis, et ceci augmentera le culte de la religion et un trafic incroyable". Le ministre ne fit rien. Champlain mourut le 25 décembre de cette année. Le Canada fut laissé à lui même et, pour surcroît de désolation, les Hollandais d'Albany vendirent des armes à feu aux Iroquois. Ceux-ci se mirent résolument en campagne (1636-37) et leurs bandes infestèrent à la fois le Haut et le Bas-Canada. La guerre contre les Hurons était en plein mouvement dès 1636. Il n'y a pas de doute que, par les Hollandais et les Suédois, les Cinq-Nations savaient que la France était engagée dans deux ou trois guerres dont elle pouvait difficilement sortir victorieuse. Devons-nous comme les Iroquois, tirer une conclusion et dire que la France ne pouvait rien faire pour sa colonie ? Le peu de secours que nous lui demandions n'aurait diminué ni ses ressources, ni son armée, ni son prestige en Europe, et, en nous l'accordant, elle eût établi son empire dans l'Amérique du Nord.

Le spectacle que nous présentent certaines parties de l'Afrique en ce moment est la répétition de ce qui s'est vu en Amérique entre les premiers commerçants européens de nations différentes qui ont paru dans ces pays nouveaux : s'ils ne font pas la guerre eux-mêmes, ils portent les sauvages à attaquer les comptoirs rivaux.

Les Wenrohronons (ainsi nommés dans une Relation) qui vivaient au delà du lac Érié, à plus de 80 lieues des Hurons, étaient d'anciens amis des Neutres. Les Iroquois les attaquèrent en 1639 et les dispersèrent ; plus de six cents de ces malheureux, la plupart femmes et enfants, furent recueillis par les Hurons et par les Neutres de Khiætoa, dont la bourgade était située au nord-est de Sarnia—plus tard mission Saint-Michel. Ces Wenrohronons devaient être une branche des Ériérohnons, peuple du Chat, établi vers Cleveland et Sandusky, non loin de quelques bourgades des Neutres, lesquelles s'avançaient jusqu'à Toledo après avoir franchi la rivière Détroit. Leur langue était celle des Hurons, des Neutres et des Iroquois. La dispersion de 1639 refoula le principal groupe des Ériés vers le centre de l'Etat actuel de l'Ohio, où ils demeurèrent une douzaine d'années dans de grands villages, cultivant la terre pour vivre, selon leur ancienne coutume.

Les Neutres (Attiwindorons) qui, jusqu'à 1638, avaient gardé leur neutralité traditionnelle entre les Hurons et les Iroquois, devinrent en butte aux coups de ces derniers. Ils occupaient l'espace compris entre la rivière Niagara, Sarnia, Goderich et Hamilton et comptaient trente-six villages renfermant quatre mille guerriers en 1616, le même nombre en 1641, avec une population de 12,000 âmes à cette dernière date ; mais ce chiffre avait été plus élevé quelques années auparavant. Sur la carte de Galinée, 1670, on voit, près de l'emplacement de la ville de Hamilton, ces

mots, placés à la tête d'une rivière : " Ici était autrefois la nation Neutre". En défrichant le sol dans cette localité, on a trouvé sur l'étendue d'une ferme ordinaire, huit cents casse-têtes¹, laissés là probablement à la suite d'une bataille où les gens de l'endroit auraient eu le dessous, puisqu'il n'est resté personne pour ramasser ces armes. La rivière en question va tomber au lac Érié ; vers son embouchure, non loin de Saint-Thomas, comté d'Elgin, il a été découvert des vestiges abondants et curieux d'un village, ou même, croit-on, de la " capitale " du peuple Neutre. Les missions ou chapelles les plus importantes que les jésuites établirent jusqu'à 1650 dans le territoire de cette nation se nommaient Notre-Dame-des-Anges, près Brantford, Saint-Alexis, près Saint-Thomas, Saint-Joseph, dans le comté de Kent, Saint-Michel, au nord-est de Sarnia, et Saint-François, un peu à l'est de Sandwich ; il y avait en outre quatre ou cinq villages de Neutres de l'autre côté de la rivière Détroit, sur le sol actuel des États-Unis.²

La conquête en règle du Haut-Canada commença par une attaque des Iroquois contre les Neutres, de manière à effrayer ceux-ci et à les contenir, tandis que, par la suite, les Hurons seraient envahis à leur tour. De fait l'écrasement final des Neutres n'eut lieu qu'en 1650, après la défaite totale des Hurons. Le génie des Iroquois leur dicta, à partir de 1639-40, un plan d'opérations comparable à celui qui s'empara de Napoléon en 1805. Subjuguer, les unes après les autres, les races qui les entouraient et traiter comme des quantités négligeables les établissements des Français, des Hollandais, etc., devint leur politique visible, et ils la poursuivirent sans relâche durant un quart de siècle, c'est-à-dire jusqu'à l'arrivée du régiment de Carignan.

Charlevoix, commentant la situation, dit : " Les Iroquois, assurés d'être soutenus des Hollandais qui leur fournissaient des armes et des munitions et à qui ils vendaient les pelleteries qu'ils enlevaient à nos alliés, continuaient leurs courses et leurs brigandages. Les rivières et les lacs étaient infestés de leurs partis ; le commerce ne pouvait plus se faire sans de grands risques. Les Hurons, soit par indolence, soit par la crainte d'irriter un ennemi qui avait pris sur eux une supériorité qu'ils ne pouvaient plus se dissimuler, soit enfin qu'ils ne fussent point encore persuadés que les Iroquois en voulaient à toute la nation, laissaient désoler leurs frontières, sans prendre aucune mesure pour éteindre un incendie qui les environnait de toutes parts."

Le frère Sagard (1625) nomme les Hurons *Houandates*, dont on a fait *Owendat*, *Wyandots* et *Yandots*. Ils habitaient entre les baies Matchedash et Notawasaga, et la rivière Severn et le lac Simcoe. Leurs cultures consistaient en citrouilles, blé d'Inde, fèves, tabac, chanvre. Voici les noms de leurs quatre principales tribus : l'Ours (Antigouantans), le Loup

¹ Voir les ouvrages de M. David Boyle sur les Sauvages du Haut-Canada.

² Voir *The Country of the Neutrals*, par James H. Coyne, St-Thomas, 1895.

(Antigononens), le Faucon (Arendoronens), le Héron (Tahontaenrats).¹ Les cinq ou six principales missions des pères jésuites se nommaient Sainte-Marie (Attasonchronens). Saint-Joseph (Ihonatiria), Saint-Ignace, Saint-Michel, la Conception (Assossani), Saint-Joseph (Teanaustayæ).

D'après Champlain, les Hurons, en 1615, comptaient de 20,000 à 30,000 âmes, ce qui embrasse probablement les gens du Tabac ou Petuneux. En 1639, les missionnaires portent à 12,000 âmes le groupe huron, sans y inclure la nation du Tabac (Tinnontates) qui habitait les pentes occidentales des montagnes Bleues, à la tête de la baie de Nottawasaga, dans le township de ce dernier nom, à deux jours de marche des villages hurons, et avait neuf ou dix bourgades renfermant à peu près 10,000 âmes en tout. On a retrouvé les traces de trente-deux villages et de quarante cimetières ou dépôts d'ossements humains dans cette région. A partir de 1640, les Petuneux furent plus que jamais unis aux Hurons. Les chapelles de Saint-Jean, Saint-Mathieu et Saint-Mathias étaient, chez eux, le centre de dix ou douze missions dispersées dans les comtés de Simcoe et de Grey. M. David Boyle, bien connu par son érudition en ces matières, dit que ce peuple était plus intelligent et plus industrieux que les autres sauvages de l'Amérique du nord.

Au mois de juin 1641, les Hurons, descendant à la traite de Trois-Rivières, trouvèrent ce poste bloqué par les Iroquois que l'on pensait occupés bien loin de là ; mais aussitôt que l'une de leurs expéditions avait porté un coup quelque part, ces infatigables destructeurs feignaient de ne plus poursuivre leur fortune, pour aller se rabattre sur un autre point et, par ce moyen, faisant toujours la guerre, ils exerçaient leur jeunesse de manière à recommencer des campagnes sans cesse fructueuses et que notre faiblesse encourageait.

Les Neutres devaient leur nom au rôle pacifique qu'ils jouaient entre les diverses tribus huronnes-iroquoises du nord et du sud des lacs Ontario et Érié. Ils n'avaient pas la même attitude vis-à-vis certains autres peuples, principalement les Mascoutins ou gens du Feu, de langue algonquine, qui demeuraient au delà de la rivière Détroit. Cette nation très nombreuse étendait sa droite jusqu'à l'extrémité ouest du lac Érié, tandis que sa gauche touchait la baie de Saginaw. Les Neutres, coalisés avec les Ottawas, faisaient la guerre aux Mascoutins dès 1615, de sorte que ces derniers répondaient aux attaques qui leur venaient par le lac Érié et par le lac Huron, car les Ottawas (langue algonquine) habitaient le comté de Bruce et l'île Manitoulin. Ces hostilités duraient encore en 1642, comme le montre la *Relation* de 1644, p. 97 : "Le peuple des Neutres est toujours en guerre avec ceux de la nation du Feu. Ils y allèrent l'été dernier (ce

¹ Voir *Relation* du P. Bressani, publiée en 1853, p. 322. Nous suivons l'étude que M. l'abbé W. R. Harris, doyen de St-Catharines, nous donne dans son bel ouvrage : *History of the Early Missions in Western Canada*, publié par Hunter, Rose, Toronto, 1893.

passage est du mois de juin 1643) en nombre de deux mille, et attaquèrent un bourg bien muni d'une palissade et qui fut fortement défendu par neuf cents guerriers qui soutinrent l'assaut ; enfin ils le forcèrent, après un siège de dix jours, en tuèrent bon nombre sur la place, prirent huit cents captifs, tant hommes que femmes et enfants, après avoir brûlé soixante et dix des plus guerriers, crevé les yeux et cerné tout le tour de la bouche aux vieillards, que par après ils abandonnèrent à leur conduite afin qu'ils traînent ainsi une vie misérable. Voilà le fléau qui dépeuple tous ces pays, car leur guerre n'est qu'à s'exterminer. Cette nation du Feu est plus peuplée, elle seule, que tous ensemble ceux de la nation Neutre, tous les Hurons et les Iroquois ennemis des Hurons ; elle contient grand nombre de villages qui parlent la langue algonquine, qui (laquelle) règne encore plus avant."

On peut considérer les Mascoutins, au cours des années 1615-1660, comme le principal peuple de l'État actuel du Michigan, depuis la ville de Détroit jusqu'au passage de Makinaw.

Le spectacle de ces luttes de barbares, semblable à celui que le centre de l'Europe avait vu il y a vingt siècles, se présente à nous sous son aspect géographique : c'était un mouvement rotatoire autour du lac Huron. Les Hurons, les Petuns (nation du Tabac), les Neutres, les Iroquois allaient attaquer vers le sud les Ériés et les Mascoutins. Ces derniers semaient à leur tour la terreur chez les Ottawas du comté de Bruce et de l'île Manitoualin, et jusque chez les Amikoués (peuple du Castor) dans le district d'Algoma, sur la terre ferme, au nord du lac Huron. Autour de cette nappe d'eau courait ainsi le tourbillon militaire qui affaiblissait sept ou huit peuples vaillants au bénéfice futur des Iroquois.

L'année 1643 fut marquée par un changement notable dans la stratégie des Iroquois. Jusqu'alors, ils s'approchaient de nos postes en troupes nombreuses, et cela pendant l'été seulement, quand les rivières étaient libres ; mais, à partir de cette époque, ils modifièrent leur plan de campagne et se divisèrent par bandes de vingt, trente, quarante, cent hommes, et se répandirent sur tous les passages du Saint-Laurent. "Quand une bande s'en va, écrivait le P. Vimont, l'autre lui succède ; ce ne sont que petites troupes bien armées qui partent, les unes après les autres, du pays des Iroquois, pour occuper la Grande-Rivière (l'Ottawa) et y dresser partout des embuscades, dont ils sortent à l'improviste, se jetant indifféremment sur les Montagnais, les Algonquins, les Hurons et les Français. On nous a écrit de France que le dessein des Hollandais est de faire tellement harceler les Français par les Iroquois, à qui ils fournissent des armes, qu'ils les contraignent à quitter le pays et même d'abandonner la conversion des sauvages." La colonie française n'avait point de soldats pour la défendre, encore moins pour aller faire la guerre au Haut-Canada.

Les Iroquois, voulant à tout prix, isoler les Français de leurs alliés (1644), formèrent dix bandes qui se partagèrent tout le pays. Les deux

premières occupaient les portages de la Chaudière et du Rideau (où est la ville d'Ottawa); la troisième surveillait le Long-Saut; la quatrième se tenait dans les lacs des Deux-Montagnes et Saint-Louis; la cinquième occupait l'île même de Montréal; la sixième interceptait le passage de la branche nord de l'Ottawa ou rivière des Prairies; les septième, huitième et neuvième se tenaient sur le Richelieu, le lac Saint-Pierre et aux environs de Trois-Rivières; la dixième, enfin, colonne volante et plus considérable, se réservait pour l'attaque du pays des Hurons.

Au printemps de cette année, le P. Bressani fut enlevé près de Trois-Rivières, et ses compagnons sauvages, massacrés. Dans la bande qui exécuta ce coup il y avait six Hurons et trois Loups (Mohicans) naturalisés Iroquois. Pendant un demi siècle on rencontre dans les rangs des Cinq-Nations des mélanges de ce genre provenant des peuples conquis. En septembre (1644), M. William Kieft, "gouverneur général de la Nouvelle-Belgique", tira le père Bressani des mains de ses bourreaux et le fit passer en Hollande.

Au mois de juillet 1644 arrivèrent de France un certain nombre de personnes, parmi lesquelles une compagnie de soldats commandée par un nommé Labarre. Les Iroquois régnaient en maîtres par tout le Canada, mais, comprenant que la chance des armes pouvait tourner contre eux si les troupes françaises entraient en lutte, ils parlèrent de la paix, espérant par cette démarche faire discontinuer l'envoi des renforts de cette nature, et calculant bien qu'il serait toujours temps, une fois la quiétude rétablie parmi nous, de préparer quelque terrible surprise contre la colonie, ou les Hurons, ou les Algonquins, et peut-être les trois ensemble. Ce stratagème leur réussissait invariablement, parce que les Français s'y laissaient prendre avec une incroyable facilité—et d'ailleurs, ils n'étaient pas en mesure d'agir autrement. Vingt-deux soldats partirent, l'automne de 1644, avec les Hurons descendus à la grande traite de Trois-Rivières; ils revinrent à Trois-Rivières le 7 septembre 1645 en compagnie de soixante canots hurons chargés de pelleteries. Il y eut en ce lieu une assemblée solennelle de toutes les nations, où la paix générale fut proclamée à la demande des chefs iroquois; mais une année ne s'était pas écoulée après cela, que ceux-ci levaient la hache de guerre en apprenant que la France ne promettait aucun nouveau secours à la colonie. Tous les Français du Canada ne comptaient que quelques centaines d'âmes (hommes, femmes, enfants, religieux et religieuses) réunies en trois endroits: Québec, Trois-Rivières et Québec.

Les Iroquois reparurent en armes, l'automne de 1646, au moment où le P. Jogues s'embarquait à Trois-Rivières pour aller passer l'hiver parmi eux, selon qu'ils en avaient exprimé le désir. Ce missionnaire fut assommé d'un coup de hache et l'on fit également périr Lalonde, son domestique. Nous donnerons plus tard la liste des personnes massacrées, de 1636 à 1664, par les Iroquois.

Le fort Richelieu (aujourd'hui Sorel) avait perdu deux hommes assommés par les maraudeurs ; un autre gisait blessé dangereusement. On abandonna la place sans garde, faute de troupes ; les Iroquois la brûlèrent. Bientôt après, leurs bandes se répandirent à la sourdine, depuis Montréal jusqu'à Québec et le long de l'Ottawa, pour surprendre les chasseurs algonquins et français.

Le P. Vimont, dans la *Relation* de 1645 (p. 19) dit : " La guerre des Iroquois n'est non plus la guerre des Français, que la guerre des Parthes n'était la guerre des Romains".

Lutter contre les Iroquois était impossible. Les Hurons, bien que de la même race qu'eux, n'avaient aucun esprit militaire, ne devinaient rien de l'imminence du péril, ne savaient mettre de l'ordre nulle part et utilisaient comme des enfants les arquebuses dont les Français commençaient à les armer. Les Algonquins avaient pour tout partage une certaine bravoure individuelle, sans la moindre discipline, et ils étaient toujours prêts à commettre quelques étourderies, à tout gâter, après quoi ils se repliaient sur Trois-Rivières, Sillery ou Québec, attirant l'ennemi sur leurs pas. Les Iroquois avaient des plans d'opération adoptés dans leurs conseils et sagement mûris ; ils agissaient avec ensemble ; leurs bandes pouvaient se mettre à l'abri dans des lieux où personne n'osait les poursuivre, pas même les Français, qui manquaient absolument de soldats. La partie était inégale et le résultat évident. La colonie française restait sans défense sous le couteau de l'Iroquois, et il est inconcevable qu'elle n'ait pas été anéantie jusqu'au dernier homme. Examinons une autre scène.

" Au delà de la nation Neutre, écrivait le P. Ragueneau qui était alors chez les Hurons, tirant un peu vers l'Orient, on va à la Nouvelle-Suède, où habitent les Andastoëronnons, alliés de nos Hurons, et qui parlent comme eux, éloignés de nous en ligne directe de cent cinquante lieues". (*Relation*, 1648, p. 46.)

Les Andastes (nord de la Pennsylvanie) au commencement de 1647, envoyèrent demander aux Hurons de se joindre à eux contre les Iroquois. " Ces sauvages, dit le P. Ragueneau (*Relation*, 1648, p. 58), sont peuple de langue huronne et de tous temps alliés de nos Hurons. Ils sont très belliqueux et comptent, en un seul bourg, treize cents hommes portant armes." Les deux envoyés des Andastes dirent aux Hurons " que, s'ils perdaient courage et se sentaient trop faibles contre leurs ennemis, ils le fissent savoir... Nous avons appris, expliquèrent-ils, que vous aviez des ennemis ; vous n'aurez qu'à nous dire : levez la hache, et nous vous assurons ou qu'ils feront la paix ou que nous leur ferons la guerre... Charles Ondaaiondiont, excellent et ancien chrétien fut député vers eux... Il partit d'ici (pays des Hurons) le 13 d'avril (1647) et n'arriva à Andastoë qu'au commencement de juin... pour les solliciter à leur moyenner une paix entière ou à reprendre la guerre qu'ils avaient, il n'y a que fort peu d'années, avec les Iroquois annicronnons." Les Andastes envoyèrent une embas-

sade aux Iroquois de quatre cantons pour arranger une paix entre eux et les Hurons, et par là forcer les Agniers à mettre bas les armes. car c'étaient toujours ces derniers qui tenaient campagnes contre toutes les nations. (*Relations*, 1647, p. 8 ; 1648, pp. 48, 58-60.)

Charlevoix ajoute : " L'occasion était belle pour reprendre sur les Iroquois la supériorité que les Hurons avaient eue autrefois, mais il ne voulurent en profiter que pour se mettre en état de parvenir à une bonne paix ; et, parce qu'ils n'avaient pas pris les moyens les plus sûrs pour y réussir, qui était de se bien préparer à la guerre, ils furent les dupes de la mauvaise foi et des artifices de leurs ennemis."

En d'autres termes, les Hurons trahirent le secret et firent savoir aux Iroquois les propositions à eux faites par les Andastes ; en retour de cette confiance, les Iroquois leur promirent mer et monde : c'était ce que voulaient les Hurons—et aussi les Iroquois. Nicolas Perrot ne tarit pas sur les lâchetés des Hurons, en parlant des quarante années durant lesquelles il les a connus.

Charlevoix poursuit : " Il y a bien de l'apparence que les Hurons remercièrent (refusèrent les offres) les Andastes... Tandis qu'ils s'amusaient à négocier avec les Onnontagués, les Agniers et les Tsonnontouans tombèrent à l'improviste sur deux grands partis de chasse de la bourgade de Saint-Ignace et les défirent entièrement. On fut ensuite quelque temps sans entendre parler d'aucune hostilité, et il n'en fallut pas davantage pour replonger les Hurons dans leur première sécurité.

Charles, que nous avons laissé chez les Andastes, eut occasion de visiter la Nouvelle-Suède et de constater qu'il n'y avait pas de missionnaire parmi les Européens de cet établissement, lequel était en correspondance régulière avec les Hollandais du fleuve Hudson. C'est même par cette voie qu'il apprit l'assassinat du P. Jogues, survenu quelques mois auparavant chez les Iroquois. " Nous jugeons, rapporte le P. Ragueneau sur le dire de Charles, que cette habitation d'Européens, alliés des Andastoeronons, sont la plupart Hollandais et Anglais, ou plutôt un ramas de diverses nations qui, pour quelques raisons particulières, s'étant mis sous la protection du roi de Suède, ont appelé ce pays-là la Nouvelle-Suède. Leur interprète dit à Charles qu'il était Français de nation." (*Relation*, 1648, p. 59-60.) Charles partit d'Andastœ le 15 août et rentra à Sainte-Marie des Hurons le 5 octobre, ayant été poursuivi par les Tsonnontouans.

La première nation qui abandonna le Haut-Canada fut celle de l'Iroquet dont le gros se rapprocha de Trois-Rivières.

La seule traite de pelleteries qu'il y eût à Trois-Rivières, en 1647, se fit par les Attikamègues du Saint-Maurice et quelques Iroquets. Les Hurons ne descendirent pas de leur pays, à cause de la guerre.

De 1640 à 1648, le nombre des colons arrivés au Canada est insignifiant ; ce qui s'explique par le désarroi des affaires de France, l'inertie des Cent-Associés, les ravages que les Iroquois exerçaient aux portes de nos

établissements. M. de Montmagny, dès longtemps découragé d'un tel état de choses, fut rappelé en 1648, et M. d'Ailleboust, son successeur, ne possédait ni argent ni aide d'aucune sorte pour remédier à la situation. Il fut remplacé en 1651 par M. de Lauzon, qui trouva moyen d'aggraver nos misères et nos périls en ne s'occupant à peu près que de ses intérêts personnels.

L'affaire des Andastes paraît avoir décidé les Iroquois à en finir pour jamais avec les Hurons. Ils se sentaient capables d'exécuter ce projet et choisissait le moment où les nouvelles de France ne parlaient que de guerre contre les Espagnols, de révoltes dans l'intérieur du royaume et de tueries identiques à celles que nos sauvages commettaient de temps en temps.

Un grand massacre eut lieu le 4 juillet 1648 à la bourgade Saint-Joseph, du pays des Hurons, d'où les guerriers étaient absents. Le P. Antoine Daniel mourut percé de flèches et son corps fut jeté dans la chapelle, incendiée avec tout le village.

Au mois de juillet 1648, les Iroquois bloquaient Trois-Rivières lorsqu'arrivèrent inopinément deux cent cinquante Hurons conduits par cinq chefs de guerre renommés, avec le P. Bressani et trois Français, et qui firent lever le siège de la place. La traite eut lieu comme autrefois. Au commencement d'août, les cinquante ou soixante canots hurons repartirent, embarquant "vingt-six Français : cinq pères, un frère, trois enfants, neuf travailleurs et huit soldats, outre quatre qu'on devait prendre à Montréal", note le *Journal* des jésuites. La plupart de ces personnes périrent, sans doute, lors des massacres qui eurent lieu, quelques mois plus tard, dans la région des lacs. Ce convoi de 1648 devait être, pour six ans, le dernier qui se rendrait aux missions de l'ouest.

Le départ de M. de Montmagny du Canada marquait la fin d'un régime qui avait prévalu depuis 1636 ; mais les nouveaux arrangements ne valaient pas mieux que les anciens, et la colonie continua à s'enfoncer dans la triste situation qu'on lui imposait.

"Le nouvel état de 1648, dit M. Gérin, constituait sur l'ancien une épargne de 19,000 francs, qui était laissée à la disposition du Conseil. D'Ailleboust s'empessa d'appliquer cette épargne à la formation d'une compagnie de soldats qui devaient se transporter sans cesse d'un point à un autre de la colonie, à la poursuite des Iroquois. Il donna à son neveu, Charles d'Ailleboust des Musseaux, le commandement de ce camp volant. Il est évident que cette mesure profitait surtout à Montréal qui était de tous les postes le plus exposé."¹

Monsieur de Montmagny avait projeté de former un camp volant dont les soldats, espèce de milice volontaire, tiendraient la campagne et poursuivraient l'ennemi lorsqu'il se montrerait dans le voisinage des habitations.² Les ressources pécuniaires lui ayant fait défaut, son successeur s'en occupa et y réussit.

¹ Léon Gérin, dans *la Science sociale*, Paris, 1891, p. 564.

² *Relation*, 1648, p. 4.

“ D’après le règlement du roi, observe Faillon, ce camp volant devait être composé de quarante soldats, et M. d’Ailleboust, qui en comprenait la nécessité, l’accrut encore de trente hommes en 1651.”¹

Un fort avait été construit ou augmenté à Sillery l’été de 1647. En 1649 “ on commença la muraille sur les deniers de la communauté, c’est-à-dire les 19,000 francs affectés par le roi pour les affaires du pays”. Les sauvages fugitifs de l’ouest et du Saint-Maurice s’y réfugièrent en bon nombre vers 1651.²

“ Le printemps de 1649 arrivé, M. d’Ailleboust envoya à Montréal M. Desmousseaux, son neveu, avec 40 hommes qu’il commandait sous le nom de camp volant, afin d’y aider à repousser les ennemis, ce qui lui fut plus aisé que de les battre, car aussitôt qu’ils entendaient le bruit des rames de ses chaloupes, ils s’enfuyaient avec une telle vitesse qu’il n’était pas facile de les attraper et de les joindre; ce renfort encouragea beaucoup les nôtres aussitôt qu’il parut, à quoi contribua beaucoup le nom et la qualité de celui qui commandait. Si l’on avait eu l’expérience que l’on a aujourd’hui, avec la connaissance que nous avons présentement (après 1670) de leur pays, 40 bons hommes bien commandés se seraient acquis beaucoup de gloire, auraient rendu des services très signalés au pays et auraient retenu nos ennemis dans une grande crainte par les coups qu’ils auraient faits sur eux, mais nous n’avions pas les lumières que nous avons aujourd’hui et nous étions moins habiles à la navigation du canot qui est l’unique moyen (de transport) dont on doit user contre ces gens-là que nous sommes maintenant.”³

M. Dollier avait été officier de cavalerie avant que de devenir prêtre. En 1666, aumônier des troupes qui attaquèrent le canton des Agniers, il se rendit compte des choses militaires du Canada, sans doute, mais que pouvait-il espérer d’une demi-compagnie de soldats lorsque, en 1649-50, la puissance iroquoise était à son apogée et que le prestige de ses armes se quintuplait de l’état déplorable des affaires de France—situation bien comprise des Agniers, des Onneyouts, des Onnontagués, des Gayogouins et des Tsonnontouans—les Iroquois, en un mot. Champlain, quinze années auparavant, réduit à modérer ses demandes de secours au plus bas chiffre et mis en présence d’un danger qui n’était presque rien, comparé à l’état de 1649, indiquait un effectif de cent vingt soldats comme indispensable, et certes! il possédait un coup d’œil que personne de son temps n’a su dépasser. Ceci est une question militaire. Les deux compagnies réclamées par Champlain, une fois arrivées ici et dirigées par lui, eussent brisé dans l’œuf la confédération iroquoise. Faute d’avoir compris cela, on se voyait, en 1649, obligé de faire quoi?—une parade de quarante fusiliers,

¹ Faillon, *Histoire de la Colonie*, II, 96.

² *Journal des jésuites*, pp. 88, 131; *Histoire de la Colonie*, II, 90; *Relation*, 1651, p. 7.

³ Dollier de Casson, *Histoire du Montréal*, p. 70.

alors que mille hommes eussent à peine suffi pour renverser ce que l'on avait laissé s'édifier, c'est-à-dire un pouvoir dix fois plus grand que le nôtre. Les quarante hommes du camp volant ne suffisaient même pas à défendre Montréal, parce que l'ennemi faisait une guerre d'embûches qui tuait nos soldats isolés et les colons, sans attaquer le corps de la place. Que restait-il pour Trois-Rivières et Québec ? Rien. Et pourtant les Iroquois, qui ne dirigeaient point tous leurs coups vers Montréal, s'en allaient inquiéter les établissements situés sur un parcours de 60 lieues en descendant le fleuve.

“ Le nouveau gouverneur monta lui-même à Ville-Marie, au printemps de l'année 1649, et réjouit par sa présence tous les colons, charmés de voir ainsi dans sa personne l'un des Associés de Montréal occuper la place de gouverneur du pays. Les hostilités incessantes des Iroquois ne permettaient guère de voyager alors sur le fleuve sans escorte, et nous voyons que M. d'Ailleboust, en faisant ce voyage, avait dans sa chaloupe douze soldats armés. Cependant, toute l'année 1648 et surtout la suivante, la plupart des Iroquois ayant été occupés à harceler les Hurons dans leur pays et à y mettre tout à feu et à sang, on n'eut à repousser à Ville-Marie que de petits partis de ces barbares, dont M. de Maisonneuve vint aisément à bout par sa prudence et le courage intrépide de ses soldats. Il ne perdit qu'un seul homme... M. d'Ailleboust annonça à M. de Maisonneuve que la grande Compagnie, voulant reconnaître les bons et agréables services que le pays recevait de Ville-Marie sous son digne gouverneur, en avait augmenté la garnison de six soldats, et qu'au lieu de 3,000 livres qui lui avaient été assignées pour lui et sa garnison, il en recevrait à l'avenir 4,000.”

Un peu plus loin, le même auteur dit que, en 1648, on avait appris la tiédeur que les Associés de Montréal manifestaient envers cette œuvre ;¹ ce qui explique pourquoi M. d'Ailleboust avait tourné ses prières du côté de la compagnie générale dite des Cent-Associés pour secourir sa colonie en détresse.

Le 16 mars 1649, les Iroquois tombèrent par surprise sur les missions de Saint-Louis et de Saint-Ignace du Haut-Canada. Il y eut un massacre général, ou à peu près. Les PP. Jean de Brébeuf et Gabriel Lallemant subirent, avant que d'expirer, des tortures inouïes. Le 17, Sainte-Marie fut attaquée sans être prise, mais le 25 mai les Hurons abandonnèrent ce lieu pour se rendre à l'île Manitoualin. Vers le même temps, le bourg Saint-Jean fut emporté par l'ennemi et le P. Charles Garnier y trouva la mort.

Tout plia devant les Cinq-Nations ; elles firent du Haut-Canada une annexe de leurs domaines de chasse qui s'agrandissaient d'année en année. Les armes françaises n'avaient pas défendu ce territoire ; les Iroquois en

¹ Faillon, *Histoire de la Colonie*, II, 96, 98.

conclurent que nous ne valions pas les Peaux-Rouges, et ils préparèrent de nouveaux plans de conquête.

Une partie des Hurons échappés de ces boucheries se jetèrent dans les montagnes de la nation du Petun, vers Goderich, où trois pères jésuites avaient établi des missions trois mois auparavant. D'autres se réfugièrent dans l'île de Saint-Joseph, en aval du saut Sainte-Marie, où il y avait une mission depuis près d'un an. Un autre groupe se dirigea vers l'île de Manitoualin, comme il vient d'être dit ; en ce dernier endroit, les pères songèrent d'abord à transporter leur maison principale, mais ensuite l'île Saint-Joseph eut la préférence.

Les Chats (Ériés) refoulés au centre de l'État de l'Ohio par les Iroquois, en 1639, donnèrent asile à l'une des cinq bandes de Hurons que le désastre de 1649-50 chassait de leur pays. Tous furent exterminés ensemble par la suite.

Parlant de ce qui s'était passé en 1649-50, la *Relation* des jésuites de 1660 (p. 14) dit : "Les uns se jetèrent dans la nation Neutre, pensant y trouver un lieu de refuge par sa neutralité qui, jusqu'alors, n'avait pas été violée par les Iroquois, mais ces traîtres s'en servirent pour se saisir de toute la nation du Petun. Celle-ci a été obligée de se réfugier chez les Algonquins supérieurs (à l'ouest du lac Huron). D'autres coururent dix journées durant dans les bois ; d'autres voulurent aller à Andostoé, pays de la Virginie ; quelques-uns se réfugièrent parmi la nation du Feu (les Mascoutins) et la nation des Chats, même un bourg entier se jeta à la discrétion des Tsonnontouans, qui est l'une des cinq nations iroquoises et qui s'en est bien trouvé, s'étant conservé depuis ce temps-là en forme de bourg séparé de ceux des Iroquois, où les Hurons vivent à la huronne, et les anciens chrétiens gardent ce qu'ils peuvent du christianisme."

Une note placée à la page 344 des relations du P. Bressani, porte en substance que la première bande des Hurons se retira dans l'île Manitoualin.¹ La deuxième se rendit aux Iroquois, espérant en être mieux traitée. La troisième chercha un asile dans l'île de Michilimakinac, mais, pourchassée par l'ennemi, elle se retira dans la baie Verte, et, plus tard, s'avança vers le sud-ouest du lac Supérieur et se fixa sur le Mississipi. La quatrième demanda refuge à la nation du Chat (Érié) dans l'Ohio. La cinquième est celle qui descendit à Québec, vécut quelques années à l'île d'Orléans et ensuite s'établit à Lorette.

La nation du Petun ne semble pas avoir subi de grandes pertes dans ces massacres, mais elle émigra vers le haut Mississipi où Chouard et Radisson la retrouvèrent en 1660 et le P. Allouez en 1667.

Au mois d'août 1649 des soldats (une dizaine probablement) partent de Trois-Rivières pour le pays des Hurons, avec quatre engagés des jé-

¹ Elle se retira tout d'abord à l'île Ahoendoe, à présent Christian-Island, qui reçut en ce moment le nom de Sainte-Marie.

suites : Pierre Tourmente, Charles Roger, Pierre Oliveau et un nommé Raison.

Vers le 22 septembre le P. Bressani revint des missions du Haut-Canada voyageant en compagnie des bandes de Sauvages amis et des Français qui se rendaient à Trois-Rivières. "Les Français rapportèrent pesant cinq mille de castor, qui était plus de 26 mille livres pour eux ; et Desfossés,¹ soldat, avec son frère, qui y avaient été un an aux Hurons, apportèrent pour leur part 747 livres pesant, qui leur fut payé à 4 francs la livre, et l'autre à 5 livres 5 sols."² Les autres Français, formant partie de la même expédition apportaient 25,000 livres pesant de castors, qu'ils faillirent perdre en arrivant à Trois-Rivières, car les Iroquois les surprirent à une demi-lieue du fort et ne furent repoussés qu'après un combat très animé.

Le P. Bressani et les Hurons repartirent au commencement d'octobre, mais ils durent rebrousser chemin à la rivière des Prairies, au nord de Montréal, par crainte des Iroquois. Ceux-ci infestaient les bords du Saint-Laurent par petites bandes, dit Charlevoix, pillaient et brûlaient les maisons, tuaient les colons isolés. Chaque jour, on les voyait jusqu'aux portes de Québec. Ils ravageaient aussi les territoires du Saint-Maurice et de l'Ottawa.

Non contents de poursuivre dans le nord et dans l'ouest les débris des tribus huronnes et algonquines vaincues et dispersées, les Iroquois engageaient partout autour d'eux des hostilités nouvelles. Leur audace, leur habileté, leur esprit de gouvernement, joints aux tristes circonstances que notre administration traversait, devaient leur assurer, durant plusieurs années, la prépondérance, par la terreur, sur tout le cours du Saint-Laurent et autres pays.

Les Sokokis, sauvages du sud-ouest, du Maine et du New-Hampshire, prenaient à leur tour les armes contre les Agniers. Ceux-ci, dans l'hiver de 1651-52, envoyaient un parti de guerre au pays des Andastes, mais ils étaient repoussés avec perte.³

Le P. Ragueneau écrivait de Sainte-Marie de Manitoualin le 13 mars 1650 : "Nous restons encore treize Pères dans cette mission, avec quatre Frères coadjuteurs, vingt-deux domestiques qui ne nous quittent jamais, et onze autres, gagés pour un temps plus ou moins considérable, six soldats et quatre enfants—en tout soixante personnes."

L'année 1650 fut une longue série d'angoisses pour le Bas-Canada, mais les malheurs que l'on entrevoyait ne se produisirent point. Les Iroquois employèrent cette année à anéantir la nation Neutre et à étendre leurs conquêtes vers l'ouest. A l'automne de 1650 ils remportèrent une première grande victoire sur ce peuple et, au printemps suivant, lui por-

¹ *Journal des jésuites*, p. 129.

² Simon Desfossés est parrain d'un Sauvage à Trois-Rivières, le 22 septembre 1649.

³ *Journal des jésuites*, 19 avril et 5 juin 1652.



tèrent le dernier coup. La moitié des malheureux Neutres devinrent fugitifs, le reste prisonniers ou tués dans les combats. Le 3 septembre 1651, la mère de l'Incarnation écrivait que l'anéantissement de ce peuple rendait les Iroquois plus insolents que jamais.

En même temps qu'arrivait à Québec la nouvelle de l'abandon du Haut-Canada par les Français et les Sauvages attachés à notre cause, on apprenait qu'une autre guerre était commencée dans le Sud. Le 30 août 1650, la mère de l'Incarnation écrivait de Québec : "Un captif qui s'est sauvé des Iroquois rapporte que les guerriers andoovesterons et ceux de la nation Neutre ont pris deux cents Iroquois. Si cela est vrai, on les traitera d'une terrible façon, et ce sera autant de charge pour nous." Les Andastes avaient, en effet, levé la hache contre les Tsonnantouans, de concert avec les Neutres. D'après d'autres nouvelles, reçues à Québec le 22 avril 1651, et notées au *Journal* des jésuites, les Iroquois, au nombre de quinze cents, avaient à leur tour attaqué la nation Neutre, l'automne précédent, et enlevé un village ; mais, poursuivis comme ils se retiraient, ils perdirent deux cents hommes. Les Cinq-Nations, résolues à triompher, avaient envoyé douze cents guerriers contre les Neutres.

En 1649 les bandes iroquoises avaient déjà atteint le territoire du Saint-Maurice en passant du lac Saint-Pierre par la rivière Machiche, et elles massacraient les Attikamègues ainsi que les autres Algonquins vivant dans ces territoires. Des groupes de Nipissiriniens, de Hurons, de peuples du haut de l'Ottawa, arrivaient par les cours d'eau du nord pour se réfugier à Trois-Rivières et à Québec. La désolation était répandue à 300 lieues à la ronde du côté de l'ouest. Le 11 mai deux hommes furent massacrés sur une ferme près de Trois-Rivières et deux autres à la rivière Champlain. La mère de l'Incarnation parle des coups qui se faisaient ce printemps autour de Québec. Le 7 juin 1650 le P. Bressani s'embarqua avec vingt-cinq ou trente Français et autant de Sauvages pour tenter de revoir les missions huronnes du Haut-Canada, mais tous ensemble revinrent avant que d'avoir remonté l'Ottawa. Les hommes qui n'avaient pas de famille s'enfuyaient vers le bas du fleuve dans l'espérance de rencontrer des navires qui les amèneraient hors de ce pays. Au commencement d'août, neuf Français furent tués à Trois-Rivières. L'année 1651 présenta un spectacle semblable.

Les Hurons, fuyant la hache de l'ennemi, arrivaient sans relâche implorer la protection de notre petite colonie. "Si cette poignée de monde que nous sommes en Canada d'Européens, ne sommes plus fermes que trente mille Hurons que voilà défaits par les Iroquois, il nous faut résoudre à être brûlés ici à petit feu avec la plus grande cruauté du monde, comme tous ces gens l'ont quasi été.

"Le secours ne peut venir que de la France parce qu'il n'y a pas assez de force dans tout le pays pour résister aux Iroquois."¹

¹ La M. de l'Incarnation, 30 août 1651.

Le fort de Trois-Rivières, situé sur la terre haute appelée le Platon, qui domine le fleuve, était, en 1641, entouré d'un fossé sec que l'on franchissait sur un pont-levis. Il n'y avait point de palissade pour entourer le fort, mais simplement quelques pièces de canon. Le village était placé à 300 pieds à gauche, côté nord-est, sur un autre plateau, un peu plus bas, communément nommé la Table, et dominant aussi le fleuve. A droite, on descendait brusquement plus de 60 pieds pour tomber dans la basse-ville aujourd'hui, où il y avait des cultures.

Il est dit, en 1648, que des prisonniers iroquois étaient détenus dans un bastion du fort, ce qui donne à croire que ce dernier formait une grande maison carrée, ayant aux angles des bastions ou demi-tourelles pour faciliter la défense. C'était là toute la fortification de la place, car le village était sans palissade. Toute la Table ou plateau de la haute-ville actuelle était cultivée, ou du moins en bonne partie défrichée, car elle était toute concédée ; c'est pourquoi il ne restait d'affecté aux pâturages que la prolongation de la basse-ville, dont M. de Montmagny accorda la concession aux habitants (1648) pour en faire une commune. Vers cette date, on comptait une vingtaine de terres concédées près du village et au cap de la Madeleine.

Le P. Jacques Buteux écrivait le 21 septembre 1649 : " Dans cette résidence des Trois-Rivières où nous donnons nos soins aux Français et aux Sauvages, nous n'avons pas d'autres forts que des forts en bois, et d'autres remparts què des marais desséchés où l'on peut aisément mettre le feu."

Le 6 juin 1651, à Trois-Rivières, Pierre Boucher, reçoit du gouverneur général une commission de capitaine de milice pour cette ville, portant instruction de diviser les habitants par escouades et de les exercer au maniement des armes.¹ Nous considérons cet acte comme le premier établissement officiel de la milice, dont la pensée fut reprise ou développée par le comte de Frontenac en 1673.

Le 17 mars 1650, la mère de l'Incarnation écrivait : " On assemble la jeunesse pour aller sur les Iroquois". Il est possible que cette jeunesse de Québec fût déjà organisée en milice, mais nous n'en savons rien de plus.

Les maraudeurs iroquois savaient fort bien s'attaquer aux bestiaux partout où ils en trouvaient. La commune de Trois-Rivières en renfermait un bon nombre dès 1648, et il y avait des prairies à foin au sud du fleuve, à Sainte-Angèle aujourd'hui. Au printemps de 1649 on envoya du blé à Québec, où régnait la disette. Il y avait alors près de vingt ans que le pays produisait du blé, des bestiaux, des cochons, des pois, du foin, sans compter le maïs indigène. " Les trois quarts des habitants ont par leur travail à la terre de quoi vivre", disait la mère de l'Incarnation le 1^{er} septembre 1652. Il est évident qu'elle oubliait Montréal, où cette proportion était beaucoup moindre.

¹ Voir *Revue canadienne*, 1879, p. 4.

“ Le secours venu de France cette année est absolument nécessaire aux Trois-Rivières, car à vrai dire, ce poste n'a pu subsister que par miracle.”

Le 25 octobre 1651 on apprit que les Iroquois avaient tué vingt-cinq Attikamègues sur la rivière Saint-Maurice.

Il y avait six ans que la colonie de Montréal était renfermée dans sa palissade, vivant des provisions apportées de France, lorsqu'elle se décida, en 1648-49, à faire des défrichements comme on en voyait autour de Québec, de Sillery, à Portneuf et à Trois-Rivières. La société dite de Montréal venait de se réorganiser à Paris. En 1651 on récolta du blé sur ces nouvelles terres, bien qu'on fût sans cesse harcelé par les Iroquois. Effrayés par ces maraudeurs, les Algonquins s'éloignaient de la place, diminuant par là même ses moyens de défenses. Enfin, toujours, remplis d'espoir, les colons attendaient des jours meilleurs.²

“ Les hommes qui composaient les trois premières recrues de Montréal ne furent pas des paysans d'une bien forte trempe. Le progrès de l'agriculture, pendant les premières années, fut, en effet, très lent. En 1646, d'après Dollier de Casson, on faisait encore tout venir de France. La sœur Morin nous apprend que “ tous ces colons restèrent près de onze “ ans renfermés dans le fort ”, y vivant en commun sans se créer d'établissement propre. Pendant ce temps, depuis plusieurs années déjà, dans le voisinage de Québec, les gens du Perche s'étaient établis sur des domaines isolés. Toutefois, n'oublions pas que les colons de Montréal étaient plus exposés que tous autres aux attaques des Iroquois, et ceci explique sans doute, en grande partie, leur longue inaction. Maisonneuve, d'Ailleboust, Closse étaient avant tout des chefs militaires. Maisonneuve était entré dans le métier des armes à l'âge de treize ans, et il y était toujours demeuré depuis. D'Ailleboust était très entendu dans l'art des fortifications. Tous deux se trouvaient éminemment qualifiés pour conduire les opérations militaires de la colonie, mais il faut reconnaître en même temps qu'ils étaient beaucoup moins aptes à jouer le rôle de patrons agricoles.

“ Les jésuites, comme la Société de Montréal, avaient eu, à l'origine, des protecteurs puissants et généreux : le duc de Ventadour, le marquis de Gamache, le commandeur de Sillery ; même la duchesse d'Aiguillon s'intéressait à eux, et leurs premières *Relations* célèbrent le grand nombre de personnes qui favorisent leurs missions d'Amérique. Avec le temps, la plupart de ces fondateurs étaient morts ou s'étaient désintéressés, et l'œuvre commencée réclamait toujours de nouveaux secours.³

“ L'œuvre de Montréal avait une raison pour ne point compter beaucoup sur l'appui du gouvernement de Québec ; celui-ci la voyait d'un

¹ *Relation*, 1651, p. 2. Quel était ce secours ? La mère de l'Incarnation le mentionne aussi dans ses lettres, édition Richaudeau, I, 460.

² Faillon, *Histoire de la Colonie*, II, 102-3, 107, 117.

³ Résultat : il fallait que le conseil de la colonie sustentât ces nécessités.

mauvais œil. Précisément parce qu'elle avait débuté avec éclat, et que, dès le premier jour, elle avait pu affirmer son indépendance, elle avait fait naître bien des jalousies. Québec n'avait pas oublié l'attitude fière des chefs montréalais qui ne voulaient point relever de son autorité, et maintenant que la nécessité contraignait Ville-Marie à se rallier à lui, c'est à contre-cœur qu'il la recevait."¹

En 1651, la sœur Bourgeois écrit que Montréal ne compte plus que dix-sept hommes en état de lutter contre les Iroquois. Le supérieur des jésuites constate qu'il "ne reste en tout qu'environ cinquante Français à Montréal"; il faut entendre par ces mots le total de la population.² Voyant la situation comme désespérée, M. de Maisonneuve prit le parti d'aller chercher du secours en France, laissant M. d'Ailleboust des Musseaux pour commander en son absence avec Lambert Closse.³

Cette année 1651 on abandonna les cinq ou six maisons habitées par des colons en dehors de l'enceinte fortifiée.

Québec n'était encore qu'une espèce de village dont les trente demeures étaient éparpillées sur le flanc du cap, la haute-ville et les environs.

Nous ne saurions dire combien de feux il y avait à Trois-Rivières, mais on y comptait vingt-huit ménages formant une population stable de 100 âmes.

Tout le Canada pouvait renfermer 600 Français : hommes, femmes et enfants compris.

Ce qui manquait toujours au pays, c'était une force militaire suffisante pour protéger les cultivateurs et même la traite des fourrures, puisque le Haut-Canada était perdu pour le commerce et que le Saint-Maurice et le Saguenay venaient de tomber au pouvoir des Iroquois. Les gentils-hommes de la compagnie des Habitants s'aveuglaient étrangement sur la situation et, tant pour leur compte que dans l'intérêt de tous, leur ligne de conduite attire peu l'admiration, d'après ce que nous connaissons d'eux et ce qu'exposa vers 1676 Aubert de la Chênaye : "Il ne leur fut pas difficile de trouver de gros crédits à la Rochelle, parce que l'on empruntait au nom de la communauté, quoiqu'elle ne consistât qu'en six familles. Lesquelles de pauvres se trouvant dans de gros managements agrandirent leurs maisons, et leur mauvais ménage altéra leur crédit et leur fit prendre conseil après quelques années de jouissance, pour ne pas payer la Rochelle, qui s'en plaignit à Paris⁴ et, après beaucoup de sollicitation, on créa un syndic pour faire des obligations au nom de la communauté pour de grosses sommes encore dues à la ville de la Rochelle. Leurs vaisseaux

¹ Léon Gérin, *la Science sociale*, Paris, 1891, pp. 556-7, 564-6.

² Dans l'*Histoire des Canadiens-Français*, III, 27, nous avons pris les mots "cinquante Français" pour autant d'hommes; c'était une erreur.

³ Faillon, *Vie de la sœur Bourgeois*, I, 30; *Histoire de la Colonie*, II, 130-33; *Relation*, 1651, p. 2; *Journal des jésuites*, 157-9; Ferland, *Cours*, I, 399; Sulte, *Histoire des Canadiens-Français*, III, 26.

⁴ Aux Cent-Associés, toujours responsables des affaires du Canada.

tous portés en Normandie, ils y firent leurs embarquements en partie à la Rochelle. Le gouverneur et les familles s'entrefaisaient des reproches et le roi ayant bien voulu les écouter, eut la bonté de nommer du corps de la compagnie¹ des personnes de la première dignité pour prendre attention à ce qui se passait dans cette colonie. Ce furent MM. de Morangis, de la Marquerie, Verthamont et Charm, et depuis M. de Lamoignon, de Boucherat et de Lauzon, ce dernier, aussi du corps de la compagnie, s'offrit de passer au pays pour accommoder les difficultés. Son embarquement se fit à la Rochelle. C'était un homme de lettres."²

Jean de Lauzon ne figure pas dans la première liste des Cent-Associés en 1627, mais il n'en était pas moins activement occupé de l'établissement du Canada depuis cette date et il continua ainsi jusqu'à 1663. A vrai dire, il fut la cheville ouvrière de la compagnie durant ces trente-six années, si bien qu'il transporta avec lui à Québec le siège de l'administration et que de 1651 à 1657, on semble n'avoir point tenu compte du bureau de Paris.

Les trois années du gouvernement de M. d'Ailleboust devant expirer l'automne de 1651, la compagnie des Cent-Associés tint une séance à Paris chez le sieur Cheffault, son secrétaire. Le 2 janvier 1651 les noms de Jean de Lauzon, Duplessis-Kerbodeau³ et Robineau Bécancour furent présentés au roi et à la reine pour le choix d'un gouverneur pendant trois ans. Lauzon fut accepté.⁴

Le 14 octobre M. de Lauzon arrivait à Québec avec M. Duplessis-Kerbodeau, nommé gouverneur de Trois-Rivières. Les appointements de ce dernier étaient élevés à 5,250 livres. Il y a apparence que Robineau avait fait le voyage avec eux. Tous ces commerçants de fourrures s'entendaient ensemble.

Pour compenser l'augmentation accordée à M. Duplessis, on venait de retrancher 1,000 francs à M. de Maisonneuve sur ce qui lui était versé annuellement depuis 1648 pour lui et sa garnison, le réduisant par là à 3,000 francs. Le gouverneur général obtenait pour lui-même un supplément de 2,000 livres, sans autre charge que d'accroître la garnison de Québec de trois soldats. Le 9 novembre M. de Maisonneuve s'embarqua pour la France.⁵

"L'arrivée de Lauzon, en 1651, inaugura les misères et les humiliations de Villemarie. Le premier acte du nouveau gouverneur fut de retrancher à Maisonneuve le supplément de 1,000 livres qui lui avait été accordé sous d'Ailleboust. A Québec, remarque amèrement M. Faillon, le conseil attribuait des pensions aux jésuites, aux hospitalières, à la

¹ Parmi les Cent-Associés.

² *Documents de la Nouvelle-France*, Québec, 1883, I, 250.

³ Ce doit être un autre individu que Duplessis-Bochart qui commandait la flotte du Canada en 1632-37. Voir le *Bulletin des Recherches historiques*, Lévis, 1896.

⁴ Dollier de Casson, *Histoire du Montréal*, Addenda, p. 265.

⁵ *Histoire des Canadiens-Français*, III, 15, 28, 30, 34, 37, 139; V, 59.

fabrique de la paroisse, au chirurgien, au boulanger et à beaucoup d'autres, et il n'y avait pour Villemarie que 3,000 livres destinées au gouverneur et à sa garnison, et 1,000 livres pour le garde-magasin de la compagnie des Habitants." 1

L'état des affaires, à Paris, était déplorable. La guerre civile s'y continuait de plus belle. L'arrangement ou paix de Rueil, en 1649, avait bien terminé la vieille Fronde ou Fronde parlementaire, mais la dispute se ravivant sous une nouvelle forme, mademoiselle de Montpensier et le prince de Condé se prononcèrent contre la cour, tandis que Turenne, tournant le dos aux mécontents, se mit au service de cette même cour qu'il venait de combattre. La reine, Mazarin, avec le roi (âgé de neuf ans), avaient une première fois quitté Paris, le 13 septembre 1648, pour Saint-Germain ; ils étaient rentrés dans la capitale peu après, mais le 6 janvier 1649, il leur avait fallu retourner à Saint-Germain. C'est après cela que la grande Mademoiselle s'était révoltée, se mettant à la tête de la Fronde des seigneurs, parce que les princes de Condé, de Conti et de Longueville venaient d'être arrêtés (18 janvier 1650). Condé fut bientôt libéré et prit les armes. Au premier moment, Mazarin feignit d'assumer tout le blâme que l'on imputait à la cour et, pour sauver celle-ci, s'exila à Cologne. Telle était la situation lorsque M. de Maisonneuve arriva en France. La cour était réfugiée à Saint-Germain. Le roi venait de déclarer sa majorité par un lit de justice, le 7 septembre 1651. Condé, battu par Turenne sous les murs de Paris, rentra dans la ville ayant son adversaire sur ses talons, le 2 juillet 1652. Mademoiselle fit tirer le canon de la Bastille pour protéger la retraite du prince et se crut un moment victorieuse pour toujours ; cependant les intérêts en jeu de part et d'autre semblèrent se concilier, la cour retourna à Paris le 21 octobre. Mademoiselle fut envoyée dans ses terres, Mazarin reprit le pouvoir (3 février 1653) avant même que tout fût pacifié, car la lutte ne se termina qu'à la fin de 1653.

Les nouvelles de France avaient parmi nous un retentissement qui paralysait les courages. Les Iroquois étaient au courant de tout cela et redoublaient d'ardeur et de confiance. La mère de l'Incarnation dit en quelques mots (26 septembre 1652) combien peu l'on comptait sur le secours de la mère-patrie.

L'année 1652 s'annonçait au Canada sous de fâcheux auspices. Le danger de plus en plus menaçant du côté des Iroquois, joint à la certitude maintenant acquise du peu de secours sur lequel on pouvait compter de la part de la France, mettait la petite colonie au bord d'un abîme dans lequel chacun se voyait rouler, pour ainsi dire.

Les nouvelles reçues de sources diverses portaient que le point de concentration et d'attaque des Iroquois serait Trois-Rivières. Il y a apparence que le camp volant passa dans ce lieu une partie de l'hiver de 1651-52, ou qu'il s'y rendit de bonne heure au printemps. Dès les pre-

¹ Léon Gérin, *la Science sociale*, Paris, 1891, p. 566.

miers jours de mars, M. de Lauzon, grand sénéchal, accompagné de René Robineau et de quinze soldats, y fit une visite. Déjà les ennemis avaient commencé leurs ravages dans les environs.

Voici un trait que raconte M. Dollier au sujet de M. de Lauzon : "Celui-ci avait promis à M. de Maisonneuve dix soldats dont il lui avait fait passer les armes par avance ; il envoya ces dix hommes au Montréal, mais il les fit partir si tard (automne de 1652) et les mit si nus dans une chaloupe qu'ils y pensèrent geler de froid ; on les prenait pour des spectres vivants qui venaient, tout squelettes qu'ils étaient, affronter les rigueurs de l'hiver. C'était une chose assez surprenante de les voir venir en cet équipage en ce temps-là, d'autant plus qu'il était le 10 décembre ; cela fit douter longtemps que ce fussent des hommes et on ne s'en put convaincre que lorsqu'on les vit de fort près ; au reste ces hommes étaient les plus malingres si nous regardons leur constitution ; même deux de ces dix étaient encore enfants, lesquels à la vérité, sont depuis devenus de fort bons habitants dont l'un s'appelle St-Ange,¹ et l'autre se nommait La Chapelle.² Ces pauvres soldats ne furent pas plutôt ici (à Montréal) qu'on tâcha de les réchauffer le mieux qu'on put en leur faisant bonne chère et en leur donnant de bons habits, et ensuite on s'en servit comme des gens à repousser les Iroquois que nous avons tous les jours sur les bras."³

Montréal n'espérait rien de bon du nouveau gouverneur général et cela explique le voyage de M. de Maisonneuve en France.

"1652, M. de Lauzon fut gouverneur à la place de M. d'Ailleboust ; persécuta Lemoine et retrancha mille livres à M. de Maisonneuve que la compagnie lui donnait, dont il fut puni, en ce que les Iroquois prirent dans cette année le reste des Hurons réfugiés à l'île d'Orléans, tuèrent l'ainé et une partie de la famille du sieur de Lauzon, le tout à la vue de Québec. Le Montréal était dans un grand péril."⁴

"En 1662, Lauzon supprima le camp volant ; c'est-à-dire qu'il fit perdre à Villemarie la plupart des avantages qu'elle avait retirés de l'administration de M. d'Ailleboust. Plus tard même, il tenta, sans y réussir, de prélever un droit sur les marchandises qui passaient devant Québec à destination de Montréal."⁵

Le 7 juillet 1652, à Trois-Rivières, le major Lambert Closse,⁶ de la garnison de Montréal,⁷ et M. des Mazures, officier du camp volant, sont présents à un contrat de mariage.⁸

¹ André Charly dit Saint-Ange.

² Honoré Langlois dit Lachapelle.

³ Dollier de Casson, *Histoire du Montréal*, p. 82 ; Faillon, *Hist. de la Colonie*, II, 136 ; *Hist. des Canadiens-Français*, III, 37-8.

⁴ Belmont, *Histoire du Canada*, p. 6.

⁵ Léon Gérin, *la Science sociale*, Paris, 1891, p. 566.

⁶ Major ? Sergent-major probablement.

⁷ M. de Maisonneuve étant parti pour la France, l'automne de 1651, M. des Musseaux avait reçu le commandement de Montréal.—Dollier, *Histoire du Montréal*, pp. 81, 83, 86.

⁸ Greffe d'Ameau.

Le 5 août 1652, à Trois-Rivières, dans un acte d'Ameau, on lit : “Guillaume Guillemot, Escuyer, sieur Duplessis Kerbodot, capitaine du camp volant, gouverneur du fort et habitation des Trois-Rivières, nommé par M. de Lauzon¹” ; il achète une terre en cette occasion.

Au combat de la banlieue de Trois-Rivières, le 19 août suivant, sont tués ou amenés prisonniers par les Iroquois : M. Duplessis-Kerbodeau, et les nommés Langoulmois, Lapalme, Lagrave, Saint-Germain et Chailon, tous soldats.²

En octobre 1652, le major Closse marche contre les Iroquois avec vingt-quatre hommes de Montréal, ce qui nous semble avoir été alors le chiffre total des gens en état de porter les armes dans cette ville. M. de Maisonneuve écrit de France qu'il lui faut au moins cent hommes de renfort pour que les Français se maintiennent à Montréal.³

Le 4 novembre 1652, Nicolas Rivard,⁴ “capitaine de milice du cap de la Madeleine”, vend une terre à Gilles Trottier.⁵ Il portait le même titre l'année précédente.

Au milieu de décembre 1652, les Iroquois enlevèrent deux Hurons près de Trois-Rivières, puis ils construisirent un fort à 3 lieues dans les bois, à l'ouest du village, afin de couper le chemin aux chasseurs qui fréquentaient ces endroits durant la saison des neiges. Pareille démarche ne s'était pas encore vue dans le Bas-Canada. On fortifia, tant bien que mal, le poste de Trois-Rivières, et l'hiver se passa en faisant bonne garde. Sitôt que le fleuve fut libre, au printemps de 1653, les bandes de maraudeurs reparurent, guettant les chasseurs et les hommes travaillant à la campagne.

Le commerce des pelleteries se ressentait de l'influence fâcheuse de toutes ces guerres. En 1653, le peu de traite qui se fit à Trois-Rivières procura quelques ressources qui furent appliquées aux fortifications. Le castor, la branche la plus considérable de ce commerce, y fut presque nul. Pas une seule peau de ce genre ne fut apportée à Montréal cette année, quoique la chasse eût été plus abondante que d'ordinaire. Tout allait donc aux Iroquois qui trafiquaient avec les Hollandais. Du côté du nord du Saint-Laurent on commençait à ouvrir des relations avec des peuples inconnus, mais déjà les Iroquois rôdaient aux sources du Saint-Maurice et du Saguenay, et bientôt nous allions les voir terroriser tous les postes du nord, y compris Tadoussac.

M. de Lauzon, voyant que la traite du Haut-Canada et du Saint-Maurice ne rapportait plus rien, forma une compagnie de quelques marchands de Québec pour exploiter celle du Saguenay, dont la compagnie

¹ Vers la fin de l'administration de M. de Montmagny (1648) on avait séparé de son pouvoir la nomination du gouverneur de Trois-Rivières.

² *Journal des jésuites*, p. 174-5. Greffe d'Ameau, 1651-1663.

³ Dollier, *Histoire du Montréal*, p. 86-7.

⁴ Ancêtre de Sévère Rivard, maire de Montréal en 1880.

⁵ Greffe d'Ameau.

dite des Habitants possédait le monopole depuis quatre ou cinq ans. On accusait ces Habitants¹ d'être en déficit de plus d'un demi-million de francs. M. Aubert de la Chênaye, cité plus haut, blâme fortement leur conduite.

Cinquante Français (des habitants sans doute), que M. de Lauzon avait enrôlés pour faire un camp volant, partirent de Sillery le 2 juillet 1653, sous la conduite d'Eustache Lambert,² dans l'intention de remonter le fleuve et de contenir les Iroquois qui se montraient par bandes à divers endroits du pays. Le plan des Iroquois consistait à bloquer Trois-Rivières et à emporter la place ; pour cela ils marchaient au nombre de plusieurs centaines, qui apparurent à la fois sur les côteaux et sur le fleuve, coupant toutes les communications. Un de leurs détachements enleva près de Québec le père Poncet, jésuite, dont ils se servirent bientôt pour demander la paix, car la défaite humiliante qu'ils subirent le 22 août à l'assaut de Trois-Rivières (où commandait Pierre Boucher) leur inspira de ruser comme de coutume en parlant de la paix. On y consentit, ne pouvant faire autrement ; il y eut échange de prisonniers ; l'automne vit la joie et la tranquillité régner partout. Bien entendu que nos gens ne comptaient pas trop sur la durée de ce calme surprenant, mais dans l'espoir des secours de France, c'était toujours du temps de gagné. Cette trêve, en somme, dura une trentaine de mois qui furent marqués par quelques coups isolés des Iroquois dans nos campagnes. Les principales forces de ce peuple étaient alors occupées contre les autres nations sauvages qui les avoisinaient, à l'est et au sud de leur pays. On se souvient que, auparavant, ils avaient conquis le Haut-Canada. Nous les verrons, après quelques années, entreprendre la conquête de l'Ouest et y parvenir. Tout cela, parceque nous n'avions un peu de troupes de notre côté pour aller mettre le feu chez les Iroquois et par là protéger nos cultivateurs. On a fait l'éloge de ce régime inqualifiable !

Le 8 septembre 1653 eut lieu la procession du jubilé à Québec, où l'on pria pour obtenir du ciel le prompt retour de M. de Maisonneuve avec les renforts qu'il avait promis d'amener de France. Le *Journal* des jésuites renferme la note suivante : " Les Onneyouts voyent la procession où il y avait plus de 400 fuseliers en bel ordre." La *Relation* de 1659, p. 18, dit de son côté : " On fit marcher quatre cents mousquetaires bien armés... qui donnèrent de l'épouvante aux Iroquois... ce qui les fit juger que cette paix leur était d'autant plus nécessaire qu'ils remarquaient d'adresse en nos Français à manier les armes, dont ils venaient d'expérimenter quelques effets aux Trois-Rivières." M. l'abbé Faillon (II, 171) commente ainsi ces textes : " On doit supposer que la plupart des hommes armés de la sorte étaient des Sauvages de Sillery ou de l'île d'Orléans, et que ces quatre cents mousquetaires n'étaient pas capables d'inspirer une grande

² Voir *Société royale du Canada*, 1896, pp. 14-17.

³ Il était dans le pays depuis une dizaine d'années.

terreur, puisque les cent hommes que M. de Maisonneuve conduisait étaient regardés et furent, en effet, comme les sauveurs du pays.”

“ De 1648 à 1652, quelques-uns commencèrent à faire de la culture (Montréal) à leur compte et, en 1653, Villemarie prit enfin la forme d’une véritable colonie. Cette année-là, Maisonneuve amena de France cent cinq colons recrutés principalement dans le Maine et dans l’Anjou. Un grand nombre de ces derniers se firent concéder des étendues de terre et, à l’aide des gratifications que leur accorda la société de Notre-Dame de Montréal, commencèrent à exploiter leurs concessions.”¹

D’après la mère de l’Incarnation, il y avait, en 1653, “ plus de deux mille Français ” dans la colonie, mais nos calculs ne montrent pas plus de 675 âmes dans la population fixe, de sorte que, si l’on y ajoute les “ Français”, population flottante, on est à peine justifiable de dire qu’il y avait en tout 900 âmes. La mère de l’Incarnation a dû écrire : “ près de mille ” et les copistes ont lu : “ plus de deux mille”. M. l’abbé Ferland,² prenant le chiffre de deux mille au sérieux, observe que “ c’était bien peu encore pour une colonie commencée depuis quarante-cinq ans, tandis que les colonies de la Nouvelle-Angleterre, suivant Josselyn, renfermaient 100,000 âmes quelques années plus tard. D’après des manuscrits de la sœur Bourgeois cités par M. l’abbé Faillon, il n’y aurait eu que cinq ou six maisons dans la haute-ville de Québec et quelques magasins à la basse-ville. La sœur ne parle sans doute que des maisons qui se trouvaient dans le voisinage des ursulines ou de l’hôtel Dieu...” et il continue en énumérant le Cap-Rouge, Sillery, la côte Sainte-Geneviève, N.-D.-des-Anges, Longue-Pointe, Château-Richer, Beauport, l’Ange-Gardien, le cap Tourmente et la côte de Lauzon, tous lieux où il y avait quelques habitants—mais ce n’était point la ville.

Nos calculs donnent 675 âmes pour toute la population française stable du Canada, l’été de 1653, savoir : 400 pour Québec et son groupe, 175 pour Trois-Rivières et le cap de la Madeleine, 100 pour Montréal.

A la fin de septembre de cette année, M. de Maisonneuve amena de France un contingent de cent à cent-huit hommes, la plupart ayant un métier, mais n’étant ni cultivateurs ni soldats—ce qui n’empêche point M. Dollier et, après lui maint auteur de les qualifier de “ recrues ” et d’ajouter qu’ils allaient défendre Montréal. On en a fait ainsi des recrues militaires. La vérité est que, à partir de 1657, ils ont été obligés de prendre les armes contre les Iroquois qui redevenaient dangereux et une quarantaine, sinon cinquante de ces braves gens périrent dans les combats des années suivantes.

Le lecteur a pu voir, au cours du présent article, quel genre de colonie les pompeux auteurs de la charte des Cent-Associés, Richelieu en tête,

¹ Léon Gérin, *la Science sociale*, Paris, 1891, p. 557.

² *Cours*, I, 414.

avaient imaginé et mis en pratique, pour justifier les écrivains actuels qui trouvent toute chose admirable au Canada durant les *temps héroïques*, c'est-à-dire alors que la mauvaise foi des gouvernants exploitait la patience, l'industrie et le courage des colons.

IV.—*Encore le P. de Bonnécamp (1707-1790)*,

Par M. L'ABBÉ AUGUSTE GOSSELIN, DOCTEUR ÈS LETTRES.

(Lu le 22 juin 1897.)

I

Le Mémoire que j'eus l'honneur de présenter à la Société royale, il y a deux ans, sur le P. de Bonnécamp, dernier professeur d'hydrographie au collège de Québec avant la conquête,¹ a reçu du public un favorable accueil. De la France, surtout, me sont venues plusieurs lettres de bienveillante sympathie, me félicitant d'avoir mis en relief la figure de ce modeste savant, et donné quelque idée du mouvement littéraire et scientifique du Canada à l'époque où il vivait.

C'est une histoire trop peu connue que celle de l'instruction publique au Canada sous le régime français. Je n'ai pas la prétention de l'écrire : je tiens seulement à constater que l'on visait généralement, à cette époque, à donner à la jeunesse une instruction pratique, en rapport avec les besoins du temps. M^{gr} de Laval ne se contente pas de fonder un séminaire : il établit à Saint-Joachim une école des arts et métiers, dont l'intendant Champigny vante plus d'une fois les bienfaits résultats.² Au Séminaire même, on accoutume les élèves, durant les récréations, à des travaux utiles : et l'on peut voir encore aujourd'hui, dans une chapelle intérieure, des ouvrages de sculpture, travaillés par les élèves de MM. de Bernières et de Maizerets, que ne désavoueraient pas les hommes du métier. Quelques années plus tard, les frères Charon établissent aussi une école des arts et métiers à Montréal. Talon, écrivant à Colbert, n'a pas assez d'éloges pour M. de Queylus, qui déploie un grand zèle "pour faire élever les garçons dans son séminaire, et les filles chez des personnes du même sexe qui forment à Montréal une espèce de congrégation pour enseigner à la jeunesse, avec les lettres et l'écriture, les petits ouvrages de main".³

M. de Denonville se plaint de la mauvaise éducation—ne confondons pas l'éducation avec l'instruction—des enfants, et de "la grande liberté que de longue main les pères et mères ont donnée à la jeunesse, dans les familles de ceux qui sont gentilshommes, ou qui se sont mis sur le

¹ *Mémoires de la Société royale du Canada*, seconde série, t. I, p. 25.

² "Le Séminaire (de Québec) a un établissement considérable au cap Tourmente (Saint-Joachim), sept lieues au-dessous de Québec, où l'on élève et instruit quantité de jeunes gens, fils d'habitants; et le tout se conduit avec beaucoup d'ordre et d'avantage pour la colonie..." (Archives du ministère des Colonies, Canada, Correspondance générale, vol. XVII, Lettre de Champigny au Ministre, Québec, 20 oct. 1699.)

³ *Ibid.*, vol. III, Mémoire de Talon à Colbert, Québec, 10 nov. 1670.

ped de le vouloir être, soit par fainéantise ou par vanité.... N'étant pas accoutumés à tenir la charrue, la pioche et la hache, toute leur ressource n'étant que le fusil, il faut qu'ils passent leur vie dans les bois, où ils n'ont ni curés qui les gênent, ni pères ni gouverneurs qui les contraignent." Le Ministre lui répond : "J'écris à l'évêque (M^{gr} de Saint-Vallier) de choisir de bons prêtres, capables, et qui s'appliquent principalement à instruire la jeunesse, en observant de ne pas pousser trop loin les instructions pour l'état ecclésiastique, étant important de n'y admettre que ceux qui seront nécessaires pour le bien spirituel de la colonie, sans trop multiplier le nombre des prêtres. Sa Majesté approuve extrêmement qu'on apprenne des métiers aux enfants pour devenir avec le temps de bons artisans.¹"

Ce que l'on paraît avoir à cœur au Canada sous le régime français, c'est de voir se former une élite de marins instruits et expérimentés; c'est de voir la jeunesse canadienne se livrer à l'étude des mathématiques et de l'astronomie, de manière à pouvoir se rendre utile dans les voyages d'explorations et de découvertes, prendre la hauteur des différents endroits parcourus, et en dresser des cartes.

Je lis dans un mémoire adressé à la cour en 1671 : "Une Académie de Marine semblerait fort utile à Québec, afin d'instruire les enfants du pays qui ne sont pas de condition à se mettre en autre métier; après quoi on les mettrait sur des barques pour qu'ils s'accoutumassent à la mer, et on leur ferait faire ensuite quelque chose de plus pour les rendre peu à peu bons pilotes et propres à faire des découvertes. Cela vaudrait bien mieux pour eux et pour le pays que le latin qu'on leur fait apprendre..."²

La même année, à la demande de Talon, Martin Boutet, "excellent mathématicien," se charge de donner à Québec un cours d'hydrographie; et désormais ce cours se continuera sans interruption jusqu'à la conquête. Après Martin Boutet, vient Jean-Baptiste-Louis Franquelin, puis l'illustre découvreur du Mississipi, Jolliet. En 1687, je lis dans une lettre de MM. de Denonville et de Champigny au Ministre : "Si Monseigneur emploie le sieur Franquelin pour les cartes, nous jugeons qu'il ne saurait mieux faire que de charger les Pères Jésuites de l'instruction des enfants du pays à l'hydrographie. Ils nous promettent de faire une classe particulière pour cela..."³

Ce n'est cependant qu'en 1708 que les jésuites sont chargés par la cour de France de la chaire officielle d'hydrographie, ou, comme on disait alors à Québec, de l'*Ecole royale de Mathématiques*. Dans cette chaire, on voit successivement installés des hommes du plus haut mérite, comme par exemple les PP. Le Brun et Lauson. Le P. Le Brun était professeur d'hydrographie en 1717, et c'est à son sujet que MM. de Vaudreuil et Begon

¹ Arch. du min. des Col., Can., C. G., vol. VII, Lettre de Denonville au Ministre, Québec 13 novembre 1685; vol. VIII, Réponse du Ministre, 20 mai 1686.

² *Ibid.*, vol. III.

³ *Ibid.*, vol. IX.

écrivait au Ministre ¹ : “ Le P. Le Brun, qui enseigne ici l’hydrographie, sera payé, suivant les ordres du Conseil (de la Marine), comme les officiers, et nous tiendrons la main à ce que ses écoliers prennent ses certificats pour être reçus pilotes ou officiers sur les navires... ” ² ”

Le P. de Bonnécamp occupait, comme nous l’avons vu, la chaire d’hydrographie au collège de Québec, de 1744 à 1759. On aimerait à connaître les noms des jeunes Canadiens qui suivirent son enseignement. Plusieurs d’entre eux, sans doute, devinrent officiers sur nos vaisseaux ou dans nos troupes, et prirent part aux différents engagements qui précédèrent la fin de la domination française dans notre pays.

Malheureusement, je n’ai rien sur ce sujet pour compléter mon premier Mémoire.

II

En revanche, je tiens de la bienveillance d’un savant astronome de l’Observatoire de Paris, M. Bigourdan, trois lettres inédites du P. de Bonnécamp, que je suis heureux d’offrir aujourd’hui à la Société royale. Elles nous font connaître et apprécier davantage la nature de ses études, de ses travaux, de son caractère et de son talent.

Ces lettres sont adressées à Joseph-Nicolas Delisle, l’un des quatre frères—le cadet—qui brillèrent du plus vif éclat, au siècle dernier, dans le monde savant. Les trois autres étaient Guillaume, Simon-Claude, et Louis. L’aîné, Guillaume, est l’auteur d’une *Carte des Environs du Mississipi*, qui fut présentée au bureau de la Marine par M. d’Iberville, en 1701 ³, et

¹ Arch. du min. des Col., Can., C. G., vol. xxxviii.

² Le certificat du professeur d’hydrographie était aussi requis pour les arpenteurs. Le 12 janvier 1753, Bigot nomme arpenteur pour le gouvernement de Montréal, J.-Bte Perrot, sur le certificat “ du P. Bonnecamp, jésuite et professeur de mathématiques, daté à Québec le 22 septembre dernier, comme ledit Perrot est capable d’exercer le dit office d’arpenteur.” (*Jugements et Ordonnances des Intendants*, vol. XXXIX, Ordonnances de Bigot.)

³ Voici la description de cette carte, telle que je la trouve dans une brochure publiée à Paris en 1892, intitulée *Quatrième Centenaire de la Découverte de l’Amérique. Catalogue des Documents géographiques exposés à la Section des Cartes et Plans de la Bibliothèque Nationale*, p. 50 :

“ DELISLE (Guillaume).—Carte des environs du Mississipi, par G. de l’Isle, géogr. Donnée par M. d’Iberville en 1701.—M^s, 1,02 sur 0,73.

“ (Belle carte donnant la route des Espagnols à la Baie St-Louis, celle de Cavelier, de la Baie St-Louis aux Arkansas, celle que les Anglais tiennent de la Caroline pour venir aux Chicassas. Les noms de villages et de villes sont accompagnés du nombre des feux. “ Dans la ville de Mexique, il y a trois lieux de longueur et presque autant “ de largeur, et dont les maisons sont très belles ; il y a plus de 4,000 carrosses, plus “ de cent églises, quantité de couvents de religieux et de religieuses ; il y a plus de “ 6,000 Espagnols et Espagnoles ; il y a plus de 200,000 Indiens et Indiennes, et plus “ de 100,000 esclaves noirs et blancs ; en tout plus de 400,000 habitants, sans compter “ les enfants, et des richesses immenses.” Cette carte embrasse en latitude l’espace compris entre Checagou et Valladolid au Mexique.)

“ Bibliothèque du Dépôt de la Marine. C. 4040.”

d'une autre intitulée *Carte des Antilles françaises et des Iles voisines, dressée sur les Mémoires manuscrits de M. Petit, Ingénieur du Roi*¹. Simon-Claude et Louis s'occupèrent surtout de travaux historiques. Leur père, Claude Delisle, fut lui-même un des plus illustres savants de son temps.

Je ne sais comment ni à quelle époque le P. de Bonnécamps se mit en rapport avec Joseph-Nicolas Delisle. Il est probable cependant que ce fut à la suite de son voyage à la Belle-Rivière, où il accompagna Céloron de Blainville, en 1749. La narration de ce voyage, et surtout la carte qu'il en dressa², le mirent en vue, à Paris, parmi ceux qui s'occupaient de géographie et de découvertes. En 1754 Delisle lui donna connaissance de ses propres travaux, et le P. de Bonnécamps lui répondit dans l'autonne par la lettre suivante :

“ Québec, ce 30 octobre 1754. Monsieur, Je ne saurais assez vous remercier de la bonté que vous avez eue de m'envoyer une copie de la carte de vos découvertes dans le nord de l'Amérique. Cette partie de la géographie ignorée jusqu'à présent commence enfin à se développer, et si quelqu'un de nos savants avait le courage de marcher sur vos traces, on ne tarderait pas à avoir l'éclaircissement d'un point très intéressant pour la religion : je veux dire la communication du nouveau avec l'ancien continent.

“ Quant au mémoire de l'amiral de Fonte, c'est grand dommage qu'une pièce de cette conséquence soit perdue, ou du moins qu'elle ne se retrouve qu'entre des mains étrangères et dépourvue de cette authenticité qui écarte les soupçons et ramène la confiance dans les esprits.

“ J'arrive d'un assez long voyage³ qui m'a donné occasion de faire

¹ “ Carte des Antilles françaises et des îles voisines, dressée sur les Mémoires manuscrits de M. Petit, ingénieur du Roi, et sur quelques observations par Guillaume Delisle... Paris, l'auteur, juillet 1717.—0,37 sur 0,64.

“ (Toute la partie depuis Sainte-Lucie, jusques et y compris La Grenade, est manuscrite et refaite par Ph. Buache, genre de l'auteur.)

“ Bibl. Nat. Cartes Klaproth, 573.” (*Quatrième Centenaire*, p. 33.)

² “ Carte d'un voyage fait dans la Belle-Rivière (Ohio) en la Nouvelle-France, 1743, par le R. P. Bonnécamps, jésuite mathématicien.—Ms. 0,30 sur 0,81.—Bibl. du Dépôt de la Marine. B. 4044.” (*Ibid.*, p. 42).

³ Ce voyage est mentionné dans une Ordonnance de Bigot, en date du 18 juin 1751 : “ Etant nécessaire de nommer une personne capable de faire les fonctions d'Hydrographe du Roy, en l'absence du P. Bonnécamps, détaché pour le service, nous avons commis et établi le R. P. Floquet, jésuite, pour remplir la dite fonction pendant le temps de son absence seulement.”

L'année précédente, le P. de Bonnécamps avait fait un autre voyage : une ordonnance de Bigot, en date du 20 juillet 1753, nous apprend qu'il avait été “ envoyé dans les pays d'en-haut ” :—“ Ayant été obligé, pour le service de Sa Majesté, d'envoyer dans les pays d'en-haut le Sieur Bonnécamps, jésuite, géographe du Roy, et étant informé de la capacité du R. P. Billard, aussi jésuite, nous l'avons commis et établi en la dite capacité de géographe du Roy pour en faire les fonctions en l'absence du dit P. Bonnécamps.” (*Jugements et Ordonnances des Intendants*, vol. XXXIX, Ordonnances de Bigot.)

plusieurs observations géographiques. Je ne manquerai pas de vous les communiquer sitôt qu'elles seront en état de paraître. J'ai l'honneur, etc., DE BONNÉCAMPS."

Delisle reçut cette lettre le 30 janvier 1755. Il fut heureux de voir le P. de Bonnécamp si résolument engagé dans la voie des observations scientifiques. Il lui écrivit de nouveau pour le féliciter de ses travaux, et se permit de lui faire quelques remarques.

Le P. de Bonnécamp lui répondit dans l'automne de 1755. Sa lettre nous fait connaître au prix de quelles fatigues et de quels ennuis se faisaient alors ces excursions scientifiques, de quelle provision de patience il fallait être pourvu pour n'y pas succomber, et quel mérite on avait de se livrer à ces travaux tout en se rendant compte qu'on n'avait pas ce qu'il fallait pour opérer avec précision.

Du reste, les beaux jours des observations scientifiques sont désormais passés. La guerre de Sept Ans vient d'éclater en Europe, et le mouvement des hostilités se propage à travers les forêts, les rivières et les lacs de la Nouvelle-France. L'année 1755 fut témoin des scènes lugubres et odieuses de la dispersion des Acadiens ; elle vit aussi la glorieuse bataille de la Monongahéla et la défaite du baron Dieskau. Pendant que nos intrépides bataillons s'élançaient de côté et d'autre pour défendre le sol de la patrie, le P. de Bonnécamp, au collège de Québec, se livre à ses études favorites, recueille ses notes, complète ses travaux. Il écrit à Delisle :

"Québec, 23 octobre 1755. Monsieur, Dans la lettre que j'eus l'honneur de vous écrire l'année dernière, je vous avais promis de vous envoyer cette année la carte des lacs Ontario, Erié et Huron, avec celle de l'Ohio ou Belle-Rivière, corrigée ; mais n'ayant pu vérifier à Québec quelques-unes des hauteurs que j'ai prises dans mon voyage, j'ai été obligé d'interrompre mon ouvrage, et d'en remettre la continuation jusqu'à ce qu'un temps plus favorable me permette de reprendre les mêmes hauteurs, et de voir par la comparaison que j'en ferais avec la latitude de Québec si elles sont exactes, ou du moins de quelle quantité est l'erreur.

"Vous me paraissez approuver la méthode dont je me suis servi pour fixer les principaux points de la route que j'ai tenue. Cependant vous souhaiteriez avoir quelques longitudes déterminées par des observations astronomiques. Je conviens avec vous que rien ne serait plus propre à rectifier l'estime des distances, qui, malgré les plus grandes attentions, n'est jamais sans erreur.

"Mais quand vous saurez la façon dont on voyage dans ce pays, vous n'aurez pas de peine à avouer que la chose est presque impossible : on a pour voiture un canot d'écorce, qui peut à peine contenir les choses les plus nécessaires à la vie ; d'ailleurs on part à une ou deux heures du matin, et l'on ne campe que longtemps après le coucher du soleil. Si l'on fait des stations, ce n'est que dans de mauvais temps, qui permettent aussi peu d'observer que de marcher. J'ai été même obligé, dans le lac Erié,

de me séparer tout à fait du convoi pour prendre hauteur aux environs de la baie de Sandouski. Pour avoir quelque chose de bien exact, il faudrait que le géographe fût maître de diriger sa route, et non pas obligé comme je l'ai été de suivre un détachement de troupes qui marchent au gré de l'officier qui les commande.

“ Je vous dirai pourtant que dans plusieurs de mes différences en latitudes estimées, la plus grande erreur que j'aie trouvée n'a pas passé 2', ce qui n'en saurait donner une idée bien considérable dans l'estime du chemin, surtout quand on a couru sur des rumb de vent un peu éloignés de l'est ou de l'ouest.

“ Sans rien ôter à M. Deshayes¹ de ce qui est dû à son mérite, j'ose affirmer que la latitude de Québec qu'il a déterminée de 46° 55' est trop forte de 7' ou 8'. Cet excès vous surprend. Mais si vous aviez comme moi sous les yeux l'instrument dont il s'est servi, votre surprise cesserait bientôt : c'est une planchette de bois d'environ 8 $\frac{3}{4}$ pouces de diamètre, et garnie d'un limbe de cuivre divisé en 360°, qui ont tout au plus chacun $\frac{5}{6}$ de ligne. Or, avec un tel instrument un observateur, quelqu'exercé qu'il soit, peut-il répondre de 7' ou 8' ?

“ Pour ce qui est de la longitude de cette même ville, je crois qu'il la fait trop petite de près de 2' : du moins, après plusieurs observations, nous l'avons trouvée, M. de Lotbinière et moi, de 4 h. 50' et quelque chose de plus. Ce surplus est encore indéterminé, attendu qu'il y a eu quelques variations dans le nombre des secondes ; mais j'espère, avant un an, n'avoir plus de scrupules sur cette matière.

“ J'ai lu avec un véritable plaisir la dissertation que vous avez composée pour rendre au journal de l'amiral de Fonte ou Fuente le degré de probabilité que la prévention semblait lui avoir ôté. Il faut l'avouer, vos réponses sont satisfaisantes, et ne laissent aux contradicteurs aucune bonne raison de douter. Cependant, permettez-moi de vous faire une objection que je suis étonné qu'on ne vous ait pas faite. Il est rapporté dans ce journal (page 22) *qu'ils avaient* (l'amiral de Fonte et le capitaine Leonardo) *avec eux deux jésuites, dont l'un accompagna le capitaine Leonardo dans sa découverte, lesquels s'étaient avancés jusqu'au 66° de latitude septentrionale dans leurs missions et avaient fait des observations fort curieuses.* Or, c'est une chose constante qu'aucun jésuite du Canada n'a encore pénétré si avant dans le nord de l'Amérique, et que nous n'avons jamais eu d'établissement dans une ville appelée Conasset. Si l'on suppose que les Jésuites en question étaient Espagnols, il faut vérifier la supposition, ce qui est aisé : il ne s'agit que d'écrire en Espagne et de s'informer des Jésuites mêmes s'ils n'ont point eu connaissance de Conasset,

¹ Auteur d'une carte, ainsi désignée dans la brochure *Quatrième Centenaire*, p. 8. “ Cartes des côtes habitées du Canada, par paroisses et par seigneuries.—Ms sur calque vers 1686.—1,15 sur 0,30. (Avec les noms des seigneuries.) Archives, Dépôt des Cartes, Affaires Etrangères, Nouveau fonds.”

ville indienne située dans l'Amérique septentrionale vers les 65° de latitude, comme vous l'avez placée dans votre première carte, ou vers les 55°, comme on la voit dans la deuxième, et dans laquelle ils avaient des missionnaires en 1640. S'ils répondent affirmativement, les découvertes de l'amiral de Fonte pourront passer pour réelles. Cependant la rencontre du capitaine Shapely, Bostonnais, demanderait encore quelques éclaircissements. On pourrait les trouver, je pense, dans les registres de l'amirauté de Boston, car il n'est pas vraisemblable que Shapely soit parti du port de cette ville sans que quelqu'un en ait eu connaissance.

“ Quant à la mer d'ouest, je ne puis vous en dire autre chose, sinon que ceux que l'on a envoyés jusqu'à présent pour en faire la découverte, sont revenus, à la vérité, bien chargés de pelleteries, mais aussi peu instruits de ce qui concernait le principal objet de leur mission qu'ils l'étaient avant de partir.

“ Permettez-moi, avant de finir cette lettre, de vous demander la continuation de votre amitié, et de vous assurer que personne n'est avec plus d'attachement et de respect que moi, monsieur, votre très humble, etc., DE BONNÉCAMPS.”

Il s'agit dans les deux lettres que nous venons de citer, de Barthélemi du Fuentès, “ navigateur espagnol ou portugais, dont les voyages réels ou imaginaires, dit Michaux, ont occasionné de longues dissertations entre les savants, et dont l'existence même n'a pu être prouvée”. Vancouver écrit au sujet de ce navigateur légendaire : “ Je ne prétends pas nier positivement les découvertes de Fuentès ; il me suffit d'avoir prouvé l'invraisemblance de sa narration.”

Delisle fit une dissertation sur le prétendu voyage de Fuentès, pour en prouver la réalité ; et il la présenta à l'Académie des Sciences en 1750. C'est cette dissertation que le P. de Bonnécamp venait de lire “ avec un véritable plaisir”. Cependant, d'après l'ensemble de sa lettre, bien qu'il affirme par courtoisie que les réponses de Delisle “ ne laissent aucune bonne raison de douter”, il est évident qu'il lui restait des doutes sur la réalité du voyage de Fuentès.

Il est plus que probable qu'il en est de ce voyage de Fuentès comme de la prétendue expédition de Jean Bourdon à la mer du Nord, en 1656, au sujet de laquelle notre excellent collègue, M. Roy, a clairement prouvé qu'elle n'a pu avoir lieu, et que tout ce qu'on en a dit et écrit n'est appuyé que sur “ une pièce apocryphe, fabriquée après coup. Il paraît, ajoutait-il, que les diplomates de cette lointaine époque, tant en Angleterre qu'en France, n'étaient pas fort scrupuleux sur l'emploi des pièces controvées.”¹ L'Amérique du Nord était une proie qui excitait la convoitise des nations européennes : c'était à qui aurait un document à exhiber pour prouver priorité de prise de possession.

¹ *Bulletin des Recherches historiques*, vol. II, 1^{re} livraison, p. 8.

L'année 1756 vit arriver à Québec plusieurs brillants officiers français, Montcalm, Lévis, Bourlamaque et Bougainville, "qui devint plus tard, dit Gauthier, une des grandes illustrations maritimes de la France". Ces officiers distingués lièrent connaissance avec l'élite de la société canadienne de l'époque, avec le clergé séculier, avec les jésuites du collège ; et lorsque le P. de Bonnécamps passa en France dans l'automne de 1757, Bougainville, écrivant à son amie et protectrice, M^{me} Hérault, lui recommanda le savant jésuite :

"Québec, 8 novembre 1757... J'avais donné une lettre pour vous à cet infortuné La Rigaudière. Son aventure m'a tellement effrayé que j'ai impitoyablement refusé des lettres à tous ceux qui, en partant d'ici, m'en ont demandé. Que sais-je, moi, s'il ne leur prendra pas la fantaisie de faire quelque grosse sottise ? J'ai cependant excepté le P. Bonnecamp,¹ que mon frère vous présentera. C'est un jésuite, qui n'en a que la robe ; vous trouverez seulement qu'il parle un peu vite."²

Voilà sur la personne du P. de Bonnécamps un détail intéressant que l'on n'aurait peut-être jamais connu, sans cette confiance toute familière de Bougainville.

Notre jésuite passa en France le long hiver de 1757-58. Il eut occasion de visiter souvent, à Paris, son ami et correspondant Joseph-Nicolas Delisle, et fit connaissance avec sa famille. Puis il repassa au Canada, en même temps que le P. de Glapion, au printemps de 1758.

III

La domination française en Amérique est sur son déclin. Encore un peu de gloire, encore quelques actions d'éclat, comme par exemple la bataille de Carillon ; mais il est facile de voir que la partie n'est plus égale entre les gros bataillons anglais et les troupes intrépides mais numériquement trop faibles de l'armée canadienne. Le P. de Bonnécamps se rend bien compte de la situation ; et dans l'automne il écrit à Delisle, non plus cette fois pour lui parler d'observations scientifiques, mais pour lui raconter les principaux événements militaires de l'année, l'affaire de Carillon, la prise de Louisbourg, et surtout pour le prévenir du sort inévitable qui attend la colonie française : on remarquera, du reste, la sagesse des remarques qu'il fait à ce sujet :

"Québec, 30 octobre 1758. Monsieur, Je ne saurais assez vous remercier de toutes les marques d'affection et de bienveillance que vous

¹ Le fait que tout le monde écrivait sans accent aigu le nom de notre jésuite semble prouver qu'au moins ce nom se prononçait sans accent. D'un autre côté, il paraît que le père signait *de Bonnécamps*—nous avons donné un fac-simile de sa signature dans notre premier mémoire : nous continuons donc à écrire son nom comme il l'écrivait lui-même.

² *Les Français au Canada, la Jeunesse de Bougainville et la Guerre de Sept Ans*, par René de Kerallain. Paris, 1896, p. 96.

m'avez données pendant mon séjour à Paris, et je vous prie d'être bien persuadé que je ne laisserai échapper aucune occasion de vous en témoigner ma vive reconnaissance.

“ Depuis mon arrivée à Québec, je n'ai pu faire aucune observation ; car à peine ai-je débarqué, qu'on m'a fait monter à Montréal pour des affaires de la mission.

“ Nous avons eu une assez heureuse traversée : elle a été même plus courte que je ne comptais ; nous n'avons mis que trente-quatre jours à nous rendre de l'île d'Aix à Saint-Barnabé : c'est l'endroit où tous les vaisseaux mouillent pour la première fois en arrivant de France. Ce mouillage est environ à soixante lieues de Québec.

“ Nous avons eu quelques avantages sur l'Anglais, en ce pays : la bataille du 8 juillet, que nous avons gagnée, a quelque chose de surnaturel : les ennemis, au nombre de 15 à 16,000 hommes, dont près de la moitié étaient de vieilles troupes d'Angleterre, vinrent nous attaquer à Carillon. Nous n'avions à leur opposer que 2,900 hommes de troupes réglées et 400 miliciens. Le malheur voulut qu'il ne se trouva pas un seul sauvage à cette action¹.

“ Le combat commença vers midi et demi, et ne finit qu'à sept heures du soir. Nos officiers français assurent qu'ils n'ont jamais vu un feu plus continu et plus vif : c'est pour dire qu'il ne cessa pas un seul instant pendant sept heures. Nous devons être écrasés, car le seul avantage qu'avaient nos troupes sur celles de l'ennemi était un méchant retranchement fait la veille avec des arbres qu'on avait abattus à la hâte, et qu'on n'avait pas eu le temps de revêtir de terre. Les Anglais ont perdu dans cette action environ 4,000 hommes. Notre perte se monte à 250 hommes, tant tués que blessés.

“ Cette victoire a été contrebalancée par la perte de Louisbourg, qui fut obligée de capituler le 27 juillet. On s'était flatté ici que les Anglais échoueraient devant cette place. Il paraissait même par les lettres écrites de cette ville qu'il n'y avait rien à craindre pour elle : apparemment qu'on ne comptait pas que les Anglais dussent y venir avec une aussi formidable artillerie que celle qu'ils ont conduite. Elle consistait dans plus de cent trente bouches à feu, environ trente mortiers et cent canons du plus gros calibre.

“ Une faute que l'on a faite, à mon avis, dans la défense de cette place, a été de n'avoir pas employé tout ce qu'on avait de forces pour empêcher la descente. C'était là le seul moyen de conserver cette place, qui n'avait d'autre défense que son enceinte, avec un fossé et un chemin couvert, sans aucun ouvrage extérieur qui défendit le corps de la place et pût faire acheter bien cher aux ennemis cette conquête.

¹ Ceci fait voir comme on appréciait les services que les Sauvages, avec leur manière toute particulière de faire la guerre, rendaient à nos troupes, lorsqu'on savait se les attacher.

“ Ajoutez à cela que les murs sont faits avec du mortier dont le sable est salé : or il est constant par l'expérience que le sable marin ne s'amalgame point avec la chaux et fait de très mauvais mortier : aussi tous les printemps y avait-il quelques réparations à faire aux murailles.

“ Environ 1,000 ou 1,200 Anglais se sont présentés au Fort Duquesne, et y ont été défaits ; mais ils doivent être suivis par 6,000 hommes, qu'il ne sera pas aussi aisé de défaire.

“ En un mot, pour vous dire les choses telles qu'elles sont, c'est qu'on ne devra point être surpris en France si le Canada tombe entre les mains des Anglais. Ils ont sur pied plus de 60,000 hommes, et à peine en avous-nous 12,000 à leur opposer.

“ On se flatte ici que la paix se fera en Europe. Elle pourra se faire en Allemagne ; mais l'Anglais ne voudra peut-être pas la paix. Il y a longtemps qu'il a envie d'avoir le Canada. Jamais l'occasion n'a été si belle pour lui ; et par malheur pour nous, il le voit aussi bien que nous : ainsi je doute fort que si la paix se fait on veuille nous y comprendre.

“ Si la Hollande et l'Espagne entendaient leurs véritables intérêts, elles se joindraient à la France pour la défense du Canada ; mais je ne sais quelle inimitié secrète et invétérée leur fait sacrifier leurs propres intérêts au plaisir malin de voir la France dépouillée de ses colonies. Au reste, si nous avons le malheur de perdre le Canada, les colonies espagnoles courent de grands risques : leur salut dépend du nôtre. Les Anglais disent ouvertement que sitôt qu'ils auront fini la guerre avec France, ils ne tarderont pas à la déclarer à l'Espagne. Leur projet est de s'emparer de l'Amérique ; et ce projet n'est point aussi chimérique qu'on pourrait le croire à Versailles ou à Madrid...

“ Si la France n'a pas pu défendre ses possessions en Amérique, comment les défendra l'Espagne ? Sa marine est fort inférieure à la nôtre, quelque faible qu'elle soit. D'ailleurs la France se joindra-t-elle à elle pour l'aider à défendre ses colonies ? Il est à présumer que la France la défendra comme elle nous a défendus.

“ Oserais-je prendre la liberté de vous prier de vouloir bien vous charger de m'acheter sept cartes, savoir : les quatre principales parties du monde, une mappemonde, la carte de la France dressée sur les mémoires de l'Académie, celle du Canada, et un plan de Paris, et de me les envoyer par duplicata. La personne qui veut faire cette emplette demande du beau et du bon ; ainsi je vous supplie de ne rien épargner. Le frère Duval qui demeure au collègue Louis-le-Grand est chargé de vous remettre l'argent nécessaire pour cette emplette.

“ Mille pardons de la liberté que je prends d'en user ainsi : je me flatte que si vous me trouvez bon à quelque chose vous ne ferez pas difficulté de m'employer et j'ose vous assurer que j'en saisis l'occasion avec bien du plaisir.

“ Permettez-moi de vous demander la continuation de votre amitié, et faites-moi l'honneur de me croire, avec le plus sincère et le plus respectueux attachement, monsieur, votre très humble, etc., DE BONNÉCAMPS.

“ Je vous prie de vouloir bien dire cent choses de ma part à Madame de l'Isle.”

Le P. de Bonnécamp n'avait plus qu'une année à passer au Canada. Après la capitulation de Québec, dans l'automne de 1759, il retourna définitivement en France, et alla, comme je l'ai dit dans mon premier mémoire, résider à Caen. On l'y trouve du moins en 1761, enseignant les mathématiques au collège. C'est là qu'il était probablement encore lorsque survinrent les décrets de 1762 supprimant la Compagnie de Jésus et enlevant aux jésuites le droit d'enseigner en France.

IV

J'écrivais dans mon premier mémoire, d'après les notes que m'avait obligeamment fournies l'archiviste du collège Sainte-Marie de Montréal : “ A partir de cette date (1762), on ne retrouve nulle part le nom du P. de Bonnécamp..., et l'on ne connaît ni l'endroit ni la date de la mort de cet homme de bien...”

Je viens de trouver son nom là où je ne m'attendais guère de le rencontrer. En feuilletant des documents absolument inédits, que l'archevêché de Québec a eu l'heureuse pensée de faire copier aux archives maintenant ouvertes du Vatican, j'ai trouvé à ma grande surprise, dans la correspondance de l'abbé de L'Isle-Dieu, non seulement le nom du P. de Bonnécamp mentionné plusieurs fois, mais la copie d'une lettre qu'il écrivit à ce vénérable prêtre quelques années après la suppression de la Compagnie en France. Cette lettre nous permet de retracer une partie jusqu'ici inconnue de la carrière du P. de Bonnécamp ; elle nous peint aussi très bien son caractère.

Avant de la citer, cependant, faisons connaître le personnage éminemment distingué et vertueux auquel elle était adressée.

Pierre de Larue, abbé de l'Isle-Dieu,¹ demeurait à Paris, et y exerça durant près d'un demi siècle les fonctions de vicaire général des évêques de Québec. Il était leur agent auprès du saint-siège et de la cour de France. C'est lui qui recevait ordinairement leur correspondance, écrivait en leur nom à la propagande ou au ministère de la Marine, pressait

¹ Abbaye de l'Isle-Dieu, *Insula Dei*. Abbaye de l'ordre des Prémontrés, diocèse de Rouen, à 4 lieues de la ville, dans une île de la rivière d'Andèle. Elle était fille de l'abbaye de Silly et fut fondée par Réginald, seigneur de Pouilly, et Gilbert de Vacueil, châtelain de Beauvais. La fondation remonte à 1187. Pierre de Larue, abbé commendataire de l'Isle-Dieu, fut nommé en 1722 : il était le trente-sixième abbé. Les revenus de l'abbaye, au XVII^e siècle, se montaient à 3,500 francs. L'abbaye était sous le patronage de la sainte Vierge. Nous sommes obligé à M. l'abbé Verreau pour ces renseignements.

le règlement de leurs affaires, et leur transmettait les réponses à leurs demandes.

On s'adressait à lui "des différentes colonies du diocèse de Québec", comme on disait alors : de l'Acadie, de la Louisiane, des Tameris, du Détroit, de Montréal, de Québec ; il faisait des extraits des lettres qui lui étaient adressées, notait avec ordre les demandes et les raisons qui les appuyaient, puis soumettait le tout au Ministre. Celui-ci mettait ordinairement en apostille sa réponse ou sa décision, que l'abbé de l'Isle-Dieu se hâtait de faire connaître à ses correspondants.

Ses fonctions de vicaire général de Québec datent de 1730, sous M^{sr} Dosquet, qui n'était encore que coadjuteur de M^{sr} de Mornay ; et il les exerça sans interruption jusqu'en 1777. Il fut alors remplacé par M. de Villars, qui reçut de M^{sr} Briand des lettres de vicaire général et s'occupa à son tour de la correspondance de Québec. M. de Villars écrivait au cardinal Castelli, préfet de la propagande, le 9 novembre 1778 : "M. l'abbé de l'Isle-Dieu n'est plus en état de pouvoir suivre cette correspondance à cause de ses infirmités et de son grand âge, qui est de près de 91 ans." Parlant ensuite de lui-même : "J'ai passé, disait-il, douze années révolues dans le séminaire des Missions étrangères de Québec.¹ et depuis plus de vingt ans je suis chargé du soin de ses affaires en France. Il y a un an que M^{sr} de Québec m'a confié les siennes."²

On aura une idée du désintéressement de ces hommes apostoliques et de la reconnaissance que leur doit l'Eglise du Canada, lorsqu'on saura qu'ils exerçaient gratuitement toutes ces fonctions, et qu'ils prenaient même la plupart du temps à leur charge les frais de port de la correspondance, qui étaient pourtant considérables. M. de Villars écrivait un jour au cardinal préfet de la propagande : "Je supplie Votre Eminence, dit-il, de me faire passer ses réponses sous l'enveloppe de M^{sr} le Nonce ; je fais la guerre à mes dépens depuis six ans que je suis chargé des affaires de M^{sr} de Québec, et les seuls ports de lettres sont un objet."³

L'abbé de l'Isle-Dieu ne vint jamais au Canada. Nous voyons cependant par sa correspondance, spécialement par ses lettres à M. Rouillé et au duc de Choiseul,⁴ qu'il connaissait parfaitement et dans toutes ses parties l'immense diocèse de Québec, ses communautés, ses principales missions. Il s'intéressait vivement à tout ce qui pouvait procurer le bien de l'église du Canada. Voyons, par exemple, comme il souhaite, avec M^{sr} de Pontbriand, que l'Hôpital général de Montréal

¹ M. de Villars fut supérieur du séminaire de Québec, de 1750 à 1756.

² Archives de la propagande.

³ Archives de la propagande, Lettre de M. de Villars au card. Castelli, 12 août 1783.

⁴ Archives de M. l'abbé Verreau, M^{ss} Viger, Correspondance inédite de l'abbé de l'Isle-Dieu avec M. Rouillé et le duc de Choiseul sur les affaires du diocèse de Québec.—M. Viger nous apprend dans une note que c'est M. Holmes qui fit faire une copie de cette correspondance et l'apporta de Paris en 1837.

passé définitivement à M^{me} d'Youville, et l'intérêt qu'il porte à la communauté naissante des sœurs grises :

“ Je rendrai compte ci-après, écrit-il à M. Rouillé, des propositions que fait la dame Veuve Youville, qui est actuellement à la tête du gouvernement de l'Hôpital-Général de Montréal. Voici les termes dont m'en parle M. l'Evêque de Québec : “ C'est, dit ce Prélat, une de ces personnes “ d'un rare mérite, et je pense que cet hôpital sera bien entre ses mains.” L'abbé de l'Isle-Dieu ajoute : “ La Dame d'Youville me fait envisager que si la cour voulait lui accorder des Lettres patentes pour la petite communauté de *Filles de Piété* qu'elle a formées au service des pauvres et au soulagement des malades, elle est sûre de rassembler 8,000 francs qu'elle m'enverra bientôt pour acquitter les dettes de l'hôpital... Elle ajoutera l'instruction au soulagement des pauvres, le soin des femmes à celui des hommes, par conséquent le soulagement des deux sexes. Cette nouvelle petite communauté se consacrerait non seulement à l'instruction des filles, mais à retirer du libertinage les personnes de mauvaise vie, sans que le temps et les soins qu'elles y donneraient fissent aucun tort au soulagement des pauvres malades...”

Ailleurs, il s'occupe des ursulines de la Nouvelle-Orléans : “ Elles me demandent, dit-il encore à M. Rouillé, de leur faire l'emplette de livres pour leurs écoles, comme des alphabets, des psaumes, des livres français pour apprendre à lire à leurs pensionnaires, externes et négresses,¹ quelques livres de piété et surtout des heures, dont elles prétendent qu'aucun marchand ne porte dans la colonie : aussi prétendent-elles qu'il ne s'en trouve plus et que tout le monde en manque. Elles n'y ont pas, non plus, de catéchismes pour l'instruction des enfants : ainsi il est difficile qu'elle soit uniforme.

“ J'avais eu le dessein de leur en faire ou d'en adopter un tout fait en France, en prenant la précaution de faire imprimer en tête un mandement par forme d'instruction propre à la colonie, et que je n'aurais fait partir qu'après vous l'avoir communiqué pour le faire examiner par qui vous auriez jugé à propos, monsieur ; mais les circonstances de la guerre ont dérangé ce projet, que mes mauvais yeux auraient présentement (1746) peine à exécuter.

“ A l'égard des livres que demande la supérieure des Ursulines de la Nouvelle-Orléans, je les crois très nécessaires, et je voudrais de tout mon cœur pouvoir en faire un présent à la colonie ; mais l'état actuel de mes affaires ne me le permet pas. Je leur en avais fait en 1746 une petite pacotille, qui montait à 150 l^{rs}. Le tout a été perdu avec mes lettres. Si j'avais actuellement une vingtaine de pistoles, dont la cour voulût bien gratifier cette maison, je recommencerais sur nouveaux frais, en y ajoutant

¹ L'esclavage était alors généralement admis dans le sud de l'Amérique du Nord : “ Les ursulines de la Nouvelle-Orléans ont été obligées d'acheter 24 testes de Nègres pour le prix de 30,000 francs.” (Lettre de l'abbé de l'Isle-Dieu à M. Rouillé, 1746.)

ce que je pourrais quêter d'ailleurs ; mais les temps et les circonstances m'empêchent de rien demander..."

Et puis, après la capitulation de Louisbourg, en 1758, et la cession à l'Angleterre des possessions françaises dans le golfe Saint-Laurent, quel intérêt ne montre-t-il pas aux pauvres missionnaires qui desservaient cette contrée ! Il envoie au duc de Choiseul un "Tableau sommaire des missionnaires séculiers qui étaient à l'île Royale et à Louisbourg, sa capitale, à l'île Saint-Jean et au port Lajoye, son fort, à l'Acadie française et anglaise et à la rivière Saint-Jean", il lui expose "ce qu'ils sont devenus", et le supplie de leur faire tenir "ce qui peut leur être actuellement dû des pensions que la cour leur faisait à chacun dans leurs postes". Il s'intéresse spécialement aux pauvres religieuses de la congrégation de Notre-Dame : "Je ne puis m'empêcher, dit-il, de supplier M^{gr} le duc de Choiseul de jeter un coup d'œil de compassion sur les trois pauvres filles de la congrégation de Louisbourg, qui sont actuellement à La Rochelle, et à qui M. Berryer (faute de fonds) ne put fixer qu'une pension de 260 f^{rs} à chacune, dont sûrement elles ne peuvent subsister et fournir à leur entretien¹."

L'abbé de l'Isle-Dieu inclinait toujours vers les mesures de conciliation, de préférence à celles de rigueur. Il raconte lui-même à M. Rouillé ce qu'il fit, à l'occasion des grands désordres causés en Acadie par l'eau-de-vie que "les Anglais s'étaient imaginés de distribuer et de verser aux Sauvages" en 1736 et 1737 :

"Sur les plaintes, dit-il, qui en vinrent à la cour de la part des missionnaires, et dans une circonstance où M. Dosquet, évêque de Québec, était à Paris, M. le cardinal de Fleury, premier ministre, parut désirer que l'abbé de l'Isle-Dieu, en qualité de vicaire général de tout le diocèse, eût recours aux censures de l'Eglise, et qu'il portât une excommunication encourue par le fait contre ceux qui distribuaient de l'eau-de-vie aux Sauvages qui en boiraient avec excès.²

"L'abbé de l'Isle-Dieu prévoyant bien que cette voie ne réussirait pas vis-à-vis des Anglais, et que la peine canonique pourrait irriter les Sauvages, et non pas les retenir, s'imagina de recourir à la voie de douceur et de persuasion.

"Il écrivit une lettre circulaire en forme d'Instruction pastorale, qui fut traduite en langue micmaque et expliquée aux Sauvages par les missionnaires. Le nom et les ordres du Roy qu'on y fit entrer, l'intérêt que Sa Majesté prenait à leur conservation, l'esprit de religion et de subordination que peu à peu on fit revivre en eux, l'horreur qu'on leur donna pour l'état où les réduisait cette liqueur..., toutes ces réflexions réunies et toutes ces raisons comprises et combinées par les chefs des Sauvages, chan-

¹ Lettre de l'abbé de l'Isle-Dieu à M. Rouillé, 1746.

² Il est à noter que le cardinal de Fleury, près d'un siècle après M^{gr} de Laval, proposait, lui aussi, d'employer les censures de l'Eglise pour arrêter la traite de l'eau-de-vie.

gèrent tout à coup leurs idées et réprimèrent l'avidité qu'ils avaient pour l'eau-de-vie, dont ils ne voulurent plus user que pour la nécessité.

“ On vit renaître en eux le respect pour la religion, la déférence aux avis de leurs missionnaires, leur attachement pour l'État et pour le Roi, leur ancienne amitié pour les habitants français, qu'ils ont depuis regardés comme leurs frères, dont ils sont devenus les protecteurs et l'appui... On en a vu un exemple dans la prise de Louisbourg, où les Sauvages micmacs ont fait la plus forte et la plus courageuse défense ¹.”

La prudence et la sagesse de l'abbé de l'Isle-Dieu lui faisaient éviter toute ingérence dans la politique : écrivant un jour au cardinal préfet de la propagande : “ J'ai toujours eu pour maxime, dit-il, depuis trente-sept ans qu'en qualité de vicaire général j'ai eu la correspondance de nos missions françaises dans l'Amérique septentrionale, qu'il ne fallait jamais que nos missionnaires se mêlassent en rien du gouvernement temporel ; et cela m'a toujours très bien réussi aussi bien qu'à eux, grâce à Dieu et à sa divine providence, qui veille toujours efficacement sur et pour ceux qui s'y confient...² ”

Par ses vertus et ses éminentes qualités l'abbé de l'Isle-Dieu s'était acquis l'estime et la confiance de tout le monde. Il jouissait d'une si grande autorité morale, que lorsque la Louisiane fut cédée à l'Espagne par le traité de Paris, on eut recours à lui pour obtenir par son influence et sa médiation que les colons français acceptassent de bon cœur le nouveau régime. Le secrétaire de l'ambassade espagnole auprès de la cour de France lui écrivit le 25 novembre 1765 :

“ Vos conseils, monsieur, et vos lumières, joints à la profonde connaissance que vous avez du pays nous seraient très utiles pour nous mettre en état de faire de la Louisiane une colonie florissante ; et je me flatte que vous ne voudrez pas nous les refuser, connaissant votre honnêteté, votre zèle pour la religion, et votre attachement pour une cour et pour une nation intimement amie de la vôtre, et dont les intérêts et les avantages doivent être à jamais les mêmes...³.”

V

Par le traité de Paris (10 février 1763), la France, qui cédait la Louisiane à l'Espagne, céda à la Grande-Bretagne le Canada et toutes ses possessions dans le golfe Saint-Laurent, sauf les petites îles de Saint-Pierre et de Miquelon, qu'elle se réserva pour l'usage de ses pêcheurs.

¹ Lettre à M. Rouillé, 1751.

² Archives du Vatican, Lettre de l'abbé de l'Isle-Dieu au cardinal Castelli, 15 juin 1767.

³ *Ibid.*, Lettre de M. Magallon, secrétaire d'ambassade de la cour d'Espagne, à l'abbé de l'Isle-Dieu, Fontainebleau, 25 nov. 1765.

Si l'on en croit l'abbé de l'Isle-Dieu,¹ ces petites îles "n'auraient jamais fait partie de l'évêché de Québec". Il veut dire sans doute que les évêques de Québec n'eurent jamais occasion d'y faire acte de juridiction, car leur diocèse comprenait toutes les possessions françaises de l'Amérique septentrionale. Quoi qu'il en soit, sitôt après la cession du Canada à l'Angleterre, les évêques de Québec, devenus sujets anglais, "ne pouvant pas communiquer" facilement avec Saint-Pierre et Miquelon, l'abbé de l'Isle-Dieu s'occupait de mettre ces îles en rapport avec le saint-siège. Bon nombre de Français et surtout beaucoup de familles acadiennes allaient s'y établir : il fallait leur procurer des secours spirituels. Il réussit à faire nommer un préfet et un vice-préfet apostoliques pour les îles Saint-Pierre et Miquelon.

Mais quelle ne fut pas sa surprise d'apprendre que la cour de France l'avait devancé, et que deux jésuites étaient déjà rendus sur ces îles, n'ayant d'ailleurs d'autre juridiction que les pouvoirs qu'ils avaient pris, en partant, de l'évêque de La Rochelle. Ces deux jésuites n'étaient autres que le P. Ardilliers, et notre P. de Bonnécamp lui-même, qui, privé du droit d'enseigner les mathématiques en France, n'avait pas voulu laisser échapper l'occasion qui se présentait de travailler au saint ministère. L'abbé de l'Isle-Dieu se hâta de leur écrire pour avoir des explications.

Nous n'avons pas sa lettre ; mais nous avons la réponse du P. de Bonnécamp : ce document, que nous croyons absolument inédit, peint bien le caractère de l'homme, et la situation un peu étrange que ces deux religieux s'étaient faite aux îles. Il est curieux de voir se répéter ainsi, après cent ans d'intervalle, la fameuse question de la juridiction de l'archevêque de Rouen.

Voici la lettre du P. de Bonnécamp à l'abbé de l'Isle-Dieu :

"A l'Isle Saint-Pierre, 15 juin 1766. Monsieur, M. l'abbé Ardilliers, aumônier du Roy, faisant les fonctions de curé à Miquelon, m'a communiqué la lettre que vous lui avez fait l'honneur de lui écrire. Tout y respire le zèle dont vous êtes enflammé pour la gloire de Dieu et le salut des âmes, tout démontre un digne ministre du Seigneur. Mais, permettez-moi de vous le dire, il paraît que vous êtes mal informé de ce qui se passe dans nos îles par rapport à la religion et à l'administration des sacrements. L'île Saint-Pierre, non plus que celle de Miquelon, n'est point privée de pasteur, et l'on y a érigé un temple très décent, où les fidèles ont la consolation d'assister tous les jours, quand ils le peuvent, à la célébration du saint sacrifice de nos autels.

"A vous parler franchement, j'ai été dans la dernière surprise quand j'ai lu dans votre lettre que les habitants de cette île étaient sans guide et sans ministre pour les conduire dans les voies du salut et les faire participer aux grâces attachées à la réception de nos augustes sacrements. En effet, j'ai tâché jusqu'à présent de remplir autant qu'il est en moi tous

¹ Voir sa lettre au cardinal préfet de la propagande, du 21 juillet 1766, citée plus loin.

les devoirs d'un bon pasteur. Si j'ai eu le malheur d'y manquer, comme cela peut être, ça toujours été contre ma volonté, et non jamais sans repentir et sans regret.

“ Quant à la juridiction que nous avons ici sur les consciences, nous la tenons de M^{sr} l'évêque de La Rochelle,¹ dans l'évêché duquel s'est fait notre embarquement. Était-il en droit de nous la donner ? Il paraît qu'oui ; du moins M. de Menou, grand vicaire de La Rochelle,² l'assure dans une lettre qu'il écrit à M. Couturier, supérieur général de Saint-Sulpice. Une telle assurance fait notre confiance, et doit suspendre vos alarmes. D'ailleurs, monsieur, nous croyez-vous, mon confrère et moi, assez téméraires pour nous ingérer dans le ministère sans être envoyés par ceux à qui seuls il appartient de le faire ? Ce n'est pas nous rendre la justice que, j'ose le dire, nous méritons ; c'est nous prendre, passez-moi cette expression, pour des aventuriers, ou du moins pour des ignorants qui ne connaissent pas la hiérarchie ecclésiastique, ni la dépendance où sont les ministres du second ordre pour l'exercice de leurs fonctions. On la connaissait parfaitement, cette dépendance, dans le corps qu'on vient de détruire en France, et dont nous étions membres, M. Ardilliers et moi ; on ne peut donc pas nous soupçonner de ne l'avoir pas connue, et encore moins d'avoir voulu nous y soustraire, ne pouvant le faire qu'aux dépens de nos consciences et de celles du peuple confiées à nos soins.

“ Si nous n'avons pas eu recours à vous pour obtenir l'approbation dont nous avons besoin, vous ne devez pas en être surpris. Nous n'avons ni l'un ni l'autre l'honneur de vous connaître. Au surplus, quand même nous eussions su que feu M^{sr} de Pontbriand, évêque de Québec, vous avait nommé son grand vicaire pour les missions répandues dans toute l'étendue de son diocèse, nous ne nous fussions pas crus obligés de recourir à vous, vos pouvoirs de grand vicaire ayant dû cesser à la mort de ce prélat.³

“ Enfin, ce qui doit pleinement justifier notre conduite, c'est que nous nous sommes adressés à un évêque⁴ qui savait où nous allions et pourquoi nous y allions, et qui en conséquence nous a munis de tous les pouvoirs nécessaires pour faire le bien spirituel des âmes dont la cour nous avait chargé. Dira-t-on qu'il s'est arrogé un droit qu'il n'avait pas ? Le dira qui voudra : pour moi, je ne serai jamais assez téméraire pour le dire ni pour le penser. Parlons ingénument : on a voulu nous déplacer ; et pour y réussir on a supposé l'illégitimité de notre mission : une ambassade partie

¹ L'évêque de La Rochelle, à cette date, était Augustin de Menou de Charnisay. Il avait d'abord été grand vicaire de Chartres : il fut nommé évêque de La Rochelle au mois d'octobre 1729 et consacré le 10 septembre 1730.

² Probablement parent, peut-être même le frère de l'évêque.

³ M^{sr} de Pontbriand mourut à Montréal le 8 juin 1760, âgé de 51 ans, et fut inhumé dans l'église paroissiale de Notre-Dame.

⁴ L'évêque de La Rochelle, mentionné précédemment.

d'ici a formé le nœud de toute cette intrigue. Pour tout dire en un mot, on vous en a imposé, et pour vous mieux tromper, l'imposture a pris le masque de la religion.

“J'ai l'honneur d'être, monsieur, avec un profond respect, votre, etc.,
DE BONNÉCAMPS.”

Inutile d'insister sur les malentendus, les quiproquos, les sophismes dont est tissée cette lettre.

Après l'avoir reçue, l'abbé de l'Île-Dieu, toujours calme et maître de lui-même, en fit une copie pour la propagande ; puis il écrivit au cardinal préfet. Nous citerons sa lettre qui fait ressortir d'une manière frappante les qualités de sagesse, de prudence et de charité, que nous avons déjà admirées en lui ; elle nous montre aussi plus nettement encore la situation fautive de nos deux jésuites aux îles Saint-Pierre et Miquelon :

“ Paris, 21 juillet 1766. Monseigneur, Je crois devoir rappeler à Votre Eminence un article dont j'ai déjà pris la liberté de lui parler et sur lequel je lui ai communiqué les mesures que j'avais prises pour remédier à un abus qui s'est introduit dans deux petites îles de l'Amérique septentrionale qui nous sont restées par le traité de Versailles et de Londres.

“ Il s'agit, monseigneur, des îles Saint-Pierre et Miquelon, habitées partie par des Français que nous y avons envoyés, et partie par des Acadiens qui s'y sont réfugiés, après s'être soustraits à la domination anglaise, pour mettre en sûreté leur foi et leur religion.

“ J'ai déjà eu l'honneur d'informer Votre Eminence qu'ayant appris que ces deux îles, quoique assez habitées, se trouvaient sans pasteur et sans guide, et par conséquent dépourvues de toute espèce de secours spirituels, et de missionnaires qui eussent les pouvoirs et la juridiction nécessaires pour les leur procurer, j'avais pris la précaution d'obtenir de notre cour la permission de leur envoyer deux missionnaires avec deux brefs de Sa Sainteté, qui m'avaient été remis par Son Excellence M^{gr} le Nonce, l'un de Préfet, et l'autre de Vice-Préfet apostoliques.

“ J'ai déjà pris la liberté de rendre compte à Votre Eminence du sort de ces deux missionnaires, qui, partis d'un de nos ports de France, dès le 28 juillet 1765, n'ont pu arriver à leur destination, et qui après une navigation de plus de quatre mois, la plus pénible et la plus dangereuse, ont été obligés de relâcher à la Martinique, l'une des îles Antilles du sud de l'Amérique septentrionale, où ils ont séjourné quarante jours, et d'où ils ont été obligés de repasser en France, faute de vaisseaux qui pussent les transporter et les rendre à leur première destination.

“ J'ai également rendu compte à Votre Eminence du sort d'un de ces deux missionnaires, qui le 22 janvier dernier est mort sous voiles, de fatigue et de maladie, dans sa traversée de la Martinique en France.

“ Quant au second, sa santé a souffert au point qu'il est hors d'état de souffrir la mer, et de repasser cette année aux îles dont il s'agit, quel-

que envie qu'il me paraisse avoir de se consacrer de nouveau à l'œuvre de nos missions, quoiqu'il y ait déjà plus de vingt-cinq ans qu'il en supporte et soutient les travaux et les fatigues.

“ Au défaut de ces deux missionnaires, je ne me suis point rebuté, monseigneur ; j'ai trouvé deux autres missionnaires, et j'étais prêt à supplier Son Excellence M^{gr} le Nonce de vouloir bien leur délivrer les deux derniers brefs de Préfet et de Vice-Préfet apostoliques que Sa Sainteté a bien voulu nous accorder ; mais je me suis trouvé arrêté par les dernières lettres que je viens de recevoir des îles Saint-Pierre et Miquelon, et dont j'ai cru devoir adresser copie à Votre Eminence, du moins de celle qui m'a paru la plus intéressante, et qui fera mieux voir à Votre Eminence le risque qu'il y aurait à exposer ces deux îles au scandale d'un débat et d'un conflit de juridiction qui ne pourraient qu'en malédifier les habitants et y porter le trouble et l'inquiétude sur la validité des mariages contractés et des sacrements reçus ; et j'ai d'autant moins osé risquer de faire partir cette année deux missionnaires munis des pouvoirs et de la juridiction du Saint-Siège pour les deux îles dont il s'agit, que les deux qui y sont se croient en droit d'y exercer leurs fonctions, sur le prétexte qu'en partant de France ils ont été approuvés par M^{gr} l'évêque de La Rochelle : comme si sa juridiction pouvait s'étendre sur un territoire qui n'est d'aucun diocèse et qui n'a jamais fait partie du sien.

“ Il est vrai, monseigneur, qu'il est d'usage en France que les évêques du lieu de l'embarquement approuvent les missionnaires qui partent, mais pour la traversée seulement ; et les pouvoirs qu'ils donnent cessent dès que le missionnaire a débarqué dans le port de la colonie pour laquelle il est destiné ; et ce même missionnaire est obligé de prendre de nouveaux pouvoirs de l'Ordinaire ou du premier de ses grands vicaires.

“ D'ailleurs, monseigneur, les deux îles dont il s'agit n'ont jamais fait partie de l'évêché de Québec ; n'y pouvant plus communiquer, d'autant qu'elles appartiennent à la France, elles tombent de droit commun sous la juridiction directe et immédiate du saint-siège. Ainsi je pense que le missionnaire qui m'écrit peut être dans la bonne foi, mais qu'il est dans l'erreur, faute de connaître la matière dont il me parle ; car quoiqu'il dise ne me pas connaître, il ne m'est point du tout inconnu, et je sais que c'est un fort honnête homme, qui a été ci-devant au collège des jésuites de Québec, et membre de la Société des Jésuites avant leur dissolution en France. Je le crois de plus très bon mathématicien, mais peu versé sur ce qui regarde la discipline ecclésiastique et la juridiction gracieuse et contentieuse de l'épiscopat ; et cela m'a fait croire ou du moins soupçonner qu'il n'en serait peut-être que plus attaché à son opinion.

“ D'ailleurs, il m'a paru par les différentes lettres qui m'ont été écrites et que je viens de recevoir des puissances temporelles des deux susdites îles, qu'on y était disposé à soutenir la validité des pouvoirs des deux missionnaires qui y sont actuellement ; et j'en suis d'autant moins surpris

que les gens du monde entendent peu ou mal, pour l'ordinaire, l'ordre et la subordination de la hiérarchie ecclésiastique : d'où je conclus qu'il n'y aurait aucune sûreté, et qu'il y aurait au contraire du danger à s'en rapporter à leur préjugé. Mais je conçois en même temps que les précautions à prendre sur un pareil abus, et pour y remédier efficacement et sans éclat, demandent beaucoup de prudence et de circonspection.

“ Pour cela, monseigneur, et après en avoir conféré avec M^{gr} le Nonce, j'ai cru devoir d'abord en informer le Ministère de notre cour, et le prévenir de l'irrégularité d'un pareil gouvernement du spirituel des deux îles dont il s'agit, afin qu'il pût et voulût bien dissuader les puissances à qui le gouvernement temporel en est confié, des préjugés dans lesquels ils pourraient être sur cela, au préjudice de la légitimité des mariages contractés, et de la validité des autres sacrements administrés, faute d'approbation et de pouvoirs valides et suffisants pour mettre leurs deux missionnaires qui desservent actuellement ces deux colonies en état et à portée d'y exercer valablement les fonctions de leur ministère.

“ Par là, monseigneur, nous éviterons un éclat qui sûrement porterait l'alarme ou du moins l'inquiétude dans les consciences des habitants, qui les uns se persuaderaient aisément qu'ils ont reçu indignement les sacrements, et par des ministres qui n'avaient ni le droit ni la faculté de les leur conférer, et les autres, qu'ils n'ont pas licitement contracté, et qu'ils peuvent annuler les mariages qu'ils ont faits et enlever par là aux enfants qui en sont issus leur état naturel et civil : et ce sont, monseigneur, ces différents inconvénients que je supplie Votre Eminence de vouloir bien non-seulement prendre en considération, mais auxquels j'imagine qu'il convient de remédier incessamment par la voie la plus simple et qui fera moins d'éclat, pour ne pas alarmer les consciences, et ne pas donner lieu à la dissolution de mariages contractés de bonne foi et dans la persuasion qu'ils étaient valides.

“ Au surplus, monseigneur, je suis bien éloigné de rien proposer sur cela, en fait de moyens, à Votre Eminence. Je dois m'en rapporter à ce qu'elle en décidera. Mais indépendamment de mon respect pour le saint-siège, je crois qu'il serait fort dangereux que les différents missionnaires qui se destinent à ces colonies, qui ne dépendent ni d'un évêque en titre, ni d'un vicaire apostolique évêque *in partibus*, crussent et fussent dans la persuasion qu'il leur suffit pour exercer valablement et licitement les fonctions de leur ministère, d'être approuvés par les Ordinaires du lieu de leur embarquement, d'autant que pouvant partir de différents ports du Royaume, ils se trouveraient approuvés par différents Ordinaires, ils se croiraient tous indépendants les uns des autres, et il n'y aurait jamais parmi eux ni autorité reconnue ni subordination pratiquée.

“ Quant aux deux missionnaires qui sont actuellement aux îles Saint-Pierre et Miquelon, je les crois deux fort bons prêtres, très réguliers et remplis de zèle ; mais comme je ne reconnais celui qui m'écrit, et dont

j'adresse la lettre à Votre Eminence, du moins la copie, que par le bien qui m'en est revenu et les bons témoignages qui m'en ont été rendus ; et que, quant au second, je ne le reconnais point du tout ; je ne prendrai point sur mon compte de leur adresser les deux brefs de Sa Sainteté, dont Son Excellence M^{gr} le Nonce est dépositaire ; et plus Elle a la bonté de s'en rapporter à moi sur le choix des sujets qui doivent être revêtus de ses pouvoirs immédiats, moins je prendrai sur mon compte d'en proposer aucun dont je ne sois aussi sûr que de moi-même. Ainsi, j'attendrai sur cela les ordres de Votre Eminence, monseigneur, et je ne prendrai aucun parti que je ne les aie reçus... Je suis, etc., L'abbé de l'Isle-Dieu."

VI

L'abbé de l'Isle-Dieu réussit à trouver deux missionnaires pour les îles Saint-Pierre et Miquelon, MM. Pinabel et Paradis. Le nonce leur remit lui-même les brefs de Sa Sainteté les constituant respectivement préfet et vice-préfet apostoliques. Mais ils n'avaient pas, comme M. Perreault, préfet de la Martinique, la faculté d'approuver d'autres prêtres pour leur venir en aide. L'abbé de l'Isle-Dieu aurait voulu que ce pouvoir leur fût accordé : ils auraient pu ainsi donner la juridiction aux deux jésuites qui desservaient déjà les îles : la population de Saint-Pierre et Miquelon augmentait par le nombre d'Acadiens qui s'y réfugiaient : "Ce qu'il y a encore d'Acadiens en Acadie, sous le gouvernement anglais, écrit l'abbé de l'Isle-Dieu, essaie continuellement de se soustraire à une domination protestante, pour mettre leur foi et leur religion en sûreté, et ne sont ni intimidés par les risques qu'ils courent, ni retenus par les promesses et les offres qu'on leur fait¹." Il nous apprend, dans une autre lettre, que près de deux cents Acadiens se réfugièrent à Saint-Pierre et Miquelon vers la fin de 1766.²

¹ Archives du Vatican, Lettre de l'abbé de l'Isle-Dieu au card. Castelli, Paris, 6 oct. 1766.

² *Ibid.* Lettre du même au même, Paris, 9 fév. 1767.—Tout ce qui regarde l'infortunée population acadienne est digne d'intérêt. Nous lisons dans une autre lettre de l'abbé de l'Isle-Dieu, en date du 24 août 1767 : "Votre Eminence verra, par le petit mémoire ci-joint, que nous avons déjà établi 78 familles (d'Acadiens) dans le diocèse de Vannes ; mais il nous en reste encore de 5 à 600, c'est-à-dire plus de 3,000 habitants, que la cour et le ministère se disposent à établir en différentes provinces du Royaume, et s'il est possible, dans une seule et même, en leur donnant des terres incultes et non habitées, et les secours d'encouragement et de moyens de facultés pour s'y établir..."

"Nous allons faire incessamment la transmigration et la réunion de 5 à 600 familles sur les terres qui vont leur être destinées, dans la vue d'en faire et d'en reformer en France une nouvelle petite Acadie, j'ai pensé dire une nouvelle église de Jérusalem, car ils y vivaient comme les premiers chrétiens de la primitive Eglise. Et c'est là, monseigneur, ce qui serait capable de me faire verser des larmes de sang sur leur état actuel ou du moins ce qui me fait désirer si ardemment de pouvoir les rassembler de façon à ne faire plus pour ainsi dire qu'une seule famille, et de pouvoir leur procurer de dignes ministres qui les rappellent à leur premier esprit de religion et de piété..."

MM. Pinabel et Paradis ne purent se rendre à leur poste en 1766. Au printemps de 1767, M. Julien Becquet fut substitué comme préfet à M. Pinabel : voici ce que l'abbé de l'Isle-Dieu écrivait à la propagande au sujet du nouveau titulaire :

“ M. Julien Becquet, du diocèse de Paris, a été élevé au séminaire du Saint-Esprit, qui m'a toujours fourni, depuis trente-sept ans, tous les sujets dont j'ai eu besoin pour toutes nos colonies de l'Amérique septentrionale, et est de plus parent du supérieur de cette maison. C'est un excellent sujet à tous égards, du côté du zèle, de la capacité et de l'expérience de notre saint ministère, et qui de plus, et depuis longtemps, cherchait à se dévouer et à se consacrer à l'œuvre de nos missions...”

Puis il ajoutait au sujet des PP. de Bonnécamps et Ardilliers :

“ Quant aux deux jésuites, je crois qu'ils n'ont jamais eu d'autre mission pour desservir les deux îles que celle de notre cour, ni d'autre approbation que celle de l'évêque de leur embarquement, et simplement pour leur traversée ; et comme je dois vous parler, monseigneur, avec toute la sincérité qu'exige de moi la confiance dont vous voulez bien m'honorer, j'ai toujours cru apercevoir que l'intention de notre cour était de les faire repasser en France, sous la juridiction de l'Ordinaire du lieu de leur naissance et de leur origine, et je crois de plus qu'ils n'auraient aucun moyen de l'éviter que celui de se rendre à Québec dans leur maison qui subsiste encore, et sous la juridiction de l'évêque de Québec...”

“ D'ailleurs, monseigneur, permettez-moi de le représenter à Votre Eminence, de qui tiendraient-ils leurs pouvoirs et la faculté d'exercer les fonctions de leur ministère dans les îles dont il s'agit, dès que les deux Préfet et Vicé-Préfet apostoliques que le saint-siège y a nommés ne peuvent y associer que des ecclésiastiques directement approuvés par Sa Sainteté ?

“ Dira-t-on qu'ils le sont de droit par les pouvoirs communicatifs que Sa Sainteté a accordés à leur général, et que leur premier supérieur majeur régulier a pu, de droit, leur communiquer ? Ce serait réveiller contre eux les dispositions peu favorables de notre cour et l'animosité de toutes les cours souveraines du Royaume contre ce saint institut, dont l'abolition nous laisse à tous égards un grand vide, sur lequel il ne nous reste, à nous autres petits particuliers, que la ressource d'en gémir devant Dieu, dès que nous ne pouvons y remédier...”¹

Il est probable que les deux préfet et vice-préfet de Saint-Pierre et Miquelon furent autorisés à s'adjoindre d'autres missionnaires, car l'abbé de l'Isle-Dieu écrivait encore à la propagande quelques mois plus tard : “ Je leur ai recommandé d'avoir beaucoup d'égards et de considération pour eux (les PP. de Bonnécamps et Ardilliers), comme de ne faire aucune difficulté de les approuver, si le besoin le requérait, mais de ne le

¹ Archives du Vatican, Lettre de l'abbé de l'Isle-Dieu au cardinal préfet de la propagande, Paris, 6 avril 1767.

faire que sur et d'après la demande que les puissances temporelles (le gouverneur et commandant) leur en feraient, pour ne pas paraître vouloir grossir leur petit clergé, ni retenir dans les deux îles plus de missionnaires que notre cour et le ministère ne voudront y en entretenir ; et cela, monseigneur, pour n'y pas retenir un plus grand nombre d'habitants qu'elles n'en peuvent comporter...¹”

Le pape Clément XIII, usant de la plénitude de son pouvoir, venait d'ailleurs de lancer un bref revalidant les actes accomplis par nos deux missionnaires et nuls par défaut de juridiction, revalidant spécialement *in radice* les mariages contractés en leur présence. Il recommandait seulement au préfet de ne faire connaître ce bref que dans le cas d'une grave nécessité, afin sans doute de ne pas troubler inutilement les consciences².

Que devinrent les PP. de Bonnécamp et Ardilliers après l'arrivée de MM. Becquet, préfet apostolique, et Paradis, vice-préfet, dans l'automne de 1767 ? Demeurèrent-ils encore quelque temps à Saint-Pierre et Miquelon ? Quels furent leurs principaux actes d'administration durant leur séjour aux îles ? Autant de questions sur lesquelles nous n'avons aucun document pour jeter quelque lumière. Une lettre d'un missionnaire actuel des îles nous apprend que, lorsque les Anglais s'en emparèrent en 1778, ils en brûlèrent toutes les archives : “ Le premier acte officiel que nous ayons, dit-il, date de 1816.”³

Ce qui est certain, c'est que M. Becquet y était encore préfet apostolique en 1770. En 1784, après la reddition des îles à la France, c'était M. Paradis qui en était préfet, et il avait avec lui comme vice-préfet M. de Longueville. Mais il paraît que le nouveau préfet apostolique n'était guère à la hauteur de sa mission : M. de Villars écrivant à la propagande lui communiquait une lettre de M. Henri, chirurgien-major aux îles Saint-Pierre et Miquelon :

“ Nous avons, disait M. Henri, M. l'abbé Paradis, préfet apostolique, qui doit vous écrire, à ce qu'il m'a dit, pour vous demander un missionnaire. Cette colonie a grand besoin d'un homme ferme et qui ait de la tête ; il est temps qu'il nous vienne, car la religion s'affaiblit furieusement dans notre peuple ; et si j'ose vous dire, la plupart n'en ont point. M. Paradis est un galant homme, sans talents pour être chef d'une colonie. C'est un bon ecclésiastique dans une communauté.”

M. de Villars ajoutait : “ Comme M. Henri est un homme de bon sens et honnête, et que son témoignage s'accorde avec celui de M. Becquet,

¹ Archives du Vatican, Lettre du même au même, Paris, 15 juin 1767.

² *Ibid.*, Bref de Clément XIII, mars 1807.

³ Lettre de l'abbé Cl. Folie à M^{re} Gagnon, île Saint-Pierre, 10 mai 1897.—On lit aussi dans une lettre de M. de Villars au card. Castelli, Paris, 9 nov. 1778 : “ Nous venons d'apprendre que les Anglais se sont emparés depuis peu de ces deux îles, et qu'ils en ont transporté les habitants ailleurs, au nombre de 300 familles.” (Archives de la propagande.)

ancien préfet apostolique à Miquelon, j'ai cru devoir envoyer à Votre Eminence un extrait de sa lettre. Elle peut se rappeler mes craintes à ce sujet, et dont je lui fis part dans le temps, *ex visu et auditu...*¹"

Il écrivait encore quelques semaines plus tard : " Je viens de recevoir une lettre de M. Paradis, préfet apostolique à Miquelon. Elle est tout à fait singulière et originale. La signature est ainsi : *Paradis, sous le nom de Préfet apostolique.*" Puis, citant un passage de la lettre : " Votre Eminence comprend mieux que moi par ce détail combien l'on aurait besoin, dans ces îles éloignées, d'un préfet apostolique homme de tête et de mérite. La piété seule ne suffit pas..."²"

Quelques années plus tard, M. de Longueville était préfet apostolique aux îles Saint-Pierre et Miquelon.

VII

Vers le même temps, en 1790, mourait le P. de Bonnécamps au château de l'amiral de Tronjoly,³ près de Gourin, dans le Morbihan, en Bretagne. Voici l'extrait de son acte mortuaire, tel qu'il se trouve dans *l'Inventaire des Archives départementales du Morbihan* :

" 29 mai 1790. Inhumation dans l'église Notre-Dame (de Gourin) de Vénérable Messire Joseph-Pierre de Bonnécamps, prêtre, ci-devant membre de la Société de Jésus, originaire de Vannes, décédé au château de Tronjoly, à l'âge de 84 ans."⁴"

Le château de Tronjoly existe encore : il s'élève au nord-est de Gourin, à la porte même du village. C'est une grande maison confortable, entourée d'un beau parc arrosé d'eaux vives. On y conserve un vieux meuble qui a appartenu au savant jésuite, et quelques livres qui portent son nom : " l'abbé de Bonnécamps, prestre".

Le propriétaire actuel du château, le comte de Lescouët,⁵ maire de Gourin et membre du Conseil général du Morbihan, descend de l'amiral de Tronjoly : un de ses ancêtres, Jean-Baptiste Rouxel, seigneur de Lescouët, épousa le 19 octobre 1779 M^{lle} Anna-Jacquette L'Ollivier de Tronjoly, fille de l'amiral François-Jean-Baptiste L'Ollivier de Tronjoly et de Françoise-Guillemette de Quélen, d'une vieille famille bretonne dont est sorti M^{sr} de Quélen, archevêque de Paris.

¹ Archives de la Propagande, Lettre de M. de Villars au cardinal Antonelli, Paris, 17 janvier 1785.

² *Ibid.*, Lettre du même au même, Paris, 7 février 1785.

³ *La Jeunesse de Bougainville et la Guerre de Sept Ans*, par René de Kerallain, p. 97.

⁴ Nous devons cet extrait à l'obligeance de M. de Kerallain, ainsi que la plupart des renseignements qui vont suivre.

⁵ M^{me} de Lescouët est une demoiselle de Carné, d'une des plus vieilles familles de Bretagne, à laquelle appartenait le comte de Carné, membre de l'Académie française.

D'après M. de Lescouët, le P. de Bonnécamp aurait été appelé à Tronjoly comme précepteur des enfants de l'amiral. Nous venons de voir qu'il y est décédé en 1790 à l'âge de 84 ans : il faut supposer qu'il y résidait depuis assez longtemps, car on n'aurait pu lui confier de pareilles fonctions dans son vieil âge. On peut donc conjecturer vraisemblablement que son entrée au château remontait au moins à une vingtaine d'années, disons à l'époque (1768 ou 1769) où il fut probablement obligé de s'éloigner des îles Saint-Pierre et Miquelon, n'y ayant pas les pouvoirs authentiques nécessaires pour exercer le saint ministère où l'avait entraîné son zèle.

Mais comment et à quelle occasion fut-il rencontré alors par l'amiral de Tronjoly, qui lui donna si opportunément l'hospitalité ? D'après certains documents aux archives de la Marine, l'amiral paraît avoir eu pour mission spéciale du gouvernement, à cette époque, de protéger les pêcheries françaises de Terre-neuve. Il stationnait donc évidemment lui-même aux îles Saint-Pierre et Miquelon, ou du moins il avait occasion d'y aller fréquemment. Sans en avoir la preuve, c'est lui peut-être qui, dans l'intérêt spirituel des résidents français, y avait attiré son compatriote qu'il connaissait parfaitement, qui appartenait comme lui au diocèse de Vannes : et l'on comprend facilement qu'il lui ait offert un asile dans son château, lorsqu'il le vit obligé de rentrer en France. Nous savons par une lettre de l'abbé de l'Isle-Dieu que nous avons citée, " que c'était l'intention de la cour de faire repasser en France les deux jésuites des îles Saint-Pierre et Miquelon sous la juridiction de l'Ordinaire du lieu de leur naissance et de leur origine ".

Le P. de Bonnécamp se chargea volontiers de l'éducation des enfants de l'amiral. Il coula des jours heureux dans ce vieux château breton, au milieu de cette noble famille qui l'avait accueilli avec tant de bienveillance, dans la compagnie de ses livres, occupé à ses études et à ses travaux scientifiques qui avaient toujours fait le charme de sa vie.

Le château de Tronjoly était d'ailleurs le rendez-vous d'une société d'élite, que le père devait être heureux de rencontrer. Il y faisait sans doute lui-même bonne figure, car nous savons, par le témoignage de Bougainville, que sa conversation n'avait rien d'austère : elle était aimable et intéressante. Que de fois, sans doute, il eut occasion de rencontrer chez l'amiral d'anciens officiers français ou autres personnages qu'il avait connus au Canada ! Il dut certainement y revoir Bougainville et s'entretenir avec lui des choses canadiennes : car le jeune et brillant officier avait épousé M^{lle} de Montendre, dont le centre familial était au château de Kerdrého, à quelques lieues seulement de Gourin.

Le P. de Bonnécamp mourut avant les mauvais jours de la révolution française : il n'en connut pas du moins toutes les horreurs. Il s'éteignit tranquillement dans le château où il avait coulé des jours si heureux et si paisibles. Quatre ans plus tard ce château était fermé... Il ne fut rouvert qu'en 1830.



V.—*Jacques Cartier—Questions de Lois et Coutumes maritimes*,¹

Par M. l'Abbé Hospice Verreau, docteur ès lettres.

(Lu le 19 mai 1896.)

Les questions que nous allons examiner dans cette troisième étude sur Cartier sont d'un ordre moins élevé que les précédentes ; mais elles ne cessent pas que d'avoir encore de l'importance. Elles nous aideront à mieux comprendre le texte du découvreur malouin, et à interpréter plus facilement certains détails dont la signification, sans cela, échapperait au lecteur. Nous allons interroger les lois et les usages maritimes qui existaient au commencement de xvi^e siècle et qui ont dû être observés par Cartier dans ses trois voyages au Canada.

Qu'on se rassure, cependant : je ne veux ni faire un cours de droit, ni étaler une érudition d'emprunt : mon œuvre sera bien modeste ; mais je crois qu'elle sera utile.

Nous lisons au début du premier voyage : “Après que Missire Charles de Mouy, chevalier seigneur de la Milleraye et Visadmiral de France, eut prins les sermens et faict jurez les *Cappitaine, maistres* et *compaignons* desditz navires de bien et loyaulment soy porter au seruice du Roy soubz la charge dudit Cartier, partimes, etc.”²

Puis, vers la fin de sa narration, Cartier, après nous avoir raconté qu'il essaya vainement de lutter contre les vents et les courants dans le détroit de Saint-Pierre³, ajoute :

“Nous ayant ce veu, retournasmes avec nos dites barques et vinsmes à noz nauires qui estoient à la voile, espérant toujours gagner en avant, qui estoient deschuz plus de quatre lieues aual le vent de là où les auyons laissées. Et nous arrivez au dit navire, assemblasmes tous les *cappitaines, pillottes, mestres* et *compaignons* pour auoyr l'opinion et aduys de ce qu'il estoit bon de faire ; et après auoir l'ung après l'autre dit que, considerer les grans ventz d'avaulx qui commençoient, et que les marées estoient fortes, tellement qu'ilz ne faisoient que décheoyr, et qu'il n'estoit possible de gagner outre en ceste saison, et aussi que les tormentes commençoient en icelluy temps en la Terre neufve, et que nous estions encores bien loing et ne sçauions les dangiers qui estoient entre deux, qu'il estoit bien temps de s'en retourner ou de demeurer par là, véant⁴ et dauantage, que si une muayson de vent de

¹ Le présent travail fait suite à deux études sur Jacques Cartier publiées dans les *Mémoires de la Société royale*, t. VIII, p. 121 et t. IX, p. 77.

² *Relation originale du Voyage de Jacques Cartier au Canada en 1534*, Paris, Tross, 1867, p. 1.

³ Entre l'île d'Anticosti et la côte du Labrador.

⁴ Du Petit-Val a remplacé ce mot par *tout le reste de l'année*, traduction de l'italien *per tutto il resto dell'anno*. Si MM. Michelant et Ramé ont bien lu, *véant*,

“ Nord nous prenoit, que c'estoit force de y demeurer ; après lesquelles “ opinions prinſes, fiſmes arrivez large à nous en retourner, etc.”¹

Dans ces deux passages, nous voyons les noms de *capitaine*, *maîtres*, *pilotes* et *compagnons*. Nous avons besoin de connaître quelle en était la signification au commencement du *xvi^e* siècle ; par là, nous pourrions nous former une idée exacte de l'office auquel ces mots correspondaient alors.

I

Aujourd'hui, nous donnons également le titre de *capitaine* à celui qui est à la tête d'une compagnie de soldats et à celui qui conduit un vaisseau. Dans la première partie du *xvi^e* siècle, ce titre ne s'accordait — autant que j'ai pu le constater—qu'à un militaire et pour un commandement militaire.

On était capitaine d'une place, ou capitaine d'une compagnie de soldats. La personne qui conduisait un vaisseau s'appelait *maître* ou *patron*. C'est ainsi qu'elle est invariablement désignée dans les édits royaux rendus au sujet de la marine, surtout dans les édits de François I^{er}, années 1517 et 1544.²

Dans l'édit de 1544, le mot *capitaine* se rencontre une ou deux fois. Il est employé avec d'autres, comme ceux de *maîtres*, *chefs*, *patrons*, *conducteurs*, afin de généraliser et de comprendre sous différents titres, l'étendue de l'autorité qui pouvait être donnée à une autre personne qu'à l'amiral ou à ses lieutenants.

avec la signification que lui donne Ramusio, doit être une locution locale. Roquefort, dans son *Glossaire de la Langue romane*, fait dériver ce dernier mot de *videns* et de *velans*, par une formation certainement très régulière, mais ni l'une ni l'autre des deux significations—*voyant* et *prohibant*—ne saurait convenir ici. Il faut donc chercher une autre étymologie. Duméril, *Dictionnaire du Patois normand*, à l'article *antan*, donne un mot qui signifie *cette année*, c'est *ouan*, formé de *hoc anno*, et il cite pour exemple :

Dit la dame : naiez paor,
Je vous mettrai en tel destor
Où il ne querra ouan.

(*Tableaux anciens*, t. III, p. 314.)

Et Roquefort, au mot *ouan*, donne cet autre exemple :

Charlot, foi que doi Sainte Jame,
Vous avez *ouan* fame prise, etc.

(*La Desputoison de Charlot et du Barbier*.)

Véant peut être une mauvaise lecture pour *ouan*. Dans ce cas, les gens de Cartier auraient voulu dire qu'il fallait s'en retourner ou se décider à demeurer sur nos côtes *cette année et davantage*, puisqu'en hivernant en Canada, ils n'auraient pu repasser en France que l'année suivante. Je crois que c'est là le vrai sens du mot employé par Cartier, et la version de Ramusio paraît exacte.

¹ *Relation originale*, pp. 47 et 48.

² Le premier signé à Abbeville, juillet 1517, le second, à Fontainebleau, février 1543-1544. Isambert, *Recueil général des anciennes Loix françaises*, Paris, 1828, t. XII, pp. 137 et 851.

La raison est facile à saisir : jusque-là, les entreprises sur mer n'avaient eu que deux buts : ou faire le commerce ou transporter des soldats. Dans le premier cas, on n'avait besoin, pour conduire les navires, que des *maîtres* et des *pilotes*. Dans le second cas, l'entreprise était commandée par un chef militaire à qui l'on donnait le titre de vice-amiral, ou de capitaine, selon les circonstances. Ce personnage pouvait donc n'être pas un marin, et de fait il l'était très rarement, comme l'affirme M. Jal,¹ dont l'autorité en ces matières est d'un très grand poids.

C'est, d'ailleurs, la conclusion à laquelle on arrive quand on étudie l'histoire de la marine à cette époque. Je ne sais si l'amiral Philippe de Chabot avait jamais mis le pied sur un vaisseau avant sa captivité, quand il fut transporté en Espagne avec François I^{er}, après la bataille de Pavie. Roberval était dans le même cas quand il fut chargé de l'expédition de 1641.²

L'importance des expéditions navales augmentant avec les découvertes, on comprit peu à peu la nécessité qu'il y avait pour un chef d'escadre d'être expérimenté au fait de la mer, comme on disait autrefois. Cependant, je le répète, jusqu'au milieu du xvi^e siècle, c'est l'officier militaire que l'on considère dans le capitaine plutôt que le marin³.

La charge de capitaine était conférée par une commission à *temps*, suivant l'expression de l'époque, et se terminait avec l'expédition qui l'avait exigée. C'est ordinairement l'amiral qui l'accordait, en vertu des pouvoirs de sa charge.

Mais ces usages se transformèrent peu à peu selon les besoins de la politique et les développements de la marine. Ainsi, dès 1575, Chaton de la Jaunaye, qui paraît s'être distingué sur mer, quoiqu'il ne fût pas pilote, est nommé par Henri III à la charge de capitaine dans la marine royale, comme à un office permanent.

Le capitaine qui avait sous ses ordres plusieurs vaisseaux en était considéré comme l'amiral⁴ et par suite, il jouissait de certains privilèges.

¹ *Documents inédits sur l'histoire de la marine au xvi^e siècle*, note 134.

² On a même vu en France un ecclésiastique, M. de Sourdis, archevêque de Bordeaux, nommé général d'une armée navale.

M. de Repentigny, qui fut plusieurs fois amiral de la petite flotte canadienne, n'était pas un homme de mer.

³ Cf. *Hydrographie, contenant la théorie et la pratique de toutes les parties de la navigation*, par le P. G. Fournier, 2^{me} édition. Paris, 1667.

Quant aux *Us et Coutumes de la Mer*, Rouen, 1671, cet ouvrage s'occupe surtout de la marine marchande. Cependant dans ses commentaires sur les *Jugements d'Oleron*, p. 10, et ailleurs, Clairac nous indique clairement quels sont le rang et les fonctions du capitaine.

⁴ " Par ce mot amiral, j'entends deux choses. La première, ceux qui en diuers temps, et pour diuerses occasions ont esté employez au gouvernement de nos Flottes par commission à certain temps, et pour quelque affaire, laquelle acheuée, . . . leur commission . . . a cessé et pris fin. La seconde, ceux qui ont eu cette charge à titre d'office ordinaire, réglé par la loy, ou érigé par Edit à perpétuité pour toute sorte d'affaires et négoes concernant la Marine, soit en temps de paix, soit en temps de guerre." *Hydrographie*, par le P. Fournier, *op. cit.*, p. 299.

Ainsi, il pouvait mettre pavillon au grand mât¹. Lui seul portait le fanal avec une lanterne sur le point le plus élevé de la poupe, indépendamment des feux dont il pouvait se servir pour les signaux de nuit. Pour ceux du jour, un trompette à ses ordres les transmettait quand le temps le permettait. Enfin, il pouvait avoir dans son navire un domestique pour le servir.

Nous verrons plus loin que sur ce point Cartier connaissait ses droits et qu'il sut s'en prévaloir.

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Quant au *maître*, son nom seul indique quelle position il occupait sur les vaisseaux. Il en avait la conduite générale, quelle qu'en fût la destination. Sous lui, se trouvaient, pour l'assister, le contremaître et les quatre compagnons de quartier.

Sur les vaisseaux marchands, il occupait naturellement la première place, mais il n'avait que la troisième sur les navires de guerre et sur ceux qui étaient simplement employés pour le service du roi. Dans ce cas, il ne venait qu'après le capitaine et le pilote, mais il conservait toute son autorité sur les matelots, et dirigeait toute la manœuvre².

Le maître était obligé de posséder des connaissances assez étendues dans l'art de la navigation ; il les acquérait par l'étude et surtout par l'expérience, et subissait un examen avant de pouvoir prendre son titre ou se charger d'un vaisseau.³

Au besoin, il remplaçait le pilote, et la responsabilité du navire tombait presque toujours sur lui. Aussi possédait-il dans tout le vaisseau une autorité très grande, sagement tempérée par les devoirs qu'il avait à remplir, et par les soins qu'il devait à son équipage.

Cet équipage, c'est lui qui le formait en choisissant les hommes qu'il

¹ Le maître du navire qui arrivait le premier sur le banc de Terre-Neuve pour y faire la pêche était considéré comme l'amiral de ceux qui venaient s'installer après lui, et, en cette qualité, il arborait pavillon au grand mât. *Us et Coutumes de la Mer*, p. 569.

² "Il n'en commandait personnellement qu'une partie. Ordinairement, dit Clairac (*Us et Coutumes de la Mer*, p. 10), le maître commande les manœuvres depuis la poupe jusqu'au grand mât ; le commandement du contremaître est depuis l'éperon ou la proue jusqu'au mast de misaine icelui compris."

La découpeure du pont, dont nous nous occuperons plus tard, faisait alors de l'avant et de l'arrière du vaisseau deux ilots séparés par une sorte d'abîme. Cette découpeure, dit l'amiral Jurien de la Gravière, limita pendant longtemps le domaine du maître et du contremaître. *Les Marins du XV^e et du XVI^e Siècle*.

³ Ordonnance de l'Amirauté, 1584, articles 86 et 87. Cette ordonnance, il est vrai, est postérieure à l'époque qui nous occupe ; mais Henri III paraît y avoir résumé ce que ses prédécesseurs avaient réglé avant lui. Depuis longtemps, le roi d'Espagne, celui de Portugal ainsi que la Hanse Teutonique, avaient passé des règlements analogues. Cf. *Us et Coutumes de la Mer*, pp. 8, 10.

croyait les plus propres à l'entreprise dont il était chargé : personne n'avait le droit d'intervenir et de gêner son choix ¹.

Dans la marine marchande, le maître avait certains droits et des obligations qu'il est inutile de signaler ici, parce qu'ils ne rentrent pas dans notre sujet.

* * *

Du *pilote*, il y a très peu de choses à dire : ses fonctions étaient alors ce qu'elles sont aujourd'hui. Il occupait toujours la seconde place, soit sur les vaisseaux du roi, soit sur les vaisseaux marchands, c'est-à-dire que sur les premiers, il venait après le capitaine, et sur les seconds après le maître.

On distinguait les pilotes *hauturiers* qui se dirigeaient en pleine mer en prenant la *hauteur* des astres, et les pilotes *côturiers*, *lamaneurs* ou *locman*,² qui étaient familiers avec une partie des côtes maritimes d'un pays, ou avec quelque rivière navigable.

Sur le navire *la Couronne*, qui a passé pour un chef-d'œuvre de construction maritime au commencement du xvii^e siècle, il y avait deux pilotes hauturiers, deux pilotes pour les côtes d'Espagne, deux pour les côtes de Saintonge, et deux pour les côtes de Bretagne.³

J'aurais aimé à constater la somme de connaissances qu'on exigeait des pilotes au xvi^e siècle. Je n'ai malheureusement rien trouvé de clairement déterminé. Les ordonnances qui leur imposaient des examens sont d'une date plus récente. D'ailleurs, je pourrai étudier cette question avec plus de détails quand j'aurai à considérer dans Cartier l'homme de science et d'expérience. Pour le moment, il me suffira de dire que si nous jugeons par leurs écrits les pilotes hauturiers français de cette époque, Gamart, Jacques Cartier, Jean Alfonse, nous verrons qu'ils avaient toutes les connaissances qu'on pouvait acquérir alors sur l'astronomie et la cartographie.

Mais il faut reconnaître que ces derniers n'étaient pas des hommes vulgaires et qu'ils formaient un nombre bien peu considérable. Quand

¹ " Il n'appartient qu'au Maître de composer son équipage, et faire élection des Compagnons qu'il a besoin ; le Bourgeois, ny nul autre ne le pouvant contraindre d'en prendre aucun s'il ne lui plaît. La raison est, que le Maître doit être asseuré de luy-mesme, et par sa propre connoissance, et non par le raport d'autruy, de la valeur, obéissance, et fidélité des Compagnons qu'il prend ou choisit. Qu'il est plege, et répond des légers méfaits de ceux de son équipage, Concierge ou Geolier, pour représenter à Justice les coupables de gros crimes." *Us et Coutumes, op. cit.* p. 54.

² " *Locman, Lomen et Lamaneur* sont Pilotes et Mariniers de rivières, pris et louez sur les lieux, comme connoissans les pas et les dangers desquels le Pilote du Navire n'a pas de notice, *Helcyarii* : que les Maîtres appellent et louent lorsque le Pilote ordinaire le requiert". " En Bretagne ils sont fort nécessaires, comme a remarqué l'auteur de la *Mer des Histoires*, liv. II, ch. II, en ces termes : Car il fait fort dangereux entre les Havres de Bretagne Armorique, sans Lomen ou Guide". *Us et Coutumes*, p. 75, *op. cit.*

³ *Hydrographie, etc.*, p. 45, *op. cit.*

l'océan eut été plus exploré, et les rivages du nouveau monde mieux connus, on se montra, sans doute, moins exigeant sur la question de la science que devaient posséder les pilotes hauturiers. C'est au moins ce qui paraît résulter des reproches amers que Clairac leur adresse en les accusant d'être inférieurs aux pilotes des autres nations.¹

Quant aux pilotes côturiers, ils étudiaient la configuration des côtes et du littoral de leur pays, les passages dangereux, les écueils, les ports de refuge, etc. ; mais là s'arrêtait leur savoir.

Quoi qu'il en soit, le droit maritime de l'époque était particulièrement sévère à l'égard du pilote quand il causait la perte du navire qu'il devait conduire à bon port. D'après les *Jugements d'Oleron* le capitaine pouvait tout simplement lui faire couper la tête sans forme de procès.²

Mais le *Consulat* se montrait plus équitable en exigeant que la cause du malheureux pilote fût jugée par l'équipage entier, et non par le seul maître.³

On avait certainement raison de procéder avec sévérité dans de pareils accidents, car on avait à redouter dans la perte des navires d'autres causes que l'ignorance : il y avait, par exemple, la cupidité, à une

¹ "Les gens de mer Portugais, les Hollandais et Zelandois sont pour la plus part d'eux, bien instruits et dressez à toutes ces nobles opérations, quoy qu'au reste le plus d'iceux soient illicites (*sic*), ils prennent grand plaisir, font honneur et caresses à ceux qui les poussent ou les portent sur le discours d'icelles, ce que j'ay expérimenté pendant 25 à 30 ans que j'en ay interrogé & mis sur telles questions, lorsqu'ils sont venus faire rapport de leur voyage au siège de l'admirauté de Guyenne à la Table de marbre.

"Mais quand aux Suédois, Danois, Alemans, Irois, Ecossois, Anglois, Basques, Bretons, Normans, Poitevins & Picards, que j'ay veus & pratiqués en semblable rencontre, j'ay remarqué qu'ils n'agrèent aucunement les dits interrogatoires, estant plus disposez à vuidier la bouteille, humer l'eau de vie, & fumer le tabac, qu'à manier adroitement l'Astrolabe, le grand Anneau, le quadran ou quart de rond, le triangle ou l'arbalestille : ce qui soit dit sans dessein d'offenser ceux que je n'ay pas veu ny pratiqué, & sans en faire regle ou jugement général sans exception pour toutes ces Nations.

"J'ay remarqué que la grande estude qui les a rendus ou fait devenir Pilotes, consiste à dresser leur routes à la manière antique, veue par veue, & par apparence de caps ou promontoires à l'aspect de Chapelles, Chasteaux, Tours, Clochers & Moulins à vent, ou par cours de Marées, & par la couleur ou condition des sables de la Sonde. Conformement à ce qu'enseignent les Routiers de *Garcie de Ferrande*, & du Capitaine *Jean Alfonse Saintongeois*. Mais du Ciel et des Mathematiques, ils n'estiment pas en avoir besoin. Si ce n'est seulement la connoissance des Gardes du Nort, qui composent la petite Ourse pour la direction du Compas par la posture de laquelle constellation les Hauturiers remarquent le Sit ou le vray lieu du Pole." *Us et Coutumes*, etc., *op. cit.*, p. 407.

² *Jugements d'Oleron*, 23, 24 et 25, *Us et Coutumes de la Mer*, pp. 74 et suivantes.

³ "Néanmoins le patron ne sera pas le seul juge pour décider si celui qui a été pris pour pilote doit perdre la tête ; cette mesure doit être résolue par le contre-maître, les marchands et tout l'équipage du navire." (Traduit du catalan par J.-M. Pardessus, *Collection des lois maritimes antérieures au XVIII^e siècle*, t. II, p. 251.) Voir, note A, à la fin de ce mémoire, quelques détails sur le *Consulat* et les *Jugements d'Oleron*.

époque où le droit de *bris*, quoique adouci, était encore en vigueur ; ou bien encore un patriotisme plus ou moins bien compris, quand les navires étrangers étaient obligés d'avoir recours aux pilotes du pays dont ils longeaient les côtes.

Le P. Fournier, en rappelant cette mesure sévère, regrette qu'elle ne fût pas observée assez souvent de son temps, " parce que, ajoute-t-il, on ne verrait pas tant de naufrages comme l'on voit".¹

* * *

" Les *compagnons*, dit Clairac, sont les mariniers de l'équipage, *socii navales*, dans Tite Live." On désignait ainsi ceux qui travaillent aux manœuvres du vaisseau ; aujourd'hui ils s'appellent *matelots*², nom qui était assez rarement employé aux XIV^e et XV^e siècles, et pendant la première moitié du XVI^e. On ne le voit pas une seule fois dans les voyages de Cartier.

Pour nous, le matelot est un mercenaire que l'on traite durement et souvent sans pitié, à qui on ne demande rien de plus que d'accomplir son travail avec la ponctualité d'une machine ; mais à l'époque où la navigation hauturière étendait le champ de ses explorations, l'homme qui partageait avec le *maître* les périls de l'océan et dont le dévouement devait assurer le salut commun, n'était pas un simple manœuvrier, c'était un *compagnon* qu'il fallait traiter avec un certain respect, soigner avec attention et toujours protéger.

Ce qui frappe dans le droit maritime de l'époque, en France surtout, c'est le sentiment de solidarité—on peut dire d'égalité qu'il reconnaît entre les compagnons et le maître. Le maître, il est vrai, commande aux compagnons, mais il ne peut les traiter à sa guise : il leur doit des soins et même des égards. Il est obligé de les consulter dans certain cas. Mais ce qui paraîtra aujourd'hui le côté caractéristique de ce droit, c'est que le matelot pouvait avoir une part dans le fret et, par là, réaliser des profits dans les entreprises dont il avait à subir les dangers.

¹ *Hydrographie*, p. 123. *Op. cit.*

² Littré, avec raison, rejette les étymologies du mot *matelot* données par Jal et par Diez. L'étymologie la plus vraisemblable, d'après lui, est le hollandais *Maate*, compagnon. " L'usage et la coutume de la mer, dit à ce sujet Clairac, est de composer l'équipage deux à deux, comme aux compagnies de gens de guerre, les soldats camarades, lesquels marchent au même rang, et c'est ce que l'on dit faire matelotage ; les deux adjoints se nomment l'un l'autre *mon Matelot*." (*Us et Coutumes de la Mer*, p. 70, *op. cit.*)

Le P. Fournier nous apprend que le premier soin du capitaine, dès qu'il est en mer, doit être d'*amateloter* les hommes de l'équipage, " les associant tous, deux à deux... commençant par soy et son lieutenant et finissant aux Pages et Garçons", etc. *Hydrographie*, p. 91, *op. cit.*

Si le *Dictionnaire de l'Académie* avait tenu compte de cette étymologie, il aurait été plus clair dans la définition qu'il donne du mot *matelot* appliqué à certains vaisseaux de ligne.

Aussi, était-il choisi avec soin, parce qu'il fallait compter sur son expérience de la mer, sur sa force et son courage et principalement sur son obéissance et sa fidélité.

Comme je l'ai indiqué plus haut, ce choix appartenait de droit au maître, qui, à son tour, avait été choisi par les armateurs ou par le capitaine, selon qu'il s'agissait de la marine marchande ou du service du roi.

Le capitaine, avant de prendre mer, était obligé de faire inscrire la liste détaillée de son équipage dans les bureaux de l'amirauté, et il devait la représenter au retour ; c'était un moyen indirect de constater les causes de la disparition de ceux qui auraient pu manquer.

Je viens de l'indiquer, les compagnons avaient le droit d'être consultés dans quelques circonstances, par exemple quand il fallait prendre la mer¹ ; quand il s'agissait de prolonger le voyage au delà du temps et du lieu convenu, car l'équipage n'était pas engagé pour l'année, ou sous bon plaisir du maître, comme cela se pratique aujourd'hui : il ne l'était ordinairement que pour tel voyage déterminé.

Nous verrons plus loin que Cartier doit se conformer à cet usage à la fin de son premier voyage.

Quand les compagnons avaient été réunis et les navires avitaillés, au moment de s'aventurer sur l'océan, il restait une dernière formalité à remplir, au moins sur les vaisseaux qui étaient au service du roi. L'amiral, ou ses officiers, se présentait pour faire prêter à l'équipage serment de fidélité au souverain et d'obéissance à ceux qui avaient quelque commandement sur les navires².

Cette formalité observée au début du premier voyage de Cartier, dut l'être encore au second et au troisième, quoiqu'il n'en soit fait aucune mention.

¹ Voici comment s'expriment les *Jugements d'Oleron* : " Une nef est en hâvre... et quand il vient à soy départir, le " maistre doibt prendre conseil à ses compagnons et leur dire : " Seigneurs, vous haïte ce temps ? (vous convient-il, ce temps ?)" Aucun qui y aura qui dira : " Le temps n'est pas bon, car il est nouvel debvenu et le devons " laisser assaeoir." Et les autres diront : "Le temps est bel et bon." Le maistre est tenu soy accorder avec ses compaignons, et s'il le faisait autrement et la nef se perdoit, il est tenu de rendre la nef... De ce c'est le jugement."

² Ce serment était exigé par l'édit que François I^{er} avait donné à Abbeville, juillet 1517 :

Article premier. "Quand aucune armée ou entreprise se fera sur la dite mer par les gens qui sont ou seront à nos gages, nostre dict amiral fera jurer les chefs de chaque navire qu'ils gouverneront bien à droit... et aussi jurera le dict maistre, contre-maistre et ses quatre compagnons de quartier et aussi répondront de leurs gens."

Et plus loin, parlant de l'équipage, le texte ajoute :

Art. 2. "Auxquelles personnes il l'amiral chargera d'obéir aux diets maistre, contre-maistre et quatre compagnons."

II

Revenons maintenant à Jacques Cartier.

A l'aide des explications précédentes, il nous sera plus facile d'étudier son rôle et de comprendre ses actes.

Et d'abord Jacques Cartier était-il pilote ?

Si par ce nom, on se représente l'homme secondaire, aux connaissances bornées et aux habitudes vulgaires tel que Clairac nous le dépeint dans ses commentaires (voir note ¹, p. 124) je répondrai : Non, Cartier n'était pas pilote, il était plus que cela. C'est un marin, comme Verrazano et Magellan, comme Cabot et Vespucci. Pour ce qui regarde la science de la navigation, nous pouvons affirmer que Cartier était pilote comme Colomb.

Où et comment avait-il acquis les connaissances nécessaires à cet office ? Nous l'ignorons encore. M. Joüon des Longrais a remis en lumière le fait probable que Cartier avait voyagé jusqu'au Brésil, et qu'il devait avoir navigué avec des Portugais, dont il avait appris la langue¹.

Le mariage de François I^{er} avec la reine douairière de Portugal, je l'ai déjà fait remarquer, avait sans doute augmenté les relations qui existaient entre la France et le Portugal ; mais ces relations dataient de loin. Dès le siècle précédent, le Portugal trouvait à Rouen et à Honfleur un marché pour les richesses qu'il allait cueillir sur les côtes de l'Afrique : on trouvait sur les navires français des pilotes portugais ou d'origine portugaise comme Jean Alfonse ;² les français montaient sur les vaisseaux portugais. Il n'est donc pas surprenant que Cartier ait été formé à l'école qui a donné au Portugal Vasco de Gama.

Aucun document ne nous fait connaître si Cartier avait reçu le titre de *pilote pour le roi* avant 1534 ; rien non plus ne nous fait voir que ce titre ait été pour lui une source d'honneurs et de richesses. La France, il est vrai, était alors au début de ses découvertes, elle n'avait pas le même intérêt que l'Espagne à perfectionner sa marine. L'Espagne attirait les pilotes étrangers, leur accordait des postes de confiance et des pensions, considérables pour l'époque, témoins Vespucci et Sébastien Cabot. Ainsi, Vespucci avait été nommé en 1508 pilote major, avec un traitement fixe, sans compter ce qu'il pouvait retirer de différentes sources. Il était chargé en outre d'examiner tous les pilotes, de les instruire, en se faisant payer

¹ *Jacques Cartier, Documents nouveaux recueillis*, par F. Joüon des Longrais, Paris, 1888, p. 10.

² La question de la nationalité de Jean Alfonse n'est pas encore décidée. Je le sais, on apporte des preuves très fortes pour établir qu'il était français. Mais il y en a de non moins probantes du côté des Portugais. (Cf. *Historia do Brazil* de Varnhagen, tome I, p. 44 ; *Amerigo Vespucci*, du même auteur, Lima, 1865, p. 115, note). D'ailleurs, Alfonse n'aurait pas été le premier pilote portugais qui se serait mis au service de la France. (Voir *Histoire du Brésil français*, par Gaffarel, Paris, 1878, page 35.)

par eux, de présider à la confection d'une carte modèle qu'on nommerait *Padron Real*.¹

Mais nous avons à considérer dans Cartier surtout le rôle de capitaine ou chef de l'expédition que le roi de France envoyait à la recherche de terres nouvelles.

Pour justifier ce choix, Cartier devait avoir un mérite peu ordinaire, puisqu'on lui confiait une mission importante où il fallait réunir les qualités du marin, de l'homme de guerre et, dans une certaine mesure, celles du diplomate ou du négociateur. Il devait, en effet, pénétrer dans des pays inconnus, savoir se défendre contre des peuples plus ou moins barbares, et tâcher d'entrer en relation avec eux.

A quelle date précise reçut-il ses provisions de capitaine ? Fut-il nommé par le roi François I^{er} ou par l'amiral Philippe de Chabot ? Nous l'ignorons complètement.

Le P. Fournier² nous dit qu'à l'occasion du premier voyage de Cartier, Chabot fit régler " les droits, pouvoirs et autorité de l'amiral de France par lettre du 6 mars 1535 vérifiée en parlement".

Comme le P. Fournier semble n'avoir pas vu lui-même le document dont il parle, il n'est pas impossible qu'il s'agisse ici de la commission accordée à Cartier. En consultant les cahiers d'enregistrement des Parlements de Paris et de Rennes pour les années 1534 et 1535, on pourrait être mis sur la voie qui fera découvrir la première commission de Cartier.

Nous ignorons également quels étaient les pouvoirs confiés à Cartier : ils dépendaient de la volonté royale ; mais ils ne devaient pas être plus étendus dans la première commission que dans les suivantes.

Dans la seconde, qui porte la date du 30 octobre 1534, Cartier est chargé : 1^o de conduire les navires ; 2^o de continuer les découvertes commencées ; 3^o " d'essayer de faire et accomplir *ce qu'il a plu au dit seigneur*

¹ Mandamos que todos los pilotos de nuestros reinos é senorios, que agora son o seran de aqui adelante, que quisieren ir por pilotos en la dicha navegacion de las dichas islas é tierra firme, que tenemos a la parte de las Indias, é a otras partes en el mar Oceano, sean instruidos é sepan lo que es necesario de saber en el cuadrante é estrolabio, para que junta la pratica con la teorica se puedan aprovechar dello en los dichos viages que hicieren en las dichas partes, é que sin lo saber no puedan ir en los dichos navios por pilotos, nin ganar soldadas por pilotaje, ni los mercadores se puedan concertar con ellos para que sean pilotos, ni los maestros los puedan recibir en los navios sin que primero sean examinados per vos Amerigo Despuchi, nuestro piloto major, é le sea dada por vos carta de examinacion é aprobacion de como saben cada uno de ellos lo susodicho ; con la cual dicha carta mandamos que sean tenidos é recibidos por pilotos espertos do quier que la mostraren, porque es nuestra merced que seais examinador de los dichos pilotos ; y porque a los que no lo supieren mas facilmente lo puedan aprender, vos mandamos que les enseneis en vuestra casa en Sevilla a todos los que lo quisieren saber, pagandovos vuestro trabajo. (*Amerigo Vespucci, son caractère, ses écrits, etc.*, par F. A. de Varnhagen, Lima, 1865, III^e partie, p. 118.)

² *Hydrographie, etc.*, p. 246.

lui commander et ordonner".¹ Il reçut, en un mot, "pouvoir, commission et "mandement spécial, avec la totale charge et superintendance des "navires, voiage et navigation tant à aller qu'à retourner".²

La troisième commission—du 17 octobre 1540—entre dans plus de détails et donne à Cartier des pouvoirs mieux définis ; il s'agit en effet d'une entreprise plus considérable : on songe déjà à commencer une colonie et, pour cela, on compte qu'il se présentera des hommes de "bonne volonté, de toutes qualitez arts et industrie" ; on pourra aussi employer un certain nombre de gens détenus dans les prisons.

Pour cette entreprise, il faudra des soldats et des officiers : Cartier aura sur tous et sur tout le commandement suprême. Maître pilote, c'est-à-dire marin dont la science, l'habileté et l'expérience sont connus, il dirigera l'expédition à travers les dangers de l'océan et les périls que devront offrir des côtes inconnues ; capitaine général, il appliquera les lois et fera des règlements pour assurer la bonne administration de la colonie naissante, si l'on peut en fonder une.

Si, comme nous l'avons dit précédemment³, la chute de l'amiral Chabot amena la révocation de la troisième commission, celle-ci n'en fait pas moins voir que les pouvoirs de capitaine différaient complètement de ceux de pilote et de maître, et, par conséquent, elle confirme les explications que nous avons données plus haut.

Passons aux privilèges et aux honneurs dont Cartier a joui en sa qualité de capitaine.

Sur ce point, comme sur tout ce qui regarde sa personne, il se montre très sobre de détails dans le récit de ses voyages.

L'énumération en sera assez courte ; mais le lecteur attentif qui parcourra les voyages découvrira peut être des faits qui m'ont échappé.

Ainsi le vaisseau qu'il monte est appelé la *nef générale*⁴, comme on appelait *amiral* le vaisseau qui portait le pavillon de l'amiral ; dans la liste des hommes de l'équipage⁵, Pierre Marquier est enrôlé comme trompette ; à deux ou trois endroits, il est question du serviteur du capitaine⁶.

Dans la narration du second voyage, on voit que Cartier a le sentiment de la position élevée qu'on lui a confiée et des honneurs qui lui sont dus. Quand il va rencontrer Donnacona pour la première fois, à terre, il se fait accompagner d'une escorte armée⁷.

¹ Le roi lui avait donc donné des instructions de vive voix.

² *Documents inédits, op. cit.*, p. 7.

³ *Mémoires de la Société royale*, t. VIII, p. 122.

⁴ *Bref récit*, Tross, ff. 6 et 13, verso.

⁵ *Documents inédits, etc.*, p. 10.

⁶ *Bref récit*, p. 37, verso et suivante. Le nom du serviteur, Charles Guyot, se trouve dans les manuscrits. Il est donné dans la récénsion qui accompagne le *Bref récit*, f. 62, verso.

⁷ *Bref récit*, f. 15, verso.

Quand il visite Stadacona d'une manière officielle, comme nous dirions aujourd'hui, il est escorté de cinquante hommes *bien en ordre*.¹

Le *Bref Récit* mentionne avec soin que, dans cette circonstance et dans la visite à Hochelaga, le capitaine était accompagné des gentils-hommes qui faisaient partie de l'expédition, et qui rehaussaient l'éclat dont le capitaine devait chercher à s'entourer.

On objectera peut-être que Cartier avait l'intention de se protéger contre toute surprise : cela est possible ; mais à l'espèce de reproche que Taignoagny lui fait au nom de Donnacona, à sa première visite, Cartier répond que c'était la coutume en France comme il devait se le rappeler.²

En effet, les officiers de haut grade, les gouverneurs de place, dans l'exercice de leurs fonctions, ou sur le territoire soumis à leur autorité, marchaient accompagnés de leur état-major et de leurs gardes de corps, comme M. de Tracy faisait à Québec en 1665. Par conséquent, Cartier donnait au moins la raison plausible qu'il avait droit à ces honneurs.

Tous ces détails nous aident à mieux comprendre ce que comportait la charge de capitaine, et ce qu'il faut entendre par "les honneurs, prérogatives, prééminences, franchises, libertez, gaiges et biens faicts"³ que François I^{er} entendait accorder à Cartier dans la troisième commission.

III

Examinons maintenant le second extrait que j'ai donné plus haut du voyage de 1534, où Cartier nous apprend dans quelles circonstances il s'est décidé à retourner en France : nous verrons une autre application du droit et des usages maritimes.

Lorsque Cartier eut contourné, en remontant à babord, la partie inférieure de l'île d'Anticosti, il reconnut, aux montagnes du nord, qu'il achevait de parcourir la circonférence du golfe, et que le but principal de son voyage était atteint. Cependant, un passage paraissait s'ouvrir devant lui, vers le sud-ouest : le désir de pénétrer dans l'inconnu et de faire de nouvelles découvertes devait naturellement le pousser de ce côté, mais il voyait en même temps que pour cela, il lui faudrait vaincre beaucoup de difficultés, surtout les vents et le courant qui étaient contraires. Que faire ? Allait-il redoubler d'efforts pour monter plus avant ? Allait-il revenir sur ses pas et reprendre la route de France ? C'était une question que Cartier ne pouvait décider tout seul.

¹ *Bref récit*, p. 29, *recto*.

² *Bref récit*, f. 15, *verso*. Sans doute, la remarque de Taignoagny se porte sur le fait que les gens de Cartier sont armés "de bâtons de guerre"; mais celui-ci par sa réponse veut évidemment faire comprendre que c'est la coutume en France que les personnes constituées en dignité sont accompagnées de gardes armés.

³ *Documents inédits*, etc., p. 14.

On lui a reproché d'avoir manqué de hardiesse et de s'être hâté de regagner Saint-Malo, quand deux longs mois — ceux d'août et de septembre, ordinairement très beaux — lui permettaient de poursuivre ses découvertes.

Cartier n'a pas besoin d'être justifié. Il suffit de lire ses voyages pour se convaincre qu'il avait autant de courage que de fermeté ; mais, en homme qui veut se faire obéir, il savait ce qu'il pouvait exiger de son équipage et ce qu'il devait lui accorder. Là se trouve l'explication de sa conduite.

C'était une maxime générale de la mer, d'après Clairac,¹ que le maître ne devait rien entreprendre d'important sans demander l'avis de l'équipage : nous voyons en effet ce principe inséré dans la législation navale de la plupart des nations qui avaient une marine marchande et militaire. C'était une des conséquences de l'organisation maritime de l'époque, où il fallait compter autant sur le dévouement des *compagnons* que sur la prudence du capitaine. Il y avait probablement une autre raison de consulter l'équipage : c'est que celui-ci n'était engagé que pour la saison de la navigation, ou pour une entreprise déterminée, et qu'il ne pouvait raisonnablement être exposé à prolonger son service au delà du terme convenu.

Cartier réunit donc tout le monde : “ les capitaines, pilottes, mestres “ et compagnons ”, et il les consulte individuellement “ l'ung après l'autre ”. Tous paraissent avoir été du même avis, et Cartier, sans récrimination, sans hésitation, reprit la route de Saint-Malo : “ après lesquelles oppinions prises, fismes arrivez large à nous en retourner ”².

Cette simplicité dans l'action ne manque pas de grandeur et dénote une âme au-dessus du vulgaire. Si Cartier tourne la proue de ses vaisseaux du côté de la France, il n'en est pas moins décidé à revenir bientôt.

C'est ce qu'il fit l'année suivante.

Cette fois, l'engagement de l'équipage avait été fait pour quinze mois et approvisionné en conséquence. Cartier n'eut à consulter personne pour savoir s'il se rendrait à Hochelaga ou s'il hivernerait sur les bords de la rivière Sainte-Croix. Cet hivernement avait été prévu et décidé d'avance ; il ne fut pas un accident, comme quelques-uns pourraient le croire.

J'estime que ce sont les mêmes raisons qui empêchèrent *Cartier et ses gens*³ de se rendre aux injonctions de Roberval lorsqu'ils le rencontrèrent dans le havre de Saint-Jean de Terre-Neuve.

L'engagement des équipages n'avait été fait, autant qu'on peut le conclure des termes de la commission donnée à Roberval, que pour la durée du voyage, et non pour un temps indéterminé qui dépendait de la volonté du lieutenant général.

¹ *Us et Coutumes de la Mer*, Op. cit., p. 11. Voir aussi plus haut, p. 126, note 1.

² *Relation originale du Voyage... en 1534*, etc., p. 48.

³ *Voyage du Sieur de Roberval au Canada*, p. 92, à la suite des *Voyages de Cartier*, Québec, 1843.

Cartier, qui avait arrêté les conditions de cet engagement, savait à quoi s'en tenir. S'il a continué sa route *secrètement la nuit suivante*, comme Roberval l'accuse d'avoir fait ¹, c'était peut-être afin d'échapper aux violences d'un homme qui ne savait pas toujours mettre assez de mesure dans ses actes de répression ².

Dans une autre étude, je tâcherai de faire voir comment on peut, à l'aide des lois et des coutumes maritimes, se rendre compte de l'armement de la petite flotte de Jacques Cartier à chaque voyage.

NOTE A

On ne m'accusera pas de faire injure à mes lecteurs en supposant que plusieurs d'entre eux ne connaissent que très peu les compilations désignées sous les noms de *Rooles* ou *Jugements d'Oleron* et *Consulat de la Mer*.

Ce sont des recueils où l'on a réuni et coordonné "les usages et les actes de notoriété attestant la jurisprudence sur les cas jugés, et sans doute les plus fréquents dans la navigation de l'époque ³".

Ces usages ne sont donc pas des lois promulguées par le souverain d'un pays en particulier : ils ont un caractère international qui les a fait accepter et suivre un peu partout, dans la Méditerranée, sur les côtes de l'Angleterre et de l'Ecosse, comme sur le littoral de la France.

Le premier des recueils nommés plus haut est le plus ancien, selon Pardessus, qui a étudié la question à fond : la rédaction en serait de beaucoup antérieure au *xiv^e* siècle ⁴, elle remonterait à la fin du *xi^e* siècle. Clairac la rapportait à l'époque de la reine Eléonore, duchesse de Guienne, *xii^e* siècle ⁵.

Quant au *Consulat*, il est né de l'institution des *Consuls de mer* ou *Consuls des marchands*. On appelait ainsi des magistrats spéciaux, hommes expérimentés en ces matières, à qui on avait confié le jugement des contestations commerciales.

Des décisions de leurs cours, est sortie cette nouvelle compilation, plus récente que les *Jugements d'Oleron*, mais encore assez ancienne, qui est devenue, par la sagesse de ses dispositions, la base des lois maritimes actuelles de l'Europe.

De même que pour se rendre bien compte de la position sociale du Canada au *xvii^e* siècle, il faut connaître le droit seigneurial et féodal, de

¹ *Voyage du Sieur de Roberval*.

² Thevet, cité par Harisse, *Notes pour servir à l'Histoire*, etc., de la Nouvelle France, pp. 12, 278.

³ Pardessus, *Collection des lois maritimes antérieures au xviii^e siècle*. Paris, 1828, t. I, p. 303.

⁴ On voit par l'ordonnance de 1364 que les *Rôles d'Oleron* servaient en France à régler les contestations maritimes.

⁵ Clairac, *op. cit.*, p. 1.

même, pour bien comprendre les conditions dans lesquelles les grands navigateurs du xv^e et du xvi^e siècle ont accompli leurs découvertes, il est bon d'étudier les lois et les usages maritimes de cette époque.

De tous les ouvrages à consulter sur ce sujet, les *Rôles d'Oleron* et le *Consulat* me semblent les plus utiles parce qu'ils sont les plus importants. On les trouvera dans la savante collection des lois maritimes publiée par Pardessus. Clairac, dans les *Us et Coutumes de la Mer*, a ajouté aux *Rôles* des commentaires intéressants.

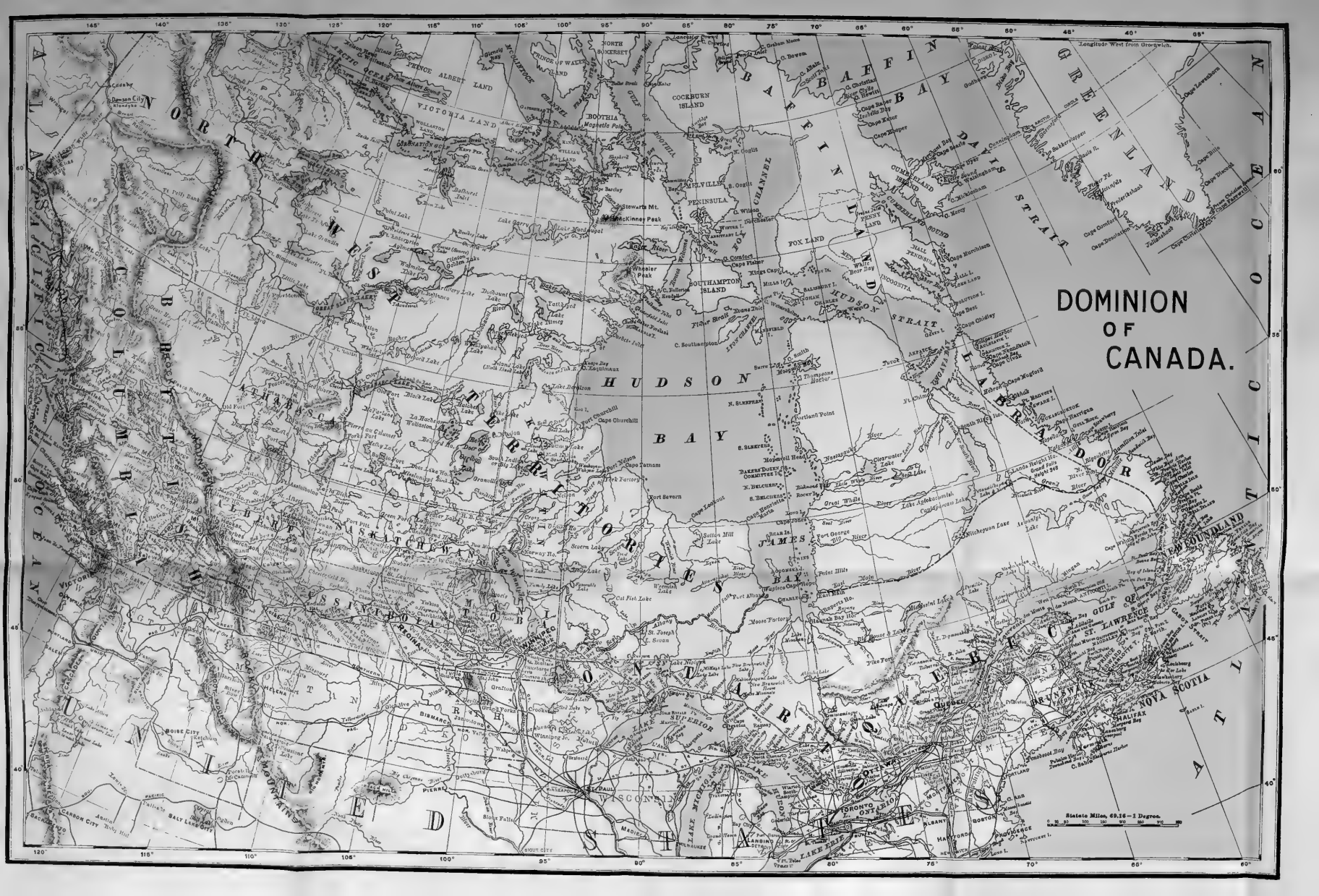
ROYAL SOCIETY OF CANADA

TRANSACTIONS

SECTION II.

ENGLISH HISTORY, LITERATURE, ARCHÆOLOGY, Etc.

PAPERS FOR 1897



DOMINION
OF
CANADA.

Scale Miles, 46.16 = 1 Degree.

I.—*Canada during the Victorian Era: A Historical Review. Illustrated.*

By J. G. BOURINOT, C.M.G., LL.D., D.C.L., Lit.D. (Laval).

(Read June 23rd, 1897.)

I.

The reigns of three English Sovereigns, Queen Elizabeth, Queen Anne and Queen Victoria—especially that of Her Most Gracious Majesty, whose diamond jubilee is arousing so joyous an acclaim throughout the Empire—will be always memorable for some of the most famous events in the history of maritime enterprise and colonial expansion. It was in “the golden days of good Queen Bess” that Englishmen made those ventures on the seas, which, in later times, led to such remarkable results and placed England in a foremost position among nations. Sixty years before her accession to the throne, an English ship was the first to touch the coasts of the North American continent, and give to England a claim to American territory which the colonizing spirit of her sons made good in the seventeenth century. After the discoveries by John Cabot in 1497 and 1498, the parsimonious, though discreet, King Henry VII., who then ruled England, took no official measures to occupy and colonize the “new-founde-lands” which were then opened up to English enterprise. No such glamour was thrown around the shores of Cabot’s *Prima Vista* as was then seen about the rich lands of the South, from which the Spaniards were yearly gathering so rich a product of gold and silver. However, a few brave fishermen from the west country of England ventured from very early times in the sixteenth century upon the waters of the new lands of Cabot, and brought home valuable cargoes of codfish which previously they had sought in the Icelandic fisheries. But, soon after Queen Elizabeth succeeded to the throne, Englishmen competed successfully in large numbers with French, Portuguese and Spanish fishermen on the banks of Newfoundland, which was now known to be an island on the confines of a continental region beyond which, it was believed, lay somewhere a northwestern passage to the rich countries of Asia. Frobisher, who is considered to be “among the famousest men of his age for counsel and glory gotten at sea,” sailed into Arctic waters and brought home some glittering sand which, he believed, contained particles of gold. Forty years before the daring, though ruinous, voyages of the brave sailor of Yorkshire, Jacques Cartier, of the Breton seaport of St. Malo, had discovered the valley of the St. Lawrence, and thought he had found in the translucent quartz rocks of Cape Diamond specimens of gold which would reward him and his companions for all the toil and difficulty they had met in their efforts to win a colonial

empire for France. While religious and civil strife prevented France from making an effort to derive some advantage from Cartier's discoveries during the latter half of the sixteenth century, England, under the influence of that new spirit of maritime enterprise which developed itself in the reign of Elizabeth, sent Sir Humphrey Gilbert to Newfoundland and Sir Richard Grenville to Albemarle Sound in North Carolina—then a part of Virginia—to spread the dominion of the Queen and make the beginning of colonial settlement. Sir Humphrey Gilbert's expedition had no other results than a barren ceremony of sovereignty on a hill overlooking St. John's harbour, while Raleigh's little colony, which was placed on Roanoke Island, disappeared in some mysterious way from human ken.

In the same reign the great Armada was scattered by the storms of heaven, and by the indomitable pluck and superior seamanship of the men who manned the little fleet, which won for itself so high a place in English historic annals and was the beginning of that noble navy which, in later centuries, made England Mistress of the Seas. Drake not only robbed Spaniards on the Spanish Main and brought back rich treasures in which even "Good Queen Bess" shared without a blush, but was the first Englishman to sail around the globe by Magellan's route and give to England a claim to possessions on the Pacific coast of North America, which received the name of New Albion on maps of the day.

It is true that Raleigh failed in his scheme of establishing colonies in the beautiful land of Virginia, of which glowing accounts were brought home by English adventurers, and it was in the reigns of James the first and Charles, his son, that the English actually founded permanent settlements on the Atlantic shore of North America. But the germs of Virginia and New England were planted by Raleigh, and the colonial and maritime enterprise of England was stimulated by such successes as were won by Howard, Grenville, Hawkins and Drake wherever they met the Spaniards who, until their day, were considered invincible at sea and allowed to have a monopoly of the land discovered by Columbus and his successors. Englishmen at last commenced to recognize the fact that their mission was on the ocean and that they could advantageously enter the field of colonial enterprise in the new world, which offered such enormous possibilities to courageous pioneers and explorers.

Nor must we forget to record among the memorable events of the same reign the formation of a famous Company which entered into competition for the rich trade of the East Indies, where, in later times, one of its servants, Robert Clive, won an Empire for England, and gave the right to Queen Victoria to be crowned its Empress.

In the seventeenth century English colonists took possession of a fringe of territory on the Atlantic coast, France occupied the shores of

Acadie and the valley of the St. Lawrence, and the Spaniards confined themselves to the Antilles, Florida, Mexico, Peru and other rich lands of the tropics. By the beginning of the eighteenth century France had twenty thousand people on the banks of the St. Lawrence and its tributary rivers, and her adventurous explorers had passed from the basin of the great lakes into the valley of the Mississippi and had given to France a right to a vast region which extended to the Gulf of Mexico. The English colonies were then hemmed in between the Atlantic coast and the Appalachian ridges, beyond which none of their most daring pioneers had passed when La Salle linked his name to all time with the mighty river near which he met a melancholy death at the hands of treacherous companions. France had now established a valid claim to dominions whose possibilities of greatness were never understood by the King and his Ministers, engrossed in the affairs of Europe. The end of the war of the Spanish succession which brought such humiliation to Louis Quatorze, and won so much fame for Marlborough, had very significant results for France and England in North America. These results have been most intelligently stated by an English writer who has reviewed the various phases of English colonial expansion from the voyages of the Cabots until the reign of Queen Victoria, who is Queen of an Empire which would never have been born had not a spirit of maritime enterprise and colonization been stimulated in the days of the Virgin Queen. One hundred and ten years after the death of Elizabeth, when another woman sat on the throne, France suffered a serious blow in America, by the treaty of peace which Louis was forced to accept as a result of the famous victories of Blenheim, Ramillies, Malplaquet and Oudenarde. "At the time of the Armada," says Professor Seeley, "we saw England entering the race for the first time; at Utrecht, England wins the race. . . . Her positive gains were Acadie or Nova Scotia and Newfoundland, surrendered by France and the Assiento compact granted by France. In other words the first step was taken towards the destruction of greater France by depriving her of one of her three settlements of Acadie, Canada and Louisiana in North America. . . . The decisive event of it is the Seven Years' War, and the new position given to England by the treaty of Paris in 1763."¹

The remarkable expansion of the colonial dependencies of England during the Victorian era may be then fairly considered as an evolution of a series of events in the history of the empire. From the days of Raleigh and other worthies of Elizabeth's day down to Pitt, Wolfe and Clive, there is a steady succession of events which eventually placed England in the van of colonial enterprise and maritime endeavour, but it was not until three-quarters of a century had passed after the treaty of Paris—

¹ "Expansion of England," p. 132.

aptly stated by Professor Seeley to be "the culminating point of English power in the eighteenth century"—and the present Queen ascended the throne, that Canada and other dependencies of the Crown may be said to have made the beginnings of that remarkable development, which is one of the most interesting and important features of the century and of the Queen's reign and has been, in a measure, some compensation for the loss of the old Thirteen Colonies through the fatuity of English statesmen in the second half of the eighteenth century.

II.

I purpose to give in the present paper a brief historic retrospect of the position Canada occupied at the time when Her Majesty ascended the Throne and to compare it with that the Dominion now holds as a federation of seven provinces and organized territories extending from the Atlantic to the Pacific ocean. No one will gainsay Canada's pre-eminence among the dependencies when we consider how much she has done in sixty years, despite the enormous difficulties that have stood in the way of her progress on account of the rivalry of a great republican Power on her borders for three thousand miles, which has drawn away from her the wealth and population of Europe, and also a large number of Canadians from year to year up to a very recent period. In this review it is necessary to refer briefly to some leading features of Canadian history. In these days, when Englishmen have learned at last to take an interest in colonial questions—to recognize the fact that lessons may be learned from even colonial history and colonial statesmanship, we feel no apology need be made even to my English readers¹ if I ask them to give their attention for a few minutes to a short account of the political evolution of the Canadian federation, which has already passed beyond the first quarter of a century of its existence. In this record we shall see what elements of stability this federation possesses, even when compared with that great Power to the south, whose remarkable development has been among the most interesting features of the century now so near its close.

Both England and France entered about the same time on a career of colonization in North America. Champlain was already encamped with his little band of settlers on the picturesque heights of Quebec² when the Pilgrim Fathers landed on the rock-bound coast of New England. Then, for a century and a half, the colonies of England and France struggled for mastery. The sturdy independence of the English colonists, accustomed to think and act for themselves, left as a rule to

¹ This special reference to "English readers" originates from the fact that a part of this monograph first appeared as a leading article in the *Edinburgh Review*, and I have allowed it to remain, though the text has been revised and enlarged.

² Champlain arrived at Quebec (Stadacona) on July 3rd, 1608, and laid the foundations of the picturesque town.

govern themselves in accordance with the free instincts of Englishmen, was in decided contrast with the subserviency of the French colonists, kept constantly in trammels by the King and his ministers who were always opposed to the merest semblance of local self-government. Under the influence of the freedom they enjoyed, and of the energy and enterprise peculiar to a commercial and maritime people, the English colonists, who inhabited a relatively narrow strip of territory from Maine to Carolina, soon outnumbered the population of the struggling community on the banks of the St. Lawrence.

In the history of the French Canadian there is much to interest us. His patient endurance, his fidelity to his country, his adventurous life in the wilderness of the West affords scenes for poetry, history, and romance. The struggles of Champlain, the adventures of La Salle in the valley of the Mississippi, the exploits of the *coureurs de bois* and gentlemen-adventurers on the rivers and among the forests, the efforts of Frontenac and other French governors to found a New France on the continent, have already found in Francis Parkman an eloquent and faithful historian. France dreamed once of founding a mighty empire which should stretch from the Island of Cape Breton or Ile Royale through the valleys of the St. Lawrence, the Ohio, and the Mississippi to the Gulf of Mexico and of eventually having the supremacy in North America; but the genius of Pitt relieved the English colonists of the fears they entertained with reason when they saw a cordón of forts stretching from Louisbourg to the heights of Quebec, Lake Champlain, Niagara and the forks of the Ohio. With the fall of Quebec and Montreal in 1759-60, France left the New World to England, and of all her former possessions she now retains only some insignificant islands off the southern coast of Newfoundland, where her fishermen continue to prosecute the fisheries as they did centuries ago before a European had founded a settlement in Canada. The conflict with France had done much to restrain the spirit of self-assertion among the English colonists, and to keep them dependent upon England; but at the same time it had shown them their power and taught them to have much more confidence in their own resources as a people. The capture of the formidable fortress of Louisbourg, one of the triumphs of Vauban's engineering skill, by the New England volunteers under Pepperrell and the fleet under Warren, was the principal incident in their history, which showed the people their strength and nerved them to enter into what must have seemed to many a hopeless struggle with England. The fall of Quebec may be considered the first step in the direction of the independence of the old English colonists.

III.

When the war of independence was over Canada was only a sparsely settled country in which the French Canadians were very largely in the majority. In Nova Scotia, New Brunswick and Prince Edward Island there was a small English population, chiefly composed of United Empire Loyalists.¹ A considerable number of the same class came over from the United States and settled in the eastern townships of French or Lower Canada—now Quebec—and in the province of Upper or Western Canada, now Ontario. Few facts of modern times have had a greater influence on the destinies of a country than this immigration of sturdy, resolute and intelligent men, united by high principles and the most unselfish motives. They laid the foundations of the provinces now known as New Brunswick and Ontario, and settled a considerable portion of Nova Scotia. From the day of their settlement on the banks of the St. John, Niagara and St. Lawrence rivers, and in the vicinity of Lakes Ontario and Erie, they have exercised by themselves and their descendants a powerful influence on the institutions of Canada, not unlike that exercised by the descendants of the New England pioneers throughout the American Union; and it is to them we owe much of that spirit and devotion to England which has always distinguished the Canadian people and aided to keep them, even in critical periods of their history, within the empire.

During the war of independence the leading French Canadians resisted all attempts that were made to induce them to unite their fortunes with the revolted colonists. The British Government and Parliament had seen the necessity of conciliating the conquered people, and had passed in 1774 what is known as the Quebec Act,² which gave additional guarantees to that nationality for the security of their property and the preservation of their language, religion and institutions. Owing in a great measure to this conciliatory policy, and to the efforts of the priests, who have always been firm friends of British rule, the French people of Lower Canada were kept faithful to the King of England, and the history of those times records the death of General Montgomery and the defeat of his troops, who invaded Canada and besieged Quebec under the delusion that the province would be an easy conquest as soon as the invaders set foot within its limits.

With the settlement of Upper Canada by the Loyalists and the English population that subsequently flowed into the country, it was

¹ In 1784 there were in Canada 10,000 United Empire Loyalists; in Nova Scotia and New Brunswick upwards of 30,000. In 1790 the population of old Canada was 161,311, of whom 120,000 were French.

² Imperial Statute, 14 George III., c. 83.

thought advisable to establish two provinces in which the French and English elements would be kept separate and distinct.¹

With the light that experience has given us in these later times, it was a great mistake, in the opinion of many statesmen, to have isolated the races, and by hedging in the French at the very commencement of their history, to have prevented the gradual absorption of all nationalities into one great English-speaking people. Parliament formed a legislature for each province, and wished the people of Canada "God speed" in the new experiment of government on which they were entering. No doubt can exist as to the sincerity and good wishes of the English statesmen of those days, but it cannot be said that they always built with wisdom. In the first place they erected a structure of provincial government which was defective at its very foundation. There was an entire absence of institutions of local government in French Canada—of that system which from the earliest period in the history of the old English colonies, enabled them to manage their local affairs. May it not be said with truth that England herself has received no more valuable heritage than that system of local self-government which, cumbrous and defective as it may have become in the course of centuries, can be traced back to those free institutions in which lay the germs of English liberty and parliamentary government?

But in Canada there was no semblance of township or parish government as in New England or even in Virginia. The people of Canada were called upon to manage the affairs of a State before they had learned those elements of government which necessarily exist in the local affairs of every community, whether it be town, township or village. It was, indeed, surprising that a people like the French Canadians, unaccustomed to parliamentary institutions or local self-government in its most elementary form, should in the early stages of their legislative history have shown so much discretion. As a matter of fact they discharged their functions for a while with prudence and set to work to understand the principles on which their system of government rested. For some years the machinery of government worked fairly enough, and the public men of both provinces passed much useful legislation. The war of 1812–15, in which Canada performed her part with credit, in a measure prevented any outbreak of political conflict, since all classes of people recognized the necessity of uniting, at such a crisis, to defend their homes and country. But when peace was proclaimed and the legislatures were relieved from the pressure that the war had brought upon them, the politicians again got the upper hand. The machinery of government became clogged, and political strife convulsed the country from one end to the other. An "irrepressible conflict" arose between

¹ Constitutional Act, 1791, or 31 Geo. III., c. 31.

the government and the governed classes, especially in Lower Canada. The people, who in the days of the French regime were without influence and power, had learned under their new system, defective as it was in essential respects, to get an insight into the operation of representative government, as understood in England.

They found they were governed, not by men responsible to the legislature and the people, but by governors and officials who controlled both the executive and the legislative councils. If there had always been wise and patient governors at the head of affairs, or if the Imperial authorities could always have been made aware of the importance of the grievances laid before them, or had understood their exact character, the difference between the government and the majority of the people's representatives might have been arranged satisfactorily. But unhappily military governors like Sir James Craig only aggravated the dangers of the situation, and gave demagogues new opportunities for exciting the people. The Imperial authorities, as a rule, were sincerely desirous of meeting the wishes of the people in a reasonable and fair spirit, but, unfortunately for the country, they were too often ill-advised and ill-informed in those days of slow communication, and public discontent was allowed to seethe until it burst forth in a dangerous form.

In all the provinces, but especially in Lower Canada, the people saw their representatives practically ignored by the governing body, their money expended without the authority of the legislature, and the country governed by irresponsible officials. A system which gave little or no weight to public opinion, as represented in the House elected by the people, was necessarily imperfect and unstable; and the natural result was a deadlock between the Legislative Council, controlled by the official and governing class, and the House elected by the people. The governors necessarily took the side of the men whom they had themselves appointed, and with whom they were acting. In the maritime provinces, in the course of time, the governors made an attempt to conciliate the popular element by bringing in men who had influence in the Assembly, but this was a matter entirely within their own discretion. This system of government was generally worked in direct contravention to the principle of responsibility to the majority in the popular House. Political agitators had abundant opportunities for exciting popular passion. In Lower Canada, Papineau—an eloquent but impulsive man, having rather the qualities of an agitator than those of a statesman—led the majority of his compatriots. For years he contended for a legislative council elected by the people, for it is curious to note that none of the men who were at the head of the popular party in Lower Canada ever recognized the fact, as did their contemporaries in Upper Canada, that the difficulty would be best solved, not by electing an Upper House, but by obtaining an executive which would only hold

office while supported by a majority of the representatives in the people's House. In Upper Canada the Radical section of the Liberal party was led by Mr. W. Lyon Mackenzie, who fought vigorously against what was generally known as the "Family Compact", which occupied all the public offices and controlled the government.

In the two provinces these two men at last precipitated a rebellion, in which blood was shed and much property was destroyed, but which never reached any very extensive proportions. In the maritime provinces, however, where the public grievances were of less magnitude, the people showed no sympathy with the rebellious elements of the upper provinces. The agitation for responsible government in those colonies was led by Mr. Joseph Howe, who in the course of his public life was always animated by truly loyal British feelings, and was never influenced by passion to step beyond the limits of legitimate constitutional agitation.

IV.

Such was the political situation in Canada when Queen Victoria ascended the throne on June 20, 1837. If we survey the general condition of things in those troublous times, the prospect was not encouraging. The total population of the provinces did not exceed 1,350,000 souls, of whom nearly one-half were French Canadians. Trade and commerce were quite paralyzed by the political discontent which had existed for years, and had already broken out into rebellion. The value of the whole trade of British North America—that is of the imports and exports in the aggregate—was about \$25,000,000. The principal trade was in fish and lumber for the export of which a considerable number of vessels were yearly built in the maritime provinces. Not more than four or five banks existed, and none of them had a large capital except the old bank of Montreal, which has always been the most important monetary institution of this continent.

The total revenue at this time did not exceed \$7,000,000, and in more than one province the revenue was insufficient to meet the legitimate expenses required for public works and other necessary improvements. In Upper Canada the situation was extremely serious. In consequence of the construction of public works, commenced in the infancy of the colony, a debt of \$5,000,000 had been accumulated when the whole revenue did not reach \$300,000, and was inadequate to pay the interest. A financial crisis in the United States had led the banks to suspend specie payments, and aggravated the difficulties of the commercial situation in Canada. The banks of Lower Canada found it necessary to follow the example of similar institutions in the American republic; though those in the upper province, to their credit, successfully tided over the crisis,

and materially lessened the weight of financial embarrassment. The total production of wheat was not beyond 5,000,000 bushels, of which nearly four-fifths, at that time, was raised in French Canada. The French *habitants* carried on their agricultural operations with little energy or skill, and from their ignorance of the system of the rotation of crops and of the true principles of farming were rapidly impoverishing the soil, so that in the course of a few years their wheat crop diminished and its quality became more inferior. Their farms were on the banks of the St. Lawrence, deep, narrow strips, and their houses were crowded as near the river as possible, as affording the most satisfactory means of communication in early times between the settlements. The most noteworthy buildings were those belonging to the Roman Catholic Church, which then, as now, dominated the province. The system of land tenure in French Canada was one not calculated to stimulate industry and develop the country. In early days the seigniorial tenure, established by Richelieu with the idea of founding a Canadian *noblesse* and encouraging settlement, had had some advantages. It was a feudal system modified to suit the circumstances of a new country. It made the *seigneur* and the *habitant*, or *censitaire*, equally interested in the cultivation of the soil. The dues and obligations under which the *censitaire* held his land were in early times by no means onerous. The *seigneur* was obliged to cultivate and settle certain portions of his land at the risk of losing it within a fixed period; a penalty frequently enacted under the French regime. He was expected to erect a mill for the grinding of grain raised in the district, but only in very rare cases was he able to afford the expense of what must have been a great convenience to the early settlers.

But the system grew to be burdensome as the country became more populous. The seigniorial exactions were found troublesome, and the difficulties that arose in connection with the disposal of lands in the numerous seigniories gradually retarded settlement and enterprise in the province. In fact, the system under which lands were granted throughout Canada was not adapted to the encouragement of settlement. With the view, probably, of establishing a state church, the Imperial Government had by the Act of 1791 granted large reserves, which were in the hands of the Church of England, and much discontent had consequently arisen among other Protestant denominations. Large tracts had also been set apart for loyalists and military men in different parts of the province. The natural consequence of this extravagance was that some of the most valuable districts of Upper Canada were kept idle and profitless for many years. The little island of Prince Edward had been nearly all granted away by ballot to a few landlords in a single day, and until very recent times its progress was retarded by a land question which always created much discontent and prevented settlement. The means of communication in each province were very inferior, in the absence of

any liberal system of municipal institutions, and in consequence of the large districts owned by absentee proprietors or by the church. If a road or bridge was required in Lower Canada it was necessary to apply to the legislature. Things were a little better in Upper Canada, where there was a system of local taxation which, imperfect as it was, enabled the people in a county to make minor improvements. Montreal, Quebec, Halifax, St. John, and Toronto were the only towns of importance, and the population of the first—then, as now, the commercial metropolis of British North America—did not exceed 40,000; while their aggregate population was 120,000 souls. The streets of all of them were either ill-lighted or left in darkness, and without pavements. The public buildings, as a rule, had no architectural pretensions. A few colleges and grammar schools had been established where the sons of the well-to-do classes could obtain an excellent classical and English education for those times. The religious communities of Lower Canada at an early period in the history of the country had established institutions where the youth of both sexes could receive certain educational and religious advantages. But the State had not in any degree intervened successfully in the establishment of a system of popular education.

The whole public expenditure for common and district schools in Upper Canada was a little above \$40,000 a year, and these schools were very inferior in every respect. The masters in many cases in this province, to which I refer especially, since now it stands unsurpassed in the character of its educational progress, were ill-paid, ill-educated men who, having failed in other pursuits, resorted to teaching as their last hope; many of them were illiterate citizens of the United States, who brought anti-British ideas into the country, and taught their pupils out of American text-books, in which, of course, prominence was given to American history and institutions. In 1838-39 there were in all the public and private schools of British North America only some 92,000 young people out of a total population of 1,440,000 souls, or about one in fifteen. The administration of justice in all the provinces except in Lower Canada was, on the whole, satisfactory for a new country, where the highest judicial talent was not always available. In the French section there was a lamentable want of efficiency in the courts, and an absence of confidence in the mode in which the law was administered. At times there was a decided failure of justice in criminal cases, owing to the complexion of the juries. In certain cases, where political or national feeling was aroused, a jury was not likely to convict even in the face of the clearest evidence of crime. English and French Canadians divided in the jury box according to their nationalities. While the judges of the highest courts were generally distinguished for learning and fairness, the justices of peace were chosen without any regard to their character or ability to try the ordinary petty causes which fell within their jurisdic-

tion. In all the cities and towns the police arrangements were notoriously defective. Immigration was rapidly falling off owing principally to the distracted state of the country, but also to the mode of transportation. Those were days when the vessels that made voyages to Canada were literally laden with disease and misery. In the over-crowded, ill-ventilated, and ill-equipped vessels that annually sailed up the St. Lawrence death was ever stalking among the half-starved, unhappy people who had left their wretched homes in the Old World to incur the horrors of the holds of the pest-ship, from which for many years had been ascending to heaven the cries of the martyred emigrant.

No feature of the aspect of things in Canada gave greater reason for anxiety than the attitude of the French and English peoples towards each other. The very children in the streets were formed into French and English parties. As in the courts of law and in the legislature, so it was in social and every-day life—the French Canadian in direct antagonism to the English Canadian. Many persons among the official and governing class, composed almost exclusively of English, were still too ready to consider French Canadians as inferior beings, and not entitled to the same rights and privileges in the government of the country. It was a time of passion and declamation, when men of fervent eloquence, like Papineau, could have aroused the French like one man, if they had had a little more patience and judgment and had not been ultimately thwarted, mainly by the efforts of the priests who, in all national crises, have intervened on the side of reason and moderation, and in the interests of British connection, which they have always felt has been favourable to the continuance and security of their religious institutions. Lord Durham, in his memorable report on the condition of Canada, has summed up very expressively the nature of the conflict in the French province. "I expected," he said, "to find a contest between a government and a people; I found "two nations warring in the bosom of a single state; I found a struggle, "not of principles, but of races."

Amid the gloom that overhung Canada in those times there was one gleam of sunshine for England. Although discontent and dissatisfaction generally prevailed among the people on account of the manner in which the government was administered and of the attempts of the minority to engross all power and influence, yet there was still a sentiment in favour of British connection, and the annexationists were relatively few in number. Even Sir Francis Bond Head—in no respect a man of sagacity—understood this well when he depended on the militia to crush the outbreak in the upper province, and Joseph Howe, the eminent leader of the popular party, uniformly asserted that the people of Nova Scotia were determined to preserve the integrity of the Empire at all hazards. As a matter of fact, the majority of the leading men, outside of the minority led by Papineau, Nelson and Mackenzie, had a conviction that

England was animated by a desire to act considerately with the province, and that little good would come from precipitating a conflict, which would only add to the public misfortunes, and that the true remedy was to be found in constitutional methods of redress for the political grievances which undoubtedly existed throughout British North America.

V.

I have endeavoured to summarize above as briefly as possible the actual state of affairs in the first years of the Queen's reign. It was a most critical time in the career of the Canadian provinces. Had the British Government been prepared to act with haste or temper, the consequences would have been fatal to the provinces; but they acted throughout on the whole with much discretion and recognized the fact at the outset that mistakes had been made in the past, and that it was quite clear that the people of Canada would not be satisfied with a mere semblance of a representative government. The mission of Lord Durham, who came to Canada as governor-general in 1838, was a turning-point in the political and social development of the British North American colonies. Whatever may be the opinion held as to the legality of the course he pursued with respect to the rebels—a number of whom he banished from the country without even a form of trial—there can be no doubt as to the discretion and wisdom embodied in his Report, of which Mr. Charles Buller, his able secretary, is generally considered to have been the writer. The statesmen of all parties in England, but especially Lord John Russell, aided in moulding a new policy towards the Canadas. This new policy of which the reunion of the two provinces under one government was the foundation, was in the direction of entrusting a larger measure of self-government to the people—of giving them as complete control of their internal affairs as was compatible with the security and integrity of the empire.

The union of the Canadas in 1841, when the French and English sections were equally represented in one legislature, was the first important step in the movement that has been steadily going on for many years in the direction of the unity and security as well as of the social and political development of the provinces of British North America. Then followed between 1841 and 1849 the concession of responsible government in the fullest sense of the term, and the handing over to Canada of the control of her public revenues and taxes, to be expended in accordance with the wishes of the majority in the popular House. At the same time came the repeal of the navigation laws which had fettered colonial trade since the days of Cromwell. The post office was given to the Canadian government, and in fact all matters that could be con-

sidered to appertain to their provincial and local interests were placed under their immediate legislative jurisdiction. The Canadian legislature, under the new impulse of a relatively unfettered action, went vigorously to work to lay the foundations of a municipal system as indispensable to the operations of local self-government. The troublesome land question, involved in the seigniorial tenure, was settled, after much agitation, on terms favourable to vested interests, while the clergy reserves were also arranged so as no longer to favour one church at the expense of others, or to impede the progress of settlement and cultivation. The union of the Canadas lasted until 1867, when it had outgrown its usefulness, and the provinces found it necessary to enter into a federation, which had been foreshadowed by Lord Durham and advocated by many eminent men even before his time.

VI.

Of all the conspicuous figures of those memorable times of political struggles, which already seem so far away from Canadians, who now possess so many political rights, there are three which stand out more prominently than all others and represent the two distinct types of politicians who influenced the public mind during the first part of this century. These are Papineau, Baldwin, and Howe. Around the figure of the first there has always been a sort of glamour which has helped to conceal his vanity, his rashness, and his want of political sagacity, which would have, under any circumstances, prevented his success as a safe statesman, capable of guiding a people through a trying ordeal. His eloquence was fervid and had much influence over his impulsive countrymen, his sincerity was undoubted, and in all likelihood his very indiscretions made more palpable the defects of the political system against which he so persistently and so often justly declaimed. He lived to see his countrymen enjoy power and influence under the very union which they resented, and find himself no longer a leader among men, but isolated from a great majority of his own people, and representing a past whose methods were antagonistic to the new regime that had grown up since 1838. It would have been well for his reputation had he remained in obscurity on return from exile, and never stood on the floor of a united parliament, since he could only prove in those later times that he had never understood the true working of responsible government. The days of reckless agitation had passed, and the time for astute and calm statesmanship had come. Lafontaine and Morin were now safer political guides for his countrymen. He soon disappeared entirely from public view, and in the solitude of his picturesque château amid the groves that overhang the Ottawa River, only visited from time to time by a few

staunch friends, or by curious tourists who found their way to that quiet spot, he passed the remainder of his days with a tranquillity in wondrous contrast to the stormy and eventful drama of his life. The writer of this paper has often seen his noble, dignified figure—even erect in age—passing unnoticed on the streets of Ottawa, when perhaps at the same time there were strangers walking through the lobbies of the parliament house and asking to see his portrait.

One of the most admirable figures in the political history of the Dominion was undoubtedly Robert Baldwin. Compared with other popular leaders of his generation, he was calm in counsel, unselfish in motive, and moderate in opinion. If there is some significance in the political phrase, "Liberal-Conservative," it could be applied with justice to him. The "great ministry" of which he and Louis Hyppolite Lafontaine—afterwards a baronet and chief justice—were the leaders, left behind it many monuments of broad statesmanship, and made a deep impress on the institutions of the country. Mr. Baldwin, too, lived for years after his retirement from political life, almost forgotten by the people for whom he worked so fearlessly and sincerely.

Joseph Howe, too, died about the same time as Papineau—after the establishment of the federal union; but unlike the majority of his compeers who struggled for popular rights, he was a prominent figure in public life until the very close of his career. All his days—even when his spirit was sorely tried by the obstinacy and indifference of some English ministers, he loved England, for he knew, after all, it was in her institutions his country could best find prosperity and happiness, and it is an interesting fact, that among the many able essays and addresses which the question of Imperial Federation has drawn forth, none in its eloquence, breadth, and fervour can equal his great speech on the Consolidation of the Empire. The printer, poet and politician died at last at Halifax the lieutenant-governor of his native province in the famous old government house, admittance to which had been denied him in the stormy times of Lord Falkland. A logical ending assuredly to the life of a statesman who, with eloquent pen and voice, in the days when the opinions he held were unpopular in the homes of governors and social leaders, ever urged the claims of his countrymen to exercise that direct control over the government of their country which should be theirs by birth, interest and merit.

In New Brunswick the triumph of responsible government must always be associated with the name of Lemuel A. Wilmot, the descendant of a famous U. E. Loyalist stock, afterwards a judge and a lieutenant-governor of his native province. He was in some respects the most notable figure, after Joseph Howe and J. W. Johnston, the leaders of the Liberal and Conservative parties in Nova Scotia, in that famous body of public men, who so long brightened the political life of the maritime

provinces. But neither those two leaders nor their distinguished compeers, James Boyle Uniacke, William Young, John Hamilton Gray and Charles Fisher—all names familiar to students of Nova Scotia and New Brunswick history—surpassed Mr. Wilmot in that magnetic eloquence which carries an audience off its feet, in versatility of knowledge, in humorous sarcasm, and in conversational gifts which made him a most interesting personality in social life. He impressed his strong individuality upon his countrymen until the latest hours of his useful career.

“ A life in civic action warm ;
 A soul on highest mission sent ;
 A potent voice in parliament ;
 A pillar steadfast in the storm.”

VII.

The results of the development of Canada since 1841 may be divided, for the purposes of this review, into the following phases :

- Territorial Expansion.
- Increase of Population and Wealth.
- Political Development.
- Social and Intellectual Progress.
- National Unity.

VIII.

From 1841 to 1867 the provinces of British North America remained isolated from each other as distinct political entities, only united by the tie of a common allegiance to one Sovereign. Their political organization was confined to the country extending from the head of Lake Superior to the countries watered by the Gulf of St. Lawrence and the Atlantic Ocean. Of these provinces Ontario was the most populous and the richest in agricultural wealth, although it has not as great an area as the province of Quebec, where a more rigorous climate and large mountainous tracts—the hills of the Laurentides—have rendered the country less favourable for extensive and productive farming operations. A very considerable portion of Ontario, even in those days, was a wilderness, and the principal cultivated tracts extended for a few miles from the St. Lawrence, and the most populous settlements lay between Lakes Ontario, Erie, and Huron. The confederation of 1867 brought four provinces into one territorial organization for general or Dominion purposes : Ontario, Quebec, Nova Scotia, and New Brunswick—and it was not until 1873 that little Prince Edward Island, the garden of the Gulf of St. Lawrence, united its political fortunes with those of the young

confederation. Efforts were made to bring in Newfoundland, but purely selfish local considerations prevailed in that island over the national sentiment; though the unwisdom of the course pursued by the island politicians has become evident according as the fishery question with the United States comes up from time to time, and it is now quite clear that this large colony, which has been placed as a sentinel at the portals of Canada, must, ere long, fall into line with its sister colonies in North America. One of the most important results of confederation in its early days was the annexation by the Dominion of that vast tract of country which, up to that time, had been almost exclusively in the possession of the Indians and the traders of the Hudson Bay Company—that region well described by General Butler as “the lone land,” over whose trackless wastes French adventurers had been the first to pass—a region of prairies, watered by great rivers and lakes, above whose western limits tower the lofty picturesque ranges of the Rockies. Next came into confederation the province of British Columbia, which extends from the Rockies to the waters of the Pacific Ocean—a country with a genial climate, with rapid rivers teeming with fish, with treasures of coal and gold, with sublime scenery only rivalled by California. A new province was formed in the Northwest, watered by the Red and the Assiniboine Rivers and territorial districts, as large as European states, arranged for purposes of government out of the vast region that now, with the sanction of the Imperial authorities, has been brought under the jurisdiction of the government of Canada. Within a period of thirty years Canada has stretched from the Atlantic to the Pacific, and the territory now under her control is very little inferior in extent to that of the great Republic to the south, and contains within itself all the elements of a prosperous future. It is, unhappily, true that this result was not achieved until blood had been shed and much money expended in crushing the rebellious half-breeds led by the reckless Riel; but, apart from this sad feature of Canadian history, this important acquisition of territory, the first step in the formation of an empire in the west, has been attained under circumstances highly advantageous to the Dominion. Canada now possesses an immense territory of varied resources—the maritime provinces with their coal, fish and shipping, together with a valuable, if limited, agricultural area, not yet fully developed; the large province of Quebec, with ranges of mountains on whose slopes, when denuded of their rich timber, may graze thousands of cattle and sheep, with valuable tracts of meadow lands, capable of raising the best cereals, and already supporting some of the finest cattle of the continent; the rich province of Ontario, which continues to be the chief agricultural section of the Dominion, and whose cities and towns are full of busy industries; the vast Northwest region still in the very infancy of its development, destined to give the confederation sev-

eral provinces outside of Manitoba, as large and productive as Minnesota, and to be the principal wheat-growing district of Canada; and, finally, the gold-producing province of British Columbia, whose mountains are rich with undeveloped treasures, and whose mild climate invites a considerable industrious population to cultivate its slopes and plateaus, and collect the riches of its river and deep-sea fisheries. Even that inhospitable Arctic region of the far northwest of Canada through which the Yukon and its tributaries flow appears to be rich with untold treasures of gold and other minerals, and promises to be a source of wealth to a country which is still in the infancy of its material development.¹

IX.

The population, which owns this vast territory, is confined chiefly at present to the countries by the Great Lakes, the St. Lawrence and the Atlantic Ocean. A considerable number of people has within a few years flowed into the Northwest, where the province of Manitoba is exhibiting all the signs of a prosperous agricultural country, and its capital, Winnipeg, has grown up in the course of sixteen years into a city of nearly 30,000 souls. The population of the whole Dominion may now be estimated at about 5,200,000 souls, and has increased four times since 1837. Of this population more than a million and a quarter are the descendants of 70,000 or 65,000 people who were probably living in the French province at the time of the conquest (1759-60). The remainder of the population is made up of English, Scotch, and Irish. The immigration of late years has been insignificant compared with that which has come into the United States, and consequently at present the natural born population amounts to about 85.09 per cent of the whole. The people of Canada have already won for themselves a large amount of wealth from the riches of the land, forest, and seas. The total value of the imports is now about \$110,000,000 and of exports at least \$120,000,000, or an aggregate of \$230,000,000 a year, an increase of \$175,000,000 within half a century. Of this large export trade at least \$50,000,000 represent the products of the farms. The province of Ontario now raises over 28,000,000 bushels of wheat alone, or an increase of over 19,000,000 since 1837. The Northwest and Manitoba raise upwards of 50,000,000 bushels, or an increase of 20,000,000 in ten years. The people have now deposited in government savings-banks, leaving out of the calculation the ordinary monetary institutions of the country, about \$60,000,000,

¹ As I read the proof of the text the world of enterprise and adventure is startled by the reports of the wealth of the region of the Thron-Diuck (corrupted to Klondike), one of the tributaries of the Yukon in Canadian territory.

made up of about 176,000 depositors, mechanics, farmers, and people of limited means. For years the only industries of importance were the building of ships, the cutting of timber, and a few ill-supported manufactures of iron and various hard and soft wares. Now there is upwards of \$360,000,000 invested in manufactures, chiefly cotton and woollen goods, of which the coarser fabrics compete successfully with English goods in the Canadian market, even crowding out certain classes entirely. Some fourteen lines of ocean steamers call at the port of Montreal, which has now a population of over 350,000. Toronto comes next in population, about 194,000, whilst the other cities, like Halifax, St. John, Quebec, Ottawa, Brantford, Guelph, St. Catharines, Fredericton, Hamilton, London, range from 60,000 to 8,000. The aggregate of the population of the cities and towns with over 10,000 population amounts to some 1,000,000 souls, or the total population of Canada in 1837. The urban population of Canada increased in 1891 to 1,390,910, compared with 912,934 in 1881, or an increase of 28·77 per cent in ten years, illustrating that there has been going on the same movement that has prevailed in the United States. The total revenue of the Dominion, apart from the local and provincial revenues, is about \$37,000,000 a year, raised mainly from customs and excise duties, which are high, owing to a largely protective policy, although much lower than those on similar goods in the United States. If the expenditures of Canada of late years have been very large, they have been mainly caused by the development of the country, and by the necessity of providing rapid means of intercommunication for trade and population in a country extending between two oceans. Canals, lighthouses, railways, the acquisition and opening up of the Northwest, and government buildings, have absorbed at least \$200,000,000 since 1867, and it is not remarkable, under these circumstances, that a gross debt has been accumulated within half a century of over \$325,000,000, against which must be set valuable assets in the shape of buildings and public works necessary to the progress of a new country. The public buildings, churches, and universities display within a quarter of a century a great improvement in architectural beauty, whilst the homes of the people show, both in the interior and exterior, decided evidences of comfort, convenience and culture. Instead of the fourteen miles of railway which existed in 1837, there are now over 16,000 miles in actual operation, affording facilities for trade and commerce not exceeded by any country in the world. One of these railways, the Canadian Pacific, which reaches from Quebec to Vancouver, on the Pacific Ocean, is the most remarkable illustration of railway enterprise ever shown by any country; certainly without a parallel for rapidity of construction, even in the United States, with all its wealth, population, and commercial energy. These railways represent an investment of nearly \$1,000,000,000 in the shape of capital stock, municipal

and government bonuses. The interprovincial trade—a direct result of the federation—is at least \$120,000,000 a year. These are some of the most remarkable evidences of material development which Canada has exhibited within fifty years. All those who wish to pursue the subject further need only refer to the official publications¹ of the government to see that the fisheries, the timber trade, and the agricultural products of Canada have all increased in the same ratio, notwithstanding commercial crises, bad harvests, and depression produced in certain branches of industry by the policy pursued by the United States for some years towards the Canadian Dominion. When we consider that the United States has received the great bulk of immigration for half a century, and that it is only quite recently that a deep interest has been taken in the development of the Dominion by the people of Europe, it is remarkable that in every branch of trade and industry so steady a progress has been made during the reign.

X.

In a new country like Canada one cannot look for the high culture and intellectual standard of the old communities of Europe. But there is even now in Canada an intellectual activity which, if it has not yet produced a distinct literature, has assumed a practical and useful form, and must, sooner or later, with the increase of wealth and leisure, take a higher range, and display more of the beauty and grace of literary productions of world-wide interest and fame. The mental outfit of the people compares favourably with that of older countries. The universities of Canada—McGill, in Montreal, Laval, in Quebec, Queen's, in Kingston, Dalhousie, in Halifax, and Trinity and Toronto Universities in Toronto—stand deservedly high in the opinion of men of learning in the Old World and the United States, whilst the grammar and common school system in the English-speaking provinces is creditable to the keen sagacity and public spirit of the people, who are not behind their cousins of New England in this particular. We have already seen the low condition of education sixty years ago—only one in fifteen at school; but now there are almost a million of pupils in the educational institutions of the country, or one in five, at a cost to the people of upwards of \$10,000,000, contributed for the most part by the taxpayers of the different municipalities in connection with which the educational system is worked out. In Ontario the class of schoolhouses is exceptionally good, and the apparatus excellent, and the extent to which the people tax themselves may be ascertained from the fact that the government only contributes annually some \$1,512,000 out of a total expenditure of about \$4,200,000.

¹ Especially *The Statistical Year Book*, ably compiled by Mr. Johnson, the Dominion statistician.

In French Canada there is an essentially literary activity, which has produced poets and historians whose works have naturally attracted attention in France, where the people are still deeply interested in the material and intellectual development of their old colony. The names of Garneau, Ferland, Fréchette and Casgrain, especially, are recognized in France, though they will be unfamiliar to most Englishmen, and even to the majority of Americans, who are yet quite ignorant of the high attainments of French Canadians, of whom Lord Durham wrote, in 1839, "They are a people without a history, and without a literature," a statement well disproved in these later times by the works of Parkman, and the triumphs of French Canadians in Paris itself. The intellectual work of the English-speaking people has been chiefly in the direction of scientific, constitutional and historical literature, in which departments they have shown an amount of knowledge and research which has won for many of them laurels outside of their own country. In the infancy of the United States, works like "The Federalist," with its wealth of constitutional and historical lore, naturally emanated from the brains of publicists and statesmen. In laying the foundation of a great nation the learning and wisdom of the best intellects were evoked, and it has been so in a measure in Canada, where the working out of a system of government adapted to the necessities of countries with distinct interests and nationalities has developed a class of statesmen and writers with broad national views and a large breadth of knowledge. On all occasions when men have arisen beyond the passion and narrowness of party, the debates of the legislature have been distinguished by a keenness of argument and by a grace of oratory—especially in the case of some French Canadians like Sir Wilfrid Laurier, the present premier, and Sir Adolphe Chapleau, lieutenant-governor of Quebec—which would be creditable to the United States in its palmy days. Any one who reviews the fourteen volumes already published by the Royal Society of Canada—one of the most useful results of Lord Lorne's administration—will see how much scholarship and ability the writers of Canada bring to the study of scientific, antiquarian, and historical subjects. In science, the names of Sir William Dawson, of his equally gifted son, Dr. G. M. Dawson, as well as of many others are well known in the parent state and wherever science has its votaries. In poetry we have the names of Frederick G. Scott, Pauline Johnson, Roberts, Bliss Carman, Archbishop O'Brien, Speaker Edgar, Ethelwyn Wetherald, Lampman and Wilfred Campbell, who merit a high place among their famous contemporaries. The historical novels of Major Richardson, William Kirby, Gilbert Parker,—notably "The Seats of the Mighty" and other works of the latter,—show the rich materials our past annals offer for romance. "Sam Slick the Clockmaker" and other books by Judge Haliburton, a Nova Scotian by birth and education, are still the only noteworthy evidences we have of

the existence of humour among a practical people, and his "Wise Saws" and "Sayings" were uttered fully half a century ago. In art we have L. R. O'Brien, George Reid, Bell Smyth, Robert Harris, J. W. L. Forster, W. Brymner, and Miss Bell, who have done much meritorious work. Yet, on the whole, if great works are wanting nowadays, the intellectual movement is in the right direction, and according as the intellectual soil of Canada becomes enriched with the progress of culture we may eventually look for a more generous fruition. The example of the United States, which has produced Poe, Longfellow, Irving, Hawthorne, Howells, Parkman, Lowell, Holmes, and many others, famous as poets, historians, and novelists the world over, should encourage Canadians to hope that in the later stages of its development the Canadian people, composed of two distinct nationalities, will prove that they inherit those literary instincts which naturally belong to the races from which they have sprung.

XI.

The political system under which the provinces are now governed is eminently adapted to the circumstances of the whole country.

In the working out of responsible government, won for Canada during the Queen's beneficent reign, there stand out, clear and well-defined, certain facts and principles which are at once a guarantee of efficient home government and of a harmonious coöperation between the dependency and the central authority of the empire.

1. The misunderstandings that so constantly occurred when the Queen ascended the throne, between the legislative bodies and the imperial authorities, and caused so much discontent throughout the provinces on account of the constant interference of the latter in matters which should have been left exclusively to the control of the people directly interested, have been entirely removed in conformity with the wise policy of making Canada a self-governed country in the full sense of the phrase. These provinces are, as a consequence, no longer a source of irritation and danger to the parent state, but, possessing full independence in all matters of local concern, are now among the chief glories of England and sources of her pride and greatness.

2. The governor-general, instead of being constantly brought into conflict with the political parties of the country and made immediately responsible for the continuance of public grievances, has gained in dignity and influence since he has been removed from the arena of public controversy. He now occupies a position in harmony with the principles that have given additional strength and prestige to the throne itself. As the legally accredited representative of the sovereign, as the recognized head of society, he represents what Bagehot has aptly styled the dignified

part of our constitution, which has much value in a country like ours, where we fortunately retain the permanent form of monarchy in harmony with the democratic machinery of our government. It would be a great mistake to suppose that the governor-general is a mere *roi fainéant*, a merely ornamental portion of our political system, to be set to work and kept in motion by the premier and his council. His influence, however, as Lord Elgin has shown, is wholly moral, an influence of suasion, sympathy, and moderation, which softens the temper while it elevates the aims of local politics. If the governor-general is a man of parliamentary experience and constitutional knowledge, possessing tact and judgment, and imbued with the true spirit of his high vocation—and these functionaries have been notably so since the commencement of confederation—they can sensibly influence the course of administration and benefit the country at critical periods of its history. Standing above all party, having the unity of the empire at heart, a governor-general at times can soothe the public mind and give additional confidence to the country when it is threatened with some national calamity or there is distrust abroad as to the future. As an imperial officer he has large responsibilities, of which the general public have naturally no very clear idea, and if it were possible to obtain access to the confidential and secret despatches which seldom see the light except in the colonial office, it would be seen how much for a quarter of a century past the colonial department has gained by having had in the Dominion men, no longer acting under the influence of personal feeling through being made personally responsible for the conduct of public affairs, but actuated simply by a desire to benefit the country over which they preside and to bring Canadian interests into unison with those of the empire itself.

Self-government now exists in the full sense of the term. At the base of the political structure lie those municipal institutions which, for completeness, are not excelled in any other country. It is in the enterprising province of Ontario that the system has attained its greatest development. Every village, township, town, city, and county has its council composed of reeves or mayors and councillors or aldermen elected by the people, and having jurisdiction over all matters of local taxation and local improvement, in accordance with statutory enactments. Under the operation of these little local parliaments—the modern form taken by the folk-mote of old English times—every community, regularly organized under the law, is able to build its roads and bridges, light the streets, effect sanitary arrangements, and even initiate bonuses for the encouragement of lines of railway.

The machinery of these municipalities is made to assist in raising the taxes necessary for the support of public schools. Free libraries are provided for in every municipality whenever the people choose—as in the cities of Toronto, Hamilton, Guelph, and other places—to tax themselves

for the support of these necessary institutions. In the other provinces the system is less symmetrical than in Ontario, but even in the French section, and in the maritime provinces, where these institutions have been more recently adopted the people have within their power to manage all these minor local affairs which are necessary for the comfort, security, and convenience of the local divisions into which each province is divided for such purposes. Then we go up higher to the provincial organizations governed by a lieutenant-governor, nominated and removable by the government of the Dominion, and advised by a council responsible to the people's representatives, with a legislature composed, in only two of the provinces of two houses—a council appointed by the Crown and an elective assembly; in all the other provinces there is simply an assembly chosen by the people either by universal suffrage or on a very liberal franchise. The fundamental law known as the British North America Act, which was passed by the Imperial Parliament in 1867, gives jurisdiction to the provincial governments over education, provincial works, hospitals, asylums, and jails, administration of justice (except in criminal matters), municipal and all other purely local affairs. In the Territories not yet constituted into provinces there is provided an efficient machinery, in the shape of a lieutenant-governor, appointed by the Dominion government; of an advisory council to assist the lieutenant-governor; and of a small legislative body of one house elected by the people, which has the power of passing, within certain defined limits, such ordinances as are necessary for the good government and security of the sparsely settled countries under its jurisdiction. These Territories are now represented in the two Houses of the Dominion Parliament. These representatives have all the rights and privileges of members of the organized provinces, and are not the mere territorial delegates of the United States Congress. The central or general government of the Dominion is administered by a Governor-General, with the assistance of a ministry responsible to a Parliament, composed of a Senate appointed by the Crown, and a House of Commons elected under an electoral franchise practically on the very threshold of universal suffrage. This Government has jurisdiction over trade and commerce, post-office, militia and defence, navigation and shipping, fisheries, and railways and public works, of a Dominion character and all other matters of general or national import. The appointment of a Governor-General by the Crown, the power of disallowing bills which may interfere with Imperial statutes and treaty obligations, and the right which Canadians still enjoy of appealing to the Judicial Committee of the Privy Council from the subordinate courts of the provinces, including the Supreme Court of Canada; the obligation which rests upon England to assist the colony in the time of danger by all the power of her army and fleet, together with the fact that all treaties with foreign powers must necessarily be negotiated

through the Imperial authorities, will be considered as the most patent evidences of Canada being still a dependency of the empire. Even the restraint imposed upon Canada with respect to any matters involving negotiations with foreign powers has been modified to a great degree by the fact that England has acknowledged for over thirty years that Canada should be not only consulted in every particular, but actually represented in all negotiations that may be carried on with foreign powers affecting her commercial or territorial interests.

Another illustration of the growing importance of Canada in the Councils of the Empire is the fact that quite recently, in this jubilee year, a Canadian judge has been placed on the Judicial Committee of the Privy Council, the Supreme Court of Great Britain and Ireland, India, and all the dependencies of the Crown.

XII.

From this brief historical summary of the leading features of the political organization of Canada it will be seen how remarkable has been the expansion of the liberties of the people since 1837, when they exercised no control over the executive, when England imposed restrictions on their trade, and officials of Downing Street were practically the governing powers.

In the formation of their constitution the Canadians have naturally borrowed the best features of the federal system of their American neighbours, and of the governmental institutions of the parent state, though not without improvement. The following brief summary shows some of the advantages which Canada possesses over the institutions of the United States as far as an experience of many years goes to prove :

1. That the powers of the provincial and federal governments are enumerated, while the residuum of power is left, in express words, to the central authority of the Dominion ; the very reverse of the constitution of the United States, which gives to the national government only certain express, or necessarily implied, powers, and leaves to the several states all those powers of local or state sovereignty not so expressly taken away.

2. In adhering strictly, in the Dominion and every Province, to the principles of parliamentary government which makes the ministry or advisers of the executive responsible to the legislature for every act of administration : a flexible system which works admirably compared with the too rigid constitutional rules of the federal and state governments, which separate the executive from the legislative authority and do not permit the advisers of a president or a governor of a state to sit in the legislature and direct its legislation.

3. The latent powers of a dissolution of parliament, which may be used at any time by the Crown, under the advice of responsible ministers, with the view of obtaining the opinion and judgment of the people at a political crisis—a safety valve wanting in the rigid system of the United States, which constantly and necessarily creates friction between the executive and legislative authorities.

4. A permanent Civil Service in the Dominion and provincial governments—a system which lies at the very foundation of all stable government, but only partially adopted of very recent years by the national government of the United States, and now urged in almost all the old States of the Union.

5. The appointment of all judges and public officials by the Crown, on the advice of ministers responsible to parliament for every such executive act, in contradistinction to the elective system of the United States of the federal republic, where judges are, in most cases, elected by the people—the federal judges being the exception.

6. The independence of the judiciary of all party and political pressure, when once appointed, since they can be removed only by the Crown, as a consequence of a successful impeachment by the Dominion Parliament, while in the several states their tenure is limited to a certain number of years—ten on the average.

7. The infrequency of political elections and the practical separation of national, provincial and municipal politics at such elections—a separation now advocated in many states and adopted by the revised New York constitution, in the case of municipal elections, especially in the cities, where the running of municipal officers on a federal or state ticket has led to gross corruption and abuse by the political machine and its professional politicians.

8. The trial by judges of all cases of bribery and corruption in municipal as well as legislative elections, a system not yet adopted by the States, and necessarily of doubtful application in a country where so many judges are elective.

No doubt there are difficulties constantly occurring in the working of the Canadian federal constitution, arising from conflicts of jurisdiction between the Dominion and the Provinces, despite the careful enumeration of powers in the fundamental law, or British North America Act of 1867; but these doubts are gradually being removed by the wise practice which places the interpretation of all written legal instruments in the courts.

Here also the wisdom and learning of the Judicial Committee of the Privy Council of England and of the Canadian judiciary are to a large extent nullifying the contentions of politicians and bringing about a solution of difficulties which, in a country divided between distinct nationalities, might cause serious complications if not settled on sound principles of law which all can accept.

XIII.

One of the most encouraging results of this political system has been not merely the material development of the country but the creation of that national sentiment which must lie at the basis of any political structure, if it is to withstand the storm of passion and faction which from time to time will beat against its walls. The government of an immense country like Canada is surrounded by many difficulties which an Englishman or an American not thoroughly conversant with its history and conditions can hardly realize. The great extent of territory and the diverse interests of the populations that inhabit it from the Atlantic to the Pacific shores require that there should be much wisdom and patience used in the exercise of the large responsibility which these circumstances throw upon the government. If we look at the map, we see lying on the Atlantic seaboard three provinces whose industries are chiefly maritime, and whose propinquity to the United States naturally gives great importance to the commercial arrangements which may exist with that country. These provinces are separated by many hundreds of miles from the populous, prolific province of Ontario, and all commercial intercourse must be by means of railroads, or by the long and expensive navigation of the St. Lawrence. To encourage interprovincial trade under these circumstances, and make the people see that their true interests should not lie in dependence upon the United States, or on any single country, but on opening up new avenues of commerce wherever practicable, has been the natural policy of the governments since 1867. The result has been on the whole moderately successful, considering that the fight has not been merely against geographical obstacles but also against the antagonism exhibited by American politicians, ever since the repeal of the reciprocity treaty of 1854. The firmness with which the government has adhered to the rights it possesses in the fisheries, and the liberality with which it has promoted maritime interests by the construction of railways and other public works necessary to the material development of the country, have succeeded in restraining the clamour that was raised for some years in the maritime provinces against the operation of the union.

The situation has still its difficulties; but there is every reason to believe that the national sentiment is largely predominant, and that the mass of the people clearly see that by strengthening the confederation they are assuring their true happiness and prosperity in the end, and that to weaken or destroy it by the withdrawal of any single province would mean the destruction of British interests on the continent and the annexation of Canada eventually to the United States. Then, leaving that branch of the subject, if we look at the distinct national elements

that exist throughout Canada we have further evidence of the difficulties with which a government has to contend in striving to achieve the unity and security of this widely extended confederation. When the Canadian provinces were united, in 1840, the French Canadians were restive and uncertain of their future. The Act of Union was considered by many of them as an attempt to make them subservient to British influences. The elimination of their language from legislative records was to them a great grievance, because it was, in their opinion, a clear evidence of the spirit which lay at the basis of the union. As a matter of fact, however, the Union Act was a measure which, from the very outset, gave to Lower Canada a political superiority in the government of the whole country. The representation of the two provinces was equal in the Assembly, but the greater unity that distinguished the French Canadians in all matters that might affect their political power, or their provincial interests, naturally enabled them to dominate the English parties, divided among themselves on so many political issues. The French language was soon restored to its old place and step by step all the principles that the popular party of Lower Canada had been fighting for previous to 1840 were granted—even an elective legislative council—under the new regime. The consequence was that French Canada eventually recognized its power, and its people forgot their old grievances and were ready to sustain the Union into which they had entered with doubt and apprehension. It was the English speaking people of the West that now raised the clamour against French domination, when the representation granted in 1840 did not do justice to the increase of population in Upper Canada, where, since that year, the progress had been more rapid than in the French section. The consequence was that the two provinces, united in law, were practically divided on the floor of parliament and government, at last, became almost impossible from the division of parties and the controlling influence of French Canada, always determined to yield nothing to the cry from the upper province that would destroy the equality of representation. The solution of the difficulties, arising, it will be seen, from national antagonism, was found in a federal union, under which Lower Canada obtained a supreme control over the provincial matters in which she has an immediate interest and at the same time has been able to exercise great influence in national affairs by means of her large representation in the Dominion parliament. The results of the political changes, which have occurred since the days of Lord Durham, have been very different from what he hoped would be the case when he wrote his famous report, throughout which there is a strong desire to diminish French Canadian influence and gradually absorb the French Canadian nationality in an English speaking people. In Lord Durham's opinion, "the first and steady purpose of the British Government should be to establish an English population, with English laws and language,

“in this province, and to trust its government to none but a decidedly “English legislature.” As a matter of fact, Lord Durham entirely underrated the national instincts of the French Canadian population and the tenacity with which they cling to their national life. *Le Canadien*, a newspaper established in French Canadian interests, in the early days of this century, struck the key note of French Canadian aspiration, when it adopted as its motto, “Notre langue, notre foi, et nos institutions.” Under the favourable conditions of the federal system Quebec has become essentially a French Canadian province in which the English are actually in a very small minority though it is one distinguished always by its great intelligence and superior enterprise. In the province of Ontario, the French race has recently controlled the election of more than one county which heretofore has been English in its representation. At the same rate of progress, and under an equally favourable condition of things, five millions of French-speaking people will inhabit the Dominion in four or five decades. In the nature of things they must always exercise a powerful influence on the future destiny of the young confederation. It is therefore all-important to understand their actual sentiment with respect to the Union. At times, when they believe their nationality is in danger or an injustice has been done to one of their race, they become aggressive, but, happily for the peace and unity of the country, the conservative instincts of the leading classes ultimately prevail over the passion and impulsiveness of the masses.

While reason and common sense have the mastery in French Canada, all classes can hardly fail to see that the institutions which they value so highly can only be preserved by such a system of government as they now possess under the protecting influence of the Imperial State, and were they, to-morrow, to find themselves in the ranks of the federal republic, their position would, in all probability, become eventually, like that of their compatriots in Louisiana, interesting from the point of view of the antiquary and the student of human life, but insignificant from a political or national aspect. No French Canadian writer or politician of weight in the country now urges so impossible or suicidal a scheme as the foundation of an independent French nationality on the banks of the St. Lawrence.

Sir Wilfrid Laurier, now the brilliant leader of the government in parliament, only voiced the sentiments of his compatriots, conservative as well as liberal, when he said, some months ago, in the presence of a large English audience in the city of Toronto :—

“If there are any amongst my fellow-countrymen who have ever dreamed of closing themselves into a small community of Frenchmen on the banks of the St. Lawrence, I am not one of them. It would be an act of black ingratitude if, after we have sought from England the privileges and rights of British subjects, we were now to reject the res-

“ possibilities of such subjects ; if having sought the protection of Britain
 “ to grow strong, we were, when strong enough, to attempt to stab the
 “ friendly hand, and refuse to cast in our lot with those who are fellow-
 “ countrymen of ours, and whose birthright we claim as our inheritance.
 “ When confederation was established it was not intended that it should
 “ be based upon the humiliation of any one race ; that any one should
 “ give up its characteristics ; but it was expected that though every
 “ nationality might retain its individuality, yet that all would be actuated
 “ by one aspiration and would endeavour to form one nation.”

At times when the French Canadians press their national prejudices to extremes, a spirit of antagonism is at once evoked between them and the English classes, but the unfortunate state of things that existed before 1837 no longer shows itself with its original intensity, and whatever jealousies or rivalries break out now and then above the surface are sooner or later carried away by the current of sound public opinion, anxious for the harmony of all classes and creeds and only solicitous for the safe working of the Union. A certain rivalry will always exist between the two nationalities, but as long as moderate and conciliatory counsels prevail, it will be, let us hope, the rivalry of peoples animated by the same patriotic impulses and engaged in the same great work of building up a new nation on this continent. At all events a great deal has been gained since 1837 in the direction of creating a friendly and harmonious feeling between distinct races who, at one time in their history, seemed on the point of engaging in an internecine conflict like that which convulsed the North and South for years.

XIV.

Every one who is at all conversant with Canadian political history for the past sixty years will recognize the fact that Canada owes much to men like Sir Louis Lafontaine, who successfully inaugurated responsible government after the Union of 1841, and did a great deal to allay sectional jealousies and antagonisms. It was Sir George Cartier, a French Canadian statesman, who carried the province of Quebec with little or no friction into the federal union. In Mr. Pope's biography of Sir John Macdonald, which appeared some time ago, justice is done to the broad statesmanship and imperial conceptions of that great Canadian Premier, whose name must be always associated with the political development of Canada since 1844 ; but, while we may commend the natural effort of a devoted private secretary to eulogise and emphasise the services of his chief, it is apparent that he has been too forgetful of the claims of Sir George Cartier, and of his followers from French Canada to recognition. Canadians, at all events, know full well that, without

the aid of his faithful friend and colleague, Sir John Macdonald would have been helpless time and again, and could never have carried out his national schemes.

With the names of Sir John Macdonald and Sir George Cartier, who did so much by their broad statesmanship to settle sectional difficulties, and lay the foundations of Confederation, must be also intimately associated that of Mr. George Brown, for many years a prominent journalist in Upper Canada, and the leader of the Radical section of the Liberal party. The pertinacity with which he pressed the claims of the upper province to larger representation in the Canadian legislature; and the violence with which his newspaper *The Globe* attacked the institutions of French Canada, more than once excited sectional passion to a high pitch, and rendered government almost impossible. But by his readiness at last to coöperate with Sir John Macdonald and Sir George Cartier in the bringing about of Confederation, Mr. Brown showed he had statesman-like conceptions of his duty at a national crisis, and placed his name in the front rank of the eminent public men who have done so much for Canada in the Victorian Era.

Happily for the present Dominion, there were also at the head of affairs in the maritime provinces men of large national ideas and signal ability; and while mistakes were undoubtedly made in the case of Nova Scotia, where the majority of the people for a time resented the haste with which their province was forced into the Union of 1867, yet one may now hesitate to dwell on the errors of judgment of those exciting times, thirty-two years ago, and may well urge that it might have been a far greater mistake had the Unionists of Nova Scotia delayed in seizing the opportunity of consolidating the provinces and preventing the perils to which they were exposed by remaining isolated from each other, at a time when they were subject to Fenian raids and the unfriendliness of the dominant party in the United States.

Of the distinguished men who brought about Confederation at so critical a period in Canadian affairs, nearly all have joined the ranks of the Great Majority. Sir Charles Tupper, who has filled many important positions in the councils of his country, and was premier of Nova Scotia from 1864 to 1867, and Sir Oliver Mowat, so long the discreet Premier of Ontario, still remain in active political life. Sir Hector Langevin, Senators Dickey and A. A. Macdonald, Hon. Peter Mitchell, and Hon. William McDougall complete the list of the survivors of the Quebec Convention of 1864.¹ The encouraging success, which has so far attended

¹ The following are the names of the statesmen who took part in the Quebec convention :

CANADA.—Hon. Sir Etienne Taché, M.L.C., Premier; Hon. John A. Macdonald, M.P.P., Attorney-General of Upper Canada; Hon. Geo. Etienne Cartier, M.P.P., Attorney-General of Lower Canada; Hon. Geo. Brown, M.P.P., President of Execu-
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the operation of Confederation, entitles the actors of 1864-67 to a memorable place in the annals of the reign.

XV.

In this review it has been my object to refer only to those salient features of the development of Canada, and to point out how much reason Canadians have for congratulating themselves on the events of the last sixty years—a period contemporaneous with the reign of the present Queen—in which they have laid the foundations of their happiness and prosperity as one of the great communities which make up the empire. It is not within the scope of this paper to point out the shadows that may obscure the panorama as it unfolds itself before us. It would be strange if, in the government of a country like Canada, many mistakes had not been made, or if there were not many difficulties in store for the youthful confederation. Dr. Goldwin Smith, from time to time, has been disposed to perform the part of the Greek Chorus to the gloomy predictions of the enemies and lukewarm friends of the confederation, but Canadians will hardly allow themselves to be influenced by purely pessimistic utterances in the face of the difficulties that they have hitherto so successfully encountered, and of the courage and hopes that animate them for the future. For a century and a half the French Canadians fought and bled for their country; they had to face famine and savages, war with the British, and, what was worse, the neglect and indifference of the parent state at the most critical period of their history; but since the conquest they have built up a large community by the banks of the St. Lawrence and its tributaries, and even the superior energy and enter-

tive Council; Hon. Alex. T. Galt, M.P.P., Finance Minister; Hon. Alexander Campbell, M.L.C., Commissioner of Crown Lands; Hon. Jean C. Chapais, M.L.C., Commissioner of Public Works; Hon. Thos. D'Arcy McGee, M.P.P., Minister of Agriculture; Hon. Hector L. Langevin, Solicitor-General for Lower Canada; Hon. W. McDougall, M.P.P., Provincial Secretary; Hon. Jas. Cockburn, M.P.P., Solicitor-General for Upper Canada; Hon. Oliver Mowat, Postmaster-General.

NOVA SCOTIA.—Hon. Chas. Tupper, M.P.P., Provincial Secretary and Premier; Hon. Wm. A. Henry, M.P.P., Attorney-General; Hon. Robert B. Dickey, M.L.C.; Hon. Adams G. Archibald, M.P.P., Hon. Jonathan McCully, M.L.C.

NEW BRUNSWICK.—Hon. Samuel L. Tilley, M.P.P., Provincial Secretary and Premier; Hon. Peter Mitchell, M.L.C.; Hon. Chas. Fisher, M.P.P.; Hon. W. H. Steeves, M.L.C.; Hon. John Hamilton Gray, M.P.P.; Hon. Edward B. Chandler, M.L.C.; Hon. John M. Johnson, M.P.P., Attorney-General.

PRINCE EDWARD ISLAND.—Hon. John Hamilton Gray, M.P.P., Premier; Hon. George Coles, M.P.P.; Hon. Thomas Heath Haviland, M.P.P.; Hon. Edward Palmer, M.P.P., Attorney-General; Hon. Andrew Archibald Macdonald, M.L.C.; Hon. Edward Whelan, M.L.C.; Hon. H. Pope, M.P.P., Provincial Secretary.

NEWFOUNDLAND.—Hon. Frederick B. T. Carter, M.P.P., Speaker of the House of Assembly; Hon. Ambrose Shea, M.P.P.

prise of the English Canadians have not prevented them from creating a province which is essentially French Canadian, and affords many evidences of prosperity due to the hardihood of the race that inhabits it. A century and more has passed since the English-speaking people sought their fortunes in the West or on the shores of the Atlantic. For years many of these hardy pioneers led toilsome lives—lives of solitude, among the great forests that overshadowed the whole country; but year by year the darkness of the woods was brightened by bursts of sunlight, as the axe opened up new centres of settlement and echoed the progress of the advanced guards of civilization. Years of hardship and struggle ensued and political difficulties followed to add to individual trials, but the people were courageous and industrious and soon surmounted the obstacles of early times. The material development went hand in hand with the political progress of the country. The magnificent heritage which the people of Canada now own is the result of unremitting toil and never-failing patience and, summing up the achievements of the past, they may well look forward with hopefulness to the future, for of them it may be truly said,

“ Men the workers ever reaping something new ;
That which they have done but earnest of the things that they will do.”

What is to be the next great step in the political career of Canada is a question which frequently occurs to imperial as well as colonial statesmen. One thing is quite certain that the movement is towards the placing of the relations between the parent state and its great dependency on a basis which will strengthen the empire and at the same time give Canada even a higher position in the councils of the imperial state.

The federation of the empire in the full sense of the term may be considered by some practical politicians as a mere political phantasm, never likely to come out in a tangible form from the clouds where it is now concealed; and yet who can doubt that out of the grand conception, which first originated in the brain of Franklin and Otis, statesmen may yet evolve some scheme that will render the empire secure from the dangers which arise from continual isolation, and from the growth of peculiar and distinct interests, that naturally result from the geographical situation of communities so widely separated from each other throughout the world?

At the Ottawa Conference of 1894, when delegates from Australasia and South Africa discussed with Canadian representatives questions affecting the Empire at large, not a word was said on the subject of Imperial federation. Imperial defence was not even considered; but, despite this studied neglect of a scheme which, more than once, had been eloquently urged by several representatives—especially by Mr. Foster, then Finance Minister of Canada—it is probable that this con-

vention would never have met were it not for the efforts of enthusiastic supporters of the movement for some years back to create a deeper interest in colonial affairs and Imperial connection. At the Conference commercial questions absorbed the attention of the delegates, and perhaps some historical students may recall the fact that considerations of trade and finance led to the famous convention that created "a more perfect union" in 1787 for the American States previously bound together by a loose confederation.

Some strong reasons may be urged by not a few persons, from an Imperial point of view, for giving Imperial assistance to such practical propositions as a fast Atlantic and Pacific steam service between Canada, Australasia, and Great Britain—soon to be realized between Canada and the parent State—and the laying of a cable, "free from all foreign control" between the Dominion and Australasia. One can see in the resolutions of the Conference advocating larger and freer commercial relations between the colonial dependencies, as well as the removal of any restraints that may be imposed by Imperial treaties on the right of Canada and other colonies to regulate their tariffs as they deem most expedient, some important evidence of the growing desire among colonial statesmen to give greater unity to the colonial empire. The Conference also urged on English statesmen the necessity of reconsidering the position they have assumed since the days of Cobden and Peel, and adopting a policy which would give a preference to colonial products in the markets of Great Britain, and create an Imperial Zollverein; but while no practical step has been taken in this direction by the Imperial Ministry or Parliament since the passing of the resolution yet one sees in the speeches of prominent British public men as well as in the strong desire evinced by Mr. Laurier and his Ministerial colleagues to draw closer to the imperial state, the most encouraging sign for the unity and integrity of the empire at large.

Indeed it is obvious that while Canadians may differ as to methods of action, neither government nor opposition have any doubts as to the advisability of strengthening the connection between the Dominion and the Mother Country. This is the paramount question of the day among all classes—among people and statesmen—and practical results of great significance must be evolved ere long.¹

¹ Since this paper was read before the Royal Society of Canada, the Diamond Jubilee, which showed so powerful sentiment of attachment to the Crown and Empire, has already brought forth a practical result by the "denunciation" of the imperial treaties with Germany and Belgium, which for some years past have evoked the hostility of the Canadian government and parliament as entirely at variance with the commercial freedom of the Dominion and her rights, expressed or implied by the British North America Act of Union, and as interposing serious obstacles to more intimate commercial relations with the parent state. This action on the part of the imperial government, in response to the bold and decisive tariff

XVI.

Only a few words in conclusion. Looking at the history of the Canadian dependency for sixty years, one can see in all the phases of its political development there has ever run "an increasing purpose." The statesmen of England and her colonies have, perhaps, builded better than they knew. The destiny that shapes our ends, "rough-hew them how we will," has been carrying the empire in a direction beyond the ken and conception of probably the most sanguine and practical minds. When we consider that the union of the two Canadas was followed in about a quarter of a century by the federation of all the provinces, and that this great measure has been also supplemented, after a lapse of thirty years, by a conference of delegates from the most distant colonial possessions, we may well believe that the thoughts of men are indeed widened throughout England and her dependencies "by the process of the suns," and that powerful current of human thought and progress which is everywhere making itself felt is carrying forward the Empire, not into an unknown sea of doubt and peril, where it may split into many fragments, but into a haven where it may rest in the tranquil waters of peace and security.

As long as the respective members of the Federation observe faithfully the principles on which it necessarily rests—perfect equality among all its sections, a due consideration for local rights, a deep Imperial as well as Canadian sentiment whenever the interests of the whole Federation is at stake—the people of this Dominion need not fear failure in their efforts to accomplish the great work in which they have been so long engaged. Full of that confidence that the history of the past should give them, and of that energy and courage which are their natural heritage, and which have already achieved the most satisfactory results in the face of difficulties which, sixty years ago, would have seemed insurmountable; stimulated by their close neighbourhood to a nation with whom they have always shown a desire to cultivate such relations as are compatible with their dignity, their security, and their self-interest as a separate and distinct community; adhering closely to those principles of government which are best calculated to give moral as well as political strength;

policy of the present Canadian ministry, is not merely another step in that evolution of events which have placed Canada in the position of a semi-independent power in the course of thirty years; but, judged by the spirit that has animated both Canadian and English statesmen in bringing it about, it is a part of that movement which seems irresistibly forcing the parent state and her greatest dependency to a closer alliance, commercial and defensive, that will make the empire impregnable. It is a forerunner, many Canadians hope, of a scheme of imperial federation which not long since seemed chimerical to those who cannot look beyond the interests of mere sections of the empire. Mr. Chamberlain has certainly not disappointed his friends who have always believed that he would make his position of administrator of colonial affairs a position of value to the empire at large.

determined to put down corruption in whatever form it may show itself, and to cultivate a sound public opinion, Canadians may tranquilly, patiently, and determinedly face the problem of the future.

When Canadians review the trials and struggles of the past in the interesting story of their country, they may well gain from them lessons of confidence for the future, and cannot forget to pay a tribute to the men who laid the foundations of these communities, still on the threshold of their development, and on whom the great burden fell ; to the French Canadians who, amid toil and privation, amid war and famine, built up a province which they had made their own by their patience and industry, and who should, differ as we may from them, evoke our respect for their fidelity to the institutions of their origin, and for their appreciation of the advantages of English self-government, and for their coöperation in all great measures essential to the unity of the Federation ; to the Loyalists of last century who left their homes for the sake of "king and country" and laid the foundations of prosperous and loyal English communities by the sea and by the great lakes, and whose descendants have ever stood true to the principles of the institutions which have made England free and great ; to the unknown body of Pioneers, some of whose names, perhaps, still linger on a headland or river, or on a neglected gravestone, who brought the sunlight year by year to the dense forests, and built up by their industry the large and thriving provinces of the Dominion ; to the Statesmen who laid deep and firm, beneath the political structure of this Federation, those principles of self-government which give harmony to the constitutional system and bring out the best qualities of an intelligent people. And above all, let Canadians of all classes and nationalities unite with heart and soul, in this remarkable month of this remarkable year, to pay a just tribute to the Great Queen, during whose beneficent reign Canadians have received such large political privileges, and whose virtues as a woman and sovereign have placed her in the estimation of her subjects in every part of the Empire, on an eminence of love and respect which none of her royal predecessors, not even "Good Queen Bess," have ever been able to reach in the brightest eras of English history.

ILLUSTRATIONS

CANADA, 1837-1897



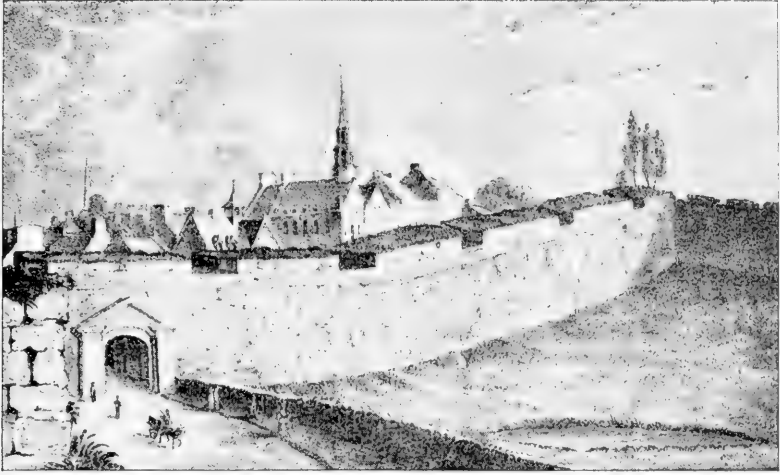
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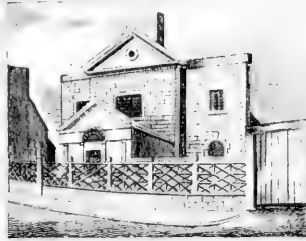
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CONGREGATIONAL CHAPEL



ST ANDREWS CHURCH

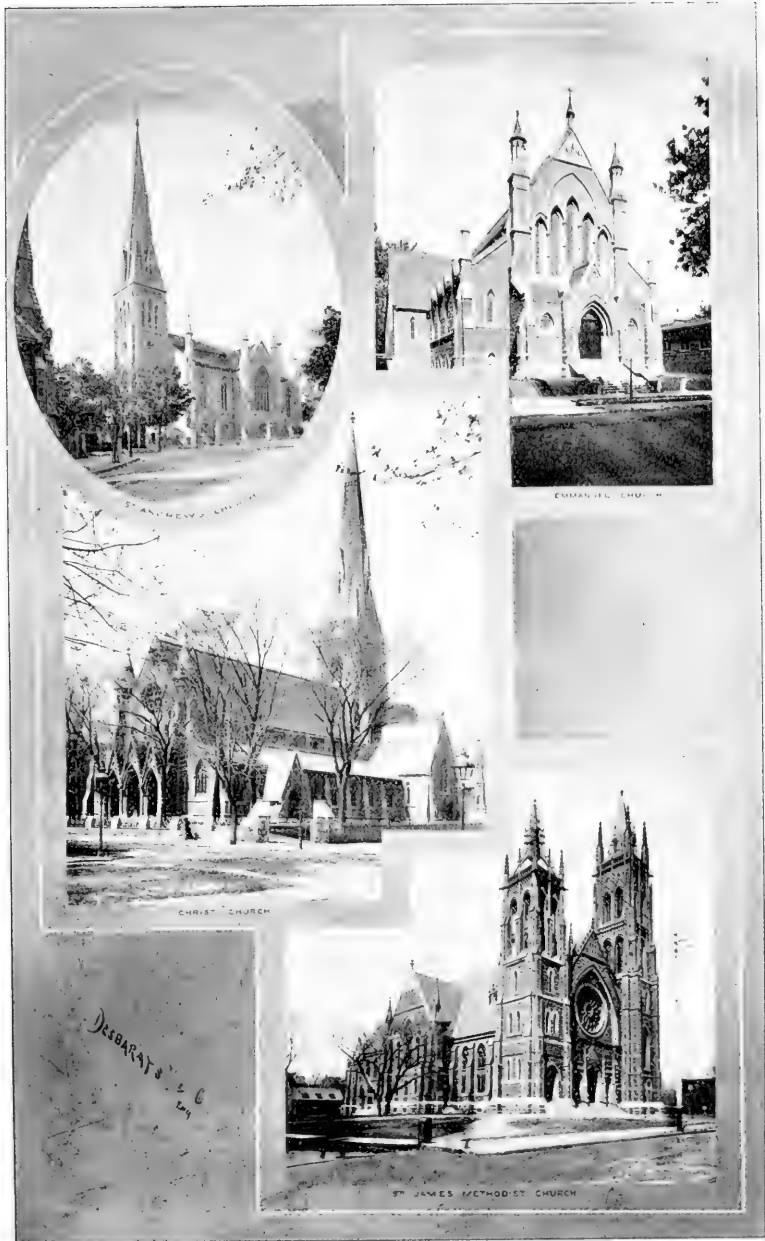


CHRIST'S CHURCH

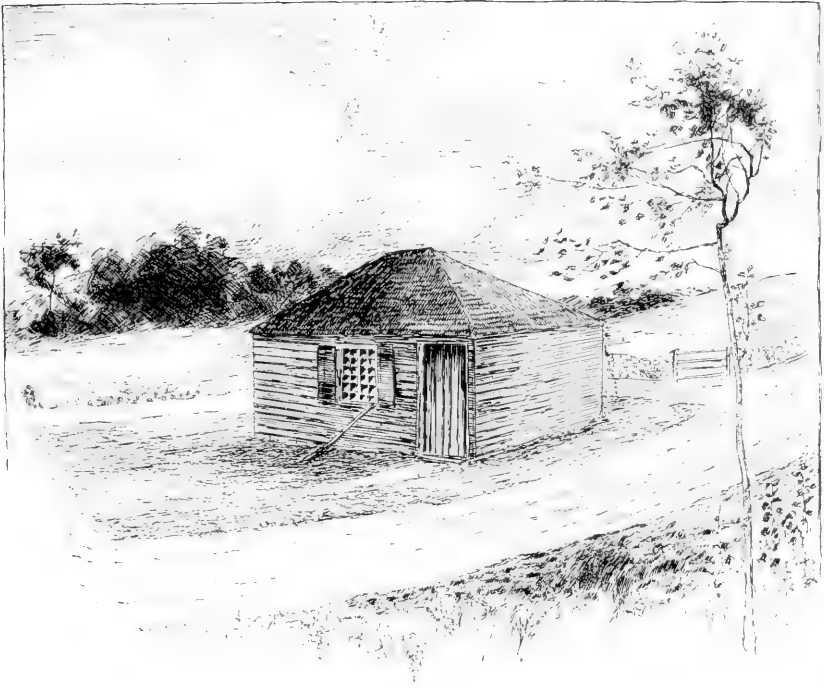


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HON. R. BALDWIN.

SIR G. E. CARTIER,

LORD ELGIN,

HON. L. A. WILMOT,

HON. J. HOWE.

SIR J. A. MACDONALD.



13.

O. CHÉMAZIE.

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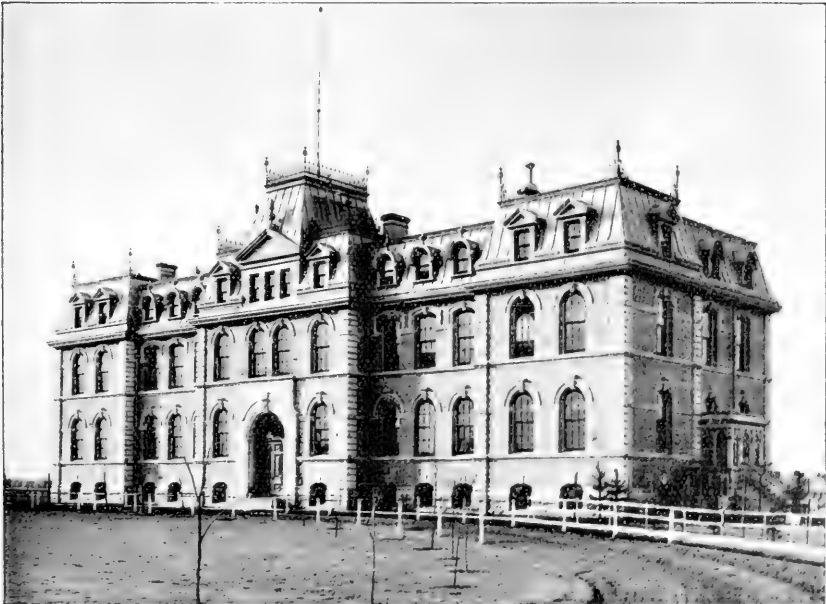
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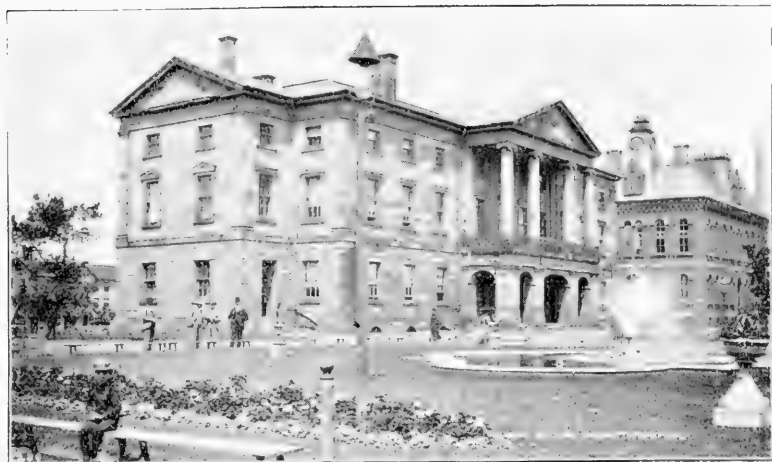
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 GILBERT PARKER.
 W. W. CAMPBELL.



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SIR O. MOWAT.

SIR W. LAURIER.

SIR C. TUPPER.

SIR R. CARTWRIGHT

II.—*Notes on the Cosmogony and History of the Squamish Indians of British Columbia.*

By Professor C. HILL-TOU, Buckland College, Vancouver.

(Communicated by Dr. G. M. Dawson, June 23, 1897.)

The following notes on the cosmogony and history of the Squamish Indians of British Columbia, a sept of the great Salishan stock, were gathered by myself from an aged Indian of that sept some time last summer. Through the kindness of the Roman Catholic bishop of the district, Bishop Durieu, I received a cordial reception at the hands of the chief men of the tribe, and on learning what I wanted they brought out of his retirement the old historian of the tribe. He was a decrepit creature, stone-blind from old age, whose existence till then had been unknown to the good bishop, who himself has this tribe in charge. I am disposed, therefore, to think that this account has not been put into English before. I first sought to learn his age, but this he could only approximately give by informing me that his mother was a girl on the verge of womanhood when Vancouver sailed up Howe Sound at the close of last century. He would, therefore, be about 100 years old. His native name, as near as I could get it, is "Mul'ks." He could not understand any English, and as his archaic Squamish was beyond my poor knowledge of the language, it was necessary to have resort to the tribal interpreter. The account will, in consequence, be less full and literal. Before the old man could begin his recital, some preparations were deemed necessary by the other elderly men of the tribe. These consisted in making a bundle of short sticks, each about six inches long. These played the part of tallies, each stick representing to the reciter a particular paragraph or chapter in his story. They apologized for making these, and were at pains to explain to me that these were to them what books were to the white man. These sticks were now placed at intervals along a table round which we sat, and after some animated discussion between the interpreter, who acted as master of the ceremonies, and the other old men as to the relative order and names of the tallies, we were ready to begin. The first tally was placed in the old man's hands and he began his recital in a loud, high-pitched key, as if he were addressing a large audience in the open air. He went on without pause for about ten minutes, and then the interpreter took up the story. The story was either beyond the interpreter's power to render into English, or there was much in it he did not like to relate to a white man, for I did not unfortunately get a fifth of what the old man had uttered from him, and it was only by dint of questioning and cross-questioning that I was

enabled to get anything like a connected narrative from him at all. The old man recited his story chapter by chapter, that is, tally by tally, and the interpreter followed in like order. The following is the substance of what I was able to record :

In the beginning there was water everywhere and no land at all. When this state of things had lasted for a long while, the Great Spirit determined to make land appear. Soon the tops of the mountains showed above the water and they grew and grew till their heads reached the clouds. Then he made the lakes and rivers, and after that the trees and animals. Soon after this had been done, "*Kā-lā'nā*," the first man, was made. The Great Spirit bestowed upon him the three things an Indian cannot do without, viz., a wife, a chisel or adze, and a salmon trap. *Ka-la'na* was a good man and obeyed the Great Spirit's commands, and in course of time his wife bore him many sons and daughters, who spread out over the land and peopled it. When the land was full of people and *Kalana* had grown very old, the Great Spirit took him away one day and the people saw him no more. Now, as *Kalana* had advanced in years the people had become very wicked and vexed the Great Spirit. And after he had left them they became worse. When this state of things had been going on for a long time, the Great Spirit made the waters rise up over all the land above the tops of the highest mountains, and all the people were drowned except one man named *Cheatmuh*, the first-born of *Kalana*, and his wife. These two escaped in their canoe, which floated about on the water for a long time, and at last, when they were nearly dead with hunger, settled on the top of a high mountain which was not quite covered with water. After this the waters subsided, and *Cheatmuh* and his wife descended from the mountain and built themselves a house, and in course of time re-peopled the land again with their offspring. A long interval now went by and the people were happy and prosperous. Many salmon came up the *Squamish* every season, and there was food for everybody and to spare.

But the Great Spirit became angry with them again a second time after *Cheatmuh's* death, and this time he punished them by sending a great snow-storm upon the land. Day after day, and moon after moon, the snow fell in tiny flakes, covering everything and hiding all the land, and the streams, and the rivers, and the trees. The snow was remarkable for its extreme fineness, and it penetrated everywhere. It came into their houses and put out the fires, and into their clothes and made them wet and cold. (In this part of his recital the old man was exceedingly interesting and graphic in his description, the very tones of his voice lending themselves to his story, and I had gathered, long before the interpreter took up the story, that he had told of something that was very small and had penetrated everywhere.) Soon all the stores of fish and all available firewood was con-

sumed, and no more could be got. Starvation and cold assailed them on every side, and soon the children and old people began to die in scores and hundreds. But still the snow came down and the misery of those that were left increased. Dead bodies lay around everywhere, dead and dying lying together. (Here the old man's voice was hushed to a plaintive wail, and the faces of his audience were an eloquent index of the tragic interest of this story of their ancestors' misfortunes.) Everything that could possibly afford sustenance was eagerly sought out and eaten. The hair was scraped from their store of skins, and the latter, soaked in the snow to make them soft, were then torn into pieces and devoured. But soon even this source of supply failed them, and their only hope now lay in the approaching salmon season. But when this long-looked-for relief came it was found that the salmon were so thin that there was nothing on them but the skin and bones. It was impossible to cure salmon of this description; moreover, they did not come in their usual numbers, and soon this miserable supply failed them also. By the help of this poor diet the more hardy of them managed to keep body and soul together for some time longer, but all who were sickly and weak gradually died off, so that in a little time there remained but a few only of the whole tribe alive. All this time the snow had continued to fall, though it was long past the beginning of summer; and now even the salmon skins and bones were consumed, and all had died of starvation but two, a man and his daughter who lived apart by themselves. These two it seems had managed better than the rest. They were the fortunate possessors of a dog, which they killed after the salmon had failed them, and this they ate, bit by bit, as long as it lasted. They also burrowed down through the snow to the moss beneath, which they gathered, and, after wiping the slime of the salmon on it for flavouring, they then made soup from it. This, together with the dog, had enabled them to outlive all the rest of the tribe. But still the snow came down, and now they also had exhausted their resources and nothing remained to them but to lie down and die as the others had done. As they sat lamenting their lot, the man happened to look soundwards, and then he saw a large fish-hawk swoop down upon the water and rise again with a large salmon in its claws. Hastily getting out his canoe he launched it, and with his bow and arrows ready at hand, he paddled out to sea and presently got within range of the eagle and shot an arrow at it. The arrow went home and the bird fell with the fish still in its claws. He quickly secured both and returned to his daughter with them. By means of this fish and bird they were enabled to sustain themselves for some time longer, and by the time this food was consumed a great change began to take place. The snow at last stopped falling and the sun appeared, and a great and rapid thaw set in. In a short space of time the great white covering of snow sank down, and the long-hidden trees, and streams, and

rivers, and land were seen once more. The man now took his daughter to wife, and from those two the land was in course of time once more repopled. Times of plenty came back, and the people learned to forget the terrible punishment the Great Spirit had sent upon their forefathers.

But once again a dreadful misfortune befell them. This time it happened in this wise. One salmon season the fish were found to be covered with running sores and blotches, which rendered them unfit for food. But as the people depended very largely upon these salmon for their winter's food supply, they were obliged to catch and cure them as best they could, and store them away for food. They put off eating them till no other food was available, and then began a terrible time of sickness and distress. A dreadful skin disease, loathsome to look upon, broke out upon all alike. None were spared. Men, women and children sickened, took the disease and died in agony by hundreds, so that when the spring arrived and fresh food was procurable, there was scarcely a person left of all their numbers to get it. Camp after camp, village after village, was left desolate. The remains of which, said the old man, in answer to my queries on this head, are found to-day in the old camp sites or midden-heaps over which the forest has been growing for so many generations. Little by little the remnant left by the disease grew into a nation once more, and when the first white men sailed up the Squamish in their big boats, the tribe was strong and numerous again. Following Vancouver's advent four generations have come and gone, the second of which was his own. What follows from this point is not of any particular interest, but before concluding my paper I desire to say that the name of this first Squamish man, as handed down by tradition,—*Kā-lā'nā*—suggests some thoughts for the ethnologist's consideration. The Haida term for God closely resembles it, viz., *Sha-lana*, the initial consonants being interchangeable throughout the tongues of this area. But if we go outside the district and language of British Columbia, and examine the genealogies of the Hawaiians, we there find this name "Ka-lana," or "Kalanani," occurring again and again. For example, we have a fragment of a chant entitled "Kaulu-a-Kalana," which in English runs thus :

I am Kaulu,¹
The child of Kalana,
Etc., etc., etc.

And Fornander, in his first volume of "The Polynesian Race" (pp. 199-200), writes thus: "It is almost certain that a number of names on the "Ulu" line were those of chiefs in some of the southern groups who never set foot on Hawaiian soil, but whose legends were imported by southern emigrants. . . . The Maui legends, the Maui family of four brothers, and their parent, a-Kalana, Karana or Taranga, are

¹ This Kaula-Kalana was a celebrated navigator.

found upon all those groups in slightly different versions. . . . It is just to conclude, therefore, that the Maui family and legends were not only not indigenous to Hawaiian soil or contemporary with any chiefs of the "Nanaula" line, but it is very questionable whether their origin does not date back to the PRE-Pacific period of the Polynesian race."

This view of Fornander's receives a striking accession of evidence from the use of these seemingly identical terms in British Columbia. I have shown that the term stands for God among the Haidas. It is also seen in the compound name of one of their ancient deities, "*Het-gwalana*," and from information supplied me by the Rev. H. H. Gowen, who was a missionary for some years among the Hawaiians, this term is used by the Polynesians in the same sense. 'Everyone,' he writes me, "of the Kamehameha line had the name Kalani forming part of his or her full designation. It appears to have been equivalent to "*exalted*," "*heavenly*," "*divine*." Again, we find a remarkable resemblance to this term Kalana or Kalani in the name of the great chief who led the Yuchchi across the Indus and conquered India about 20 B.C., whose name, as given by the Chinese historians, is "Karranos," or "Kalanos."

These facts will receive an accession of interest when I state that my studies of the languages of the natives of this province have resulted in yielding evidence of intercourse or relationship of some kind between the Kwakiutl-Nootka and Salish stocks and the Malay-Polynesians, between the Haida-Tlingit and the Japo-Corean, and between the Dené, or Athapascan, and the Chinese and cognate races. Of the Dené tongue it is no exaggeration to say that 50 per cent of its radicals are pure archaic Chinese. I append a short comparative vocabulary of these :

ENGLISH.	CHINESE.	DENÉ.
Water	tsui	thù, tsoo
Face	men	nin
Feet	gea	khe'
Mouth	how	fwa
Skin	p	eve
Mountain	tsan	tsal
Stone	tse	tse
Grass	to	tlo
Corpse	kle-zie	ezie
Sky	hen	ya
Star	slen, sen	shen, sen
Snow	sheat	t'si
Bird	dea, tea	ta
A fly	yain	tain
Wood	chi	chin
Tree	tsi	tsel
Small	thlo	tsol
Wet	tsil	tsil
Arrow	chi	kie

ENGLISH.	CHINESE.	DENÉ.
Bow	kuū	in-thiū
Bone	kwat	kwen
Boat	chau	t'su (canoe)
Child	tsi	tsi-ya
Breast	yu	t'su
Brother (elder)	hiung	unâ
“ (younger)	ti	ché
Dog	kuen	t'len
Day	chen, tien	tzin
Eye	muk	woda
Fire	hwo	kron
Father	pa pa	apa
Mother	mo	emon
Man	yan, jin	dané, tiū, ji, ya
Grandfather	tsu	etse-yan
Grandmother	tsu	etsu
Sister (younger)	tze	edeze
Summer	chañ-choū	tañ-gron

I might extend this list almost indefinitely, but I think enough radicals have been given to show the marked lexicographical similarities between these two languages. Nor are these Chinese similarities confined to the vocabulary, they extend to the morphology of the language as well, and the characteristic methods of denomination in Chinese find their exact counterpart in the first three of the four classes of nouns into which, according to Father Morice,—than whom there is no higher authority—the nouns in the Dené language may be divided.

It is my intention to offer a fuller paper on these Asian affinities later. Our lack of analytical knowledge of the language of British Columbia makes it difficult at times to proceed and be sure of one's ground. The Dené radicals here offered are some of those given by Father Morice, and may, therefore, be considered correct. The Chinese terms are either from Edkin, or from local Cantonese, the dialect of which, as Edkin has pointed out, is a purer and more archaic form of Chinese than the court or literary forms.

III.—*The Origin of the Haidahs of the Queen Charlotte Islands.*

By JOHN CAMPBELL, LL.D.

While the society is celebrating the landfall of the illustrious John Cabot upon the eastern shore of our Dominion four hundred years ago, I have thought it not inappropriate to chronicle a possibly more ancient and more adventurous voyage that has left a permanent impression upon the islands of the far west. This voyage was undertaken at some remote period by the ancestors of those natives of the Queen Charlotte and adjoining islands now known as Haidahs. My attention was first called to these Indians by Mr. Francis Poole's book on the Queen Charlotte Islands, published in 1872; for the "Voyages of Captain Meares," published in 1791, give no definite information concerning them. Vocabularies of their language were edited by Gallatin and Scouler in the *Archæologia Americana* and the *Journal of the Geographical Society of London*, and to these was added, in 1877, the collection of Mr. George Gibbs in the first volume of the *Contributions to American Ethnology*, published by the United States Geographical and Geological Survey. In 1880, making use of this scanty material, I instituted a comparison of the Haidah dialects with those of the Malay-Polynesian family, which appears as an appendix to a paper on the "Origin of the Aborigines of Canada" in the *Transactions of the Literary and Historical Society of Quebec* of the following year. About the time that paper was read, I was favoured by Dr. George M. Dawson with a copy of his elaborate report on the Queen Charlotte Islands, which contains seventy large octavo pages on the Haidahs, and twelve of specimens of their language. This volume was supplemented in 1884 by "Comparative Vocabularies of the Indian Tribes of British Columbia," by Dr. W. F. Tolmie and Dr. George M. Dawson, which devotes 26 of its 127 pages to the Haidahs. Finally, in the *Transactions of this Society for 1895*, appears that great desideratum, a Haidah Grammar, from the pen of the Rev. C. Harrison, and edited by Dr. A. T. Chamberlain.

A mere glance at the grammar sufficed to show that the Haidahs could not possibly be ranked as a people of Malay-Polynesian origin, in spite of the resemblance of the vocabularies. The Haidah is a postpositional, and the Malay-Polynesian are prepositional languages. Nevertheless, of all the northern Asiatic tongues, Japo Siberian, Mongol, Tungusic, etc., there is not one that exhibits any affinity to the Haidah vocabulary, although their grammatical structure is more or less accordant. But, scattered through the Malay-Polynesian area, and cropping up more widely in Borneo, New Guinea, Australasia, the New Hebrides and the

Fiji islands, appears the Papuan or Melanesian stock, with a distinctly postponing syntax, and a vocabulary that, in its widely divergent forms, exhibits every gradation of influence by the dominant speech through which it has passed, or in the midst of which it now lies. It is generally conceded that these Melanesians were the original inhabitants of the regions in which they are now found, and that those who dwell upon the outskirts of the area have been displaced from their primitive insular abodes by the Malay and Polynesian peoples. The wide extension of the latter from Madagascar to Easter Island, and from Formosa to the Sandwich Islands, indicates maritime adventure of no ordinary kind at some remote period in history. It is true that the Melanesian, with the exception of the Fijians and some other islanders, as at present found in a pent-up, subject, and degraded state, shows no evidence of sea-going powers, but the fact that he is now found as far west as Flores and as far east as Fiji, is proof sufficient that he also was at one time a master of the ocean.

The pure Papuan is, no doubt, a black,—the negro of the Pacific—while the complexion of the Haidah is fairer than that of most of the coast tribes in the neighbourhood. But the Melanesian, as Wallace, Whitmee and other writers have shown, is of all shades, an evidence, it is thought, of mixed blood, to which also his language testifies. The Alfuros, or Harafuras of Celebes, are such a mixed race, and, according to Durville, quoted by Latham, they are whiter than the Malay inhabitants of the island. Similar to them are the Dyaks and Idayans of Borneo, and the Battas of Sumatra. In their use of large canoes and in their proficiency in carving, as well as in the actual features of their idols and medicine posts, the Fijians claim kindred with the Haidahs, in spite of the difference in colour. The houses of the latter point to an insular origin as well as their maritime habits, but in the matter of dress, equipments, implements and folk-lore, it is hard to institute a comparison, partly from lack of material, partly because the Haidah has largely borrowed from his neighbour, the Tshimsian. Language remains, therefore, the test of their relationship, and that test I have applied in the case of over two hundred words, nouns and pronouns, adjectives and numerals, verbs, adverbs and postpositions. For the Malay-Polynesian and Melanesian languages I have, in addition to dictionaries of the Malay, Tongan, Maori and other dialects, drawn upon the collections of Crawford, Belcher, Wallace, Hale, and many other writers, together with vocabularies found in the transactions of the Anthropological and similar societies. To these must be added Dr. John Fraser's work, entitled "An Australian Language," which really contains grammar and vocabularies of five dialects of that continent. My materials for comparative purposes have not been so complete as I would have desired had time permitted further research, but they are sufficient to make it morally certain that the Haidahs are a Melanesian stock with a considerable Malayan admixture.

Crawford supposes the Hindoo migration to the Malay archipelago to have begun in the thirteenth century, and it is supposed that this and the subsequent Mahometan invasions caused large displacements of population. That the expulsion of the Haidahs was posterior to the rule of the Hindoos seems evident, from their possessing the Sanserit *surya*, as the name of "the sun," in the form *tzoore*. It is also possible that the Haidah *kung*, the moon, is a form of the Sanserit *chandra* abbreviated. Malay domination has stamped itself upon the language in the word for man, *orang*, *olang*, which is the Malay's peculiar property, and which the Haidah but faintly disguises in *eetling* and *ihlinga*. Other Malay terms, such as *perampuan*, woman; *kapala*, head; *mata*, eye; *telinga*, ear; *tangan*, *lima*, hand; *ruma*, house; *bumi*, *tanah*, earth; *api*, fire; *baik*, good; *jahat*, bad, etc., are conspicuous by their absence, while the Papuan and Australian forms are exceedingly numerous. The absence of labials in Haidah, the place of which is taken generally by the sound of *w*, sometimes by an aspirate, and but rarely by the liquid *m*, exhibits phonetic decay not uncommon in American dialects, and renders perplexing, at first sight, the identity of compared words. Another source of difficulty is the combination *tl*, which is not characteristic only of Aztec speech. In most cases it appears to be an expedient for an original *l* or *r*, as in *eetling* for *orang*. This is a mere matter of dialectic variation, as appears from a comparison of the various forms of Caucasian speech. Thus, in Lesghian, the Avar word for night is *rahle*, but in Andi it is *retlo*. The sun again is *beri* in Akush, and *mitti* in Andi. The Nicaraguan dialect of the Mexican reveals the same equivalency, the Aztec *Nahuatl* being its *Nahuar*.

What stamps the Haidah as a Melanesian language is its grammatical construction, in which it differs entirely from the Malay and the Polynesian proper. These latter are preposing languages, which does not simply mean that they make use of prepositions, but that they also place the governing word before its genitive, the temporal index before the verbal root, and, generally speaking, the abstract before the concrete as in Semitic and Indo-European speech. The Melanesian languages, in general terms, do the very opposite, and are thus postpositional, in all of which respects the Haidah agrees with them. A comparison of Mr. Harrison's Haidah grammar with Threlkeld's Australian one, does not indeed reveal identity of structure, which would be remarkable, but it exhibits so many and such striking points of resemblance as to show that the two languages belong to one and the same family. In the Malay archipelago the presence of the same syntactical order may easily be detected, even within the compass of a brief vocabulary. Now, the Malay calls the middle of the night *tengah malam*, in which *tengah* is middle and *malam* is night; but the native of Teor terms a finger-nail *limin-kukin*, in which *limin* is hand and *kukin* is nail. While both seem

natural to an English person, the two forms are foreign to each other in the Pacific islands. Take again the word for egg: it is *muntiro* in Liang, *mantirhui* in Morella, *munteloa* in Batumerah, *momatiro* in Lariki, but in all these cases the first syllable stands for *mano*, a bird. All of these dialects, therefore, are Melanesian and not Malay. It is very common among uncivilized people to call the fingers the children of the hand. Were this the case in Malay-Polynesian, the word children would come first as in the Tongan *cow-nima*, the company of the hand, in which *cow* is company and *nima* hand. But in Teor fingers are *limin-tagin*; in Larika *lima-hato*; in Cajeli *limam-kokon*; in Liang *rima-kuhatu*; in Amblaw *lemnati-kokoli*. In these cases the first word is pure Malay, *lima* or *rima*, the hand, but the construction is that of a people who had not submitted to Malay syntax.

It may be objected that this Melanesian syntax is found not only in Haidah, but also in a very large number of American aboriginal languages. This is true. It is the order in Iroquois and Dacotah, Cherokee and Choctaw, Shoshonese and Zuni, Aztec, Peruvian and Chileno. It is also the Turanian order in Europe and Asia, counting out the Chinese and their monosyllabic associates. But these other American, and the European and Asiatic postponers, have not, like the Haidahs, a Melanesian-Malay vocabulary. Their words are, with a few exceptions that tend to show the unity of all speech, quite different from those of the Queen Charlotte Islanders. The Haidahs have articles, definite and indefinite. The Turanians proper of Europe, Asia and America, have none. But the Algonquins have, and the Malay-Polynesians and the Caffres of Africa, and also the Melanesians. Whether the latter borrowed them from the Malays or not who can tell? The Haidah articles are *nung* and *lth*, and the Australian are *unni* and *gali*. The Haidah thus presents a peculiar philological study as a purely Turanian language, in syntactical order, that has borrowed extensively from the Malay vocabulary, and that, probably from the same source, has differentiated itself from other Turanian languages by the appropriation of a spurious article. Its postpositional particles are not without analogy to the Japanese and cognate tongues, but their affinities are all with those of the Melanesian area, and in particular with those of far distant Australia. In Australian speech we probably have the Melanesian at its purest and, unfortunately, at its scantiest.

Commerce has carried the Malay numerals all over the Pacific into almost every Melanesian habitat except Australia. The original Melanesian type, of which the Haidah is a rescript, is lost; even Australia, which only counts as far as four, does not know it. It has to be picked up in fragments scattered over the whole insular area. A reference to the appended vocabulary will show that the chief affinities of the Haidah numerals are with those of Timbora, or Tambora, and Sumbawa, con-

cerning which Latham says: "In each of these vocabularies Malay words form the greater proportion. In each of them, however, are also found Australian vocables." Sumbawa, to which Timbora belongs, is in the very heart of the Malay archipelago, and most of its numerals are Malay in character. Those that are not accord with the numerals of the Haidahs. I am aware that there are some comparative philologists who regard the common possession of a numeral system as one of the most convincing proofs of a common origin. This is a great mistake. The original Celtic numerals have been replaced by the Latin. The Arabic have diffused themselves in Africa, the Sanscrit in India, and the Malay in Polynesia. In the intercourse of half-civilized or savage peoples with their superiors, no words are more easily lost. Whether the numerals of the Haidahs represent those of ancient Melanesian speech or not, they are an evidence that Malay influences were not sufficiently strong to impose upon them its arithmetical system.

Of more importance than these are particles, such as the postpositions, of which a list of twenty-six is appended. These are Australian as well as Haidah, and, were we in possession of lists of similar parts of speech from Sumbawa and its vicinity, links might be found to unite the far distant vocabularies. The same is true of pronouns, of which, unfortunately, my collection is small. Nevertheless it will be found to exhibit traces of kinship between the compared languages such as to render complete the cumulative argument for their original unity. I have before me Adelung's "Mithridates," Klaproth's "Asia Polyglotta," Hunter's "Non-Aryan Languages of India and High Asia," the "San Kokf Tsou Ran To Sets," and many more recent collections of Asiatic vocabularies, in which I have searched in vain for such traces of linguistic affiliation as I have found between the Haidah and the Melanesian of the Malay-Polynesian area. That the resemblance is fortuitous is an impossibility to any one who has made an exhaustive study of languages, however improbable it may appear at first sight to link Australians and Queen Charlotte islanders as members of the same family.

There is linguistic evidence of no mean order that many American families of man came to this continent by way of the Pacific islands. Such are the Mbaya-Abipones of the Gran Chaco; the Tupi-Guaranis of Brazil; the Caribs, the Huastec-Maya-Quiches of Central America, and the Algonquins of the north. All of these are of Malay-Polynesian origin except the Tupi-Guaranis, and they are Melanesian, like the Haidahs. The difficulty of a comparatively savage people traversing a wide ocean is an argument that should not weigh against the demonstration of language. The people of Easter Island came within eighteen hundred miles of the American coast, but, supposing them to have started from the Philippines, their route was one of eight thousand miles. Even recently, in comparatively small canoes, the islanders of the South Seas

have made voyages of many hundreds of miles. But, from a remote period, centuries before it was known to Europeans, the Malays, in their large *prahus*, visited the fishing grounds off the northern shores of Australia. As for the size of their vessels, it is related that a chief of the Tonga islands visited Fiji, three hundred and sixty miles away, in three canoes, which together contained two hundred and fifty people with provisions for the voyage. In the time of early Portuguese colonization in the east, the kingdom of Acheen, in Sumatra, sent against them a fleet of ninety vessels, some of them of four hundred tons burden, and carrying seven thousand men and much artillery. The Haidahs appear to have kept up their love of large canoes. The dug-out which carried Mr. Poole from the Queen Charlotte islands to the mainland had three jury-masts and a main stay-sail, and carried thirty-seven people with two tons of freight. From whatever point the ancestors of the Haidahs set out on the voyage that landed them in their American home, that voyage must have been a long and distressing one, yet not an impossibility to people inured to a rough life on the sea.

It has been objected that the prevalence of northeast and southeast trade winds in the tropics is an argument against long voyages towards the western coast of America, but Dr. Lang, in his "View of the Polynesian Nation," has successfully controverted this opinion by giving many testimonies to the fact that, within a few degrees north and south of the line, westerly winds are as frequent. He also accounts for distant colonization on the part of the South Sea islanders by the custom of conquerors to compel the vanquished survivors to put to sea in their canoes, and not return on pain of death. Such forced migrations have been the means of settling the coasts of America from Japan and other points in Northern Asia, as well as from the islands of the Pacific. The Haidahs, as a subordinate Melanesian people, probably found in rebellion against their Malay masters in some part of the archipelago, were, at some remote period, offered their choice between death and expatriation, and, spurned from every intermediate landing-place, at last found refuge on the uninhabited islands of the far east. This may have taken place at any time between the thirteenth and sixteenth centuries. In the latter period the power of the Melanesian must have been broken and his race reduced to degradation.

That the Haidahs represent a comparatively recent immigration to the American coast seems evident from their western location. All other American tribes of oceanic derivation are found in the east. Such are the Mbaya-Abipones, the Tupi-Guaranis, the Caribs, the Mayas of Yucatan, and the Algonquins. All of these landed originally on the west coast, whence they were driven eastward by invading tribes from Japan and the Asiatic mainland north, which displaced them through superior valour. These invasions appear to have begun early in the eighth cen-

tury for North America, and in the eleventh for the southern continent. Hence the Algonquins and Maya-Quiches must have come to America before 700 A.D., and the Caribs, Guaranis and Abipones before 1000. The Haidahs may not have arrived till five centuries after the latter date, when the great stream of immigration had ceased. I am not aware that any trace of Melanesian blood or language is to be found in the Sandwich Islands, the nearest to the American coast of any considerable centre of Polynesian population. The ocean route of the Haidahs may never be known, but the fact of it is proved as conclusively as if its log were written, by the evidence of comparative philology.

A comparison of the Haidah dialects with the Malay-Polynesian and Melanesian languages :

ENGLISH.	HAIDAH.	OCEANIC.
Man	eetling, eetlinga, eetlingah, ithlunga, ihlinga, ehlin	aulong, <i>Formosa</i> ; ulun, <i>Malagasy</i> ; orang, <i>Malay, etc.</i> ; lanang, <i>Bali</i> ; langang, <i>Madura</i> ; lusuisha, <i>Tasmania</i> ;
Woman	aiadda, chada, jada.	hieti, <i>Wahai</i> ; wadon, <i>Java</i> ; faitoh, <i>Timuri</i> ; quadne, <i>Tasmania</i> ; jadda, <i>Malagasy</i> ;
Child	njada, ntzahtha, nuntshaita. hudsu, keet, kithutso, denung, kinnash, naatzootzoo.	wanudyo, <i>Java</i> ; dindah, <i>Baju</i> ; inosu, <i>Rotuma</i> (wife); ina, <i>Formosa</i> . kachun, <i>Mysol</i> ; dodio, <i>Menado</i> ; atai, <i>Tarawan</i> ; kudjaguz, <i>Australia</i> ; indong, <i>Tagala</i> ; anak, <i>Malay, etc.</i> sunu, <i>Java</i> ; anakoozoog, <i>Sulu</i> ; zanic, <i>Malagasy</i> ; anako, <i>Baju</i> ; inianak, <i>Ahtiago</i> ; nati, <i>Tarawan</i> ; nanat, <i>Wahai</i> ; tahinae, <i>Tonga</i> ; tama, <i>Fakafo</i> ;
Father	hungiltso, koodel. haidi, haat, haddeh, hahta, ongai, haung, te-hung.	kaingal, yinalkun, <i>Australia</i> ; kaindul, <i>Australia</i> ; gazala, <i>Malagasy</i> . utha, <i>Rotuma</i> ; pito, yayab, <i>Java</i> ; kattam, <i>Pelew</i> ; etemen, <i>Malicollo</i> ; apang, <i>Biajuk</i> ; amahan, <i>Bisayan</i> ; yaman, <i>Sanguir</i> ; kunni, dunjo, <i>Australia</i> .
Mother	oi, owwa, oway, owwai, owa, owgha.	yaiya, <i>Tidore</i> ; ma-owa, <i>Galela</i> ; fae, <i>Tonga</i> ; ibu, <i>Malay, Sunda</i> ; ago, <i>Australia</i> ; uhani, <i>Rotuma</i> ; waiana, <i>Australia</i> .
Husband	telat, teetlahh, teetlahla, tlahal, titlagha.	lelay, <i>Malagasy</i> (man); lela, <i>Baju</i> (man); taroraki, <i>Bolanghitam</i> ; arracat, <i>Pelew</i> (man) laki, <i>Malay</i> ; pulahau, <i>Wahai</i> ; dullai, kardo, <i>Australia</i> .
Wife	sha, teetsah, teetshaa, tetsha, titzaga, tsar.	saua, <i>Borneo</i> ; sawa, <i>Sanguir</i> ; sawah, <i>Sulu</i> ; abehwa, <i>Matabella</i> ; jiyu, <i>Mysol</i> ; hoa, <i>New Zealand</i> .
Brother	toon, tuni, townai	tuanna, <i>Atui</i> ; santono, <i>Java</i> ; ading, <i>Lampung</i>

ENGLISH.	HAIDAH.	OCEANIC.
Brother	toun, titoungah	djen, <i>Mille</i> ; taina, <i>Fakaafo</i> ; teina, <i>New Zealand</i> ; tehina, <i>Tonga</i>
	dai, teetah	adi, <i>Java</i> ; taeae, <i>Tahiti</i> ; taëi, tathi, <i>Fiji</i> ; daiadi, <i>Australia</i>
	tekwai, tikagha	adik, <i>Malay</i> ; adisahi, <i>Bali</i> ; adikayi, <i>Sunda</i> ; tuaka, <i>Fiji</i>
Sister	chesi, chasi di-jasha, ti-jaska tee-taa	kati, kauat, <i>Australia</i> djuko, <i>Australia</i>
People	toonay, chastoon haitis, haidah hadis, tehaidaahga	djen, djatan, <i>Mille</i> ; teina, <i>New Zealand</i> heieti, <i>Wahai</i> ; taata, <i>Atui</i> ; taotao, <i>Formosa</i> tao, <i>Macassar</i> ; tauo, <i>Tagala</i> ; taowe, <i>Bugis</i>
Head	hatsh, kats, katza katz, kadze, tih-hats	katow, <i>Tavoo</i> ; kadou, <i>New Zealand</i> kahutu, <i>Mysol</i> ; chetuk, <i>Madura</i> atu, <i>Tarawan</i> ; katta, <i>Australia</i> batcha, <i>Manicolo</i>
Hair	kats, kuts, kashkeht	hutu, <i>Tidore</i> ; udu, <i>New Zealand</i> ; uta, <i>Menado</i>
	tih-hatsin	kaat, kittug, <i>Australia</i> ; kide, <i>Tasmania</i> utan, <i>Sanguir</i> waukaugh, <i>Formosa</i>
	kow kaskaitl, katlkaitl	hua, <i>Batumerah</i> ; keo, <i>Lariki</i> ; hue, <i>Wahai</i> keiule, <i>Morella</i> ; kaiola, <i>Liang</i> ; keulo, <i>Teluti</i>
Face	haugh hung, hange, hoanga hunge	hihika, <i>Liang</i> ; uwaka, <i>Morella</i> gonaga, <i>Gani</i> ; uhunam, <i>Alfuros</i> bangat, <i>Sunda</i> ; dangoy, <i>Batan</i> ganga-foni, <i>Waigiü</i> (cheeks)
Forehead	kwul, kkiulh tun-kwuul	alis, <i>Malay</i> ; lae, <i>Tonga</i> , <i>Fakaafo</i> , etc. golo, holo, ullo, iouullo, ngulu, <i>Australia</i>
Ear	kiu, geu, kew keu, te-kiua	quaka, <i>Andaman</i> ; koyge, koidji, <i>Tasmania</i> chiu-ping, <i>Lampung</i> ; nan-gow, <i>Galela</i> tain-gah, <i>Sulu</i> ; cuegne, ton-ka, <i>Australia</i>
Eye	hongai, hungeh, hunge honge, tl-hungee	kanohi, <i>New Zealand</i> ; inirko, <i>Ombay</i> wangua, <i>New Caledonia</i>
Nose	kun, kwun, kwin tun-kwun	egong, <i>Lampung</i> ; kunguh, <i>Bali</i> jjunga, <i>Bolanghatam</i> ; nguno, <i>Galela</i> ngunu, <i>Sohoa</i> ; swanga, <i>Tavoo</i> ; soun, <i>Waigiü</i>
Mouth	kut hadle, hatle, hetli hutil, haitleeh	ngutu, <i>Fakaafo</i> ; nboutou, <i>Ticopia</i> gnutu, <i>Tonga</i> ; bun-gut, <i>Bali</i> sun-gut, <i>Sunda</i> ; ngundal, <i>Australin</i>
Tongue	tahanga, tuntangen tangil, tangul tangl, tungl	talen, talang, taling, <i>Australia</i> nangaladi, <i>Galela</i> ; dadila, <i>Formosa</i> dilah, <i>Tagala</i> ; damaran, <i>Waigiü</i>
Teeth	tsing, tsinga, thsin tshin, tun-tsinga	kasinga, <i>Biajuk</i> ; nisinto, <i>Tomore</i> nisin, <i>Teor</i> ; ngin, <i>Mille</i> ysangh, <i>New Ireland</i>
Beard	skiwi, kaiowa, skiwigh tskehwe, tunt-skiue skowre	cava, <i>Tonga</i> ; kumi-kumi, <i>New Zealand</i> kumi, <i>Fiji</i> ; kumkum, <i>Rotuma</i> kowder, <i>Malay</i>

ENGLISH.	HAIDAH.	OCEANIC.
Neck	hil, balh, tshil tung-hill	leher, <i>Malay</i> ; lalau, <i>Fiji</i> ; lacoco, <i>Tavoo</i> kulleung, kuro, wolt, dildil, <i>Australia</i>
Arm	hea, heai, hie, hyaih ihai, tukh-hyeh, hea-kow hie-kwal	siu, <i>Rotuma</i> ; bai, <i>Tarawan</i> ; chas, <i>Samang</i> cui-guddian, <i>Batan</i> ; hinguai, <i>N. Caledonia</i> houana, <i>Tasmania</i> ; guna-lia, <i>Australia</i>
Hand	stuel, stlai, stlah shtlai, tunsklai slai	chiulok, <i>Lampung</i> ; ala, <i>Awaiya</i> tanaraga, <i>Mangarei</i> ; ngalau, <i>Tagala</i> garikih, <i>Madura</i> ; harau, <i>Java</i> rizlia, keri, <i>Australia</i> ; liga, <i>Fiji</i>
Fingers	stu-kuna, stle-kunge slt-kungeh, slak-unge sl-kunge, tunsklai-akungi slai	goola-mai, <i>Sulu</i> ; liman-kokon, <i>Cajeli</i> sar-anga, <i>Bouton</i> ; tar-uni, <i>Camarian</i> kaniuko, <i>Mysol</i> ; wangan, <i>Wahai</i> jari, <i>Malay, Lampung</i> ; kokon, <i>Cajeli</i> kokowana, <i>Sula</i> ; uun, <i>Saparua</i> kaimuk, <i>Tobi</i>
Finger-nails	stlakwun, stlkwun stlekun, tun-stlekun shlukun, sligoon	talahikun, <i>Wahai</i> ; tereina, <i>Liang</i> terein, <i>Lariki</i> ; karungun, <i>Australia</i> logini, <i>Massaratty</i>
Body, chest	hloo, klueh teetul, thloo	koli, <i>Sula</i> ; kaleh, <i>Salayer</i> ; karoko, <i>Bouton</i> hatare, <i>Wahai</i> ; wauel, <i>Formosa</i> ; dada, <i>Morella</i>
	katle, ilthlo kann	kalakalath, <i>Pelew</i> ; salira, <i>Sunda</i> chino, <i>Tonga</i> ; tinana, <i>New Zealand</i> anana, <i>Lariki</i> ; yango, <i>Fiji</i>
Belly	kitz, keitsh, kadza kichi	gete, <i>Tonga</i> ; ethi, <i>Rotuma</i> cheong, <i>Samang</i> ; geun, <i>Mille</i>
Leg	kula, kial, kwulo kiul til	sikil, <i>Java</i> ; chakor, <i>Bali</i> ; bilis, <i>Sulu</i> la, <i>Rotuma</i> ierka, irako, garo, ngurri, <i>Australia</i>
Foot	teelilla, hlkeal sta, stai, staich ti-skaia, kl-stai	iraka, <i>Ombay</i> asta, <i>Madura</i> ; hasta, <i>Java</i> (hand) siki, <i>Sulu</i> ; hoots, <i>Malagasy</i> ; aika, <i>Liang</i> si, kaki, <i>Malay</i> ; adigha, <i>New Caledonia</i>
Bone	skoodze, skooji skwuts, tskwudza	wuku, <i>Macassar</i> ; koknatea, <i>Amblaw</i> tosan. <i>Java</i> ; sui, <i>Rotuma, Fiji</i> ; kotye, <i>Australia</i>
	hitlai	tulan, <i>Lampung</i> ; tolang, <i>Madura</i> ; urut, <i>Teor</i> towler, <i>Malagasy</i> ; tul, <i>Tobi</i>
Heart	kouga, kook tee-kuk, t-koya kudine	ikeiki, <i>Tarawan</i> ; ngako, <i>New Zealand</i> susu, <i>Fiji</i> ; huang, <i>Rotuma</i> ; ki, koort, <i>Australia</i> hatai, <i>Sulu</i> ; jantong, <i>Malay</i> ; tintin, <i>For-</i> <i>mosa</i>
Blood	kai, hui, ai, haih, haiyah	dah, <i>Rotti</i> ; daha, <i>Biajuk, Menado, Sanguir</i> raha, <i>Wayapoo</i> ; rah, <i>Lampung, Boli, Java</i> houda, <i>New Caledonia</i>
Village	nakwan, naikwunaiun nowatlwun	kaan, <i>Tarawan</i> ; langhanua, <i>Rotuma</i> ngurang, <i>Australia</i>

ENGLISH.	HAI DAH.	OCEANIC.
Chief	itluktas, itlagata iklakta, itlagit	aring, <i>Bugis</i> ; karaing, <i>Macassar</i> ariki, <i>Paumotu</i> , <i>Raratonga</i> ; ratu, <i>Sunda</i> aliki, <i>Fakaafa</i> , <i>New Caledonia</i> turanga, <i>Fiji</i>
House	nah, naa, na naskoosil	banna, <i>Bouton</i> ; uma, <i>Sula</i> , <i>Teluta</i> ; maia, <i>Australia</i> gunyu, <i>ngurra</i> , <i>Australia</i>
Bow	ti-shwanshin heht	huma, <i>Wahai</i> ; umah, <i>Java</i> tito, <i>Atui</i> ; gandiwa, <i>Madura</i> husu, <i>Saparua</i>
Arrow	tlket, tlkit, thlait, klehda, hklaida tsitung tshtullung, tsitilung tsutalung, tsitahlung skoo-dsitalung kungal	hela, <i>Wahai</i> ; usulah, <i>Gah</i> ore, <i>Manicolo</i> dota, <i>Ombay</i> ; tkugh, <i>Formosa</i> tharinga, thurang, <i>Australia</i> (axe) dullugang, <i>Australia</i> (a little lance) durinda, <i>Australia</i> (to pierce) gnahow, <i>Tonga</i> ; kinnee, <i>Australia</i>
Axe	tshooltshoo, kwetljaw kiatlzow, kitlechow kitlzew, kiutlcho kiutldzaou	tolie, <i>Cajoli</i> ; toola, <i>Australia</i> galeleh, <i>Salibabo</i> korrie, <i>Australia</i> ikiti, <i>Batumerah</i> ; katuen, <i>Massaratty</i>
Adze	hota	taito, <i>Galela</i> ; aati, <i>Awaiya</i> todo, <i>Wahai</i> ; dota, <i>Ombay</i> (axe)
Knife	skow, kutkwan yats, yatza, yahdz heatsa	isowa, <i>Teor</i> ; sei, <i>Lariki</i> ; see, <i>Liang</i> ; kobi, <i>Sula</i> kadutan, duwung, <i>Bali</i> (dagger); katgo, <i>Java</i> katanan, <i>Massaratty</i> ; seito, <i>Teluti</i> seeti, <i>Morella</i> ; seit, <i>Saparua</i> ; akaditz, <i>Tarawan</i> kotikoti, <i>New Zealand</i>
Canoe	kloo, klu, kluh klyuun tloo	hol, <i>Teor</i> ; saloi, <i>Borneo</i> ; koure, <i>Manicolo</i> roho, <i>Timuri</i> tala, <i>Saparua</i> , <i>Camarian</i> ; deru, <i>Galela</i>
Sky	yen, yaien kweeskun kwai usha, shah	hanit, <i>Batan</i> ; hani, <i>Marquesas</i> ; yangle, <i>Pelew</i> gagono, <i>Java</i> hakoso, <i>Java</i> ; ngawiyat, <i>Java</i> angkasa, <i>Bali</i> ; gudjait, <i>Australia</i>
Sun	choweein, kung chueen, jewi dzikwai tzoore	sungingi, <i>Java</i> ; ingkong, <i>Timbora</i> ; hangat, <i>Wahai</i> wangi, <i>Tidore</i> ; unu, <i>Bolanghitam</i> ; singa, <i>Fiji</i> coyoss, <i>Pelew</i> ; hai, <i>Atui</i> ; kiun, ganga, <i>Australia</i> uei, <i>Formosa</i> ; asa, <i>Rotuma</i> ; seasan, <i>Mysol</i> djaat, <i>Australia</i> ; jauw, <i>Utanata</i> surya, <i>Bali</i> ; yaro, <i>Tobi</i> ; tegoura, <i>Tas-</i> <i>mania</i>

ENGLISH.	HAIDAH.	OCEANIC.
Moon	kung, kunga	hiano, <i>Teluti</i> ; ma-heina, <i>Tonga</i> ; mangong, <i>Timbora</i>
Stars	koohwin, koom	ketang, <i>Bugis</i>
	kaitza, kaitsahw	wuan, <i>Gah</i> ; makuin, <i>Tobi</i> ; vena, <i>Tasmania</i> ehetu, <i>Atui</i> ; hetu, <i>Tahiti</i> ; hotu, <i>Sandwich</i> hetika, <i>Panmotua</i> ; hethu, <i>Rotuma</i> ; edju, <i>Mille</i>
Day	kailta, kailtah	toloti, <i>Massaratty</i> ; tilassa, <i>Gah</i> ; kuliginta, <i>Baju</i>
	kaeltah	lintang, <i>Java</i> ; koluin, <i>Alfuros</i> ; tulu, <i>Wahai</i>
	sunglan, shandlung	adlau, <i>Bisayan</i> ; hadlau, <i>Sulu</i> ; adlau, <i>Iloco</i> andru, <i>Malagasy</i>
	halsa-haunsa	alo-wata, <i>Morella</i> ; biley-tueng, <i>Rejang</i>
Night	utkagun	bal-anto, <i>Gani</i> taginita, <i>Galela</i> ; aggao, <i>Cayayan</i> ; cocook, <i>Pelew</i>
	sainthah	dientan, <i>Java</i> ; anotau, <i>Tahiti</i> ; antu, <i>Malagasy</i> seasan, <i>Mysol</i>
	sinki, shingia, singgah	sangan, <i>Baju</i> ; wengi, <i>Java</i> sas-ang, <i>Bugis</i> , <i>Macassar</i> (dark)
Wind	alga, ahlekwa, halkiuil	olawaha, <i>Matabello</i> ; hulaniti, <i>Batunerah</i> halometri, <i>Lariki</i> ; garagaran, <i>Gah</i> urwawa, <i>Lobo</i> ; bullului, <i>Australia</i> melgull, <i>Pelew</i> (dark); dalu, <i>Java</i>
	tadzu, tatsu	mataki, matangi, <i>Marquesas</i> , <i>N. Zealand</i>
Thunder	tutshao, tutsuka	gutto, <i>Mille</i> ; thangi, <i>Fiji</i>
	tajow	
Lightning	helun, hilinga	guruh, <i>Malay</i> ; grug-grug, <i>Bali</i>
	hilunga, heelunga	kuru, <i>Fiji</i> ; tulumu, <i>Australia</i>
Rain	heelang	ltag, <i>Formosa</i>
	sbihaultin, skutkaulta	kilat, <i>Malay</i> , etc.; oohila, <i>Tonga</i> ; wottol, <i>Australia</i>
	kligukoo	rykkat, <i>Formosa</i> ; coreowe, <i>Pelew</i>
Fire	shingu	onga, <i>Rotuma</i>
	tull, dull, talla	kull, <i>Pelew</i> ; ulah, <i>Amblaw</i> ; hura, <i>Galela</i>
Water	tulleekwa	olan, <i>Tagala</i> ; oolan, <i>Sulu</i> ; golim, <i>Mysol</i> urong, <i>Salibabo</i> ; karu, <i>Tarawan</i> yuro, <i>Australia</i>
	tsano, tsanoo, tshuno	sana, <i>Sunda</i> ; ginni, <i>Java</i> ; guni, <i>Java</i>
Fire	tsunno, tsanno	yong, unai, <i>Australia</i> ; une, <i>Tasmania</i>
	lannu	bromo, <i>Java</i> ; rahi, <i>Rotuma</i> kalla, <i>Australia</i> ; kanaku, pahunu, <i>New Zealand</i>
Water	auntl, kuntl, kundl	dorr, <i>Batchian</i> ; taru, <i>Tobi</i>
	huntle, ondl	waili, <i>Cajeli</i> ; welo, <i>Teluti</i> ; weyr, <i>Liang</i>
	hautl	tirto, <i>Java</i> ; ayer, <i>Malay</i> ; aer, <i>Salibabo</i> kolle, <i>Australia</i>

ENGLISH.	HAIDAH.	OCEANIC.
Earth	tlga, klik	dara, <i>Lampung</i> ; darat, <i>Malay</i> , etc.; luu <i>Rotti</i>
	klika, kleega	charik, <i>Bali</i> ; gelegele, <i>Tonga</i> ; kele, <i>Fakaafo</i> ; nggelli, <i>Fiji</i>
	towge	tanah, <i>Malay</i> ; tougoutoo, <i>Tonga</i> tagal, <i>Java</i> , <i>Bali</i> , etc.
Sea	tung, tanga	tasi, <i>Rotti</i> ; taao, <i>Batan</i> ; towain, <i>Teluti</i> dagat, <i>Tagala</i> ; taisin, <i>Alfuros</i> ; tahi, <i>Tonga</i> tai, <i>Fakaafo</i> ; tat, <i>Tobi</i> ; donai, <i>N. Caledonia</i> odern, <i>Australia</i> ; waaung, <i>Formosa</i>
River	kundl, huntl-iuun ondl-kwaw	kali, <i>Java</i> ; walungan, <i>Sunda</i> ; ylog, <i>Tagala</i> wailanim, <i>Alfuros</i> ; tolo-maina, <i>Wahai</i> weyl-hatei, <i>Morella</i> ; turagung, <i>Australia</i>
	kwaiungun	sungai, <i>Malay</i> , etc.; songai, <i>Madura</i> sawan, <i>Sanguir</i> ; ongagu, <i>Bolanghitam</i>
Valley	heta, uhheit klegalash	tawhati, <i>New Zealand</i> nggaliko, <i>Fiji</i>
Prairie	kligulle, thikilyoun	tagal, <i>Bali</i> , <i>Madura</i> ; tagil, <i>Java</i> ; gunnigal, <i>Australia</i>
	kunna	werewere, <i>Fiji</i> ; garawan, <i>Australia</i> tachan, <i>Timuri</i> ; konouko, <i>Sandwich</i>
Mountain	klitow, klitaua, kldohw kligtkaizootla	haldoko, <i>Java</i> ; redi, <i>Java</i> prawoto-okolo, <i>Java</i> ; lakti, <i>Rotti</i> thuangsolo, <i>Rotuma</i> ; taiyal, <i>Australia</i>
Island	kwaia, guai, kwai hunthehla	joo, <i>Sulu</i> ; waf, <i>Gani</i> ; yef, <i>Mysol</i> yanuyan, <i>Fiji</i> ; kalindyi, <i>Australia</i>
Stone	hlka, klehat	selo, <i>Java</i> ; rukkah, <i>Mille</i> ; rau, <i>Tobi</i> ureure, <i>Fiji</i>
	ska, kwau, kwoah teedza	wahku, <i>Kissa</i> ; waiwai, <i>Turawan</i> ; nggiwa, <i>Fiji</i>
		watu, <i>Bali</i> ; kowatu, <i>N. Zealand</i> hathu, <i>Rotuma</i>
Salt	tanga, tangakaga tung, tangkahya tung-hlailla	deeaenne, <i>Waigiu</i> ; wahte, <i>Formosa</i> tasek, <i>Bali</i> ; teisim, <i>Alfuros</i> ; tasie, <i>Awaiya</i> asin, <i>Bisayan</i> , etc.; asing, <i>Sanguir</i> ; tintui, <i>Fiji</i>
		chela, <i>Bugis</i> ; serer, <i>Malaqasy</i> ; sela, <i>Salayer</i> wassi, <i>Java</i> ; seti, <i>Mysol</i> ; heta, <i>Wahai</i> ;
Iron	yautsha, yaedzi, yiedzi heats, hyahdz, tatets iretza	taa, <i>Liang</i> bahdyan, <i>Batan</i> ; dodiodo, <i>Galela</i> leti, <i>Mysol</i> ; puruti, <i>Utanata</i> ; wurusese, <i>Lobo</i>
Tree	kuit, keht, kait	wit, <i>Java</i> ; kathu, <i>Fiji</i>
	sahantsinghiang	gota, <i>Galela</i> (wood), kundu punyanya, <i>Bali</i> ; ayung, <i>Timuri</i> ; vunikau, <i>Fiji</i>
		gnaiownee, <i>New Caledonia</i>
Wood	tshano, tsanoo	tangkal, <i>Sunda</i> (tree); tanghee, <i>N. Caledonia</i>

ENGLISH.	HAIDAH.	OCEANIC.
Wood	tsannu, skangu	kani, <i>Mille</i> ; kiante, <i>Andaman</i> ayun, <i>Timuri</i> (tree)
	kuk	chuk, <i>Samang</i> (tree); kago, <i>Iloco</i> (tree); gagi, <i>Gani</i> kayu, <i>Malay, etc.</i> ; kaju, <i>Salayer</i>
Leaf	hil, hyill, tshilhil	allell, <i>Pelew</i> ; eilunim, <i>Alfuros</i> ; kaluin, <i>Mysol</i> leko, <i>Macassar</i> ; arau, <i>Fiji</i> ; ailau, <i>Liang</i> <i>Morella</i>
	skumal	koman, <i>Massaratty</i> ; hatimootoo-merow, <i>Tidore</i>
Bark	kodze, kohdza	kutai, <i>Saparua</i> ; kakutut, <i>Gani</i> (skin)
	kwst, kwuts	kidna, <i>Tasmania</i> (skin)
Grass	khun	poenai, yindal, <i>Australia</i>
	ku	ijan, <i>Malay</i> (green); woiyo, <i>Australia</i>
Flesh, meat	kia, kiagh	hisi, <i>Bali</i> ; gusi, <i>Sanguir</i> kokor, <i>Batan</i>
	ghaat, kaht	wat, <i>Formosa</i> ; waouti, <i>Awaiya</i> ; mbithi, <i>Fiji</i> yat, <i>Andaman</i> ; dadja, <i>Australia</i>
	kira	hela, <i>Wahai</i> ; isicolo, <i>Teluti</i> ; nangalaki, <i>Galela</i> irigo, tirigo, <i>Tarawan</i> ; yul, karai, karndo, <i>Australia</i>
		how, <i>Teor</i> ; kaso, <i>Tidore</i> ; yes, <i>Mysol</i> ; asu, <i>Java</i>
Dog	ha, haa, haah	ngaike, <i>Paumotua</i> ; yas, <i>Ahtiago</i> ; ek, <i>Sa-</i> <i>mang</i>
	hagh	asau, <i>Timuri</i> ; asu, <i>Bugis</i> ; asoh, <i>Biajuk</i> gaso, <i>Galela</i> ; yuggi, <i>Australia</i> kasak, <i>Samang</i> ; oosah, <i>Sulu</i>
Deer	kaht, kaat, kait kat, kait	kelang, <i>Mysol</i> lalah, <i>Java</i>
A fly (mosquito)	slagdun, kwulhaigwun	ralugoh, <i>Menado</i> ; orali, <i>Bouton</i>
	stfaltikwon	lalangow, <i>Borneo</i>
	tshilkultoon	sisil, <i>Morella, Baju</i> ; sisili, <i>Batumerah</i> (m)
	tshikuldigwa	katinali, <i>Salayer</i> ; kasisili, <i>Salayer</i> (m)
Snake	kaiskal	saa, <i>Salayer</i> ; savha, <i>Bouton</i> ; yuki, yungga, <i>Australia</i> taksoko, <i>Java</i> ; toga, <i>Tonga</i> ; tekoss, <i>Gah</i>
	sik, siguh	ahas, <i>Tagala</i> ; haas, <i>Sulu</i> kades, <i>Bali</i> (fowl); kite, <i>Lampung</i> (duck)
Bird	hedit, hutait	itek, <i>Samang</i> (duck); tuwi, <i>Liang</i> ; pitek, <i>Java</i> (fowl)
	hetehd, hatteht	tehui, <i>Cajeli</i> (fowl); teput, <i>Wahai</i> (fowl)
		tahuti, <i>Massaratty</i> (fowl); toa, <i>Fiji</i> (fowl)
		topatopa, <i>New Zealand</i> ; jida, moutamouta, <i>Australia</i>

ENGLISH.	HAIDAH.	OCEANIC.
Egg	kow, kaua	gosi, <i>Tidore</i> ; ko, kao, <i>Australia</i> otioy, <i>Batan</i>
Feathers	kaan	komeka, <i>Tasmania</i> ; handok, <i>Sunda</i>
	tuhaun, taghoon	dokoi, <i>Sanguir</i> ; toholim, <i>Alfuros</i> ; ini, <i>Rotuma</i>
Wings	tahwunna	teyholi, <i>Awaiya</i> (wing)
	chaua	huhu, <i>Kissa</i> ; gogo, <i>Tidore</i> ; owhu, <i>Bouton</i>
	hi, hiai, hyai, sheai	kihoa, <i>Batumerah</i> ; iho, <i>Lariki</i> ; yeou, <i>Ahtiago</i>
Duck	nihuia	hihouo, <i>Teluti</i> ; sewiwi, <i>Java</i> ; fieh, <i>Mysol</i> nifako, <i>Gani</i>
	haha, hauh, hahha har	buiga cherere, <i>Malagasy</i> ; yuranyi, karangi, <i>Australia</i>
Pigeon	nsaia	angso, <i>Java</i> ; gangsa, <i>Bali</i> (goose)
	kwutkwuneest, nukwt	bodowanking, <i>Bugis</i>
	skatunga kulsde	gotgang, wongawonga, <i>Australia</i> dara, <i>Bali</i> ; garalga, <i>Australia</i> ; kereru, <i>New Zealand</i>
Fish, salmon	tsina, tshein	ikan, <i>Malay, etc.</i> ; ikani, <i>Bouton</i> ; thung, dhyng, <i>Formosa</i>
	cheena, seena	kena, <i>Sula</i> ; kina, <i>Sanguir</i> ; icanne, hiene, <i>Waigi</i>
White	tarun	nggoli, <i>Fiji</i> ; sira, <i>Cayayan</i> ; ulam, <i>Java</i>
	utta, hattut, kadi	patah, <i>Java</i> ; tea, <i>Tonga</i> ; teatea, <i>Tahiti</i>
	aghda	vuti, <i>Fiji</i> ; puteh, <i>Malay, etc.</i>
	kinhatta	anaputi, <i>Tagala</i> ; maydae, <i>Batan</i> ; maputeh, <i>Bugis</i>
Black	hater	putil, <i>Saparua</i> ; putile, <i>Awaiya</i> ; daari, <i>Galela</i>
	hlahl, klahtl	kolo, <i>Java</i> ; tatataro, <i>Galela</i> ; kela, <i>Rotuma</i>
	tlkuhl, klhatla	uliuli, <i>Fakafo</i> ; loaloo, <i>Fiji</i>
	tlahilega haidamasa	leleng, <i>Macassar</i> ; hireng, <i>Java</i> itam, <i>Malay</i> ; audim, <i>Formosa</i> ; hitam, <i>Salayer</i>
Red	klehut	lalotong, <i>Bugis</i> ; kokotu, <i>Tidore</i>
	mesh, mush, mus	machala, <i>Bugis</i> ; mosina, <i>Wahai</i> ; mia, <i>Sula</i> mecoit, <i>Gami</i> ; miya, <i>Wayapoa</i> ; miha, <i>New Caledonia</i> ; ussin, <i>Cayayan</i>
	shaeta, siet, skeit	gateh, <i>Java, Bali</i> (blood); gattih, <i>Sunda</i> (blood)
Blue	shaida, shit	eja, <i>Macassar</i> ; sak, <i>Borneo</i> ; shei, <i>Mysol</i> amagh, <i>Formosa</i> (blood)
	hutlilh, kwolkulh	ruru, <i>Tidore</i> ; lala, <i>Saparua, Camarian, Teluti</i>
	ohlh, ohtlhutl	biru, <i>Malay</i> ; bilu, <i>Sulu</i> ; lao, <i>Salayer</i>
	ohtlh klehut kinhlilh	karakarawa, <i>Fiji</i> ; tearawa, <i>Rotuma</i> bului, kaoaraoa, ngundur, <i>Australia</i> amala, <i>Batumerah</i> ; melah, <i>Mysol</i>

ENGLISH.	HAIDAH.	OCEANIC.
Yellow, brown	kuntluh, kundlh susindil	kuning, <i>Malay</i> ; nguila, <i>Cagayan</i> dilao, <i>Tagala</i> ; kunukunu, <i>Gah</i> bahendak, <i>Biajuk</i> ; gunaguna, <i>Australia</i> gunainguna, <i>New Caledonia</i>
Green	skinow, shinnauia ohlh, hutlihh, ohtlh kutlanu	ijam, <i>Java</i> ; ugan, <i>Malay</i> ; gian, <i>Australia</i> hilao, <i>Tagala</i> ; kakariki, <i>New Zealand</i> gidyungidyun, <i>Australia</i>
Large	youn, uun iuun, iuunk	wanko, <i>Langowan</i> ; jimug, <i>Aru</i> agang, <i>Bali, Malay</i> ; agung, <i>Java</i> : naiki, <i>Timor</i>
Small	kutsoo, hudzu ehudsu, ehutsungken itsootsooka	nui, <i>Tahiti, etc.</i> ; kainu, kaiyung, <i>Australia</i> chade, <i>Macassar</i> ; kichi, <i>Sulu</i> ; kiiti, <i>Wahai</i> kidikidi, <i>Bouton</i> ; kedi, <i>Salayer</i> chanek, <i>Bali</i> tiutiu, <i>Sulu</i> ; dekai, <i>Batan</i> ; dictai, <i>Bisayan</i> dodio, <i>Menado</i> ; kadodo, <i>Sulibabo</i> ; decheki, <i>Galela</i> didiki, <i>Baju</i> ; kutu, <i>Kaiowa</i> ; dikit, <i>Bat-</i> <i>chian</i> tsuts, <i>Rotuma</i> ; ngiti, <i>Raratonga</i>
Strong	dukyia, tahkwia tagwia kukwus	tagoh, <i>Lampung</i> ma-djodjau, <i>Mille</i> ; pabaka, <i>New Zealand</i> koko, <i>Madura</i> ; kawat, <i>Java</i> ; kaukauwa, <i>Fiji</i>
Old	kaia, kuaia kaiee, kahka tangehka	ma-kaua, <i>Fiji</i> ; kaiun, <i>Australia</i> tua, <i>Bali</i> ; toa, <i>Bugis</i> ; nggasi, <i>Fiji</i> tuhak, <i>Samang</i> ; antichs, <i>Malagasy</i>
Young	atunena kowdl hautlabkun, autlahung	tahinae, <i>Tonga</i> (infant) haareng, <i>Rotuma</i> ; gazala, <i>Malagasy</i> (infant) olitao, <i>Bisayan</i> ; dhulungaimba, <i>Australia</i>
Good	lai lagan, laisunga lahkung, lahgunng	aolo, <i>Awaiya</i> ; lille, <i>Tonga</i> ; laha, <i>Tidore</i> ; alla, <i>Baju</i> nalaing, <i>Iloco</i> ringei, <i>Formosa</i> ; nukkung, <i>Australia</i> lelei, <i>Samoa, Fakaafo</i> ; leilei, <i>Rotuma</i>
Bad	taghunna, tahungka tahnuga tahner kumlangan	kahon, <i>Bali</i> ; dautan, <i>Bisayan</i> ; kino, <i>Rara-</i> <i>tonga</i> mungeet, <i>Pelew</i> ; akeno, <i>N. Zealand</i> ; nakie, <i>Cajeli</i> yangasiri, <i>Fiji</i> ; tama, <i>Tobi</i> marakai, <i>Cagayan</i> ; maraghet, <i>Batan</i> leanga, <i>Samoa</i>
Cold	whi tehweega, teowheh ka i tut	bagoa, <i>Sula</i> chake, <i>Bugis</i> ; tijok, <i>Malay</i> ; mapagui, <i>Tagala</i> tiis, <i>Sunda</i> ; toe, <i>Atui</i> ; toketoke, <i>Rorotonga</i> toetoe, <i>Tahiti</i> ; matit, <i>Rotuma</i> guiaca, <i>New Caledonia</i>

ENGLISH.	HAIDAH.	OCEANIC.
Hot	kina, keena hunan teekinakai	kuno, <i>Saparna</i> ; ahuan, <i>Matabello</i> san, <i>Gani</i> ; sun, <i>Rotuma</i> angat, <i>Malay</i>
I	hla, klaha, tlaou dia, teea	kawulo, <i>Java, Sunda</i> ; kawula, <i>Madura</i> ; itar, <i>Mille</i> hulun, <i>Java</i> ; hora, <i>Bali</i> ; area, <i>Lobo</i> titwa, <i>Bali</i> ; te, <i>Tonga</i> ; atu, <i>Tahiti</i> ; tea, <i>Tarawan</i>
Thou	dunga, tunga taha, dahou	dehna, <i>Madura</i> ; ngoe, <i>Tarawan</i> ; angkau, <i>Malay</i> diko, <i>Java</i> ; dika, <i>Madura</i> ikau, <i>Sulu</i> ; ygao, <i>Tagala</i> manih, <i>Sunda</i>
He, etc.	wunnisha, wunasa laah, laha, laou ou	bal, dulla, nyuly, <i>Australia</i> iya, <i>Lampung</i> ; siya, <i>Sulu</i> ; yea, <i>Tagala</i> ; oia, <i>Tahiti</i> aia, <i>Tonga</i> ; ia, <i>Tarawan</i>
We	itla, taleetla tullung, talung tullunga	tautolu, <i>Tonga</i> ; keirau, <i>kndaru, Fiji</i> ; derro, <i>Mille</i> siramo, <i>Batan</i> ; drivan, <i>Malicollo</i> ; gully, galata nglung, ngadli, ngalu, nilgung, <i>Australia</i> ara, ngaira, <i>Tarawan</i> ; kula, <i>Java</i>
You	dalunga, tullunge dalung tkullala tahhunga	dru, drau, <i>Fiji</i> ; nurang, ngindula, <i>Australia</i> moutolu, <i>Tonga</i> ; nataroi, <i>Malicollo</i> lua, <i>Samoa</i> ; orua, <i>Tahiti</i> ; korua, <i>Paumotu</i> , <i>N. Zealand</i> tou, <i>Samoa</i> ; kimingu, <i>Erromanga</i> ngindingung, <i>Australia</i>
They	klaa, laha, ltha watltasa wadzohunna	la, latou, <i>Samoa</i> ; rau, ratou, <i>Fiji</i> ; raua, ratou, <i>Tahiti, N. Zealand</i> ; eris, <i>Rotuma</i> ; koira, <i>Fiji</i> atau, <i>Marqucsas</i> ; ar, kar, <i>Australia</i>
This	aah, aha adshi anis, lshwanna	iki, <i>Java</i> ; iyak, <i>Sunda</i> ; siji, <i>Lampung</i> heto, <i>Biajuk</i> ; tudeh, <i>Samang</i> ini, <i>Malay</i> ; nek, niki, <i>Bali</i> ; iana, <i>Bugis</i> ; neko, <i>Madura</i> ; puniki, <i>Java, Bali</i> ; paneka, <i>Madura</i> ; unni, konno, nidja, <i>Australia</i> ; tenei, <i>N. Zealand</i>
Th	waahse, wadshi waha, wukwosa wunis atokulta	eta, <i>Sunda</i> ; itu, <i>Malay</i> ikuiko, <i>Java</i> ; ia, <i>N. Zealand</i> ; iya, <i>Batan</i> puniĸo, <i>Java</i> ; hantuk, <i>Bali</i> ; ianatu, <i>Bugis</i> girowa, <i>Madura</i> ; tera, <i>N. Zealand</i> ; kikilly <i>Australia</i> iaoon, <i>Sula</i> ; yaon, <i>Tagala</i> ; tena, <i>N. Zealand</i> ahena, <i>Tonga</i>
All	watlwan, wadluhun watlewun, wahtlawun wautliwan	sadarum, <i>Java</i> ; lamon, <i>Lampung</i> (many) lahat, <i>Tagala</i> ; dilan, <i>Tagala</i> kirun, <i>Australia</i>

ENGLISH.	HAIDAH.	OCEANIC.
Many, much	kwan, kwanika, kwaan kwankukh, kwanewun	kweb, hakung, <i>Java</i> ; paghan, <i>Bisayan</i> bannyak, <i>Malay</i> ; banyak, <i>Madura</i> kumai, <i>Australia</i>
Who?	gushu	saha, <i>Sunda</i> ; isiu, <i>Sulu</i> ; cohai, <i>Tonga</i>
Far	kishto, kistho tsinagun, dsinga jinga, tsingaeewun watskwahakweth	ngandi, ngando, <i>Australia</i> inejao, <i>Biajuk</i> ; auanoaatu, <i>N. Zealand</i> jabo, <i>Madura</i> ; kuun, <i>Australia</i> hadoh, sawat, <i>Bali</i> ; hetuh, <i>Biajuk</i> ; adayo <i>Iloco</i> tauhti, auoatu, <i>N. Zealand</i>
Near	ahunung, knnungwik kumtsingang anana, aanau, anannok	winnima, <i>Australia</i> ; ngaki, <i>Australia</i> kuinbu, kanaibo, <i>Australia</i> ambani, <i>Macassar</i> ; arani, <i>Cagayan</i>
To-day	hait, aiut, aiyut aiatta, waiatta asshandneeah	ita, <i>Iloco</i> aiyi, <i>Australia</i> ; kawai, <i>Andaman</i> hadlau, <i>Sulu</i> ; beahoni, <i>Tonga</i> hikkainungge, <i>Australia</i>
Yesterday	utahl, adahl attahtaleesta tahtaleesta, adatltho tagha	ralo, <i>Tobi</i> wattanggrau, <i>Australia</i> colthocoyoss, <i>Pelew</i> cagahapon, <i>Bisayan</i> ; teang, <i>Rotuma</i>
To-morrow	utahl, tahtla attahtla, adatlthslo sungodlun	nguruko, ngrekkald, <i>Australia</i> ; esokhari, <i>Malay</i> waragura, <i>Tobi</i> ; roaroa, <i>Fiji</i> andelac, <i>Batan</i> ; hengihengi, <i>Tonga</i>
Here	aah haikwa	jah, <i>Lampung</i> ; gagito, <i>Borneo</i> ; atia, <i>Tobi</i> hiriki, <i>Beli</i> ; are, <i>Utanata</i> ; alyikke, <i>Australia</i> akhi, yai, <i>Australia</i> ; ngriki, <i>Java</i>
There	waab, wakwa	jo, <i>Atui</i> ; gagien, <i>Borneo</i> ; koso, <i>Bugis</i> boko, muggau, <i>Australia</i>
Yes	ang, anguh, aung	uan, <i>Cagayan</i> ; oon, <i>Batan</i> ; oen, <i>Iloco</i> yuin, <i>Australia</i> ; ina, ana, <i>N. Zealand</i> aaa, <i>Pelew</i> ; hahei, <i>Formosa</i> ; inggih, <i>Java</i>
No	kano, kum kowuno ungai	saan, <i>Iloco</i> ; ima, <i>Tahiti</i> ; tamu, <i>Fiji</i> kamil, keawai, tarno, tano, <i>Australia</i> ungah, <i>Batan</i> ; inke, <i>Rotuma</i> ; senga, <i>Fiji</i> naiyung, <i>Australia</i> ; jangan, <i>Malay</i>
1	skwansun, swansung skwansen, swaunshung shwansung, sowhunsun	saangu, <i>Bouton</i> ; umsiun, <i>Wayapo</i> nosiuni, <i>Massaratty</i> ; seena, <i>Tambora</i> wanait, <i>New Caledonia</i> ; saitavan, <i>Erromanga</i>
2	tsahantsin sting, stung stun, stunga shtung	tong, <i>Pelew</i> ; satunggil, <i>Java</i> ; djuon, <i>Mille</i> wadon, <i>New Caledonia</i> ; sinuto, <i>Galela</i> zua, <i>Flores</i> ; doua, <i>Waigiu</i> kadjen, neingeng, <i>Australia</i>
3	tlkwunilh, tlkwunihl hlawhul, lthunilh thlonutl	tatlu, itlu, <i>Tagala</i> ; taruano, <i>Bouton</i> gatil, <i>Sula</i> ; atlo, <i>Philippine</i> ; thola, <i>Rotuma</i> entol, <i>Alfuros</i> ; tatl, <i>Manilla</i>

	ENGLISH.	HAIDAH.	OCEANIC.
		klunet, klohuntla	kunete, <i>Lifu</i> ; riangi, <i>Ternate</i> ; rangi, <i>Tidore</i> torutu, <i>Marquesus</i>
4		stansung, stunzing	koan, <i>Nicobar</i> ; kudein, <i>Tambora</i> ; tan, <i>Caroline</i>
		stunsung, stansien	sakawan, <i>Java</i> ; oang, <i>Pelew</i> ; oan, <i>Tobi</i> ; omen, <i>Mille</i>
5		stanshung	enhata, <i>Alfuros</i> ; mendavat, <i>Erromanga</i>
		klalth, klilth, klaith	kutelin, kuklin, <i>Timbora</i>
		klelha, klelth, klehtl	krirum, <i>Tanna</i> ; lalima, <i>Bali</i> ; lailem, <i>Mille</i>
6		klehtlik	gangsai, <i>Java</i> ; sukuring, <i>Erromanga</i>
		klunlh, kloounihl	rora, <i>Tidore</i> ; rara, <i>Ternate</i> ; hol, <i>Caroline</i>
		kloounulh, klewunnutl	lepwonan, <i>Gani</i> ; laen, <i>Timuri</i> , <i>Savu</i>
		klowunthlil, lthuunilth	krirumriti, <i>Tanna</i> ; dildjuno, <i>Mille</i>
		klumith	lomi, <i>Wahai</i> ; gurum, <i>Tuham</i> ; chalemen, <i>Lifu</i>
7		dzigoowa, tshikwa	tujoh, <i>Malay, etc.</i> ; tuju, <i>Sambawa</i> ; tik, <i>Papua</i>
		sikwa, sekwa	hiku, <i>Sandwich</i> ; iko, <i>Kissa</i> ; uju, <i>Biajuk</i>
		tsegwah, chigwau	fick, <i>Waigiu</i> ; tik, <i>N. Guinea</i> ; turyu, <i>Kayan</i>
8		tsikkwaiilk	titura, <i>Serang</i> ; suku-rimuaru, <i>Erromanga</i>
		stanshung, staensunga	koneho, <i>Tambora</i> ; kanyphpa, <i>Formosa</i>
		stansiona, stunsunga	tufkangi, <i>Tidore</i> ; itupangi, <i>Galela</i> ; enfoan, <i>Nicobar</i>
		stahnsunga, stanshanga	wannaimguen, <i>N. Caledonia</i> ; hanya, <i>Biajuk</i>
		standzoora	adjino, <i>Mille</i> ; enwol, <i>Alfuros</i>
9		klashwashingo, klaths- kwanson	kunengemen, <i>Lifu</i>
		klaalowansingoo, klat- leswanzingoo	adillimedjuon, <i>Mille</i> ; turaasa, <i>Ende</i>
		klatsanungsokwilth	salapan, <i>Sunda</i> ; jalatien, <i>Biajuk</i>
10		klahtlswansingu	trasa, <i>Flôres</i>
		klaalh, klal, klahalh	siam, sam-bilan, <i>Malay, etc.</i>
		klalth, klaalth	ruluh, <i>Bisayan, Samang</i> ; rulu, <i>Tagala</i>
		klath	saroni, <i>Timbora</i> ; horihori, <i>Paumotu</i> ; rulu, <i>Timuri</i>
		klahtl	hulu, <i>Rotti</i> ; ahooroo, <i>Otaheiti</i> ; anahooroo, <i>Easter</i>
20		klalthstung, klalisting, klalestung	dungol, <i>Mille</i>
		lugnaskwan	kalehdoso, <i>Java</i> ; kalohaana, <i>Bisayan</i>
		lagwswango, lagwasawanagha	dalauang-pous, <i>Tagala</i> ; oloyuck, <i>Pelew</i>
		lagwaswanshung	bulurua, <i>Ende</i>
100		klaleklal	raho, <i>Kissa</i> ; ratuh, <i>Mangawi</i> ; saratus, <i>Malay</i>
		lakwakwalth, lagwath- elth	iraiki ambiniifula, <i>Malagasy</i> ; rasa, <i>Teor</i>
		lignaklaith, lagwathlahtl	lutcho, <i>Gah</i> ; saratuspuluh, <i>Malay</i>

ENGLISH.	HAIDAH.	OCEANIC.
To eat	tatla kultah, kltahsung	tauri, <i>Fiji</i> ; dara, <i>Australia</i> tali, taldona, takilliko, <i>Australia</i> ; wharakai, <i>N. Zealand</i>
To drink	tota hootli, hootwla klewhotle	ate, <i>Rotuma</i> garugi, <i>Australia</i> errak, <i>Mille</i>
To run	hanthlinetl althla, kahtla kahheetla	melim, <i>Pelew</i> ; limi, <i>Tobi</i> ; laina, <i>Australia</i> lari, <i>Malay</i> ; lella, <i>Tonga</i> ; karehe, <i>N. Zealand</i> tittorht, <i>Mille</i>
To dance	hiatl, hiatla heyahlt, heathlohtla	hari, <i>N. Zealand</i> ; oola, <i>Tonga</i> ; garre, <i>Australia</i> ruoia, <i>Tarawan</i> ; riki, <i>Fiji</i> ; kotaratara, <i>N. Zealand</i> ; untelliko, <i>Australia</i>
To sing	kadzootla kukwoyungithla tkweyungatla skalung	wittilliko, <i>Australia</i> ngengele, <i>Fiji</i> yuzganung, <i>Australia</i>
To sleep	kadetla, kateetla tkahdehtla tai	tidor, <i>Malay</i> ; kaikaru, <i>N. Zealand</i> ; madura <i>Mille</i> magtulog, <i>Bisayan</i> ; macaturue, <i>Cagayan</i> toog, <i>Sulu</i> ; tolog, <i>Tagala</i> ; tudui, <i>Borneo</i> tavo, <i>Fiji</i> ; turu, tilem, <i>Java</i>
To speak	kusootla, kusohtle kilhkwultla guishoo	titri, <i>Tobi</i> ; nutur, <i>Java</i> lolocoy, <i>Pelew</i> ; yalla, wiyellico, <i>Australia</i> kata, <i>Malay</i> ; kaya, <i>Fiji</i> ; wichanten, <i>Java</i>
To see	kaintla, kunthla kindle	quendera, nganna, gakilliko, <i>Australia</i> naori, dara, taratura, <i>Tarawan</i> ; kele, <i>Rotuma</i>
To love	istionunga	kawdangoi, <i>Formosa</i> ; konohi, koingo, <i>N. Zealand</i>
To kill	kidishtahtla laltiaiugh, lachtech kotulkun tiuh	tchatdaou, <i>Batan</i> ala, <i>Rotuma</i> (death) duradun, <i>Australia</i> ; tonaragun, <i>Australia</i> matehe, <i>Madura</i> ; patay, <i>Tagala</i> ; tai, <i>Tonga</i> tukituki, <i>N. Zealand</i> ; dakkai, <i>Australia</i>
To sit	kaoolthla, kauuthla	locloc, <i>Tagala</i> ; nguddela, ngurria, <i>Australia</i> nduri, <i>Fiji</i> ; rarau, tuturu, <i>N. Zealand</i>
To stand	kiahuh kiaetla, keeahutla kiarootla	kuduk, <i>Borneo</i> ; tekateka, <i>Fakaajo</i> warria, ngakilliko, garokilliko, <i>Australia</i> dirangal, <i>Australia</i> ; diri, <i>Malay</i>
To go	kaietla, kuaietla kaitla, dakaithla	ettal, <i>Mille</i> ; hael, aloo, <i>Tonga</i> ; korunu, <i>Bolanghitam</i> makalu, <i>Batan</i> ; haere, <i>N. Zealand</i> ; alu, <i>Fakaajo</i>
To come	tawit	yannagirra, tangara, ūuwoilliko, <i>Australia</i> taweke, <i>N. Zealand</i> ; ıaitu, <i>Tobi</i> ; waito, <i>Mille</i> dumahi, <i>Sanguir</i> ; tao, <i>Tahiti</i> ; teka, dateng, <i>Java</i>

ENGLISH.	HaidaH.	OCEANIC.
To come	haidlulul, hehltah haloit	kule, <i>Ahtiago</i> ; haere, <i>N. Zealand</i> ; roko, <i>Tarawan</i> aloweï, <i>Awaiya</i> ; iroua, <i>Formosa</i> ; quangloa, <i>diru</i> , uwolliko, <i>Australia</i> ; dirawoei, <i>Java</i>
To walk	kaitla, kahtla kakungla karun	koresse, <i>Waigiu</i> ; haere, <i>N. Zealand</i> hahani, <i>Tahiti</i> ; yannagirri, <i>Australia</i>
To work	ista, isttikla	pailam, <i>Mille</i> thathau, <i>Fiji</i> petchiol, <i>Malay</i>
To steal	koltli inkwulhtaiin	ngala, <i>Sunda</i> (take); ratacoa, <i>Cagayan</i> araoto, <i>Fiji</i> (take); bunmulliko, <i>Australia</i> angkat, <i>Malay</i>
To lie	kilkatung	kabuluanan, <i>Tagala</i> ; haavare, <i>Tahiti</i> ; pooting, <i>Sulu</i>
To give	koout ittsilh laklista	gakoyelliko, ngakoia, <i>Australia</i> ato, <i>Tonga</i> ; hoatu, <i>N. Zealand</i> gukilliko, ngungilladanna, <i>Australia</i> ; ka- cito, <i>Tobi</i> erengi, <i>Bugis</i> ; sareangi, <i>Macassar</i> ; lan- guiana, <i>Cagayan</i>
To laugh	kha kakwutta	horoa, <i>Tahiti</i> hohehohe, <i>N. Zealand</i> tertawa, <i>Malay</i> ; mag-catava, <i>Bisayan</i> ; nagka-tawah, <i>Sulu</i> panag-catas, <i>Iloco</i> ; cata, <i>Tonga</i> ; kintai, kentallico, <i>Australia</i>
To weep	skaitl shiitle	kindaiwanna, <i>Australia</i> mag-hilac, <i>Bisayan</i> ; tungkilliko, <i>Australia</i>
Rainbow	kwotsakwokun	kuwung-kuwung, <i>Bali</i> ; kuwung, <i>Java</i> anuanua, <i>Sandwich</i> , etc.; ouenuku, <i>N. Zea- land</i>
Cheeks	kuntseda	gonaga, <i>Gani</i> (face); bangat, <i>Sunda</i> (face); gangafoni, <i>Waigiu</i>
Saliva	tiltut klana, klan tilta	tdhukal, kullo, <i>Australia</i> liang, <i>Borneo</i> ; gialang, <i>Australia</i> ludah, <i>Malay</i> ; tohulah, <i>Awaiya</i> , <i>Saparua</i> tehula, <i>Liang</i> , <i>Morella</i> ; tohula, <i>Batumerah</i>
Throat	kaginzo	kungan, <i>Malay</i> ; tenggo, <i>Borneo</i> (neck) kaki, <i>N. Zealand</i>
Chin	filkai	tal, kir, <i>Australia</i> ; irakata, <i>Ombay</i>
Lips	kwoothadgoose kwooseoou kutsirun	igad, simood, <i>Sulu</i> ; ngutu, <i>N. Zealand</i> ; gnutu, <i>Tonga</i> tembeningusu, <i>Fiji</i> ; lau-nguta, <i>Fakafo</i> mogudai-lea, <i>Australia</i> ; mogudilia, <i>Tas- mania</i>

ENGLISH.	HAIDAH.	OCEANIC.
Shoulder	skul	kaligh, <i>Formosa</i> (arm); kooloogoono, <i>Tavoo</i> |klessine, <i>Umbay</i> ; outalen, <i>Manicolo</i> wurru, wollar, <i>Australia</i> tuketuke, <i>N. Zealand</i> ; nogait, <i>Australia</i>
Elbow	hietsikwe hikwuse	
Hip	anlkwan	ngakang, <i>Australia</i> ; henguepuan, <i>New</i> <i>Caledonia</i> anfoloni, <i>Waigi</i>
Knee	kwullo kwulokutz	tuor, <i>Batan</i> ; tohor, <i>Tagala</i> ; touri, <i>N. Zea-</i> <i>land</i> ; eturi, <i>Tonga</i> banguiligha, <i>New Caledonia</i> ; tangoulou, <i>New Ireland</i> ; kairigowoko, <i>Uea</i> ; lukut, lutut, <i>Malay</i> ; rouga, <i>Tasmania</i> ; tauraugh, <i>Formosa</i> ; ndaru, <i>Fiji</i>
Ankle	stakwultinge staikwooltingui	kuiletinen, <i>Mille</i> wirungkang, <i>Australia</i>
Liver	tilkwul	guralong, <i>Australia</i>
God	suniatlaidus	sinleo, <i>Navigators</i> ; gundyar, <i>Australia</i>
Devil	haidetana	puttikan, wandong, <i>Australia</i>
Smoke	kaiow	asap, <i>Malay</i> ; yaphoi, <i>Mysol</i> kobun, <i>Gah</i> ; aowaht, <i>Morella</i> kukus, <i>Java</i> ; hasah, <i>Lampung</i> okoo, <i>Madura</i> ; aho, <i>Tonga</i> auahi, <i>New Zealand</i>
Ashes	hitulhait	yafleit, <i>Teor</i> ; laftain, <i>Ahtiago</i> lavanuk, <i>Malagasy</i>
Sand	tas	tok, <i>Mille</i> ; wetyut, <i>Australia</i>
Oil, fat	kaijoo	gua, <i>Gah</i> ; gnaco, <i>Tonga</i> ; newaiyu, <i>Wahai</i> kipai, <i>Australia</i>
Milk	tlinowe	ronunu, <i>Malagasy</i>
Horns	kwaihilkian	garran, <i>Australia</i>
Frog	wuhas tlkunkostal lthkenkwastan	mboti, <i>Fiji</i> ; kokug, <i>Australia</i> gungalang, gindurra, <i>Australia</i>
Road	kuwe kuwe-tumzu	guiabau, <i>Malay</i> ; aya, <i>Sulu</i> ; tuhun, <i>Wahai</i> yowung, gawalla, <i>Australia</i>
Blanket	giat	aguiddan, <i>Cagayan</i> ; higdaan, <i>Bisayan</i> idda, <i>Iloco</i> (bed) cawd, <i>Mille</i> ; vata, tutewi, <i>Fiji</i> (bed)
Mat	ilgush	kalasa, <i>Gani</i> ; kaili, <i>Awaiya</i> ; kloss, <i>Java</i> hilil, <i>Morella</i> ; lalakai, <i>Fiji</i>
Thread	haithulga kaitlul	gill, cray, <i>Pelew</i> ; folu, <i>Malagasy</i> urh, <i>Mille</i> ; arare, <i>Tarawan</i> ; lawi, <i>Java</i> gal, warraur, <i>Australia</i>
Net	katlioo	lawa, <i>Fiji</i> ; karun, <i>Tarawan</i> gulla, karrarri, raoroa, <i>Australia</i>
Rope, line	tlgai	tal, <i>Malay</i> ; taula, <i>Fakafo</i> ; ndale, <i>Fiji</i> tari, <i>Tobi</i> ; kokuel, <i>Mille</i> ; kora, <i>Tarawan</i> waras, <i>Lobo</i>

ENGLISH.	HAIDAH.	OCEANIC.
Club	shidze	woddi, kotara, <i>Australia</i>
Spear	kito	chei, <i>Mysol</i> ; tite, <i>Wahai</i> ; chantakan, <i>Madura</i> ; tiao, <i>Rejang</i>
	chatl	golo, <i>Java</i> ; kalei, <i>Saparua</i> ; galegala, <i>Teor</i> tara, <i>Tarawan</i> ; gallagalla, <i>Matabello</i>
		kullar, dullu, dual, <i>Australia</i>
Hook	tawhul	kanorika, <i>Tobi</i>
Cup	skadlha	quall, <i>Pelew</i> ; koali, <i>Malay</i> ; gooloo, <i>Tonga</i>
Dish	kaitla	gurra, gulluman, <i>Australia</i>
Bowl	kanilo	ndari, <i>Fiji</i>
Above	sha	asa, <i>Bugis</i> ; atas, <i>Malay</i> ; itaas, <i>Tagala</i> hataas, <i>Sulu</i> ; saitaas, <i>Bisayan</i> ; kiath, <i>Australia</i>
After	tla, gla, silid	licuc, <i>Cagayan</i> ; licudan, <i>Iloco</i> ngolanga, willug, yarewar, <i>Australia</i> gi, <i>Tonga</i>
Among	shu	ka, <i>Bali</i> ; gia, <i>Tonga</i> ; ka, ya, <i>Australia</i>
At	gua, gwau	ganka, ungunai, einga, gungkura, gwai- kangat, <i>Australia</i>
Before	kwunast	
Below	het, hetit	hakten, <i>Bali</i>
Between	aada	ditangah, <i>Malay</i> ; tunti, tuntauk, <i>Australia</i>
Except	adang	tai, <i>Tonga</i> ; anye, <i>Australia</i>
For	an	ma, <i>Tonga</i> ; an, yanno, nung, <i>Australia</i>
From	staha	ti, <i>Sunda</i> ; teka, sako, <i>Java</i> kai, dyi, <i>Australia</i>
In, into	a, ai	ai, <i>Madura</i> ; ai, e, ya, ka, angk, <i>Australia</i>
In front of	hantla	ungul, <i>Australia</i>
Of	washt	auwe, ba, umba, koba, <i>Australia</i>
	gie	ka, <i>Bali</i> ; go, gai, gu, ak, ag, yog, <i>Australia</i>
On	inka	ing, <i>Java</i> ; ngadja, <i>Australia</i>
Out	kia	hagoah, <i>Sulu</i>
Over	telga	duwur, <i>Java</i> ; wara, <i>Australia</i>
On account of	hagunan	tin, <i>Australia</i>
Through	kalthgud	durada, <i>Australia</i>
Throughout	kalthgwid	kardagar, <i>Australia</i>
To	aa	ay, <i>Tagala</i> ; ha, <i>Sulu</i> ; ka, <i>Malay</i> , <i>Madura</i> ai, e, ak, angk, ko, <i>Australia</i>
Unto	ga	ungai, <i>Australia</i>
Up	sik	gihage, <i>Tonga</i>
With, by	alth	ulih, <i>Malay</i> ; kalih, karo, sarto, <i>Java</i> sarta, <i>Madura</i> ; ald, al, ile, lo, urrugan, <i>Australia</i>
Within	nagust	uneg, <i>Iloco</i>
Without	kiagust	saguas, <i>Bisayan</i> ; gitooa, <i>Tonga</i>

IV.—*Termination of Sir Humphrey Gilbert's Expedition.*

By the Rev. GEORGE PATTERSON, D.D., LL.D., F.R.S.C.

(Read 24th June, 1897.)

On the 11th June, 1583, Sir Humphrey Gilbert, under a commission received some time previous from Queen Elizabeth, authorizing himself, his heirs and assigns to discover, occupy and possess such remote "heathen lands not actually possessed of any Christian prince or people, as should seem good to him or them," sailed from Causand Bay, near Plymouth, with five vessels, forming the pioneer expedition of English colonization in America. Two days after, one of the vessels, the "Raleigh," so-called from his step-brother, Sir Walter Raleigh, at whose expense she had been fitted out, deserted and returned to England.

The other four reached Newfoundland in safety, and on the 5th of August he landed and took possession of the island in the Queen's name. Here various troubles arose, in consequence of which one of the vessels was sent back to England with a number of the men.

On the 20th of the same month, with the three remaining vessels, he set sail from St. John's for the west. These vessels were the "Delight" of 120 tons burthen (usually spoken of as the Admiral), Maurice Browne, captain, and Richard Clarke, master; the "Golden Hinde," 40 tons burthen, in which was Edward Hayes, captain and owner, and William Cox, of Limehouse, master; and the "Squirrel," a cockle-shell of ten tons, called the frigate, in which it is said "The Generall (that is the commander, viz., Gilbert himself) made choice to goe, the same being most conuenient to discouer vpon the coast and to search into euery harbor or creeke, which a great ship could not doe."

Eight days after sailing, or early in the morning of the 29th, the "Delight" was lost, and of those on board, reported as numbering nearly a hundred, but probably considerably less, only fourteen escaped by putting to sea in the pinnace.

In consequence of this disaster and other troubles, Gilbert resolved to return to England with his two remaining vessels. On the way the "Squirrel," in which he had sailed, foundered with all on board, and his career was brought to an untimely close.

Where did the wreck take place, which was the means of bringing the expedition to such an unfortunate termination? In a note to my paper on Sable Island, read before this society at their meeting in 1894, and published in the Transactions of that year, I mentioned that some writers had supposed that it was there that Sir Humphrey's leading

vessel was lost, but that Hayes's narrative clearly showed that this took place near Cape Breton.¹

In the Transactions of this society for 1896 appears a paper by Dr. Brymner, Dominion Archivist, in which, ignoring Hayes's narrative, he assumes throughout that it took place on Sable Island. The question is not of great importance, but as everything connected with the expedition is of interest, and particularly as it concerns the fate of him who has been well named the father of English colonization in America, it may be worth while examining the matter more carefully.

There are two accounts of the event, one by Clarke, master of the "Delight," the other by Hayes of the "Golden Hinde," both of which are given by Hakluyt. The part of the first which concerns our present subject is as follows :

"A relation of Richard Clarke, of Weymouth, master of the ship called the Delight, going for the discouery of Norembege, with Sir Humfrey Gilbert, 1583. Written in excuse of that fault of casting away the ship and men imputed to his ouersight.

"Departing out of Saint Iohn's Harborough in the Newfoundland the 20 of August, unto Cape Raz, from thence we directed our course unto the ile of Sablon, or the Isle of Sand, which the Generall Sir Humfrey Gilbert would willingly haue seene. But when we came within twentie leagues of the isle of Sablon we fell to controuersie of our course. The Generall (Gilbert) came up in his Frigat and demanded of mee Richard Clarke, Master of the Admirall, what course was best to keepe ; I said that westsouthwest was best, because the wind was at South and night at hand and vnknown sands lay off a great way from the land. The Generall commanded me to go Westnorthwest. I told him againe that the Isle of Sablon was Westnorthwest, and but fifteen leagues off, and that he should be vpon the island before day if hee went that course. The Generall sayd my reckoning was vntrue, and charged me in Her Maiesties name and as I would shewe myself in her Countrey to follow him that night.² I, fearing his threatenings because he presented Her Maiesties person. did follow his commandement, and about seven oClock in the morning the ship stroke on ground, where shee was cast away. Then the Generall went off to sea—the course that I would haue had them go before—and saw the ship cast away, men and all, and was not able to save a man for there was not water upon the sand for either of them, much less for the Admiral that drew fourteen feet."

Hayes's account is more particular, and has generally been accepted as trustworthy. We give it somewhat condensed : "We departed from

¹ Cape Breton is used here and throughout this paper, except where otherwise indicated, for the cape so named. This name was not given to the island till some time later.

² Here Hakluyt has the following marginal note : "Herein Clarke vntruely chargeth Sir Humfrey Gilbert."

this harbor of S. Iohns vpon Tuesday the twentieth of August, which we found by exact obseruation to be in 47 degrees 40 minutes. And the next day by night we were at Cape Race, 25 leagues from the same harbourough.

“ This Cape lyeth Southsouthwest from S. Iohn’s ; it is a low land, being off from the Cape about halfe a league ; within the sea riseth vp a rocke against the point of the Cape, which thereby is easily knowen. It is in latitude 46 degrees 25 minutes.¹

“ Vnder this cape we were becalmed a small time, during which we layde our hookes and lines to take codde, and drew in lesse than two hours fishe so large and in such abundance, that many dayes after we fedde vpon no other prouision.

“ From hence we shaped our course vnto the Island of Sabla, if conueniently it would so fall out, also *directly to Cape Britton*.

“ Sabla lieth to the seaward of Cape Britton about 25 leagues, whither we were determined to goe vpon intelligence we had of a Portingall (during our abode in S. Iohns), who was himself present, when the Portingals (about 30 yeares past) did put into the same island both neat and swine to breede, which were since exceedingly multiplied. This seemed vnto vs very happy tidings to haue in an Island lying so neere vnto the maine which we intended to plant vpon, such store of cattell, whereby we might at all times conueniently be relieued of victuall, and serued of store for breed.

“ In this course wee trended along the coast which from Cape Race stretcheth into the North West making a baye, which some call Trepafsa. Then goeth out againe towarde the west, and maketh a point which with Cape Race lie in maner east and west. But this point inclineth to the north, to the west of which goeth in the bay of Placentia. We sent men on land to take a view of the soyle along this coast, whereof they made good report, and some of them had will to be planted there.

“ The distance *between Cape Race and Cape Britton* is 87 leagues. *In which navigation* we spent eight dayes ; hauing many times the wind indifferent good, yet could we neuer attaine sight of any land all that time, seeing we were hindered by the currant. At last we fel into such flats and dangers, that hardly any of us escaped ; where neuertheless we lost our Admiral with all the men and prouision, not knowing certainly the place. Yet for inducing men of skill to make coniecture, by our course and way we held from Cape Race thither, and thereby the flats and dangers may be inserted in sea Cards, for warning to others, that may follow the same course hereafter, I haue set downe the best reckonings that were kept by expert men, William Coxe, master of the Hind, and John Paul his mate, both of Limehouse.

¹ To show how near they were able to come to accuracy in their observations at that time, I may mention that St. John’s is now found to be in 47° 33′ 33 N.L., and Cape Race in 46° 40′.

“ Reckonings kept in our course from *Cape Race towards Cape Briton and the Island of Sablon* to the time and place where we lost our Admirall :

August 22	West	14 leagues.
	West and by south	25 “
	West northwest	25 “
	West northwest	9 “
	South southwest	10 “
	Southwest	12 “
	South southwest	10 “
August 29	West northwest	12 “
	Here we lost our Admirall.	

Summe of these leagues 117”.

(By the mate’s reckoning, however, they had run 121 leagues. He adds) :

“ Our course we helde in clearing us of these flats was east southeast and southeast, and south 14 leagues with a marvellous scant¹ winde.”

“ The manner how our Admirall was lost.

“ Upon Tewsdaye, the 27 of August, toward the evening our Generall caused them in his frigate to sound, who found white sande at 35 fathome, being then in latitude about 44 degrees.

“ Wensday towards night the winde came South, and we bare with the lande all that night Westnorthwest contrary to the mind of Master Coxe ; neverthelese wee followed the Admirall, deprived of power to avoide a mischiefe, which by no contradiction coulde he holde other course, alleaging they could not make the shippe to work better, nor to lye otherwaies.

“ The ewening was faire and pleasant, yet not without token of storme to ensue, and most part of this Wednesday night, like the Swanne that singeth before her death, they in the Admirall or “ *Delight*,” continued in sounding of Trumpets, with Drummes and Fifes ; also winding the Cornets, Haughtboyes ; and in the end of their iolitie, left with the battell and ringing of doleful knels. * * * * *

“ Thursday, the 29 of August, the winde rose and blewe vehemently at South and by East bringing withal raine and thicke miste, that wee could not see a cable length before us. And betimes in the morning wee were altogether *runne and folded in among flats and sandes*, amongst which we found shoale and deepe in every three or four shippes length, after we began to sound, but first we were upon them unwares until Master Coxe

¹ The word scant is here used in the nautical sense as descriptive of a wind so nearly ahead that the vessel can scarcely lay her course with the yards sharp up.

looking out discerned (in his judgment) white cliffs crying (lande) withal, though we could not afterward descry any land, it being more likely the breaking of the sea white, which seemed to be white cliffes, through the haze and thicke weather.

“Immediately tokens were given vnto the Delight, to cast about to seaward, which being the greater shippe, and of burden 120 tunnes, was yet foremost upon the breach, keeping so ill-watch, that they knewe not the danger, before he felt the same, too late to recouer it ; for presently the Admirall stroke aground and had soone after her sterne and hinder partes beaten in peeces ; whereupon the rest (that is to say, the Frigat, in which was the Generall, and the Golden Hinde) cast about East southeast bearing to the south, even for our lines into the windes eye, because that way carried us to the seaward. Making out from this danger we sounded one while seuen, then fiue fadome, then foure fadome and lefse, againe deeper, immediatly foure fadome, then but three fadome, the sea going mightily and high. At last we recouered, (God be thanked) in some despaire, to sea roome enough.

“In this distrefse we had vigilant eye vnto the Admirall, whom wee sawe cast away, without power to give the men succour. But all in vaine, sith God had determined their ruine ; yet all that day and part of the next, we beat vp and downe as neere vnto the wracke as was possible for vs, looking out if by good hap we might espie any of them.

The writer then tells us how they afterward learned that fourteen of the crew had leaped into the pinnace, which was towed astern, and cutting her adrift put to sea without food or even fresh water. After being driven before the wind for six days, and suffering incredible hardship, they were picked up by some Frenchmen and carried to France. The narrative then proceeds :

“After this heauie chance we continued beating the sea up and downe, expecting when the weather would cleere up, that wee might yet beare in with the land, which we judged not farre off, either the continent or some Island. For we many times, and in sundry places, found ground at 50, 45, 40 fadomes, and lefse. The ground coming vpon our lead beeing sometimes oazie sande, and otherwhile a broad (*qu* broken) shell, with a little sand upon it.

“Our people lost courage dayly after this ill-successe, the weather continuing thicke and blustering, with increase of cold Winter drawing on, which tooke from them all hope of amendment, setting an assurance of worse weather to growe vpon vs euery day. The leeside of vs lay full of flats and dangers ineuitable if the wind blew hard at South. *Some againe doubted we were ingulphed in the Bay of S. Lawrence*, the coast full of dangers, and vnto vs vnknown. But aboue all prouision waxed scant and hope of supply was gone, with losse of our Admirall. * * *

“So vpon Saturday in the afternoone of the 31 of August, we changed our course, and returned backe to England. * * * * *

"The wind was large¹ for England at our returne but very high, and the sea rough, insomuch as the Frigat whereon the Generall went was almost swallowed vp.

"Monday in the afternoone we passed in the sight of Cape Race, hauing made as much way in little more than two dayes and nights backe againe, as before wee had done in eight dayes from Cape Race, vnto the place where our ship perished. Which hindrance thitherward, and speed backe againe, is to be imputed vnto the swift current, as well as to the winds, which we had more large in our returne."

Such are the two accounts. Hakluyt gives another "written by Sir George Peakham, Knight, the chiefe aduenturer and furtherer of Sir Humfrey Gilberts voyage to Newfound Land." But he received his information from Hayes, and gives us no additional particulars.

It will be seen that these two narratives differ. Their statements are directly contradictory as to the party upon whom rests the blame of the disaster. Clarke attributes it to the obstinacy of Gilbert himself in refusing to take his advice as to the course to be sailed, and compelling him, the master, by the Queen's authority to take what he knew to be a wrong course. Hayes on the other hand as strongly affirms that it was owing to the obstinacy and wilfulness of Clarke himself or whoever had the direction of the "Delight," in adopting that course and following it in defiance of all remonstrance. There is here not merely a question of accuracy but of veracity.

To determine it scarcely belongs to our present inquiry. I think it right, however, to say that I deem it unfair to the memory of the gallant commander to assume the truth of Clarke's charges, especially as he was clearly not disinterested, but writing to throw the blame off himself, and when his statement is contradicted by another, whose narrative bears all the marks of truthfulness, who had as good if not better opportunities of knowing the facts, and who had no object in stating anything but the truth.

Coming, however, to the point on hand, it will be seen that Clarke represents them as having sailed from Cape Race direct for Sable Island, and as being wrecked upon it. On the other hand Hayes states that while intending to visit it, their first destination was Cape Breton, and that it was land near it on which the "Delight" was wrecked. "From hence" (Cape Race), he says "we shaped our course vnto the Island of Sabla, *if conueniently it would so fall out, also directly to Cape Britton.*" This was the objective point of their voyage, and the writer tells us that the whole of their voyage was spent in reaching it. "The distance between Cape Race and Cape Britton," he says "is 100 leagues, *in which navigation we spent eight dayes,*" on the last of which the wreck took place. From that point also they started on their return to England.

¹ The word is used here as the opposite of scant, as denoting what sailors call a free wind, one so nearly fair that it is easy to lay the ship's course.

As to the credibility of this narrative we have to say : 1. That throughout it manifests a close acquaintance with the purposes and intentions of Gilbert, and that all the circumstances of the case go to show that the writer was in a position to be well informed. 2. He gives details of the voyage, the courses and distances run, taken down at the time and records their position as taken by observation and their soundings. These may not be accurate, but such a narrative could not be fabricated. It carries the impress of truthfulness on its face. Hence by most writers it has been received with entire confidence. Clarke on the other hand gives scarcely any details, must have written without his journals and other papers, which were lost in the wreck of the "Delight," and was writing with the design of defending himself—as he says "in excuse of that fault of casting away the ship and men imputed to his oversight."

Then the representation that while Gilbert intended visiting Sable Island, his first point of destination was Cape Breton, bears all the marks of probability. That island lies east and west with a breadth now of only one and a half then perhaps three miles wide, with a bar extending from the east point for fifteen miles or more, on which any vessel striking would be involved in certain destruction. In any case no seaman, at all acquainted with the dangers by which it is surrounded, would coming westward steer directly for it. He would sail either to the north or south of it giving it a wide berth, and then make his distance north or south as the case might be. On the other hand Cape Breton was long known to the Breton fishermen, from whom it received its name, as well as to mariners of other nations, and long formed an objective point for vessels visiting these shores, and from which to take their departure on leaving to return.

This is corroborated by the account given of the first part of their voyage. It is plain that they could not have intended to settle on Sable Island. Their object was colonization of some part of the coast, and as Hayes says, hearing of cattle having been placed upon it having multiplied, they intended to take advantage of the opportunity afforded of having in "an island so neare *the maine which we intended to plant upon*, such store of cattell." Exploration, however, must precede settlement, and accordingly this first engaged their attention. For the better prosecution of this object Gilbert went in the "Squirrel," the frigate as it was called. In pursuance of this idea, they "trended along" the Newfoundland coast till near the entrance of Placentia Bay, where they landed. From this point they did not see the land principally from the density of the fog, yet on the evening previous to the wreck they still speak of "bearing along the land," and afterward they judged that they were near the land, either part of the continent or some island.

That it was the coast of the island of Cape Breton which they had reached at the time of the wreck appears evident from the courses and

distances sailed. The reckonings of two of the most skilful seamen on board the "Golden Hinde," the master and mate, are given. We have had that of the former worked out as follows :

COURSE.		Diff. of Latitude.		Departure.		Diff. of Longitude West.	Latitude and Longitude reached.
		North.	South.	East.	West.		
West ... 8 pts.	42	.....	.....	.....	42	61·19	Lat. from (Cape Race) = 46° 40' N.
W.S.S... 7 "	75	.....	14·63	.....	73·56	107·01	Diff. of Latitude (42·71m.) S = 43.
W.N.W..6 "	102	39·	.....	.....	94·23	137·81	Latitude reached = 45° 57' .
S.S.W... 2 "	30	.....	27·7	.....	11·48	16·74	Long. from (Cape Race) = 53° 08' W.
S. W ... 4 "	36	.....	25·45	.....	25·45	36·92	Departure = 291·46 m = 7° 4' 30".
S.S.W... 2 "	30	.....	27·7	.....	11·48	16·62	Long. reached = 60° 12'.
W.N.W..6 "	36	13·77	.....	.....	33·26	48·22	.....
		52·77	95·48		291·46	424·51	
			52·77				
			42·71				

By this it appears that the average course was to the south of west ; and by calculation that they had made a southing of about 43 minutes in latitude, bringing them to the latitude of 45° 57', which is that of Cape Breton. By the master's reckoning they had sailed 121 leagues, by the mate's 117. By calculation the first represents a distance westerly of 291 miles or 7° 4' 30" of longitude, bringing them to 60° 12' west longitude, which is at the western side of the entrance to Gabarus Bay, about fourteen miles from Louisbourg. (See map page 129.)

The mate's reckoning would place them still farther north. We do not rely upon either as sufficiently accurate to enable us to determine their true position, but we might expect that they would give us an approximation to it, otherwise what would be the use of keeping such reckonings. To allege that while by the estimate they could make of their courses and distances they would be in the neighbourhood of Cape Breton, they were really on Sable Island more than a hundred miles distant, and that they had gone this far out of their calculations in a voyage of about three hundred miles is manifestly absurd. What renders

the idea even grotesquely so is that this must have taken place directly in the face of wind and sea. It had been "blowing vehemently" from the south bringing the full swell of the Atlantic from the same direction. We can understand how under such influences the mariners should find themselves driven considerably farther north than they counted on, but how could they drift or be driven so far to the south?

Farther, when we come to examine the details given of this part of the voyage, we will see that they are entirely irreconcilable with the idea of the wreck of the "Delight" having taken place on Sable Island, and that some part of the coast of the island of Cape Breton must have been the scene of the event. Let it be noted that both Clarke and Hayes agree that they had been sailing all the night previous west southwest,¹ with a strong southerly gale. With such a wind their course would probably be even more northerly than they calculated. But taking it as west northwest, if they struck Sable Island it must have been on the south side. Now passing some minor points, which render this incredible, we note that the description given of the place where they struck is inconsistent with the idea of its having taken place there. The writer says that they fell among shoals or flats as he calls them, where the leading vessel drawing only fourteen feet of water went aground, and where on sounding they found seven, five, or only four fathoms of water with deeper places at distances of three or four times the vessel's length. Certainly this is not a description of the south shore of Sable Island. There are on it no shoals or flats. It slopes gradually to deep water except as crossed by three bars over which the sea breaks heavily, when there is any sea running.²

Still farther I venture to affirm that no mariner at all acquainted with that shore will ever believe it possible for the "Hinde" and the "Squirrel," and the "Delight" boat to have beat off from it to sea. Even in ordinary weather vessels do not anchor on that side of the island, and landing is only attempted under special circumstances after a continuance of northerly wind and fine weather. But with a southerly gale blowing all night and driving the sea upon that side of the island for vessels so close upon the shore that one drawing fourteen feet of water was completely wrecked, to work off to sea in the wind's eye, as they express it, would by any Nova Scotia sea captain, or Acadian or New England fisherman be regarded as an achievement as practicable as a voyage to the moon.

¹ The mate of the "Hinde" makes their course, however, northwest by west, or one point more to the north.

² In my paper on Sable Island, published in the Transactions of the Royal Society of Canada for 1894, the misplacement of a comma has altered the meaning of a sentence on this subject. It is there said "Beside these bars, at each extremity of the island there are three shoals or ridges parallel with the shore." The comma should have been after "island" and not after "bars."

Finally, the conclusion that the wreck took place somewhere on the coast of the island of Cape Breton is corroborated by the last circumstance mentioned. Having run to sea fourteen leagues, they for a part of two days cruised up and down with the wind from the south, and they supposed the land on their lee finding soundings at 40, 45 and 50 fathoms. If they had run that distance south from Sable Island they would have been in the Gulf stream, where they could not have obtained soundings under one or two hundred fathoms or probably more. But to the north of it and off the southeastern coast of Cape Breton along its whole length extend a succession of banks with just such depths of water as is here given. It is a curious coincidence that while the author tells us that the lead brought up "oazie sand" and according to one edition, "brown shell" and to another "broad shell," but probably both misreadings for "broken shell," the "Sailing Directions" state that on the western edge of this bank the soundings show "pebbles and broken shells."

All the circumstances then concur to show that the wreck could not have taken place on Sable Island, and to confirm the statements of Hayes, that the direct point of their destination was Cape Breton; that near it the wreck took place, and that it was from that point they sailed on their return.

I may add here that the description given of the scene and circumstances of the wreck seem to imply that they had run into some harbour, cove or bay. They had been running west northwest, with the fog so thick that they could not see a cable's length ahead, when suddenly they found themselves among shoals, and a little after they passed what one man believed to be white cliffs, but which they afterward deemed, and which we know from the coast, must have been the sea breaking on the land. Continuing, the "Delight" struck, not upon the rocks, but upon the ground. The other vessels putting about to run out to sea, passed over shoals with five, four and even only three fathoms of water upon them. This has all the appearance of their having got into some harbour and worked their way out again.

Can we fix more definitely the spot? The writer, with the pious design of enabling those who should come after him to discover the flats, and mark them on charts for warning to others, has given us the courses and distances sailed, according to the reckoning of the most competent seamen on board. Yet we cannot certainly determine the scene of the event; but all the circumstances agree with the conclusion that it was Louisbourg Harbour, and render it extremely probable.

1. Louisbourg is near the position they would be according to the reckoning of those on board. By the masters, as we have seen, the wreck took place in latitude $45^{\circ} 57' N.$, and longitude $60^{\circ} 12' W.$ Louisbourg is in latitude $45^{\circ} 54' N.$ and longitude $59^{\circ} 52' W.$ 2. Louisbourg Harbour exhibits such shoals as described, the charts marking the depth

of water as seven, five and four fathoms. 3. It agrees with all the circumstances of the narrative. The entrance is about half a mile wide, between a point on the northeast side, formerly known as Lighthouse Point, and Goat Island, a small island on the southwest. It is very easy of access, and a vessel running in a westerly or northerly course would readily enter, and keeping on would strike the western shore. If, as she entered, she went a little to the southwest she would get among the shoal waters near the eastern end of Goat Island, or if she went more to the northeast she would be in a similar position off the Lighthouse Point.



MAP SHOWING ENTRANCE TO LOUISBOURG HARBOUR.

The sea beats constantly against these, particularly the former, and especially during or after southerly or easterly gales, shows white foam as it dashes against the crags. If, then, Gilbert's vessel passed near this, the master would have seen what he regarded as white

cliffs. Passing the east point of Goat Island and running the course mentioned, west northwest, and making allowance for the leeway which they must necessarily have made in such a blow from the south, they would have struck the shore about half a mile to the east of where has since stood the Grand Battery.

Here the nature of the ground agrees with the idea of this being the scene of the wreck of the "Delight." The coast is generally rocky, but here the shore is low, and in front of it the bottom is clayey, graduating into softer mud farther out. Now, the narrative makes no mention of rocks. On the contrary, it describes the "Delight" as having "stroke aground," implying that instead of being dashed against the rocks she was stuck in the mud, and as he says, "the sterne and hinde partes were beaten to peeces." One cannot but notice how exactly this agrees with the manner in which the vessel carrying the Apostle Paul to Rome was wrecked at Malta: "They ran the ship aground and the forepart stuck fast and remained immoveable, but the hinder part was broken by the violence of the waves." Mr. Smith, in his monograph on that voyage,¹ shows that this could only have taken place with such a bottom as he found at St. Paul's Bay, Malta,—mud graduating into stiff clay, similar to what is found at this part of Louisbourg Harbour. And the results were the same. While "the sterne and hinde partes were beaten to peeces" the forepart remained embedded in the sand. That it continued entire for a time is evident from the fact that when last seen the captain stood firm on the highest part of the deck calmly facing death.

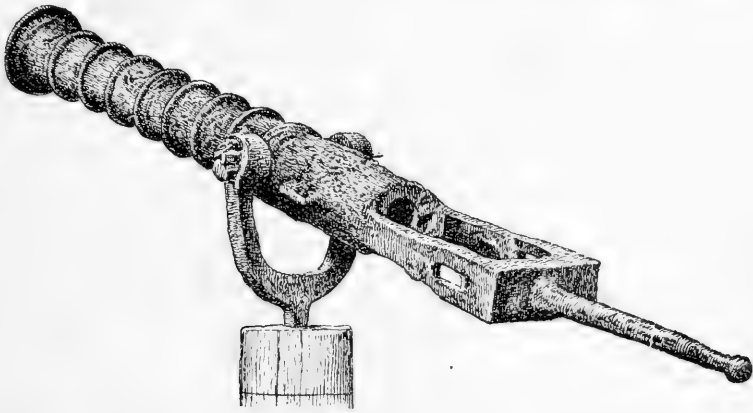
Then the narrative of the smaller vessels getting out to sea agrees with the view that this was the scene of the shipwreck. As their course inward was west northwest, their course out being north northeast, would, if nothing else intervened, have brought them back upon their track, and so upon the shoals near Goat Island. But, as I have said, in going in they must have made leeway, and in putting about they must have fallen off. Then, if the wind continued as it had been, south by east, a course east southeast would be sailing pretty close on the wind, as a sailor would say, within five points, and as the wind was high they must have made more leeway in going out than in entering. They would thus be brought nearer to the opposite side of the entrance, or near to Light House Point, and thus in shallow water, where, before getting to sea, they found only three fathoms of water under them. This would agree with the idea that the point I have indicated on the western side of the harbour was the scene of the wreck of the "Delight."

Lastly, while all the circumstances agree with the view that Louisbourg was the scene of the wreck, there is no other harbour on this part of the coast of which this can be affirmed at least to the same degree. Gabarus Bay to the west is capacious enough, and it has plenty of deep

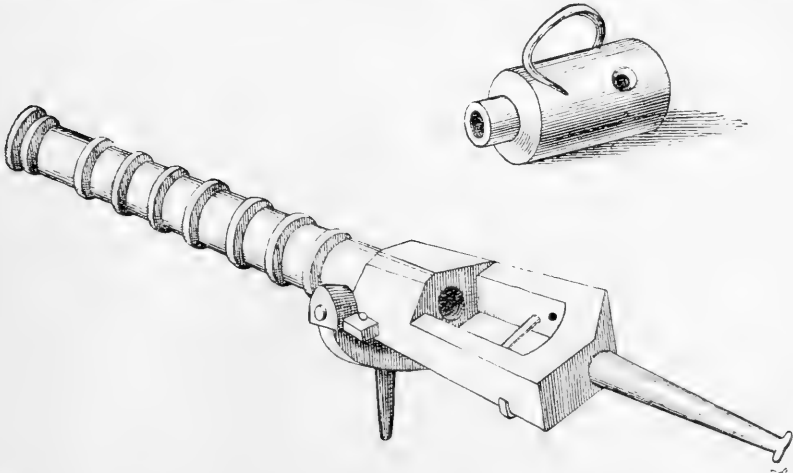
¹ "Voyage and Shipwreck of St. Paul," by Smith, of Jordan Hill.

water. But it has not the land-locked character which appears to have belonged to the place from which these vessels made their way to sea. A vessel might enter on a west northwest course and depart by a north northeast course clear of all such shallows as described.

A circumstance may be mentioned here which, perhaps, has some connection with the subject. At this point some fifty or sixty years ago,



a hooped cannon was found embedded in the mud off the shore below low water mark. At the same place was also found an anchor of very ancient form, and there are reports, which I have not been able to verify, that other articles remain embedded in the stiff clay of that part of the shore.



These could have no connection with the French fortifications at Louisbourg for they did not begin their works of that kind till after the cession of Nova Scotia in 1713, long after guns of that construction had been superseded by those made of cast metal. Moreover they were found at

quite a distance from any of the French works, and in a position showing that they could have no connection with any of their works on land. Neither could they have belonged to the vessels which they sank in the harbour, for independent of the fact that these vessels would have had guns of modern construction, these were not found in deep water. The whole circumstances indicate that they belonged to some vessel or vessels wrecked on the spot.

Moreover the cannon is constructed exactly after the model of English guns of the 16th century. In a work entitled "The gun and its development," by W. W. Greene, published by Cassell & Co., page 24, there is a representation of a cannon in the British Museum, marked as "an English gun of the 16th century." The plate has no scale connected with it to indicate the size of the cannon, but a comparison of it with a photograph of the one found at Louisbourg will show that in form, appearance and construction they are so much alike that they must have been formed after the same pattern, so that the description of the one will serve for the other.

Such guns were originally constructed of iron bars laid side by side longitudinally, and not even welded to each other, but kept together by iron rings forced over them when red hot. In those of late date they were welded, so as to form an internal tube. This from Louisbourg is proved to be of malleable iron, but the point of junction of the sections cannot be detected by the naked eye. It is without including the handle five feet long. At the muzzle it is about four inches in diameter, with a bore of about two inches and continues so for about three feet. On this are nine small rings or hoops and a larger one at the muzzle, from an idea prevalent then and long after that a gun needed to be specially strengthened at that point. Three feet from the muzzle there is a shoulder increasing the diameter to six inches, this continues to increase for a foot farther when the whole is nine inches. Behind this is a chamber for the reception of the breech block or vent piece. This is missing, but we can see exactly what it was by the representation of the English one. It was made to fit the chamber, and by a handle on the top could be lifted out or when charged replaced, when it was retained in its place by round bolts passing horizontally through the sides of the chamber into it. This cannon shows the holes for the purpose. The butt was prolonged into a handle about a foot long.

On the sides of the barrel are two small trunnions, which enter into what forms sockets in the two branches of a swivel arrangement on which the whole is supported. In this way it could easily be raised or depressed by means of the handle. The two arms unite in a round bolt, which was no doubt inserted in a socket, in whatever was used to support it, and by which it might be swung round laterally.

It seems then that this is a gun of the 16th century, the age of Gilbert, and that it was lost in a vessel which was shipwrecked in Louisbourg

harbour at a point where as we have seen there is a strong probability that his vessel was lost. There is thus a possibility, I venture to think, even a probability, that this is a genuine relic of his expedition. If this could be proved, it would add another to the many touching memories that hover around that ancient site, as connected with the pioneer attempt at English colonization in this quarter of the world.



V.—Supplementary Notes on Sable Island.

By the Rev. GEORGE PATTERSON, D.D., LL.D., F.R.S.C.

(Read 23rd June, 1897.)

Since the publication of my paper on Sable Island, read before the Royal Society of Canada at its meeting in 1894, several articles on the subject have appeared in the journals of the day, without, so far as I have seen, adding anything of importance to our information regarding it. In the report of the Dominion archivist for 1895, however, are given a number of papers relating to the commencement of the first government establishment on the island, which I had vainly sought for in the Record office in Halifax. From these and other sources I have obtained a few additional facts which add something to our knowledge and enable us to clear up some points which were in uncertainty.

I.

EARLY LEGEND.

The whole circumstances of the island, its physical phenomena, the dire catastrophes of which it has been the scene, and the deeds of wickedness which have stained its shores, are fitted to cast an awe over the mind of the thoughtful visitor, even when not inclined to superstition; but considering the class who have principally frequented it, we might expect it to be the very home of weird legend. Besides those we have already referred to, Abbé Ferland, in his work "Les Sablons," has given another which may have a basis of fact, and which, at all events, is of interest as showing the superstition of the fishermen on our coast in the past, perhaps to a considerable extent at the present time, and how legends are formed and grow.

Among the colonists brought out by De LaRoche, it is alleged, was a Franciscan monk, charged by his superiors with the spiritual care of the party, and to explore, on behalf of the church, the new world. When they were left on the island, this father chose to land with them and to share their solitude and their dangers. These men, of whom the greater part had been drawn from the prisons of France, were generally bad subjects, but their repentance was not deemed impossible, and while this was the case he would not abandon them.

Then followed a life of patience, devotion and continued disquietudes. His warnings, exhortations and prayers were often without effect. Still they did not turn to hate him. On the contrary, though his preaching and conduct were a severe reproof to them, they still respected or soon became attached to him.

Soon they became divided into two camps, the good and bad or the bad and less bad. The one recognized no law but their own caprices, and refused to obey the officers placed in charge of them. The others were ranged on the side of order, such as they could maintain in such circumstances and in such society. Bloody strifes followed, in which nearly three fourths of the men perished.

All this time the good father preached obedience and peace. Respected but not obeyed, and often repulsed, he at least had the consolation that none refused his ministrations in the hour of death.

When at length the exiles were to be removed, he was very sick, those about him indeed were looking every moment for his death. They wished him to embark, but he besought them to allow him to remain on the island. "I have no long time to live," he is represented as saying, "perhaps only a few hours. I shall die here in the little hut which I have constructed, in which I have prayed for five years as the anchorites of the desert. The winds and the sands will charge themselves with my burial."

Sorrowfully they bade him adieu and sailed away. However his hour had not yet come. He recovered very quickly and lived many years as an eremite on the island. He passed his time in prayer, meditation, the care of his little garden, and the gathering of shell fish and fruits, which, with his vegetables, formed his fare. Almost every year shipwrecks afforded opportunities for him to exercise his charity. He received visits from the fishermen of Canso, Sezembre (Sambro), La Heve and other Acadian ports. He made them visit a way of the cross which he had erected; he aided them with his prayers and counsels, and received from them the elements for the celebration of the mass.

When he died and where he was buried is unknown. But his spirit is said still to hover over this desolate region. The fishermen allege they have often seen him marching at a slow pace along the borders of the lake or of the shore, or on the bank, as in his lifetime, reciting his rosary; or often standing or on his knees on the cliffs, examining the sea tossed with tempest, watching and praying for the unfortunate mariners in danger of perishing.

Again they have seen him suspended, as in an ecstasy, in space, delineated against the azure sky, or upon the shadow of the dark heaped-up clouds or in the fog; sometimes his hood removed and his hands lifted to heaven as at the altar, or, again, his head covered, with his beads in one hand and the right stretched out as if to bless, to succour and to absolve.

Again they have seen him in his dark robe of aerial druggot, girt with the girdle of the seraphic St. Francis, appear upon the bars and around the isle, gliding through the air as the resurrection bodies appear and disappear, or as in an assumption to the infinite presence. By such sights their spirits are revived and their hearts strengthened.

II.

NOTICES OF THE ISLAND IN THE 17TH CENTURY AND EARLY PART
OF THE 18TH.

Since my last paper was written I have found a few brief notices of the occupation by both English and French in the 17th century.

In 1634 the island was granted, along with Port Royal and La Heve, by the Company of the Hundred Associates, to Claude de Razilli, brother of Isaac de Razilli, who had been appointed commander or governor-in-chief of Acadia, and who had commenced a settlement at La Heve. He had been largely engaged in the fishing business, and it was probably under his direction, and for his benefit, that the party of Frenchmen established themselves upon the island after the return of Rose, as mentioned in my paper.¹

In the following year a small vessel belonging to Sir Richard Saltonstall, which had been sent out to Connecticut, was, when returning to England, wrecked on Sable Island. The French on the island received the shipwrecked company kindly, and with their aid a small vessel was constructed out of the wreck, by which they managed to reach the mainland. They reached La Heve in safety, where De Razilli treated them most kindly, giving four of them a passage to France, and furnishing the others, who preferred returning to New England, with a shallop for that purpose.

Commander De Razilli died that year or the next, and his brother transferred the rights of both to Charnisay, and the French seem to have abandoned the island. From that time we have, in Winthrop's journal, accounts of the visits of the English, but no mention made of any French residents. In 1637 twenty men went from Boston in a pinnace, especially to hunt the walrus on it, but after cruising about for six weeks and not being able to find it, returned home. In September they again set out with some more skilful seamen, intending to winter there. Nothing was heard from them for nearly two years. In March, 1639, a vessel was despatched to Sable Island to bring them back, but she was wrecked there. Out of her timbers they constructed a small vessel, in which they reached Boston. They reported the climate of the island to be temperate and healthy. During the nearly two years they had been upon it there had not been a death or case of sickness among them. They had collected a large quantity of seal oil and skins, and some walrus ivory, but the loss of the vessel had destroyed their hope of profit from the venture.

By the same journal it appears that in the years immediately following, several parties went out from Boston to hunt or fish there. One

¹ Trans. Royal Society of Canada, 1894, II., 11.

company, in 1642, brought back as the produce of their efforts to the value of fifteen hundred pounds in walrus ivory, oil and skins, and in seal oil and skins, and some skins of black foxes. The cattle it was thought were all destroyed, though from Bishop St. Vallier's letter, mentioned in my paper,¹ there must have been a remnant left, which afterwards multiplied.

In the early part of the 18th century we find again the stock either reduced or exhausted, and benevolent persons replacing them. Thus, besides the efforts of the Rev. Mr. Mercier, mentioned in my paper, the papers published in the Dominion Archives for 1895,² mention as specially conspicuous in the good work, Thomas Hancock, Esq., a most respectable merchant of Boston. Some time before 1760 he had, from motives of humanity, fitted out a schooner, on board of which he embarked horses, cows, sheep, goats and hogs. These were landed and generally answered very well. No great depredations were made on these till the commencement of the American war, during the course of which privateersmen and lawless persons of every description frequently landed on the island, so that by the close of the war none of the animals remained, except some of the horses. These had afforded food to many unfortunate persons thrown upon the island. But wreckers had carried off cargoes of them to sell in the West Indies, or killed them and offered their skins for sale in Halifax. Under the circumstances the wonder is that they did not become extinct.

III.

RELATING TO FOUNDING RELIEF ESTABLISHMENT.

The documents published in the report of the Dominion Archivist for 1895, are : 1. Observations upon an establishment proposed to be made upon the island for the relief of the distressed and the preservation of property, by Sir John Wentworth. 2. Statement of facts relating to the project, by John Howe, with accompanying reports, and address of the House of Assembly in favour of such an establishment. These are dated 1800 and 1801 ; and supply some additional information regarding the state of matters on the island at that time.

Mr. Howe's statement, in addition to the other evil deeds of which the island had been the scene, mentions the following system of fraudulent procedure. Vessels with valuable cargoes were largely insured, and then run ashore, where the parties could do so with least danger. Afterward the principal goods were landed and concealed, till they found it convenient to take them away.

¹ Trans. Royal Society of Canada, 1894, II., 45.

² Rep. Dom. Arch., 1895, 86.

The statement, in order to show the importance of a relief establishment, gives an account of the more important wrecks that had recently occurred. Of one of these the crew being detained on the island all winter, the captain employed part of his time in exploring the island, and reported as follows: that it was his custom immediately after a storm to examine the part of the island most affected by it. In doing this he has counted upwards of forty wrecks, which had been uncovered, not one of which was visible at its commencement. The hulls of some of these vessels were apparently whole and lying in all situations, but the greater number exhibited only parts of wrecks. In a few days a storm would spring up from an opposite quarter, cover these wrecks and uncover as many more. By following the practice of exploring the island after a storm, he found that there was no part of it free from wrecks, but that it was perfectly surrounded with them. If this be not an exaggeration, we may well regard the loss of life and property on this island in the past as simply appalling. The author of the statement might well say "When it is considered that the island is thirty miles in length, and that though its breadth appears small on the map, yet that the sands that surround it take up vessels in some parts more than twelve miles distant, the mind must be struck with horror in contemplating the lives which must have been lost out of those wrecks, whose remains are still so visible, and still more so when to this number of visible wrecks is added the multitude of vessels which have gone to pieces, and the remains been carried out to sea."

IV.

LOSS OF DUKE OF KENT'S EQUIPAGE.

We have among these papers the official account of the loss of the vessel containing the equipage of the Duke of Kent. Haliburton, both in his History and in "Wise saws and Modern Instances," gives the name of the vessel as the "Princess Amelia," represents it as taking place in 1802, more than two years after the Duke had finally left the province, and as attended with the loss of 200 lives. By the statement we have already quoted her name is given as we had already done as the "Francis."¹ She was a snow of about 280 tons burden, the master's name Letson. She sailed from Portsmouth on the 25th of October, 1799, in company with the "America" mast ship, under convoy of H.M. ship "Bonetta." A succession of gales followed their departure, during which the "America" dismasted, got back to Portsmouth, and the "Bonetta" with difficulty reached Lisbon. No tidings of the "Francis" being received for a length of time, in May following H.M. cutter "Trepassey" being about to proceed to Newfound-

¹ In one place she is called the "Frances." From the preference given at that time to female names for vessels, we would be disposed to believe it correct.

land, Lieut. Scambler in command of her, was directed to stop at Sable Island to obtain information, if possible, of the "Francis" or of any other unfortunate vessel that might have been wrecked there during the winter and to land some animals. His official report is as follows :

" HIS MAJESTY'S CUTTER TREPASSEY,
" AT SYDNEY, 17th May, 1800.

" SIR,

" Agreeable to your orders I proceeded to Sable Island, and on Tuesday morning, the 13th May, I went on shore and landed the ewe, goat, sow and two pigs sent by Sir John Wentworth ; after staying there nearly an hour without discovering any person on the island, and seeing a schooner at anchor in the N.E. arm, being some distance from the cutter, I returned on board, intending to beat up to where she lay, but the current prevented me, it running at $2\frac{1}{2}$ miles an hour S.W. by S. About 4 in the afternoon I discovered her under sail. I immediately weighed, made sail and spoke her ; she proved to be the ' Dolphin ' of Barington, laden with fish, seal skins and seal oil. She had several trunks very much damaged, on board, and appeared to have been washed on shore. One trunk was directed, *His Royal Highness Prince Edward, No. 2* ; another trunk directed *Captain Sterling of the 7th Regiment Foot*, both empty. Also a trunk containing two great coats, the livery worn by the servants of His Royal Highness. The master of the schooner informed me that he had two men on the island this winter, on the sealing concern, who had built a hut on the east end of the island. The two men being on board, I learned from them, that about the 2nd December last, after a very severe gale of wind from the southeast a woman was found washed on shore on the southside of the island ; also the trunks before mentioned, twelve horses, two cows, one bull and two sheep all drowned (the horses were shod) and part of three boats, no name could be distinguished on them."

The pilot who went in the "Trepassey," gave the following additional information received from the men he met on the island. They stated that "on the 2nd December they observed a large snow at a little distance from the northeast bar. She was endeavouring to beat off all this day. The weather was remarkably fine for a winter's day, but the wind was extremely light and baffling, that at night she made no great progress. As the day shut in, the weather began to thicken, and was soon followed by a tremendous gale from the southeast, which continued with extreme violence through the night. In this gale the "Francis" must have been driven on the sands, and in the course of the night have gone to pieces, as neither the snow, or any part of her were to be seen in the morning. Soon after the storm had abated, the corpse of the woman above mentioned was found. She had a ring on her finger, but not being able to

get it off the men declared they buried it with her. A number of articles were saved, which were carried to Barrington."

The report also gives the names of the passengers: "Dr. and Mrs. Copeland, two children and a maid servant; Captain Holland, 44th Regiment; Captain Sterling, 7th Regiment; Lieut. Mercer, Royal Artillery; Lieut. Sutton, 7th Regiment; Lieut. Roebuck, 7th Regiment; Volunteer Appinshaw, 7th Regiment; Sergeant Moore, Privates Thomas King, Abbott, 16th Lt. Dragoons; Judd, coachman to the Duke of Kent, and four other servants of his." These with the crew numbering nineteen, are counted as forty lost in the vessel altogether. But they really number only thirty-eight. This is very different from Haliburton's story of 200 perishing and of Lieut. Towns on his visit nearly three years later having such an awful task in burying the dead, for which was required a grave as large as a cellar, very definite dimensions truly.

It seems evident that Mr. Haliburton confounded this visit of Lieut. Scambler and the visit of Lieut. Towns. We have in this the original of the story of Mrs. Copeland's ring. It is certain that her body came ashore with the ring on her finger, which was so swollen that it could not be taken off. The story of the finders that they buried it with her is quite incredible. But tradition goes farther. It tells that she was cast upon the shore not dead but only in a state of insensibility, and that when the wretch began cutting off her finger to get the ring she rose to confront him. What really transpired is known only to God, but there were those who believed that the robber had added murder to his other crimes. At all events we have not the least doubt of that part of the tradition, that the ring was traced to Nova Scotia and recovered. And the story was widespread that the man suffered all the anguish and terrors of a guilty conscience. As Mr. Haliburton says, nothing would induce him to go out of doors after night. By others it was alleged that the spectre of his victim was always present with him, with her mutilated finger pointing to him, and that though he returned to Nova Scotia and gave up the ring, he could not get clear of the vision. The case was one fitted to excite the superstitions of the fishermen. So that we need not be surprised to learn, that in the weird shapes, which the mists and vapours assume amid the gray sandhills, they believed they saw the shade of the pale lady in her long white robe, her hair floating to the wind, and her hand stretched out as in the act of reclaiming her ring.

V.

THE "PRINCESS AMELIA."

From this statement and information received otherwise, we are enabled in some measure to clear up the matter of the "Princess Amelia." It is clear that she was not the vessel that carried the Duke's equipage and that was lost on Sable Island. Mr. S. D. McDonald notices the "Princess Amelia" as one of the fleet at the taking of Louisbourg, in 1758, but she could have nothing to do with our present history. Mr. Murdoch in his history gives an account of a brig "Princess Amelia," Captain Wyatt, lost on Sable Island in November, 1797, and of the crew escaping to the mainland.¹ Mr. Akins in his history of Halifax repeats the story.² It is strange, however, that the statement of Mr. Howe, though written to show the urgent necessity of a relief establishment on the island, and for this purpose holding up the cases of recent wrecks makes no mention of her. It mentions the case of a ship in 1796, whose crew were taken off nearly in the same way as Mr. Murdoch describes in the case of the "Princess Amelia," and a brig "Lord Duncan," with a captain also named Wyatt, which was lost in the fall of 1798, and the "Francis" in the fall of 1799, but says nothing of any other.

But passing this we have lately received information of another "Princess Amelia," this time a real one, which helps to explain Mr. Haliburton's blunder. On the 20th November, 1799, Prince Edward appointed Lieut. John Mowat, then serving as lieutenant on board H.M.S. "Asia," master and commander of the "army armed brig 'Princess Amelia,' equipped for the service of the Government, to be employed under the direction of the commander-in-chief of Her Majesty's forces in British North America." In his commission, which is signed Edward, it is said "you are to observe and follow such orders and directions as you shall from time to time receive from me or the officer in the chief command for the time being." Lieut. Mowat continued in this position till June, 1802; though the Prince had left for England some months before.³ This vessel was usually known as the Prince's yacht and thus she may have been confounded with the vessel, which was bringing out his equipage.

With these supplementary notes our lucubrations on this fated and fateful isle terminate.

¹ History of N.S., II., 526.

² N.S. Hist. Soc. Coll., VIII., 121.

³ We lately inspected the commission and other papers preserved in Lieutenant Mowat's family in St. Andrews, N.B.

VI.—*The Voyages of the Cabots.—Latest Phases of the Controversy.*

By SAMUEL EDWARD DAWSON, LIT.D. (Laval).

(Read June 23rd, 1897.)

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| 1. <i>Preliminary.</i> | 10. <i>The World Map of Juan de La Cosa.</i> |
| 2. <i>Opening of the Question in 1831.</i> | 11. <i>The Bonavista Landfall.</i> |
| 3. <i>Recent Revival of the Controversy.</i> | 12. <i>Sebastian Cabot.</i> |
| 4. <i>Methods of the Discussion.</i> | 13. <i>Censorship over Spanish Maps.</i> |
| 5. <i>Advocates of Cape Breton and Labrador.</i> | 14. <i>The Map of 1544.</i> |
| 6. <i>The Cape St. John Landfall.</i> | 15. <i>Dr. Grajales.</i> |
| 7. <i>The Labrador Landfall.</i> | 16. <i>Cape Breton a Natural Landfall.</i> |
| 8. <i>The Point of Westward Departure.</i> | 17. <i>The Voyage of 1497.</i> |
| 9. <i>Variation of the Compass.</i> | 18. <i>The Island of St. John.</i> |
| | 19. <i>Date of the Landfall.</i> |
| | 20. <i>Conclusion.</i> |

APPENDICES.

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|-------------------------------|---|
| A. <i>The Labrador Coast.</i> | D. <i>The Climate of Cape Breton.</i> |
| B. <i>The Seven Cities.</i> | E. <i>The Tanais.</i> |
| C. <i>Cape Race in June.</i> | F. <i>Prince Edward Island, not Cabot's St. John.</i> |

1.—*Preliminary.*

The public commemoration of the four hundredth anniversary of the landing of John Cabot and of the planting of the English flag in the western world was an act of historical justice. The ceremonies which then occurred have, not only rescued a great name from the danger of utter oblivion, but have placed an event of momentous importance in its true historical perspective. The question was first publicly raised by the Rev. Dr. Harvey, of St. John's, Newfoundland, in a paper read before the Historical Society of Nova Scotia in 1893,¹ and the inception of the commemoration recently consummated will be found in the Proceedings of the Royal Society of Canada in 1894. A letter from Dr. Harvey is embodied in the report of the council, and the present writer contributed to the Transactions the results of a long and careful study of the whole subject. The progress of the movement may be followed in the Proceedings of 1896 (pp. xxiii.—xxxii.) and Transactions (sec. ii., p. 1), where a second paper may be found, and its completion is recorded in the Proceedings at the front of the present year's volume. It is reasonable to expect that now, after the celebration is over, public interest in the subject will begin to flag and, as the present writer, in his paper of 1894 (Trans. R.S.C.

vol. xii.), revived the discussion, it may not seem presumptuous if he attempts to summarize it to the present date. In doing so he would repeat that, like the landfall of Columbus, the landfall of Cabot can only be demonstrated to a very high degree of probability, for there has not been in either case any succeeding occupancy, as in the case of the Plymouth landing, to prove the landfall by that continuous oral testimony known as tradition; and here may be repeated, what will be seen from the report of the committee (Proceedings of 1896, p. xxx.), that there was never any intention to commit the corporate society to any expression of opinion as to the conflicting theories. The opinion of individual members of the committee was clearly stated; but the present writer, who drew up and moved the report, was careful to guard against any misconception on that point.

In studying the subject the reader should bear in mind that the landfall of the voyage of John Cabot in 1497 was first definitely located, in the year 1544, on the east coast of Cape Breton. That is not only the first locality specified (eighty years before the suggestion of any other), but it is the only one for which any positive evidence exists. Without anticipating the argument which must follow, the simple fact stands clearly out that the indication of the Cape Breton landfall rests upon the evidence of Sebastian Cabot reduced to graphic form in his lifetime. This had been forgotten and was rediscovered in 1843. In the meantime other theories had replaced it, and the present writer has done nothing beyond vindicating the first—the original—and the almost contemporary statement. In this present paper he has sought to place before the reader the means of forming for himself a reasoned opinion. For that purpose the two great maps round which the controversy has raged have been reproduced, and citations from the authorities referred to are made in the very words of their respective writers.

2.—The Question Opened in 1831.

Richard Biddle's work, published in 1831, marks an era in the history of the Cabot voyages. Up to that date there had, for a long time, existed in England, although not on the continent of Europe, a belief that the landfall of the voyage of 1497 was in Newfoundland. He shook that theory by his researches; in fact he was the first who applied modern critical methods to the subject, and the result among students was the general adoption of an opinion that the landfall was on Labrador north of the latitude of 53° —from 53° to 58° —on that part of the coast known as Northern Labrador. To that theory many scholars adhere to the present day. Other documentary evidence, however, unknown in Biddle's time came to light in succeeding years and largely influenced opinion, for it was of the nature of contemporary testimony. The result was a review

of the whole subject and the wide acceptance of the revived belief that the landfall was on Cape Breton island. These two schools alone occupied the field in the long controversy which arose; because, in fact, nothing was found to reinforce the opinion that the landfall was in Newfoundland, while no evidence of a positive nature had at any time been put forward to establish it. Very little, therefore, concerning Newfoundland appeared in the very extensive literature not only of books, but of reviews and magazines, in whose pages for the past forty years the controversy has been carried on.

3.—Recent Revival of the Question.

The discussion, revived in the Royal Society of Canada in 1894, was carried on in Newfoundland with singular acrimony. This was unexpected, because the question had previously been considered solely as a historical one. My own attention had been specially drawn to it in 1884, when, as local secretary to the British Association, I was called upon to prepare a "Handbook of the Dominion" for the meeting at Montreal. The secretary of the Geographical Section wrote me then a kind note to say that the landfall (Bonavista) indicated as that of the first voyage "was not in accord with the results of modern research," which placed it on the island of Cape Breton. My previous studies had been in other fields of Canadian history, but since that time, as opportunity offered, I went over the whole literature of the Cabot voyages and I was surprised to find that there was no positive historical evidence for the theory of a landfall at Bonavista and in my paper I thought it right to say so. It was not accurate, therefore, to inform a Newfoundland audience "that the learned Dr. Dawson, as he himself declares, has only recently taken up the study of the Cabot voyages."² What I did say was: "That for many years, under the influence of current traditions and cursory reading, I believed the landfall of John Cabot to have been in Newfoundland; but a closer study of the original authorities led me to concur in the view which places it at Cape Breton."³ The impressions conveyed by these two sentences are not identical.

While, then, for more than sixty years, this question has been banal among scholars, I was not able to find in Dr. Justin Winsor's encyclopedic treasury of American historical research, or in Mr. HARRISSE'S numerous and exhaustive writings, any serious discussion of the Bonavista landfall; and I quickly discovered that the reason was because nothing in the original records suggested it. When Mr. HARRISSE abandoned the Cape Breton theory of his first book,⁴ and, in 1892,⁵ adopted another, he passed over to Labrador as the only alternative.

When I wrote my first paper in 1894, Judge PROWSE'S "History of Newfoundland" had not been published, and, when it appeared, I searched

it in vain for positive evidence in support of Bonavista; for I thought that if there existed anything conclusive upon the point, the untiring research evident in that volume would have discovered it. I then wrote a second paper (Trans. R. S. C., 1896). A heated controversy succeeded in Newfoundland, but nothing new, save a comparatively recent map by Dupont (a cartographer of Dieppe in 1625), was elicited.

4.—*Methods of the Discussion.*

The discussion in Newfoundland (in which I took no part) assumed an adjectival form very unusual in the forum of historical inquiry. The use of such words as "senseless," "absurd," "preposterous," belongs to another age and to another arena. These adjectives prove nothing. Nor is it in the least degree conclusive to write of "the great Dr. Harvey" or "young Dr. Dawson." If, indeed, there were any one in Newfoundland old enough to remember having seen John Cabot land at Bonavista, such an argument might be satisfactory; but, as it is, considerations of that nature are irrelevant. The birthplaces of those who have written upon this subject have, moreover, no bearing on the question of the landfall of 1497. The question is broader than any colony—broader than the Dominion; for the attendance of many scholars from the United States showed that the people of that nation claim, and justly so, as much right, title and interest in the discovery of America as we do. It may be true, as Judge Prowse remarks, that he "prepared his history for his own 'countrymen,'"⁶ but, as I had ventured to point out, no argument can be founded upon that fact.

In like manner, Bishop Howley, writing in 1891, thus pleads his nationality: "As a Newfoundlander, reared in the tradition which has 'been held from time immemorial, that Bonavista—happy sight—was 'the landfall, I feel loath to give it up without a struggle.'"⁷ While such circumstances may not be the most favourable for impartial investigation, they may account for the warmth of the discussion and the magnitude of the adjectives employed. He adds, when discussing my papers: "I was not aware that he (Mr. Dawson) was born in Cape Breton,"⁸ and Mr. HARRISSE, catching the same idea, speaks of my papers as "patriotic."⁹ Cape Breton is a good place to be born in, and no wonder John Cabot spoke so highly of it in its summer adornment and thought silk and brazil-wood might grow there. In a valuable paper on the ports and ocean routes of the North Atlantic Capt. Smith, R.N.R., while discussing the projected line of fast ocean steamers, incidentally observes of Cape Breton that "some of the loveliest and most picturesque 'places in any portion of the globe are to be found within its borders in 'every direction.'"¹⁰ As a matter of fact, however, I was not born there and the people who live there have not now, or at any previous time, manifested the slightest interest in this question.

In my second paper I said that I had two objects : One was to establish the landfall of 1497 and the other to dispel the fog that was gathering around our geographical history in the shape of a theory that Cabot had discovered and named Prince Edward Island. It is scarcely fair to make this out to mean that I admit that "I set out to prove" that Prince Edward's Island was not Cabot's St. John, and then to add that it was "a very unfavourable attitude for a dispassionate consideration of historical evidence."¹¹ It is stating, in effect, that when I first undertook the inquiry I did so with a preconceived determination to prove a conclusion antecedently formed on other than historical grounds. I have made no such admission. My distinguished critic had, in writing his address, motives of a precisely similar kind, namely to establish a different landfall and to prove that Prince Edward Island *was* Cabot's St. John. There is no ground for assuming that, in the preliminary process of examining and weighing evidence, my mind was in any more unfavourable condition than that of any other writer who seeks to place the results of his studies before the world.

5.—*Advocates of Cape Breton and Labrador.*

In a criticism of Archbishop O'Brien's address Judge Prowse states that "the claim of Cape Breton is utterly untenable; opposed alike to "common sense and reason and all the contemporary records."¹² It is therefore only right to repeat that it was the first place ever mentioned as the landfall, and that a large number of very eminent men have held and advocated that very theory. It has, moreover, been the prevailing theory during the past forty years. I shall have space to mention only a few of those persons "wilfully obstinate or lamentably ignorant of the "value of historical evidence,"¹³ who have held it. There was Mons. d'Avezac—foremost name in the Geographical Society of France—whose numerous writings on the geography and cartography of the Middle Ages are known and sought of all students. The study of his life was the North Atlantic and the discoveries of its early sailors and his influence pervades all the literature of the question. Then there was Dr. Charles Deane, of Boston, author of the treatise on the Cabot voyages in volume III. of Winsor's history and a life-long student of early American geography. He had made, at his own expense, twelve complete photographic copies of the Sebastian Cabot map of 1544 of the full size of the original and deposited them in twelve great libraries in the United States. Another "absurd" person is Elisée Réclus, author of the great work on geography republished by the Appletons,¹⁴ and of many other important works—the greatest living French authority on geography. Among these persons "lamentably ignorant of historical evidence" was the late Dr. Justin Winsor, author of the "Narrative and Critical History of

America." (Alas! that I have to use the past tense in writing of the foremost scholar of the age in such questions as these.) Then we must count in Mr. Nicholls, the librarian of Bristol; Mr. J. Carson Brevoort, in his lifetime of the Astor library; Mr. J. F. Kidder, the Abbé Beaudoin and Mr. Edward Eggleston. I need go no farther, for Dr. Winsor says that the Cape Breton theory "is commonly held now."¹⁵ None of these were born in Cape Breton—and now I will add the name of one of our leading Canadian writers, Dr. J. G. Bourinot, who was born there.

But Judge Prowse states that "all intelligent minds"¹⁵ concur in his view that Bonavista was the landfall. Those, therefore, who have advocated a landfall at Labrador must be classed as unintelligent. In this class we must then include Richard Biddle, the first student to apply critical methods to the subject; Baron Alexander von Humboldt, author of "Cosmos" and the "Examen Critique;" Dr. J. G. Kohl, the traveller and geographical scholar who traced the great series of American maps now at Washington; the late Henry Stevens—keenest of critics—whose wide range of knowledge was utilized by the British Museum authorities in collecting the American section of their great library; and Mr. Henry HARRISSE, to whose invaluable writings we must constantly recur. Then there is Mr. John Boyd Thacher, of Albany, author of "The Continent of America, its discovery and its baptism," who favoured the society by attending its meeting at Halifax, and is to contribute a paper to the present volume. Among French Canadian authors of note are the Abbés Ferland and Laverdière, scholars worthy of a place in the front rank in such questions. Beyond all manner of doubt none of these gentlemen were born in Labrador. It is a serious thing to count them among persons destitute of intelligent minds. They are scholars, who probably have not seen Newfoundland; but it is wanting in precision for Judge Prowse to say even that "all intelligent Newfoundlanders are on his side."¹⁷ Mr. J. P. Howley, the Director of the Geological Survey of Newfoundland, is a most intelligent and scientific Newfoundlander yet he holds to Labrador; and the Rev. Dr. Harvey, whose works on the History and Physical Geography of Newfoundland are known and esteemed in England and the United States, adheres to Cape Breton. Bishop Howley has a landfall all to himself at Cape St. John and has written to disprove the Bonavista theory. Saving Judge Prowse, these are the only writers in Newfoundland who have taken part in this discussion; and so, in the last analysis, Judge Prowse stands alone, among these four, for Cape Bonavista. In his own words: "Alone, like *Athanasius contra mundum*, "fighting for the creed of Christendom against the world."¹⁸ The parallel is not exact, for Athanasius was fighting for the older faith.

There was, beyond doubt, a polemical advantage in conducting the controversy in Newfoundland as if the Cape Breton theory were new and advanced solely by the Rev. Dr. Harvey and myself. It permitted a

latitude of language which otherwise would have carried on its face its own refutation. In the mass of literature contributed to the press by Bishop Howley and by Judge Prowse, as well as in the long and carefully prepared lecture afterwards published by the former, there is no hint that they are attacking opinions long and widely held among scholars. This was scarcely fair to the people of Newfoundland who were entitled to a full presentation of the subject. Again, in the elaborate discussion of the question in his lecture, Bishop Howley makes allusions to Homer, Plato and Aristotle, to the Norsemen and Adam of Bremen and to many other authorities of an earlier age, as well as to many persons and matters incidentally connected with this inquiry; but no mention is made of Juan de La Cosa, the one sailor and cartographer who knew more about the question than anybody else save the two Cabots. No notice was taken of the existence of a map upon which the whole discussion was turning—a map which is the chief treasure of the Naval Museum of Madrid—which was published in facsimile as the contribution of Spanish scholarship to the Columbus celebration of 1492; for La Cosa was the companion of Columbus on his first and second voyages, pilot and master chart-maker, and owner of the admiral's flag-ship. This map is the first map containing any delineation of the new world. There are facsimiles of it in all the works of reference and all the writers on this question discuss it. It was, therefore, due to the intelligent audience of Newfoundlanders who listened to that long lecture to inform them of this cardinal point in the discussion, in order that they might be able to arrive at a reasoned opinion based on all the evidence.

Of the Newfoundlanders then who took part in this discussion two have written on behalf of a landfall on the island—one at Cape St. John, the other at Cape Bonavista and each has, in effect, confuted the other. Bishop Howley says: "I believe that I am the only person who has fixed upon Cape St. John as the landfall. I may say that this is not, strictly speaking, a new theory. It is included in the northern coast of Newfoundland. It is only a question of a very few miles between it and Bonavista; an absolutely trifling distance when the whole breadth of the Atlantic ocean is considered,"¹⁹ There is an element of inconsistency in the above sentence, for if he first launched the theory it must be new; besides, on examining the chart, it will appear that two of the widest bays on the coast intervene between the two points in question. Measuring from the lighthouses: From Cape St. John across Notre Dame bay to Cape Fogo is 60 miles; from Cape Fogo along the coast in a straight line to Cape Freels is 30 miles, and across Bonavista Bay, from Cape Freels to Cape Bonavista, is 39 miles. In all, the distance is 129 nautical or 149 English miles. This is too long to be considered as an "absolutely trifling distance" in any relation. Without, however, stopping to discuss this, it may well be asked, what has become of the

“ immemorial tradition of Bonavista—happy sight,” the glad cry of the storm-tossed mariners? What shall we say of Mason’s map? of Dupont’s map? and what of Keels, “ where the first keel grated on the “ shingle?” and of King’s cove—“ the royal port, where the royal stand-“ ard was hoisted?”

6.—The Cape St. John Landfall.

It will be convenient to pause here and ascertain how, according to this new theory, John Cabot got to Greenland on his way to make a landfall at Cape St. John.

In the early part of his lecture the bishop treats of the Norse voyages to Greenland and Vinland. I pass over statements concerning these voyages, for they are not now in question, merely observing that if the Northmen of Greenland discovered America in A.D. 1000 it is no proof that a vessel from Bristol had to go to Greenland to do the same thing in 1497. “ The Norsemen of Iceland,” he continues, “ never altogether lost “ their connection with these western lands, and up to the time of Colum-“ bus and Cabot, Greenland was still inhabited, A.D. 1492” (p. 14). At that time John Cabot “ was a man of influence in the commercial world of Bris-“ tol.” “ It can scarcely be doubted then that he made several voyages to “ Iceland, and that he knew well the course to that island (p. 6). He was “ well acquainted with the position of Greenland from his intercourse with “ the Icelanders” (pp. 13-14). Concerning these statements I would only remark that, while Cabot could easily have heard from the Bristol mer-“ chants trading to Iceland much concerning that island, there is no record of his having visited it, and that, instead of being a man of influence, it is expressly stated by his countryman, Soncino who knew him, that he, “ being a foreigner and poor, would not have been believed” if the crew (on the first voyage) had not been Englishmen, and testified that what he said was the truth. In this way, however, the lecturer proved that John Cabot was well acquainted with Greenland. Now, as John Cabot’s destination was Zipango and Cathay and the latitudes of these places were laid down for him on Behaim’s globe and Toscanelli’s chart between the parallels of 35° and 50° directly west of Europe, it is evident that any knowledge of Greenland he might have possessed would have prevented him from going in that direction and would have deterred him from approaching its ice-laden waters in the month of May to search for a region of spices and brazil-wood.

The minute and protracted examination of all surviving records and notices of the Cabot voyages has, during the last few years, resulted in a general consensus of opinion that there are two groups of documents which should be carefully distinguished. For convenience sake let them be called groups A and B. Group A consists of contemporary documents,

and group B of reports of conversations at second-hand and notices by writers long after the event. Group A is concerned solely with the first voyage which has just been commemorated. Together with his brothers, Lewis and Sancius, Sebastian is once mentioned in the letters-patent, but there is no indication of any of the family save John Cabot having been on the voyage; nor is there in any other document of group A the least mention of any of them. On the other hand, in group B there is not the remotest trace of John Cabot ever having been concerned in a voyage to the west. The conversations and incidents related refer solely to Sebastian. John Cabot is absolutely non-existent in them, and the son is the sole hero. Inasmuch as it has been demonstrated that it was John who made the first voyage, it is now the generally received opinion that group B refers to the second voyage, and many think that Sebastian did not sail in the first expedition. In my first paper I endeavoured to explain this, as regards Sebastian, by showing that the circumstances related in group B refer to the second voyage and that they are in the main true; saving the suppression of his father's share in the adventure and the absence of mention of any voyage prior to the one he was speaking of. In my paper of 1894 I separated these documents and considered them under distinct headings. That was one of the essential points in my argument and under a separate heading I contrasted them by the strongest possible antitheses. I wrote: "The course of the first voyage was south of Ireland; then for a while north and afterwards west, with the pole star on the right hand. The course of the second, until land was seen, was north, into northern seas, towards the north pole, in the direction of Iceland, to the Cape of Labrador, at 58° north latitude." The references showed that I was quoting these phrases from the documents in each respective class. Bishop Howley charges me with confusion and inaccuracy because, he adds, "we know the general trend of the second voyage was the same as the first." Now that is just what we do not know; because we have no means of knowing save from the records which I was quoting in their very language and, while group A makes no mention of ice and indicates a pleasant and temperate climate, group B is characterized by repeated mention of ice in all the shapes it is met with on the coast of Labrador to the present day. There is no confusion in my sentence above quoted. It is one member of a strong antithetical statement extending over a page and each item is a quotation from its respective group of documents. That this grouping is correct is manifest also by the fact that Peter Martyr and Gomara give Cabot's experience with ice and his coasting voyage south to 38° as characteristic of one and the same voyage and thus the possibility is excluded of that having been the voyage which was accomplished in 93 days.

It must be carefully noted that it was the voyage of 1497 and no other which was the subject of commemoration. The bishop truly re-

marks that none of the four letters which undoubtedly refer to the first voyage have any mention of latitude. That, in fact, is another distinguishing mark of class A. They speak of soil, climate and vegetable productions, but no latitude is specified. He then states that he had previously said "that the subsequent writers, Gomara and Peter Martyr and others, "when they mention latitude, were speaking expressly of the second voyage." ²⁰ "If this be not the case," he remarks, "they were confounding the two voyages." He does not assert that, but adds, "Whatever may be thought of this it does not affect the present argument." Then taking the admitted fact that Cabot turned at first to the north, he adds to it "that there is no reason to suppose that he went north on the second voyage" (which is clearly in the teeth of the writers above mentioned), and he concludes, "Hence, when these writers tell us that he went north to a certain point, we are safe in applying the statement to the first voyage, even though the writer himself may have been confounding the two voyages." In other words, that the latitudes characteristic of the second voyage may safely be transferred to the first. In this way the whole of the documents are bunched up together.

With such a canon of criticism it is no wonder that the bishop complains of "bewildering confusion" having arisen. It must result when the statements cited are wrested away from the plain intent of the writers to fit into the requirements of an elaborate theory. Then when it is desired to get Cabot to Greenland, we are told his reason for going there was "that he wished to keep as long as possible on the well-known and well-beaten track to Iceland before trusting himself to the vast unknown regions of the west." ²¹ Therefore he sailed north until he reached latitude 60°, when he turned west, for "his object was (p. 17) to reach Cape Farewell in Greenland." Wanting to go west, he went north because he knew the way! And again, "It (p. 15) cannot then be doubted for a moment that Cabot knew of this land (Greenland), and that it would be necessary for him to make the southern point of it Cape Farewell, and doubling this point bear away towards the northwest. "This is what he tried to do"—and so he got to Greenland. Because he knew the way he coasted northward along the west of Ireland and Scotland (p. 15) to St. Kilda's, and then turned west to Cape Farewell. But he could not have known the way or he would not have gone west of Ireland. The course from Bristol for St. Kilda's was *inside* of Ireland and through the Irish channel and every mile he sailed to or beyond Cape Clear was a mile lost. The very fact that he went south of Ireland proves that his intended course was not north but west. The more he knew about Iceland and Greenland the less he would be disposed to associate them with Cathay and Zipango.

Keeping in mind that the question is of the first voyage and of John Cabot, we shall soon see where this canon of liberty of selection and

adaptation has led. Take a paragraph on p. 13: "Again we know from "a conversation reported by Ramusio that Cabot" (that was Sebastian) "was acquainted with the principle of great circle sailing, and claimed "that his course to the northwest would open India by a shorter route "than the westerly run of Columbus. Again: As we have already "remarked, he" (that was John Cabot) "had learned from the Arabian "merchants that the lands of Cathay and Zipango were to be found "towards the northwest." ²² Here the father and son are confounded together, and, moreover, Cathay might well be northwest (i.e., northeast) to the Arabian merchants near Mecca in lat. $21^{\circ} 28'$, and not to Bristol merchants in lat. $51^{\circ} 30'$, who were already 30° to the north of Mecca.

At p. 25 is another instance. We have seen that the statements as to latitude of Gomara and Peter Martyr were taken from the context in group B and applied to the first voyage, but here they are taken in again and applied to the second, where in truth they belong. Cabot is here thought to have entered Hudson's strait and passed up Fox channel as far as 66° or $67\frac{1}{2}^{\circ}$, within the Arctic circle. Then, in the same paragraph (p. 26), the information from Ramusio and Richard Eden is brought in, about the discontented sailors, belonging to a third voyage which some think occurred in 1517, but which, in the opinion of many students, never occurred at all. The main thesis of the lecture is to show that John Cabot, with the open ocean before him to the west, knowing of no obstacle, and seeking Cathay, known to be in latitude 35° to 50° on the east coast of Asia, sailed to Cape Farewell in Greenland, and having reached it (p. 21) early in June, "passed on in search of the northwest "passage."

But having got to Greenland, and starting off as explained above to the northwest, how did Cabot light upon Cape St. John? He was going northwest and he arrives far to the southwest. We find that having arrived at Cape Farewell "he made no delay" (p. 21). "He saw (p. 21) "that it was bleak and uninviting even then, early in June," and "he "made no landfall." That, however, was the first land seen after a voyage of 1,500 miles and, therefore, *was* his landfall in the plain and accepted meaning of the word.

Following the lecture we have traced Cabot's course to Cape Farewell, and now we learn that from that point "we have no reliable statement as to the exact course steered by Cabot when he turned his prow "westward ho! His own log being lost, we must trust to the statements "of men such as Soncino and De Ayala, who, not being nautical men, "were not particular to a point or two." ²³ Here one may reasonably ask, what "reliable statement" has the bishop been following which has brought Cabot to Cape Farewell, in Greenland, early in June and then deserted him? And, in truth, the lecturer is not satisfied in his own mind. The confidence which traced Cabot 390 miles north to St. Kilda's, and

1,135 miles west to Greenland ceases, for the course is sometimes said to be northwest and sometimes west. Measuring the distances on the chart it appears that a northwest course would take him up Davis strait into Cumberland sound; westward was Cape Chidley, 630 miles away; southwest was Labrador, the nearest points of which Indian Harbour and Indian Tickle were each respectively 545 and 550 miles distant; and, southwest by south, 715 miles away, was Cape St. John in Newfoundland, where he had to find his appointed landfall in making a westerly course. The problem was difficult, but the Arctic current comes in like a *Deus ex machina* and drops him down on the cape required. This is how it came about. At Greenland "he met, of course, the great Labrador current" (p. 21)—"the distance from Greenland to Labrador is about 800 miles. If we allow Cabot six days to make that distance, at 140 miles a day, more or less, and if we allow him to drift southwards, by force of the Labrador current, at the rate of 50 miles in 24 hours, that would bring him southward about 300 miles before striking land. In that case he would make the landfall on the Labrador coast about latitude 55°, or in the neighbourhood of Byron bay. He may, however, have been carried farther south and struck on the Newfoundland coast." 24

Several objections present themselves. The distances are erroneously given. Cape Chidley is only 630 miles west of Cape Farewell, and the coast of Labrador extends eastwards through ten degrees of longitude, or half the whole westerly course; therefore he could not have missed it, especially when sailing at the rate of 140 miles a day. Thus, from Cape Farewell, on a westerly course, he would have crossed the meridian of Cape St. John at a distance of only 345 miles west; and as Cape Farewell is in 60°, and Cape St. John is in 50° north latitude, he would have to drop 600 miles of latitude while making only 345 miles of west longitude—a very immoderate use of the Arctic current. And, moreover, the extreme rate of the Labrador current is not two miles, but one mile and a half an hour. I certainly will not dispute the lecturer's conclusion, and will cheerfully admit that *if* Cabot went to Greenland, and *if* the current had been one-third swifter, and *if* the distance to Labrador had been one-third longer and the distance to Newfoundland one-half shorter, the claims of Cape Breton would be "utterly out of court." I would, however, beg the student to observe that the Arctic current does not stop short at Cape St. John, and a vessel will drift as easily south *from* Cape St. John as south *to* it. I shall return to the current later on.

Having now got John Cabot to Cape St. John, it will be in order to consider the marks of identification which point it out as a landfall. We learn that "it is (p. 36) a high and prominent headland" "fixed on by the Treaty of Utrecht, A.D. 1713, as the limit of the French treaty rights." This is inaccurate, and, moreover, has no bearing on the landfall of 1497.

If it be relevant it will prove the claim of Bonavista, for that was the spot fixed by the Treaty of Utrecht.²⁵ We are then informed that it is, as an island, a very early name on the maps, and that such transfers of names were "quite a customary thing" in those days. It is no doubt a fact that the name occurs 26 years before that of Bonavista, and, as Bishop Howley observes, there is no island at Bonavista lying "before the land." There are two islands there, but they are small, and are inside the cape. He then quotes (p. 37) Cabot's map of 1544 to prove that there was "a large island" marking the landfall. He forgets, however, that he is quoting from the printed legends on the map he saw at Paris, and which he pronounces to be of "very recent date,"²⁶ and that, elsewhere, in another argument (on page 22), he had quoted from Clement Adams's copy of the map to show that it was "a small island." Without stopping to reconcile this contradiction, he goes on to point out that near Cape St. John is an island with the remarkable name of "New World island," and another called Fogo island—an old name on the maps. These islands are, it must be observed however, on the opposite side of Notre Dame bay and adjacent to the opposite headland, forty miles from Cape St. John. Either island might answer, for neither of them is very large or very small. There is no lack of islands, for the bays on the east coast of Newfoundland are clustered with islands. Finally, there is a "tradition" here also, for we learn that "it is stated in the chronicle " that he (Verazzano) came to the land formerly [i.e., in 1497] discovered " by Cabot, which is in latitude 50°"—"the exact latitude of Cape St. John." This shows, we are told, "that at that early period the tradition was in favour of Cape St. John as the site of the landfall" (p. 38). This statement occurs again on page 36, with particulars which enable the reference to be identified. He says of Verazzano, that he coasted "north until he came to the land, which in times past [viz., 1497] was discovered by the Britons [viz., Cabot], which is in latitude 50° north." The passage is thus seen to be a quotation from Verazzano's report to the King of France, Francis I., excepting the explanatory words which the bishop has inclosed in brackets. The reader would naturally infer that the Britons are the English under Cabot—a manifest error, for Hakluyt, whose translation is used, meant Bretons, not English, and throughout his work (as Eden also does) he spells the word *Briton* (sometimes *Britayne*), as, for one instance out of many, in Drake's voyage to the Isle of Ramea he speaks of the "Britons of Saint Malo and the Baskes of Saint John de Luz." Verazzano was sailing on the coast to create a claim for France, and he was pointing out to the king that the land in question had been discovered by Bretons, subjects of France. The French always disputed the English claim on the strength of this very voyage. In Hakluyt Cape Breton is always spelled Cape Briton. The bishop has inadvertently disproved his own case.

In illustration of the preceding remarks I insert here (fig. 1) a reconstruction of Toscanelli's chart, made from materials existing in his letters to Columbus, and in other authorities, just preceding the discovery of America. It is found in Nordenskiöld, Winsor, Kretschmer, Markham and other works of authority. The same information is on Martin Behaim's globe of 1492. What is there on this map, embodying as it does the belief of that period, to suggest a northwest passage? Why passage? The way was over an open ocean, there was nothing to pass round. That was the information patent to all sailors at the time.

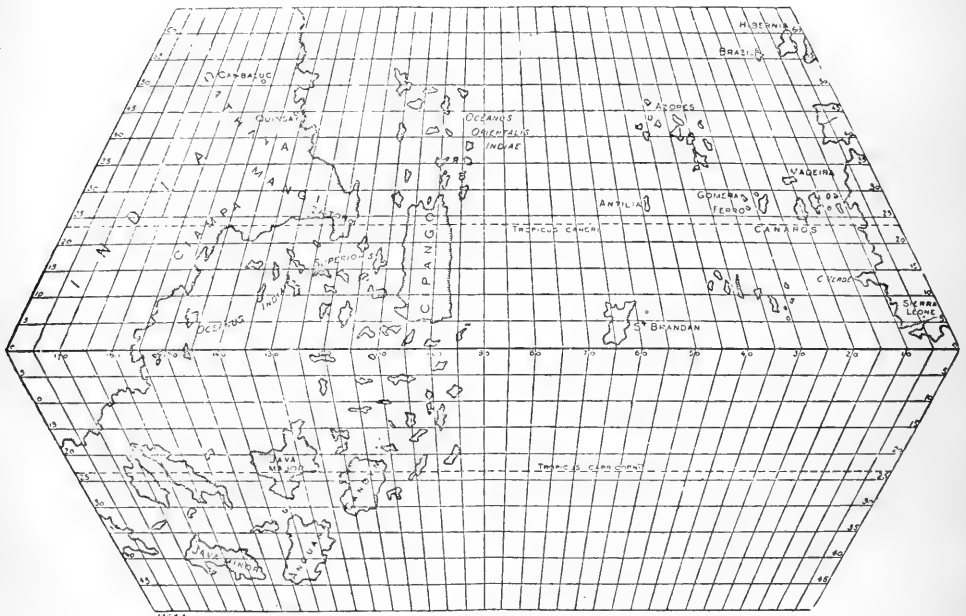


FIG. 1.—TOSCANELLI'S MAP.

7.—*Labrador.*

The theory of a landfall at Labrador has not gained ground of late years. Sir Clements Markham, in his recent paper, declares that "Labrador must be rejected as out of the question." Judge Prowse is equally decided. He says: "The great cod fishery does not begin until July, and its bleak and rugged shores could never be described as 'wooded, or beautiful and pleasant.'"²⁷ Not one of those who argue for Labrador has ever spoken of its attractiveness and fertility. Archbishop O'Brien, in his presidential address, "inexorably excludes Labrador, Cape St. John and Bonavista" by a very ingenious and original argument, drawn from Soncino's reference to the "country of the Tanais."

It will not do, however, to allow the case for Cape Breton to rest upon that argument, for it is founded upon a misunderstanding of the conditions of the problem. The disputants in this controversy are not nearly so ignorant of ancient and mediæval cartography as the archbishop supposes, and while essaying to bar the main entrance of the fortress, he is letting his opponents in by the postern. To avoid confusion I have referred to Appendix E the consideration of this point, and would merely observe that if the archbishop's hypothesis were sound it would inexorably exclude not Labrador and Newfoundland, but Cape Breton and Newfoundland, and the theory he has laboured to construct would be destroyed by striking away its fundamental proposition.

Although Bishop Howley advocates a landfall at Cape St. John, he has a kindly feeling for both Bonavista and Labrador. It is only Cape Breton—the first recorded landfall—which he cannot abide. Thus he writes: "As a matter of fact there are immense forests on Labrador, where timber is found much larger than anything of the kind in Newfoundland or Cape Breton." If this really be intended to apply to the coast of Labrador, one can only wonder and pass on. It is no doubt the fact that at the heads of such deep inlets as Sandwich bay and Hamilton inlet, in sheltered places, large firs may be found, and recent explorations have revealed in the valleys of the interior the spruce and poplar of the sub-arctic forest; but at 58° is the northern limit of the growth of trees, and throughout the peninsula north of 54° reindeer moss replaces the scanty and dwarfed tree growth on all open situations where there may be soil over the rock. In both my previous papers I have given the testimony of sailors, from the time of Jacques Cartier to the present day, as to what the coast of Labrador really is, and must from the very nature of things ever be; and I would especially ask the reader to consider the evidence in Appendix A to my paper of 1896 (R. S. C., Vol. II., New Series). The coast in question is the Atlantic coast from 53° north to Cape Chidley, against which the Arctic current pours the whole ice-discharge of the Polar ocean. Here is a description, from the Sailing Directions of the British Admiralty, from Cape St. Lewis, at 52°, southward: "The coast is composed of bare granite hills * * * that navigation is difficult is due to the frequent fogs, the heavy easterly swell rolled in from the Atlantic, and the icebergs which are almost always drifting along with the current from the northward." ²¹ Farther on we read: "The climate on this coast is extremely severe, the mean temperature of the year being below freezing point;" and at page 16: "Field ice remains in the vicinity of Greedy harbour until about the middle of July, soon after which the fishing fleet are enabled to sail northward." ²² Greedy island is at 53° 40'. Of the coast northwards we read again (p. 381): "Icebergs may be encountered all the year round, but are most numerous from June till August, when occasionally they are found in im-

“ mense numbers, consisting often of huge cubes, and not, as a rule, presenting the picturesque shapes they assume when seen farther south at a later date.” That is about the time when Mr. HARRISSE pictures the little “ Matthew ” sailing leisurely along to Cape Chidley and back, the crew hunting on shore and replenishing their stock of provisions.³¹ The picture is idyllic, but here is the reality copied from a letter by the correspondent in Newfoundland of a large Toronto daily newspaper. It is dated September 9th, 1896: “ This season the ice blockade, owing to inshore winds, remained on the coast (i.e., the Labrador coast) all the month of July, preventing hundreds of crafts from reaching their destination and hundreds of others from pursuing their operations, because the ice chilled the water and kept the fish out in the deeper leads, so that it was not till the first week in August that any quantities of fish really began to be taken.”³² From the table in Appendix G to my second paper, it will be seen that at latitude 54° the fish, in favourable seasons, strike the coast on July 15, and from 56° to 53° the date is from July 28th to August 15th. The weight of the argument against Labrador is that, on the first voyage, no mention whatever is made of ice, and, on the second, all the narratives record it as a new phenomenon; for the sailors of those days, accustomed to the eastern Atlantic, had experienced nothing like it before, because the west coast of Europe is kept clear of ice by the Gulf stream. I have referred to Appendix A some farther notes upon the coast of Labrador, and I trust that students of this subject will read them and keep well in mind that the Labrador landfall is supposed by those who support it to have been somewhere between Sandwich bay and Cape Chidley, that is from 53° 30' to 60° north latitude. I invite attention to the fact that the statements here and in Appendix A are quotations, and that those who deny them are contradicting not me, but sailors who are familiar with the coast, and who wrote without reference to this controversy. They wrote from actual knowledge and not with subjective views of what ought to be there to make a suitable landfall.

While it seemed to me that I had demonstrated the impossibility of such a landfall as John Cabot describes having occurred on June 24th on any part of the Labrador coast, Mr. HARRISSE urges, both in his last book, “ John Cabot,” and in his “ Forum ” article, that “ the date of the landfall must be set back into May, or, at least, two or three weeks before June 24th, to allow Cabot the necessary time to get back to Bristol.” He thinks that the crew “ rested awhile and devoted some time to refit or repair their diminutive craft, as well as to take in wood and water and renew the stock of victuals, which could only be done by hunting and salting game on the mainland.”³²

In my paper of 1896 I fell into an error, which Mr. HARRISSE has very properly pointed out. At p. 55 of his “ John Cabot,” in connection

with Soncino's account of the quantity of fish found by Cabot, he says "the spot noted for its amazing quantity is the vicinity of Cape Chudleigh, " which the above details and other reasons seem to indicate as the place " visited by John Cabot in 1497." I too hastily assumed that the visit was the landfall, but Mr. HARRISSE indicated his meaning more indefinitely at p. 110, where he says, "the critic must place the landfall on some point " of the north coast of Labrador, probably between Sandwich bay and " Cape Chudleigh." I did not observe until after my paper was printed that there was in the volume a map showing a landfall at Sandwich bay, and a coasting voyage north to Cape Chidley and a return south along the coast to Newfoundland. I would, however, remark that anywhere from Sandwich bay north, June 24 or July 3 is too early for fish. Greedy harbour is close to Sandwich bay—a little south of it—and there, as pointed out in the Labrador Pilot, quoted *ante* p. 153, "Field ice remains " until about the middle of July, soon after which the fishing fleet are " enabled to sail north," so that if John Cabot could have got there "two " or three weeks before June 24th," which is Mr. HARRISSE's last theory, or even on June 24 or July 3, there would have been no fish, for according to the table given in Appendix G of my paper of 1894, the fish do not strike in at that latitude until about July 15. To suppose the little "Matthew " was plying up and down that coast for game at that season of the year is more difficult than to suppose that by some happy chance she got through the ice at some one point, even near Cape Chidley, and got quickly away again.

It has been pointed out that, in the year 1497, the calendar had not been reformed, and that June 24th was really much later. The exact retardation of the calendar in that year was nine days, and translated into new style it would be July 3rd, but the conditions are very little altered and the objections remain insuperable still. They are not based on a narrow margin of a few days, for an exceptional season might then be supposed to cover the case. The date of the clearing of the ice from the coast north of latitude 53° is much later, as the table of the arrival of the cod will show, and the extracts given here and in Appendix A will substantiate.

After the very full details in my previous papers, and especially in Appendices A and G of the paper of 1896, it is unnecessary to dwell upon the subject longer. And now I would ask the candid reader whether it is probable that John Cabot, having made his landfall on the coast of Atlantic Labrador, and coasted it to Hudson's strait, would have dared to take there the next year a large expedition to settle that country, and with assorted stocks of caps, cloths, laces and miscellaneous goods for the inhabitants³³? A land where there are now no settlers but the Moravian Brethren and the Esquimaux round their missions! I need not inquire why, when the second expedition steered north and went to Labrador,

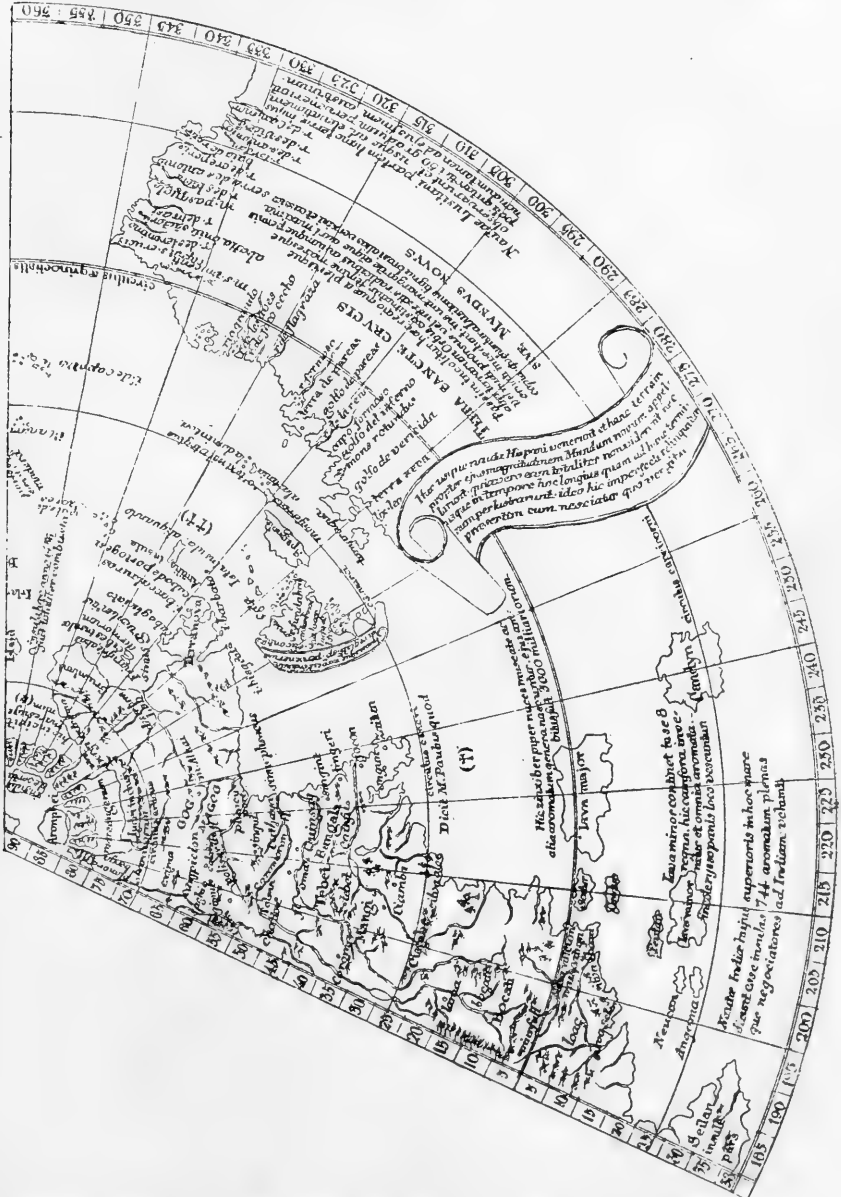
the Cabot family, after its return, fell into the background, and the letters patent were cancelled by the issue of new letters in the year 1501 to others. Yet of this formidable coast John Cabot is supposed to have reported that "it had an excellent climate where silk and dye-woods "grow." I can understand that in Cape Breton in the warm, sunny days of summer (Appendix D) a man might think anything possible in so pleasant a country, but if John Cabot *did* see Northern Labrador and said that about it, Sebastian did not inherit the full power of the paternal mendacity.

8.—The Point of Westward Departure.

It is evident from Soncino's second letter that John Cabot made some northing after he passed the southern point of Ireland, and there is no mention in the papers of group A of how far he went north. Archbishop O'Brien thinks he made only a slight deflection to the north, but does not dwell upon the point, for he recognizes that the course could only be west. Sir Clements Markham supposes he was driven north by stress of weather. It is possible that he went north far enough to get his true course in sailing westerly upon a globe, as is usually done to the present day.³⁴ Markham says, with great reason, "His course is clearly "pointed out by the object of his voyage, which was, like that of Columbus, to reach the territory of the Grand Khan. The course of Columbus was west, and that of John Cabot must also have been west."³⁵ This was also manifestly the opinion of both the Spanish ambassadors. Puebla wrote that "a person like Columbus had come to England to "persuade the king to enter into an undertaking like that of the Indies," and later, when Cabot told them where he had been and the direction he had sailed, they both reported that the land he had found was already in the possession of Spain. The Italian correspondents reported that it was in the territory of the Grand Khan. The latitude of that country was known to Toscanelli and Behaim from the reports of Marco Polo and other travellers. A reference to the map of Toscanelli, *ante* p. 152, will show that Cambaluc, the capital city of the Grand Khan, is in lat. 50°. It is Marco Polo's name for Pekin (which is really in lat. 40°), and Quinsay is laid down in lat. 45°. Columbus sailed south to Gomera to get upon the parallel of Zipango and Mangi, which he gave out he had found, and Cabot, by sailing west from the English channel, would strike the territory near the northern capital of the Grand Khan. These considerations all point to a westerly course. It was not Iceland Cabot promised to King Henry VII. The Bristol merchants knew more about Iceland than Cabot did. It was the land of silks, spices and brazil-wood he promised and thought he too had found.

Obscure though this point may be, we are not left without a guide. The latitude of 53°, which I assumed to be the point of departure, is

supported by evidence nearly contemporary and by a man who made the voyage at that time. In the Ptolemy of 1508 is a supplementary map by John Ruysch. I give here a cut of the western half of this map, for it is a map of the world on a conical projection. It is the first engraved



RUYSCH'S MAP, A.D. 1508. THE PROJECTION IS CONICAL, SO THE MAP MUST BE TURNED TO BRING THE APEX TO THE NORTH—(FROM LELEWEL).

map containing a delineation of any part of the new world. The editor of this edition of Ptolemy was Marcus Beneventanus, who published a commentary with it. Mr. HARRISSE, without whom one cannot do anything in this inquiry, gives the following translation of the part referring to this map³⁶ :

“ Johannes Ruysch, who, in my opinion, is the most competent geographer, and the one who has best depicted the world, and upon whom we rely in this little work, *says he has navigated from the southern part of England to 53° north latitude, and that he has sailed in the latter parallel as far as the eastern coasts.*”

Referring to this, Bishop Howley (p. 20) thinks that 53° is a typographical error, but, as Ruysch, like Cabot, said nothing about going to Greenland, there is no reason to assume the existence of an error. We cannot correct his own statement and send him on so circuitous a route to suit a theory of where he ought to have gone. There was in the crew of the “ Matthew ” a Burgundian, and HARRISSE, DEANE, WINSOR and many others believe that Ruysch was the man. These were my reasons for fixing on 53° N. as the point where Cabot turned west. As before explained, it is not mathematical proof, but it amounts to a very high degree of probability, and, moreover, nothing of so positive a nature can be shown for any other theory.

9.—*Variation of the Compass.*

Capt. Fox, U.S.N., in his careful study of the “ Landfall of Columbus,” invites “ the student to take notice that, notwithstanding the observations in regard to the westerly variation, on the 13th, 17th and 30th of September the admiral did not alter his courses to make true west, but that he held firmly to west by compass.” To this I would add the remarks of another scientific navigator and a life-long sailor on these northern seas — Samuel Champlain. He wrote: “ The early navigators who sailed to parts of New France on the west, thought they would not be more astray in going thither than when going to the Azores, or other places near France, where the variation is almost insensible in navigation, and where the pilots have no other compass than those of France set to northeast, and representing the true meridian there. And so, when sailing continually towards the west and wishing to keep on a certain latitude, they would shape their course straight towards the west by their compass, thinking they were sailing on the parallel they wished to go upon, but continuing on in a straight line and not in a circle, like all parallel lines on the globe. After a long distance, when in the sight of land, they sometimes found themselves three, four or five degrees more southerly than necessary, and thus they were deceived in their latitude and reckoning.”³⁷ These two sailors will answer those who hold either that variation makes no matter,

or that it is about the same now as it was in 1492. The discussion concerning the landfall of Columbus was carried on chiefly by sailors, who knew what an essential condition the variation of the compass is in all nautical questions. It is amazing that any one should consider it to be merely of "academic interest" and "not germane" to the question.

Strange though it may appear, I find myself compelled to explain that by "variation" I mean "declination," and that the two words are synonymous. "Variation" is the nautical word, and is exclusively used on the charts and in the books published by the British Admiralty—it is, therefore, sufficient for my use, and I do not presume to improve upon it. "Dip," as called by mariners, or sometimes by others "inclination," is a very different phenomenon, and we have in this discussion nothing to do with it. It was solely "variation" with which Sebastian Cabot concerned himself, and which he affected to have discovered. That is clearly evident in Legend No. 17 on his map, and is elementary in the literature of the question. The sluggishness of the needle in high latitudes had, as I pointed out in my first paper, been noticed and was recorded on Ruysch's map, but the minds of all the great sailors were intent solely upon discovering a series of magnetic meridians, distinguishable by the variation of the needle, and available as a sure indication of longitude. It was not until 1543 that the phenomenon of "dip" first attracted attention, and in 1547, Affaytato dedicated to Pope Paul III. a little treatise on the newly observed property or "descent" of the needle to the pole. The discovery was afterwards claimed, in 1576, by Robert Norman, who first introduced the "dipping needle," all of which goes to show the erroneousness of statements to the effect that Cabot claimed only to have discovered the dip of the needle, and that by "declination" he meant, or anybody else meant, "dip." That such a statement was ever made is not the least among the eccentricities of this discussion.

It must be evident to those who have given this question long and serious study, with the view solely of arriving as nearly to the truth as the evidence will permit, that the range of magnetic variation on the Atlantic in 1492–1500 must be an important factor in any conclusion as to the course of these voyages. In my first paper I endeavoured to form a reasoned opinion about it, and, as the subject is highly technical, I followed the guidance of the accomplished officers of the U. S. Geodetic Survey, whose calculations I found ready to my hand. As might have been expected, Sir Clements Markham and Mr. HARRISSE recognized at once the relevancy of the principle of my remarks. The former did not think that the variation assumed would carry Cabot clear of Cape Race, and the latter essayed to demonstrate, by mathematical formulæ, the fallacy³³ not only of my reasoning, but, strange to say, of the facts. In calculating the course, Sir Clements started out west at a point farther north, Blacksod bay in lat. 54°; but Mr. HARRISSE adopted a different

method. He took the following sentence from my paper of 1894 as his text: "If Columbus, on a direct western course, dropped 240 miles from Gomeria with a variation of one point west, it is altogether probable that John Cabot, with a variation of a point and a half, would have dropped about 360 miles to the south on his western course across the Atlantic." To that Mr. HARRISSE replies: "Yes, it is probable that then Cabot would have dropped about 360 miles, provided his course had been precisely of the same length as the course of Columbus."

The objection is exceedingly well put, and does not require any mathematical support. The course of Columbus from Gomeria to Watling's island is usually estimated at 3,150 miles, and Mr. HARRISSE has put that figure in his formulæ, but in doing so he vitiated the whole calculation *ab initio*; for it is not the total length of the course which is the prime factor here, but the length of the course which was subject to the disturbing element—to wit, the westerly magnetic variation acting upon and modifying both.

Perhaps I failed in clearness in not saying expressly that my argument was not *a pari* but *a fortiori*; still, on looking again over the paper, that idea seems to pervade it. At p. 59 I contrasted those very differences of condition which my critics urge. In the one case the steady trade wind astern—the smooth seas and the fair weather; and, in the other, the variable winds and heavy seas of what I called "the most storm-tossed region in the world of ocean." I spoke of fogs, and made express mention of the Arctic current, and estimated its average rate correctly, according to the Admiralty Sailing Directions, at one mile an hour, showing that I had taken these conditions of difference into account and that the increment of variation was one only of several influences tending to draw Cabot to the south. The sentence being quoted from the portion of my paper devoted solely to the consideration of variation, hardly expresses the full scope of the argument. It was not intended to be, and could not be, an argument in the least degree amenable to mathematical treatment, and when six hypotheses and two erroneous quantities are put by my critic into mathematical costume and treated by mathematical methods, it is no wonder that the results do not tally with the facts. I am glad, however, to have the opportunity of going over the subject again.

Although the observations of Columbus in 1492 give a firm datum, the argument, in the main, rests upon the uniformity of the laws of nature, by which we are led to assume that in whatever way the magnetic pole and curves of variation are shifting now they were shifting then, in that slow change which is still going on from year to year. It has been said that the subject is obscure, and that we do not know these laws in their full extent. That is quite true, and yet we are constantly acting in recognition of them so far as our knowledge extends. It is fair,

then, to assume that, wherever the magnetic pole of that period may have been situated, the magnetic curves bore, in a general way over large areas, relations to each other similar to those existing at the present time. The variation now, at the admiral's point of observation in 1492, is 20° W., and the variation at Cape Race is 30° W., and it may therefore be fairly argued *a priori* that the relations between the quantities would be the same at that date. We are not, however, shut up to an argument *a priori* alone. We have actual observations extending back for 250 years, and it was on these chiefly that I based my opinion that the average variation in Cabot's time over that part of the Atlantic traversed by him was one point and a half, and some details of these observations were given in my first paper. I then pointed out (at p. 69) that Reinel's chart of A.D. 1505 showed plainly upon it, by its double scale, a variation on the Newfoundland coast of nearly two points. If, in my first paper, I had given Mr. Charles Schott's map of the North Atlantic, drawn to accompany Capt. Fox's paper, this discussion might have been avoided. I give it herewith, and, for the sake of clearness, to avoid wandering over the whole field of terrestrial magnetism, I have eliminated all magnetic lines, saving the line of no magnetic variation of A.D. 1492 to A.D. 1500, the period now in question.

Mr. Schott did not put forth this map as absolutely, but as approximately correct, so far as data existed and the laws of terrestrial magnetism were ascertained. For the purposes of a general argument like mine, an appeal to the uniformity of nature in connection with the relative positions of the magnetic curves of the present day would perhaps have been sufficient; but I am glad here to bring under the attention of the reader the results reached by a scientific officer of high repute in this very difficult field, particularly as it enables me to show with more precision the place where Cabot crossed into westerly variation.

And now, if we examine this map, we will see the course of Columbus from Palos to Gomera. There he got upon the parallel indicated by Toscanelli as that of Zipango and Southern Cathay. From Gomera he started on his western course as marked out by a due west line dotted on the map. That course, near the meridian of longitude 30° W., crosses a curved line extending northeastwards across the ocean. This is the line of no variation (agonic line), and when Columbus crossed it his needles "wested." Farther on, about longitude 40° , he noticed a "westing" of a full point, and there the straight course on the map stops. The erroneous datum which vitiates Mr. HARRISSE'S mathematical formulæ is, that he counts the whole course as 3,150 miles from Gomera; whereas the length should be counted, for the purpose of this argument, from the point where the disturbing influence first began to act.

From the map it will be seen that the agonic line extends to the northeast, as also do all the magnetic curves upon the present charts;

and if this curve be produced, as are the curves of the charts of the present day it will touch the west coast of Ireland. My answer, therefore, to Mr. HARRISSE is that, in measuring the length of the line of divergence south of a due west course, we must commence in the case of Cabot near the coast of Ireland, and in the case of Columbus at a considerable distance west of Gomera; and it must be observed also that it was not until he reached longitude 40° that the admiral noticed a variation of a full point.

Resuming the argument from the uniformity of nature, I would invite attention to the charts of the present day, by which it will appear that a course west from the coast of Ireland cuts the lines of magnetic variation in quick succession, while, farther south, they widen out, so that, in the south, a vessel in the last of its course is sailing on the circumference of a curve and towards a lesser variation, while, at the north, she is sailing constantly towards an increasing variation. This must have been relatively the case also 400 years ago, though to a lesser absolute degree. The amount of variation was less, but the relative variation would have been proportionate.

Returning now to Mr. HARRISSE's mathematical demonstration, it will appear that from his sum total of 3,150 miles³⁹ must be deducted at least 672 miles, leaving a distance of 2,478 miles; but, by the admiral's course, as worked out by Capt. Fox, the distance was only 3,105 miles,⁴⁰ so that at the outside only 2,433 miles were sailed subject to westerly variation. In the case of Cabot, however, sailing on a parallel twenty-three degrees farther north, the line of westerly variation would be crossed close to the coast of Ireland. His whole course on the Atlantic would be subject to this disturbing influence. The distance from that coast, at latitude 53° to Cape Race is not 1,600 but 1,740 miles, as carefully measured on an Admiralty chart, and the admiral's course, subject to westerly variation, was 684 miles longer. Cabot, on a northern parallel, would, of necessity, cross the magnetic meridians in quicker succession, and the proportionate degree of variation would be probably correct, as stated in my first paper. Mr. HARRISSE is quite right in stating that the conditions of the two courses were different, but he is not correct, however, in thinking that my "belief that the landfall actually was at "Cape Breton rests mainly on this supposition." It rests upon cumulative evidence, of which this is but one point. Moreover, it is not right to assume that the compass of Columbus showed any easterly compensation, for the custom was to correct the compass before sailing to the true north of each country, as explained by Champlain in Appendix A of my first paper.

While adhering to the general conclusions of my first paper, and without going over Mr. HARRISSE's calculations, which the measurement on the map demonstrates to be wrong, I would repeat that

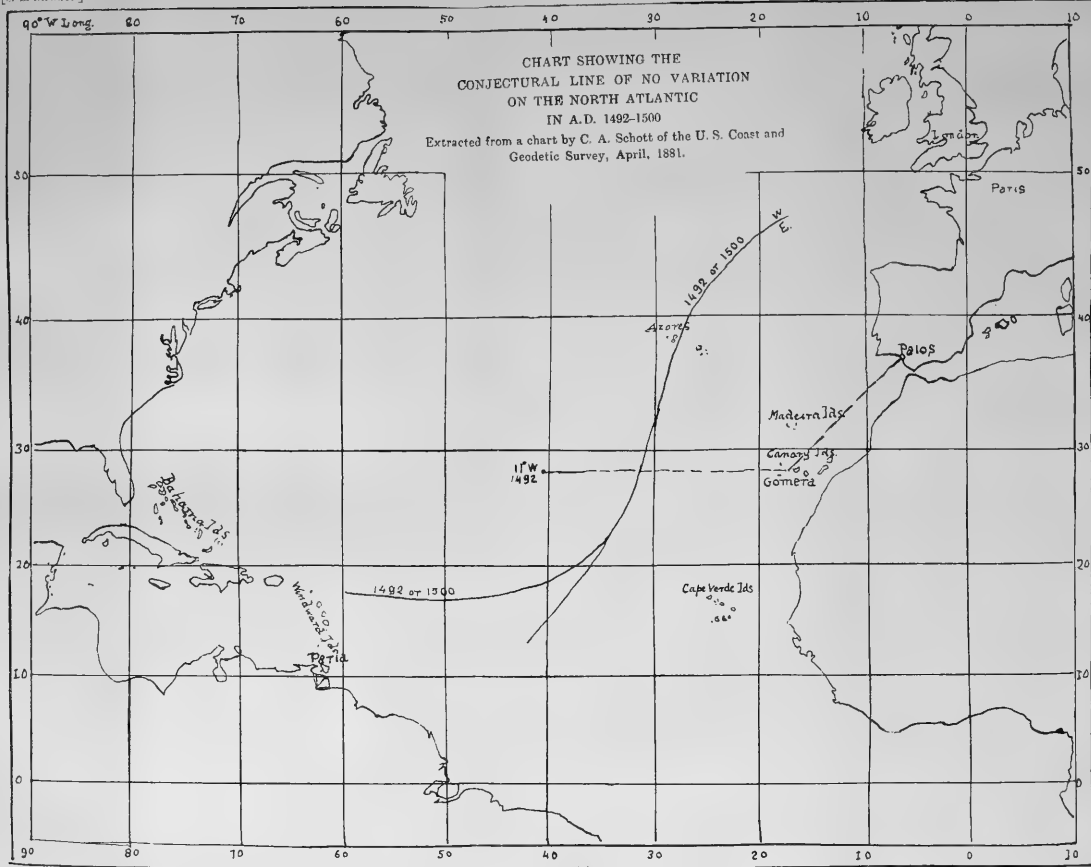


Fig. 3—to face page 113.

mathematical methods are out of place in inquiries such as this in which no solid mathematical datum is available. Mr. HARRISSE has proved by his formulæ that to sail from latitude 53° on the coast of Ireland, and to miss Cape Race, would require an angular deviation of twenty-nine degrees. On the other hand, I have taken an Admiralty chart (as any one may do for himself) and drawn upon it a straight course between the two points, and I find by measurement that an angle of deviation from a true west line of only twelve and three-quarter degrees would have enabled Cabot to clear Cape Race. One point and a half is nearly seventeen degrees, so that my first calculation allowed plenty of room. The voyage of Columbus is not here in dispute, but that he did actually drop south from Gomera to Watling's island is ascertainable by the latitudes on the map, and the amount of westerly variation experienced is proved by his own recorded observations. It necessarily differed at different points, but the average quantity was probably one point as stated; and now that, in order to explain my meaning, I have drawn a course on the map, I hope that no one will waste his time to point out the absurdity of any one supposing that Cabot sailed on a straight line to graze Cape Race. We may all be sure that his real course was a devious one. We may also be sure that in sailing west he did his best to follow his compass, and if by head winds he was forced to make long stretches to the north or south, that he always returned to his compass course—more essential to him, if there could be degrees in necessity, than to Columbus, because he passed through a wide extent of fog-infested ocean. All the natural forces still dominant upon the ocean—the currents and the magnetic variation then existed and were tending to make his course swerve southwards. These other physical causes will be considered elsewhere.

10.—*The World Map of Juan de La Cosa.*

On reference to my preceding papers it will clearly appear that the central point of my argument is La Cosa's map. Who he was, and what the map is, has been told in the previous papers at wearisome length. Mr. PROWSE, junior,⁴ with a true appreciation of its importance, attacked the date of the map. Bishop HOWLEY, in his long argument, scarcely mentions it, and Judge PROWSE calls it "a rude sketch," "the most archaic production that can be imagined, without a single name on it which is not conjured out of the old Spanish pilot's inventive brain," "forgetting that, at page 13 of his "History," he had called La Cosa "a distinguished Biscayan navigator and geographer." Archbishop O'BRIEN speaks of the map as the "offspring of Cosa's imagination," and selecting a part of it, turns it up at right angles and sets it as he thinks that part should have been drawn. Those who know the map best admit that it "is not

“ drawn to scale, nor in strict conformity with modern maps as to figure.” It is an imperfect map, because the materials are imperfect, for it is the very earliest existing map upon which any part of the new world is shown, and it was made only eight years after the discovery of the West Indies by Columbus, and three years after the first voyage of Cabot. There is no east coast of Asia on the map; for the coast we now know as America is taken as the east coast of Asia, as will appear on inspection of the map attached to this paper. Winsor remarks that the drafts of John Cabot “ were doubtless used by Juan de La Cosa in delineating the “ Asiatic coast in the map of A.D. 1500, now preserved in the Archives “ of the Marine of Madrid.”⁴³ Those who use it for measurements, as a modern map, must fall into error, for modern maps are based on scientific surveys; and those who see only an extract from it must fail to understand it, because they do not see the extract in relation to the rest of the map. It is a map of the whole world, drawn on a plane, before Mercator's projection was invented, and, therefore, from the very necessity of the projection the east and west lines at the north must be enormously exaggerated. Any one will see that who will peel an orange and lay out one hemisphere of the skin on a plane surface. It was the glory of Mercator sixty years later to have invented a method of compensation by which true distances and courses on the sea may be ascertained, although it is still by enormously exaggerating the land areas at the north.

La Cosa got his information where he could, from all existing maps, and from the charts of the Portuguese who, only three years before (in 1497), had doubled the Cape of Good Hope and sailed their ships in eastern seas. The original is in colours, and the continental areas are, after the manner of that age, filled with kings and queens and towered cities. It is full of legendary and biblical lore—the three Kings of the East, the Queen of Sheba, the Great Khan of Tartary, Gog and Magog, are there, together with men whose heads are set flat down on their shoulders, and many other traditional monsters. To reproduce these in colour would cost too much, and would not assist in this controversy. Defective as the map is, it is distinctly superior to the maps made for many years after. It is fairly drawn, for France, Spain, Italy, the Levant and the Black sea and Sea of Azof; the Mediterranean and Atlantic coasts of Africa are fairly well done, but Denmark, the Baltic sea and the Scandinavian countries are very imperfect and far out of correct proportion. In the east, Hindostan is scarcely indicated; while Ceylon is enormously exaggerated and distorted; Zanzibar and Madagascar are far out of position in the eastern ocean, and the former island is immensely too large. These islands had at that time been visited by the Portuguese, while only the Cabots had reached the northern part of America. A glance at the map will show how impossible it would be to apply measurements to the distorted delineations of the northern countries of Europe,

known though they had been for hundreds of years, or to the countries of southern Asia just opened up by the Portuguese. If the total length of England and Scotland be compared on La Cosa's map with that of France or Spain on a north and south line, they will be found to be the same, but a glance at a modern map will show that while France and Spain each extend through seven degrees of latitude, Great Britain extends through ten. And, again, we know the length of Cuba to be 720 miles, and the distance from Gibraltar point in Spain to the Bay of Biscay to be 510 miles, but they are the same length on La Cosa's map. If La Cosa knew Cuba, he knew Spain better. Even our own plane maps will mislead unless the principles of their construction are carefully considered. New York, on a Mercator chart, is exactly half way between Cape Race and Havana, but the real distances differ by more than two hundred miles. In a previous part of this paper the distance from Cape Farewell to Cape St. John was given at 715 miles, but measured on a modern chart with a scale it is very nearly the same as from Cape Race to New York, 1,025 miles; or from New York to Havana, 1,230 miles. In like manner the west coast of Newfoundland is 316 miles long, but on the chart Cape Breton and Nova Scotia together appear by the scale to be the same length, though the true distance is 376 miles. In modern maps the northern regions are unduly expanded in definite proportions well known to students, but before Mercator's method came into use, the longitudes were expanded out of proportion to the latitudes. Moreover it must be observed that the basis upon which Archbishop O'Brien's theory rests is arbitrary in all its extent. He states that the Spaniards knew well, not only the latitude, but the length and breadth of Cuba. The fact, however, is that the Spaniards at that time did not know any one of these things. Upon the very map itself is the proof; for the latitude of Cuba is from six to eight degrees too far north. He has not observed that Cuba and Hispaniola are drawn entirely north of the Tropic of Cancer, whereas they are entirely south of it. Not only on La Cosa's map, but on all the maps down to 1520, Cuba is drawn north of the tropic. It is so drawn on the Canerio map (1502), the Ruysch (1508), the Ptolemy (1511), the Peter Martyr (1511), the Ptolemy (1513), the Reisch (1515), the Schoner (1520), and on many of later date. The reason is not far to seek, but it lies in those studies which the archbishop considers to be not germane to the subject. On any modern map the tropic just grazes Havana, the northernmost point of the whole group of the larger Antilles. Then the Spaniards did not know the length of Cuba, for it is shown on La Cosa's map as no longer than Hispaniola, whereas Cuba is nearly twice as long as Hayti. That they did not know the breadth of Cuba is evident by inspection and comparison with a modern map, for the island is out of shape and proportion. Moreover, the uncertainty existing then about the dimensions of Cuba is

evident from the fact that Columbus to the day of his death, five years later than the date of this map, insisted that Cuba was a part of the mainland.

And yet, after all, there is a method as to latitude on this map. The Equator and the Tropic of Cancer are given, and between them are 23° 28' of latitude; so if we take Cavo de Ynglaterra to be Cape Race, we

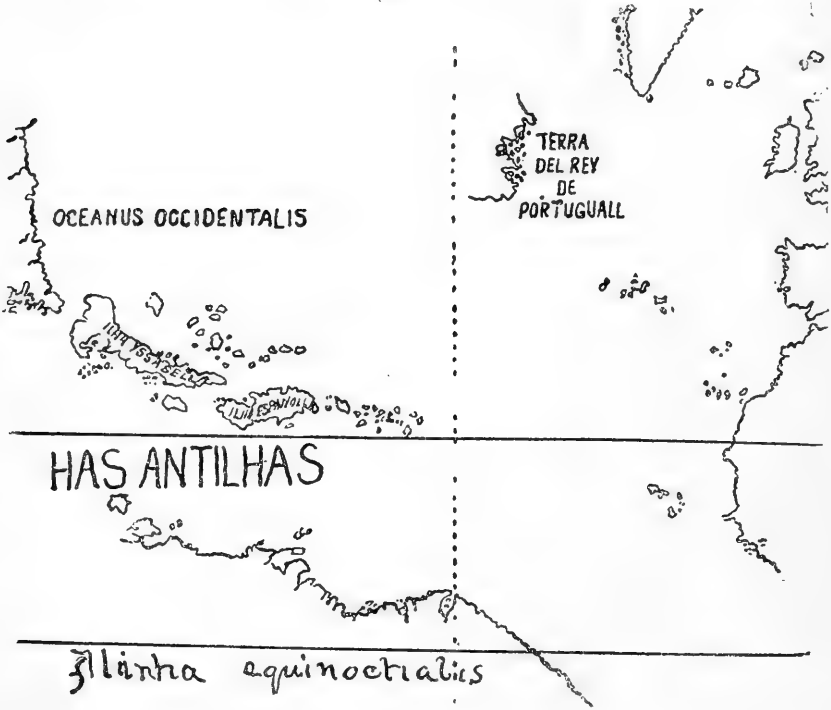


FIG. 4.—THE CANTINO MAP, 1501-2, SHOWING THE GREATER ANTILLES NORTH OF THE TROPIC AND THE ELONGATION OF NEWFOUNDLAND TO THE EAST.

shall find it to be in 54° 30', about the same distance too high as Cuba is too high. A similar result will appear if we measure from the rhumb-line running due west parallel to the tropic from the windrose in the Strait of Gibraltar, so that the whole of the North American side of the map, from the Antilles to Cape Race, is thrown up in latitude, and, proportionately to the West Indies, Cavo de Ynglaterra is very nearly in its proper latitude—not exactly but nearly, within one or two degrees—near enough to identify it; for if there be one thing in this discussion which seems irrational to a student of cartography, it is to take these early charts and measure them as if they were the result of a scientific admiralty survey.

So much for latitudes; but it is far different as to longitudes, and for two very sufficient reasons: First, because there was absolutely no

method known of computing longitude; and, second, because of the immense difficulty of representing a globe on a plane surface. We read our Mercator maps and are not misled, because we are accustomed to them, and most people know they are true only as to the sea courses, but show enormous distortions of the continental masses at the north, for a degree of longitude at the pole, where it vanishes to nothing, appears as wide as it is at the Equator. In reading these old maps we must take into account not only the projection and the magnetic variation, but also the impossibility of ascertaining longitude.

Returning, however, to La Cosa's map, I would remark that if countries so well known as England and Scotland, the Scandinavian

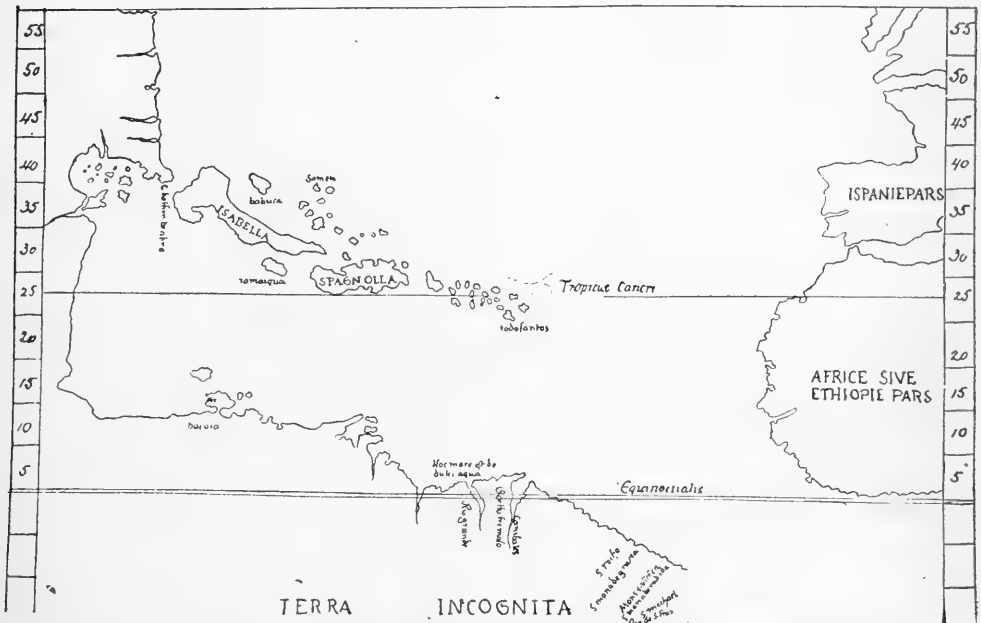


FIG. 5.—THE (SO CALLED) ADMIRAL'S MAP IN THE STRASBURG PTOLEMY (WALDSEEMULLER'S) OF 1513, SHOWING THE LATITUDES OF THE ANTILLES NORTH OF THE TROPIC.

peninsula and Denmark will not admit of measurement by a scale, how unreasonable it is to apply the strict rules of a modern map to the coasts of America drawn eastwards by errors of 25° in longitude, for it will be seen that the Cavo de Ynglaterra is drawn eastwards almost to the Azores. The same elongation is shown on the coast of South America, which is cut by a meridional line drawn east of the Azores. Yet La Cosa was chief pilot with Hojeda, in the expedition of 1499, which discovered an extensive part of the coast of South America; and, fresh from sailing along the coast, immediately after his return to Spain, he drew this map,

so that the South American portion was drawn from his own personal knowledge. No one was better equipped for such a task, for John Fiske, quoting Las Casas, says he was the best pilot of his day, and that his reputation as a cartographer was also high, and his maps were much admired." This exaggeration of the east and west coast lines appears on all plane charts of that period. What data susceptible of even approximately scientific comparison could have been ascertained in these early coasting voyages with the rough instruments then in use? If, therefore, any one takes these early maps and measures along the coasts and finds the distances correspond to the recent accurate scientific surveys of the admiralty charts, he will have overproved his case, and the more exact the coincidences appear the more likely it will be that they are imaginative. The geography of these coasts, as of all others, very slowly attained its present accuracy. These early maps must be taken chiefly for their general direction, because the compass was the mainstay of the old sailors, and La Cosa's map can no more be held to conform to measurements than can the Cantino, the Canerio, the Ruysch, the Sylvanus, or any other of the earlier maps of America. I cannot express my meaning better than by using the words of Mr. John Fiske. He says: "The discovery of America was not such a simple and instantaneous affair as is often tacitly assumed."⁴⁵ And again: "In geographical discussion the tendency to overlook the fact that Columbus and his immediate successors did not sail with the latest edition of Black's General Atlas in their cabins is almost inveterate; it keeps revealing itself in all sorts of queer statements, and probably there is no cure for it except in familiarity with the long series of perplexed and struggling maps made in the sixteenth century. Properly regarded, the discovery of America was not a single event but a very gradual process."⁴⁶ So Bunbury, in his *History of Ancient Geography*, likewise observes: "Not only is geography in its very nature a progressive science, but the slightest attention to its history in mediæval or modern times will show that the steps of its progress are often vacillating and uncertain." A more extended survey of the maps of the period would have prevented any one from taking the flags on La Cosa's map so seriously as to suppose that they were intended to represent real flags, planted at regular intervals by Cabot along the coast, and that a search by officers of the Geological Survey could ever result in discovering along the shore holes drilled in the rocks, or piles of stones, reared to support the flagstaffs.

The coast line I have taken as the south coast of Newfoundland is repeated in Ruysch's⁴⁷ map of the world, published with the Ptolemy of 1508, and there also it is portrayed as the east coast of Asia, because the River Polisacus is shown. An extract from this map is given (p. 157) showing the western half. The extract from the Cantino map (fig. 4) shows Cortereal's discoveries on the east coast of Newfoundland. On

the east coast of Greenland is a legend, which cannot be shown on the small sketch, stating that it (Cape Farewell) is taken to be the extremity of Asia. That was the opinion current at that time.

It is admitted by all authorities that the outline of the northeast coast of America is based on John Cabot's map. That Ayala sent a map of John Cabot's first voyage to the King of Spain is on record, and he sent it before the return of the second expedition. Some have thought that the results of the second voyage also appear, but, while that may be true, it is an assumption which has not the support of a document on record. The insertion of names shows that La Cosa had before him an authentic chart of that portion only of the coast he has placed names upon. The extension of the nameless coast north and south may, as some high authorities have supposed, have been borrowed from previous maps of Asia, or from a general report of the second voyage of Cabot. If he had had a chart of the second voyage he would have copied the names. In any case the second voyage did not reach farther south than 35° to 38° , according to the existing records, and beyond that the coast line must be conjectural. When it is asserted that La Cosa had procured a map of the second voyage more correct than the first, it is assuming something for which not the least shadow of proof can be adduced.

The cardinal point of the controversy is the *Cavo de Ynglaterra*. If it be Cape Race, then, of necessity, the named coast line is the south coast of Newfoundland, and the last name of the series, *Cavo Descubierto*, is a point by compass west from Cape Race. Cabot's discoveries are laid down as west from Bristol, and Columbus's discoveries are west from Gomerá—west from the point of departure of each; while their true direction is south of west by very nearly the angle of the course by their compasses. It is significant that the *Cavo de Ynglaterra* is laid down on the same parallel as Bristol—exactly west of it, and it is too far north of its true latitude by the same distance that Cuba and the West India islands are too far north of theirs. This need not interfere with its identification as Cape Race, because in Reinell's map of 1505, *C. Raso* is $50^{\circ} 30'$ by the perpendicular scale, and in the great mappemonde of Henry II., A.D. 1546, showing Cartier's discoveries, it was also placed at $50^{\circ} 30'$, though its real latitude is $46^{\circ} 39'$, or about four degrees farther south. That the longitude is far out need not be wondered at, for the sailors of those days had no means of ascertaining longitude save by dead reckoning. Nordenskiöld informs us that "longitude could only be got in exceptional circumstances,"⁴⁸ and Humboldt says: "The direction is more important than the estimation of distances, for, as before stated, in the voyages of those days they exaggerated the distances."⁴⁹ This map of La Cosa's must not be taken separately from the series of maps of the period, and the disproportion of the longitude upon it is not more than on the other early maps.

It is just here where the archbishop's argument is the weakest. He has not taken into consideration the whole series of maps nor the fact that even the Mediterranean sea—the centre of the ancient and mediæval world, not only on La Cosa's but on all maps, was twenty degrees astray in longitude. Commenting on this, Kohl says: ⁵⁰ "It is well known that the great father of geography, Ptolemy of Alexandria, committed the extraordinary error of assigning to the Mediterranean sea a length of not less than sixty-two degrees of longitude, which was upwards of twenty degrees too much. This amazing mistake affected all our maps of the Mediterranean, more or less, until the beginning of the last century. . . . In this instance the contest between truth and error lasted more than 1,500 years, until, at length, the French geographer, Delille, gave to the sea its true limit."

But while all these maps present difficulties of their own, they must be taken as they are or rejected in their entirety, and here would seem to be the fatal error of Archbishop O'Brien's method. He cuts the Gordian knot heroically. To use his own words: "We say at once that Cosa, having received a copy of Cabot's chart, joined it to his own, making it run east and west instead of north and south. . . . He did not tamper with its scale or reduce its proportion." That is, La Cosa took Cabot's supposed chart of the second voyage and simply stuck it on to his own, only turning it round the wrong way! This is surely the quintessence of hypothetical geography.

It is not possible in serious inquiries to detach a part of the coast line of a map and radically alter its direction without striking at the very foundation of all geographical studies. What these pilots did know was their compass course, and to suppose that a man of the experience of Juan de La Cosa could mistake a course of north and south for a course of east and west is practically to pronounce as incompetent and ignorant one of the three foremost seamen of his age. This would be a very daring thing to do in any case; but here is a man whom Humboldt calls "that great sailor," "that skilful pilot;" whom Peter Martyr lauds for "his great ability in constructing marine charts;" whom Las Casas asserts to be the "best pilot who could be found for the seas of the Western Indies;" and he is charged, four hundred years after the event, with a blunder, undiscovered until now, too gross to be made in an elementary class in geography, and this in a map which was made for the King of Spain, and supposed to have been hung up in the office of Fonseca, the Spanish minister of marine. All these old charts had wind-roses to show directions and lines of compass-bearing run across them. This map of La Cosa is oriented by the great wind-rose south of the east and west coast line, by the equinoctial line and the Tropic of Cancer, and by the meridional line through the Azores. If we are permitted to take it to pieces and wheel up a portion of its coast line at an angle of 90 degrees,

all documents may be redrawn to suit the theories of any writer. Such heroic treatment is, in effect, making the documents to suit the theory, not the theory to suit the documents. If we are not to take documents, such as maps, in a series, and use one to throw light on the other—use them to show the gradual development of the contour lines of a coast and the gradual evolution of the correct cartography of lands gradually discovered—then there can be no such thing as scientific geo-



FIG. 6.—CANTINO MAP, 1501-2.



FIG. 7.—CANERIO MAP, 1502.



FIG. 8.—KING MAP, 1502.



FIG. 9.—RUYSCHE MAP, 1503.

graphy, and theorizing will take the place of patient investigation of truth. Such a line of procedure is opposed to the entire course of modern methods of investigation, and is without a precedent in the history of cartographical research. In reasoning, the true course is from the premises to the conclusion; but this is from the conclusion to the premises and the whole character of the map is changed and its unity is broken. If the Cavo de Ynglaterra be Cape Chidley, the whole of Hudson's bay and strait is opened up one hundred and ten years before Henry

Hudson, and the map would stand alone—the first map to show America, and containing features of enormous importance to be straightway forgotten for over a hundred years. It will stand out distinct from the whole series of maps, nor, even then, will its contour be brought into harmony with modern maps, for the coast of Atlantic Labrador runs to the northwest and not due north.

Returning, however to the line of my argument, and to show that Cavo de Ynglaterra is really no other than Cape Race, I give on the preceding page the outlines of the corresponding headlands on the maps next succeeding in date until the cape is permanently named.

It will be seen at once that from the very first this cape—the most striking feature on the northeast coast—was recognized as the key-point of the geography of the western continent. There is no headland to compare with it in its commanding position. It is the nearest point to England, and might well be called Cape of England, or Cape of Portugal, according to the nationality of the namer. In the Cantino map, 1501-2, there are no names on the coast, but the headland is there. The same may be said of the Canerio map. In the King chart, 1502, it is named C. Raso. In Ruysch's map, 1508, it is called C. de Portogesi. After that, upon every map, the name is Cape Raso—there was never any change.

Sir Clements Markham, in his paper before the Royal Geographical Society, identifies it as Cape Race; Kohl had done so previously; Judge Prowse points out that the name still survives on the coast. He says: "In 1500 we have unmistakable evidence, from Spanish sources, of English discoveries in the map of Juan de La Cosa. Cape Race, or possibly Cape English, in St. Mary's bay, is represented by Cavo de Ynglaterra (English cape)." ⁵¹ The judge was not then entangled in controversy, but he now drops all notice of the map, excepting to say that La Cosa was an old pilot who invented all the names, and that none of the names he gave exist on the coast. Cape English is a precipitous bluff, forming the eastern headland of St. Mary's bay, on the south coast of Newfoundland, thirty miles west of Cape Race.⁵² Humboldt took the Cavo de Ynglaterra to be some cape near Belle Isle, and supposed that the coast with flags was the Canadian Labrador inside the strait, and the long shore of the north side of the Gulf and River St. Lawrence. He never thought of altering its direction, for that, he says, is the one thing to be observed in studying these old maps.

I can only join with Kohl in wonder at a theory which opens up the Gulf of St. Lawrence and still leaves it to be discovered by Cartier thirty-five years later; which suppresses the whole south side formed by the peninsula of Gaspé and the provinces of Nova Scotia and New Brunswick, and puts the north shore of the estuary of the St. Lawrence *vis-à-vis* to Cuba across an open ocean. The opinion will not, I think, be shared by

many who know the gulf. They will recognize at once that all the Maritime provinces of the Dominion are effaced by it, and the whole Gulf of St. Lawrence (inclosed from the ocean and entered by three straits, Belle Isle, Cabot and Canso) is thrown open, ceases to be a gulf, and its northern shore, for it will have no southern one, lies open to the coast of South America over a stretch of unbroken ocean.

The theory of the presidential address is indeed original. It not only opens up Hudson's bay, but it sweeps away all the eastern part of the Dominion, for it draws a straight north line from Cape Henry, in Virginia, to Cape Chidley. Let any one draw such a line. It will be seen to pass through Quebec and cut away Newfoundland, Nova Scotia, New Brunswick, Eastern Quebec and all the New England States, and expose a north and south line to the Atlantic ocean. Humboldt's line is at right angles to this. This theory supposes a periplus of the gulf; but no gulf is left to make a periplus in, for wheeling up the coast line does not make a gulf there. The gulf began first to exist on the map of Viegas, in 1534, as is evident by the whole series of maps shown in my former papers. The hypothesis fails also to comply with the requirements of the liturgical method, for Cabot could not have discovered the *Cavo Descubierta* on June 24, and the *Cavo de S. Jorge* on April 23. He did not leave Bristol until May. Again, the *Cavo de S. Luzia* is put down as Cape Freels on the east coast of Newfoundland, and *S. Luzia* as Cape St. Michael on Northern Labrador, while there is only one St. Lucy, and her day is December 13. Then, St. Nicholas cannot be any other than the benign Bishop of Myra—the ever-ready helper of all sailors and merchants. The fort of St. Nicholas, on the Lido, guarded then, as now, the approach to Venice from the sea, and the Abbey and Church of St. Nicholas figure largely in Venetian history. Besides, he was the patron saint of seaports, and had been for a thousand years before 1446, when St. Nicholas of Tolentino was canonized. Then, at Bristol, a church of much resort was dedicated to him. The original foundation was in the time of Canute, and the parish still exists. The festival of this St. Nicholas was on December 6, as it is still. I do not know anything about the festivals of the ordination of St. Gregory, or of St. John of Nicomedia, but the dates of the festivals of St. Lucy, St. Nicholas and St. George are sufficient to show how insecure a theory founded upon the calendar may be. It seems, moreover, improbable that sailors would name a coast after festivals not in the Breviary, and known only to those specially instructed in such subjects.

The archbishop's "final proof" is in the very remarkable etymologies of the names on La Cosa's map. The descriptions supposed to have accompanied the hypothetical map of Cabot's second voyage, which La Cosa is supposed to have grafted upon his work, were packed into single words compounded from the resources of several languages. I shall not go

over the words themselves, but would merely remark that the procedure is based on another hypothesis. The archbishop says that "Cosa was a classic scholar imbued with the epigrammatic spirit of the age. He was learned in the classicism of the Renaissance, and condensed a description into a compound word, adapting Spanish or Latin terms." Everything known of La Cosa points the other way. No record of his birth or baptism can be found, and although it is generally thought that he was born at Santoña, it is not proved. It is proved, however, that he belonged to a family of sailors, and that the greater part of his youth was spent at sea. He had been sailing and trading to Flanders when Columbus chartered his vessel, and himself with it, to go on his first voyage. No indication of his classical studies exists, but his consummate skill as a seaman is the theme of many Spanish authors, and his capacity as a geographer is evidenced by the fact that he was master chart-maker to Columbus, who became jealous of La Cosa's reputation. It will be necessary to cite some authority for La Cosa's classical attainments before discussing his etymologies. History shows that he was an accomplished navigator and a skilful cartographer, while this hypothesis assumes that he was an accomplished epigrammatist and a classical scholar, but so ignorant a sailor and cartographer as to mistake north and south for east and west.

11.—*The Bonavista Landfall.*

At the time of the meeting of the Royal Society at Halifax, I had received a report, in an English newspaper, of the paper read by Sir Clements Markham before the Royal Geographical Society. It was a very full report, but since that time the Journal of the society for June has been published, containing an authentic copy of the paper. Judge Prowse informs us that "Sir Clements Markham has seen the error of his ways, and, in his recently carefully prepared address, goes out of his way to refute the absurd Cape Breton theory."⁵³ And, again, he says Sir Clements Markham "made a complete recantation of his erroneous views," adding that "I [Judge Prowse] took infinite pains to bring him round to the Newfoundland side." It is remarkable that an "absurd theory" which, the judge adds, "no sensible man would believe,"⁵⁴ should have been advocated for so many years by a man of Sir Clements Markham's attainments, and that it should have required "infinite pains" to remove it. Again, the judge informs us that he has, in the Marquess of Dufferin, another illustrious convert. Whatever Lord Dufferin may have written in the unpublished letter referred to, is not open to discussion. He wrote in Scribner's Magazine, depending upon Judge Prowse's "History" for the existence of an "immemorial tradition." In his address at the inauguration of the Cabot tower in Bristol, Lord Dufferin spoke of "the Cape of Bonavista, or whatever point on the

“coast of Newfoundland, Labrador or Cape Breton, the learned may determine to be his landfall;”⁵⁵ a sentence, in its non-committal pregnancy, worthy of a diplomatist of his lordship’s great experience. He was evidently not anxious to be the subject of “infinite pains” from anybody.

A careful perusal of Sir Clements Markham’s paper does not, however, confirm the “recantation” represented by Judge Prowse. The paper is easily accessible, and I may spare the space of long extracts by a brief summary of those conclusions which bear on this special question. Sir Clements gives his opinion that Cabot set out to go west; that, owing to bad weather, he at first made nothing, being driven probably as far out of his projected course as Blacksod bay in lat. 54°; that the magnetic variation existing then would probably bring him on a westerly course to Bonavista, which, if Soncino’s evidence alone be taken, was his landfall; that there is nothing impossible about a landfall at Cape Breton; that the drift may have taken him there, although it was unlikely at that time of the year; that a chart by John Cabot of his first voyage was sent to the king of Spain; that it was incorporated in La Cosa’s map; that *Cavo de Ynglaterra* is Cape Race; that the coast with names, to the west, is the south coast of Newfoundland; that *Cavo Descubierta* is Cape Breton. He sums up his opinion that if the map of 1544 is rejected, the landfall will be at Bonavista.

Everything Sir Clements Markham says must be taken in the most serious manner. Two conditions must be noted in this very restrained recantation, viz., the testimony of Soncino must be taken alone, and the map attributed to Sebastian Cabot must be rejected. He does not categorically decide to adopt this course, and thus leaves the field open to those who take into account the whole evidence and accept the map of 1544 either in whole or in part. So far, then, the judge’s illustrious converts leave the question open to an unlimited liberty of philosophising, and I return untrammelled to the subject of Bonavista.

Judge Prowse, who, as has been shown, is the only witness, “contra mundum,” for Bonavista, puts his argument thus: “My argument is founded on the name Bonavista—it is distinctly Italian. In Spanish it would be Buena Vista, in Portuguese Boavista.”⁵⁵ He does not add that in Italian it would be Buonavista, and that it is actually Boavista on the first map where the name is found. The fact is that Bonavista is an unchanged Portuguese word. The nasal sound, though omitted in spelling, is sounded in the pronunciation. It is the name of the easternmost island of the Cape de Verde group, belonging to Portugal, and another of the same group is called Fogo. So, in Newfoundland, one headland of the same bay is Bonavista and the other Fogo—names given by the Portuguese after their own home islands. All this argument about Boavista is the result of not considering that in Portuguese the nasal sound is not

written—thus, Joao, Joha, is Joam or Johan; capitao is capitano, and Lisboa is Lisbon. In like manner, the name of the poet Camöens is written Camões, and Don Sebastian is Dom Sebastiao.

In my second paper (p. 6) I said that the name "Bonavista does not appear on any map until Gaspar Viegas's, in 1534; that, is for thirty-seven years after Cabot's discovery." For this Judge Prowse takes me to task. He says, "The Majollo map (A. D. 1527) contains Bonavista;"⁵⁷ and again, "Dr. S. E. Dawson is quite astray in his statement that Bonavista does not appear on any earlier map than 1534. It appears on probably the most important of the earlier charts, the Majollo map."⁵⁸ I would refer Judge Prowse to his own "History" (at page 31), where, in the chronological summary at the head of Chapter III., is the entry, under date A. D. 1534, "Gaspar Viegas's map shows Bonavista for the first time on our coast."

Bishop Howley is equally precise. He says, in the Magazine of American History: "We have as early as 1527, on Majollo's map, the beautiful name *Buonavista*, which is found on all the earliest maps, and survives to-day in Newfoundland as the bay, the cape and the settlement of Bonavista;"⁵⁹ and again, in his printed lecture (p. 35), he says the name is "on all the earlier maps." I am sure the bishop thinks so, for in his paper on Jacques Cartier's voyages⁶⁰ he gives a tracing (see fig. 10) of



FIG. 10.

From vol. xii., Trans. R. S. C.,
Sec. II., p. 176.

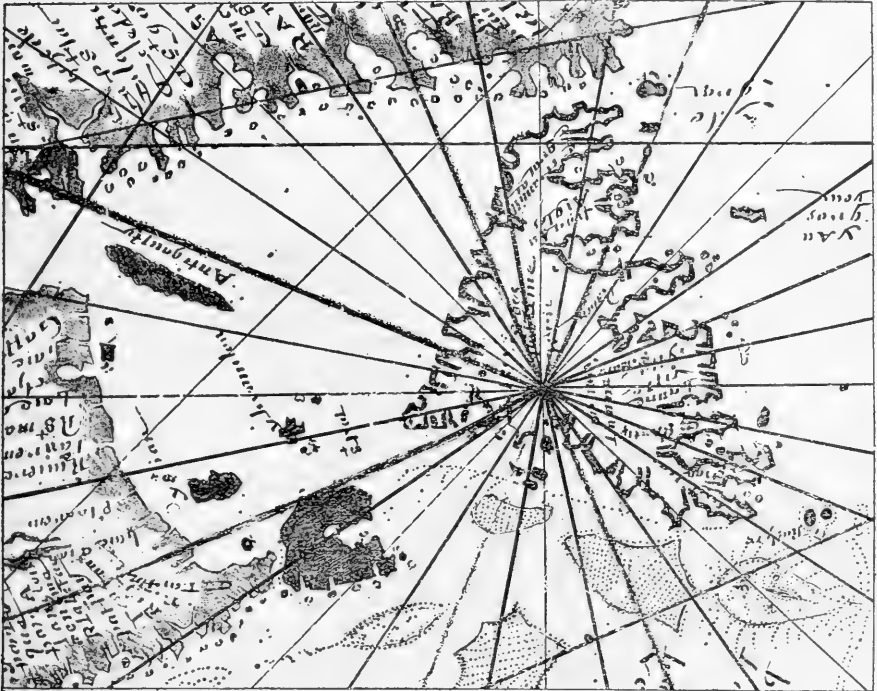
the Majollo map (p. 176), on which C. Bonavista appears. In my paper, at page 76 of the same volume, I gave a tracing of the same map. My tracing was from Kretschmer, and the name Bonavista is not on it because it is not in Kretschmer. Other facsimile copies of this map may be found in Winsor, "Narrative and Critical History," vol. iv., p. 38, and in HARRISSE, "Discovery of America," p. 216. Bonavista is not found on any of them. A close inspection of fig. 11 will show the words "ben posta," and it will be found also thus on Kretschmer's, Winsor's and HARRISSE's facsimiles, but C. Bonavista will not be found. We may now be informed that "ben posta" means Bonavista, and that it is "absurd," "ridiculous," "senseless" or anything else of a similar objectionable nature to think differently. I did not recognize it, inasmuch as

"ben posta" made sufficient sense; and evidently Judge Prowse did not, or he would not have made such a statement in his "History." It is always better to put the names as they are written, and explain why they should be altered. Nor can the name Bonavista be ascribed to Cortereal,

While on the subject of this map, I would remark that Bishop Howley uses it to support another argument in his lecture. At p. 21 he quotes Soncino thus: "At 400 leagues he (Cabot) found *terra firma*;" and adds: "Now, on the map of Majollo (1527), Cape Farewell, in Greenland, is quite distinctly given, as is named, *Terra Firma*." It is given in the bishop's sketch (fig. 10), although not in the atlas of Kretschmer, but I find in Winsor's and Harrisse's facsimiles, not *Terra Firma* (for the land is named Lavoradore), but *Ille Firme*,⁶¹ referring to the islands on the coast. That argument, therefore, falls to the ground.

The claim of Bonavista rests almost solely upon a map attributed to John Mason, governor of Newfoundland, first published in Vaughan's "Golden Fleece," in 1625. Under the name Bonavista is printed a *Caboto primum reperta*, and this is taken as proof that Bonavista was the landfall. The first serious attempt at a colony had been made in 1610, and Vaughan's "Golden Fleece" was published as a description of the island to induce settlement. Any special authority resulting from Mason's name is, however, removed by a note at p. 106 of Judge Prowse's "History." He says: "A close examination of this map shows that it was not constructed by Mason, all its features being traceable in much older maps; the only contribution of Mason's being the great lake or sea (Fortune bay), which he probably saw from some hill in Placentia bay on one of his exploring expeditions. The map probably belongs to the Anglo-Dutch group, and is mainly of French origin." It is difficult to see what importance a map published 128 years after the event in dispute can have as evidence of an "immemorial tradition." It is proof merely of the existence of an opinion in 1625. The same remark applies to the only new contribution to the evidence for Bonavista that this discussion has elicited—the Dupont map. Judge Prowse calls him "the celebrated explorer and geographer,"⁶² and adds that his map was "published in 1625," but was "prepared much earlier." Later, however, he says that it is dated in 1625, and is in the Dépôt de Cartes of the Ministry of Marine, and that while the names on the map are in black ink, Bonne Viste is in red, and opposite are the words *prima invena*, also in red ink. There is a fair presumption that one refers to the other. Dupont was a cartographer of Dieppe, A. D. 1625-1634. Mr. Harrisse mentions his name once in a foot-note at p. 216 of his *Jean et Sébastien Cabot*, and it is found in Lelewel and in the list of a great collection of maps exhibited at Paris. He was not an explorer, but one of a school of cartographers at Dieppe. The map is in manuscript, and was never published, and it is a map of the Atlantic ocean, on parchment, in two pieces. It is inscribed "*par Jean Du Pont de Diepe, 1625,*" and dedicated "*à Monsieur le Président de Lozon, 1625.*" No mention of Cabot is upon the map, but the words *prima inven(t)a* are presumed to refer to his discovery of Bonavista. An extract from this map is given (fig. 12), and it will be seen to

be inferior to the published maps of the same period, *e.g.*, Mason's and Champlain's; but is interesting from never having appeared before in this discussion. The names are very difficult to read. *Prima inuenta* is in the centre of the island, and is much obscured by the lines of compass bearings.



* FIG. 12.—DU PONT'S MAP, A. D. 1625.

There are two other identifications—one is that there is a place near Bonavista called Keels; this is supposed to mean that the "first keel" grated "on the shingle there." The theory seems far-fetched. It is far more probable that the settlers called it after Keel, in Mayo, in Ire-

* The drawing of this map is very rough. This is a reduction from a photograph. Many of the names are illegible. They are upside down on the Newfoundland and New Brunswick coasts. Turning the map and reading from the south, on the east coast of Newfoundland, in order, are C. de Ras, C. St. Ian, C. St. Francis, Bonne Viste, Ylle St Marc, R. St. Ian, Port aux Aigles, Cremailiere, C. Grat. In the centre of the island, running at right angles to the south coast, is *prima inuenta*, and behind that are three names, referring probably to the south coast. The first is illegible, the second is La Baleine, and the last Les Vierges. No doubt the islands of the Eleven Thousand Virgins were intended. They are on the south coast in the old maps. The names in italics are new names not found on early maps. For further remarks on this map see *infra*, App. F., where also Mason's map will be found.

land—a similar coast ; and, lastly, there is also a place near called King's Cove, and it is thought the name signifies that there the royal standard was set up.⁶³ There is no evidence to support this view.

I come now to the grand argument—the ancient immemorial tradition—of what ? Certainly it ought to be of the landfall of John Cabot and an English crew in 1497. This tradition could not have existed in Newfoundland, where for a long time there was no permanent settlement, for the fishing fleet came in spring and went back in the fall. It might have been that a few men would occasionally be left to cut wood and build wharfs and boats, but there are no definite traces of that having occurred. The stages and huts would, of course, remain from year to year. Judge Prowse finds the earliest narrative about the island to be Parkhurst's, in 1578. It is found in Hakluyt, and the passage is quoted in the judge's "History."⁶⁴ We learn from it that at that time there were fishing in the harbours 100 sail of Spaniards, 50 sail of Portuguese, 150 sail of French and Bretons, besides 20 to 30 Spanish whalers, "but of English only 50 sail." There is no mention of settlers, and indeed if there had been any possession by settlement, the letters-patent of Queen Elizabeth would have been unmeaning ; for they applied to lands only "if they shall not be before planted or inhabited." Gilbert, in 1583, set up the royal standard, and took possession for the crown of England, and, in the contemporary report, it is expressly said that he "was the first of our nation that carried people to erect an habitation and government in these northern countries of America."⁶⁵ But 1583 was eighty-six years after Cabot's voyage, and there were no people then on the island to have carried a continuous tradition. In fact, it would seem, after all, that there is not at the present moment a tradition ; for it has been shown by Bishop Howley (p. 151, *ante*) that the tradition was for Cape St. John—a tradition existing in Verazzano's mind ; for, beyond all question, there was no one on the coast when Verazzano made his voyage ; therefore he must have carried the tradition there, and, inasmuch as his voyage was the foundation of the French claims by discovery, it is improbable he would have commenced by establishing those of England. Nevertheless, the bishop maintains that this "shows that at that early period the tradition was in favour of St. John as the landfall."

Bishop Howley thinks there really was a tradition attached to Bonavista, not, however, a tradition of a landfall of English sailors, such as we are looking for, but of Cortereal and the Portuguese ; and this was the way it happened. "He [Cortereal] had doubtless made himself well informed of the whereabouts of Cabot's new lands. It is not at all improbable that he may have got possession of Cabot's papers, map, log and globe, so mysteriously lost. We have reason to believe that he made almost directly the headland of Newfoundland, which was situated in 48½ degrees north latitude, and which, being a most prominent and impor-

“tant point, must undoubtedly have been seen and well located by Cabot. “To this important headland Cortereal gave the name of Bonavista. It “was most probably his landfall.”⁶⁶

At last, then, we have run this tradition to earth. It was a Portuguese tradition of a Portuguese landfall, and the English tradition was for Cape St. John, and existed in the mind of a French captain! But Bonavista must have a tradition, after all that has been said about it, and this is it.

“Cabot first made land at Cape St. John, yet he afterwards fixed on “the point now called Bonavista as the signal point for voyagers from “Europe, and to take a departure from on going eastwards. I am sure “John Cabot took special and particular bearings of this point. I believe “it to be the point of which Soncino is speaking when he says Cabot “made certain signal marks.”⁶⁷

That is letting down Bonavista as easily as possible. There is a tradition of landfall, but it is Portuguese, and the English tradition is not of landfall but of land-departure. I would merely observe that no trace has survived of any such special solicitude for Bonavista, and that theories based upon a chain of such phrases as “doubtless,” “not at all improbable,” “may have,” “we have reason to believe,” “most undoubtedly,” “most probably,” “I am sure,” and “I believe,” cannot help us much in this very difficult inquiry.

Finally I come to La Cosa's map. It is generally admitted to be a map of the south coast of Newfoundland. But Bonavista is not upon the south coast of Newfoundland, but upon the east coast, and it is evident, therefore, that Bonavista is excluded from the first voyage. The first flag on the coast and the first name is at Cape Race. Bonavista is not near Cape Race. It is two degrees and three minutes of latitude to the north, equal to 123 geographical or 138½ statute miles in a straight line. If, then, Bonavista was the landfall, Cabot never gave it a name—never claimed it—but sailed many more than 138 miles along the sinuosities of the east coast, and did not name one headland, but waited until he turned Cape Race, and then started up and studded the south coast with names, and La Cosa commenced at the same point and marked it out on his map with flags. This is seen at once by the very statement to be improbable up to the boundary of impossibility.

12.—*Sebastian Cabot.*

Before passing on to the remaining points of this inquiry, it is necessary to consider again, for a while, the character of Sebastian Cabot. My own view is stated at length in my first paper. In effect it was that he was boastful and vainglorious; that he suppressed his father's agency in the voyages of 1497 and 1498, and that he was not so much a great sailor

as a great nautical theorizer. I suggested that many of the falsehoods attributed to him might be due to the fact that they came through second-hand reports; that he might have been always talking of the second voyage, in which I believed he really took part, and that his suppression of the facts of the first voyage might be due to the suspicious jealousy of the Spanish authorities. I expressly said (p. 85) that it is hard to believe that Sebastian Cabot was a mere "pretender to nautical knowledge, "because Ferdinand and Charles V. were good judges of men, and they "trusted him to the last." In former years Biddle and Nichols and others had almost succeeded in effacing the memory of the father, and in effecting an apotheosis of his son. Now that the pendulum has swung to the other extreme, it is right to return for a moment and review my estimate of his character in the light of these recent papers.

I think Mr. HARRISSE is quite justified in saying that "Sebastian Cabot was a man capable of disguising the truth, whenever it was to "his interest to do so."⁶⁸ In that respect I think he was, for the period, in no way singular. I shall not venture to cite instances, for fear of stirring up new controversies, but when we are told that "he was, in an age "of mendacity and intrigue, the greatest liar of the age;"⁶⁹ that "his "proved infamous character keeps him out of court;"⁷⁰ that he was "an "unmitigated charlatan, a liar and traitor,"⁷¹ I think that the case against him has been overstated. Other writers have taken up the same theme, and I cannot help thinking that they are expecting from men of the Renaissance period a standard of candour which was not in vogue at that time. There were similar weak points even in the character of the great admiral, brought out by Dr. Justin Winsor in his "Life." He was not free from self-assertion and boastfulness, nor from jealousy of the merit of others, nor from a tendency to arrogate for himself credit justly due to his companions, and he was not always careful in such matters to adhere closely to the truth. In Sebastian Cabot I think I see the defects of the great admiral magnified, and, then, I still think there is much force in the view expressed in the paper of 1894. The first voyage was more a voyage of reconnaissance than an expedition. It was in one small vessel, which returned quickly when it touched land; but the second was in reality an important enterprise and a survey of an extended coast, and I cannot help thinking he sailed on the second expedition and coasted from Labrador to Carolina. As I pointed out before, every allusion to Sebastian Cabot's voyage and every report of it on record contain notices of ice and northern latitudes. I shall not go over the ground again, for it is fully covered in the papers already in the "Transactions." I am not in the least disposed to palliate Sebastian's unfilial conduct, and I think that, for a strictly accurate man, he was born in too many places. I would, however, receive his testimony *pro tanto*, and I would allow it to confirm and even to explain statements

based upon other foundations. This is done continually in courts of justice; and to pronounce Sebastian Cabot a liar and dismiss him from the controversy is going further than is usual in historical inquiries. In fact, the matter seems almost to have got to the point that no evidence will be admitted to corroborate anything Sebastian Cabot ever said, or rather was ever reported to have said, for we have nothing direct from his own pen.

Then again, it seems to me to be going to an extreme to pronounce Sebastian to be no sailor and no geographer. It proves too much; for, if Sebastian Cabot was an impostor, Ferdinand of Aragon, Charles V., Edward VI., and all the other exceedingly capable men around them were fools. Now we know that these men were statesmen of no common order—accustomed to deal with and make use of men—versed in every wile of statecraft. Ferdinand was a master in the art of dissimulation, wary and unrelenting. If, indeed, Cabot had been the only maritime authority at the court, one might imagine that he could deceive landsmen—but he was not. The court of Spain had many able sailors, competent to expose a nautical impostor, who, moreover, was a stranger—an English Italian among a jealous people as the Spaniards were.

I do not think that we are justified in supposing he was a great sea captain, for he failed as a commander. A man, even now, might be a distinguished secretary of the admiralty, an authority on naval affairs and an accomplished geographer, yet not competent to take an active executive command. I believe Sebastian Cabot to have been versed in all the nautical science of his time, but not necessarily capable to command a fleet. I should not wonder if there were many men now in Her Majesty's service doing good, useful nautical work, who are in a similar position. I called Sebastian Cabot a theorist—a scientific theorist, with a fixed idea about the North Pole—but not, therefore, of necessity the absolute impostor that some of my critics conceive him to have been, and, in confirmation, I find in Mr. HARRISSE'S *John Cabot* (p. 229) the following quotation from Oviedo, which precisely expresses the view I have advanced. "Cabot is competent and skilful in his occupation of cosmography, and for constructing plane as well as spherical maps of the entire world. But there is a great difference between leading and governing men, and handling an astrolabe or a quadrant." My belief has been that the failure of the expedition to the Moluccas, of which we have so full a record, is the explanation of the failure of the second voyage to America, of the particulars of which so little has survived. It seems to me that there are, in the study of history, moral difficulties and intellectual difficulties, as insurmountable as any physical obstacle can be, and here is one. An emergency arose in fitting out a military expedition, and Sebastian Cabot was picked out in all England to make a map of the theatre of operations; he went to Spain with Lord Willoughby, the gen-

eral in command ; King Ferdinand wrote to Lord Willoughby to send Cabot to him, and the same day he wrote to Cabot. A few weeks later he wrote twice again, on the same day, letters concerning Cabot. He took him into his service in 1512, and made him a naval captain with a salary of 50,000 maravedis. In 1514 he was called to court to consult with the king about an intended expedition ; the next year his salary was raised, and, together with several distinguished sailors, he was made royal pilot ; that year he was called to Badajoz on a commission with eminent cosmographers to report on the line of demarcation, and in 1518 he was created pilot major of Spain. His duties were to examine and certify all pilots, to compile and keep up the standard official map, and to receive and embody on it the reports of all returning sailors. He had to certify all maps, and he was the supervisor of the professor of cosmography at the ministry of the Indies at Seville. In 1524 he was again put on a commission with distinguished cosmographers to settle the line of demarcation. He then went to South America, and his office was kept open for him. He incurred lawsuits and was punished by fine and banishment for some high-handed acts on the expedition, but was soon recalled and reinstated in his former office. In 1533 he made a large map of the world for the council of the Indies, and when he left Spain he was on a commission to examine Medina's "Art of Navigation." He had power to suspend pilots, and he appointed a friend as acting officer when he went to England, and the Emperor Charles V. repeatedly tried to get him back to Spain, and kept his office open for him until 1552.

In England, where he went in 1547, an old man of 72, he was trusted by Edward VI., and his salary increased. He became governor of the Company of Merchant Adventurers and had charge of the nautical affairs of the realm. He had all his life, as Mr. HARRISSE states, a high reputation in Italy and England. He was retained in high office in Spain, and he was placed in high office in England, a country not very tolerant of foreigners.

Here, then, is a monstrous improbability ; that a man without any advantages of birth, wealth, or influential connections, a foreigner among two jealous nations, should have been all his lifetime at the head of the nautical affairs of the greatest naval powers in Europe ; no geographer, and yet incessantly making maps for public departments ; no cosmographer, and yet called on as an expert in important suits and selected as a commissioner to determine the line of demarcation ; no sailor, and the examiner and certicator of all the pilots of Spain ; no man of science, and the censor of the chair of cosmography for the council of the Indies, the Admiralty of Spain. This man served some of the most capable princes who ever sat upon a throne, and it remained after 350 years for us to find him out. Surely this is a stupendous improbability ; surely the view of his character, presented in my paper of 1894, must be nearer the

truth. If we study that age in its own literature—in Machiavelli's works, in the life of Benvenuto Cellini, in the histories of Spain and Italy—we will obtain the measure of Cabot's character—insincere, shifty, vainglorious, jealous of the reputation of others, greedy of reputation for himself; but not a fool, not an impostor, not a charlatan, not a liar more than the courtiers he lived among.

While there is no palliation for the evident endeavour of the son to suppress and, even when in England, to minimize the achievements of his father, it must be remembered that it was common in those days for sailors to pass from the service of one prince into that of another, and necessarily some negotiations must have preceded every such transfer. Humboldt remarks that "Vespucius, Cabot and Magellan passed alternately from the service of one prince into that of another. Their loyalty consisted in embracing with ardour the interests of the country where they were resident, and their consciences were troubled the less by the memory of benefits received in proportion to the length of the list of their grievances against the ungrateful government whose services they meditated abandoning."⁷² Cabot was not a native born Spaniard or Englishman, but Magellan was a Portuguese who betrayed to Spain the belief that the Moluccas were within the Spanish lines of demarcation, and commanded an expedition to occupy for Spain rich islands in the east which his own countrymen had discovered. To the names above mentioned may be added many others. In Mr. Harrisse's list of pilots it will be seen that Ribero, Pedro Reinol, and Estevan Gomez were Portuguese who passed into the service of Spain between 1517 and 1524, and the pilots of Magellan's expedition were also Portuguese.⁷³ These are only a few names hastily selected. The list might be much enlarged. Dr. Justin Winsor, in explanation of some of Sebastian Cabot's evidence in the case of the heirs of Columbus, says: "Too much should not be made of these variances, however, since Sebastian Cabot at both these dates was a paid officer of Spain, and could hardly be expected to damage the interests of his Spanish masters or his own."⁷⁴

While there are points in Sebastian Cabot's life worthy of reprobation, he is not alone the object of these censures. One cannot fail to be struck with the arbitrary way in which the moral character and the abilities of the men who are subjects of this controversy are dealt with. Biddle blackened Worthington's character and Nichols assisted, while in reality the maps he was charged with selling to Phillip II. were safe in England many years later, in 1582.⁷⁵ Bishop Howley "has a strong suspicion that John Cabot's maps were purloined and sent off to Spain by "Dr. Puebla," and again he suspects that "Cortereal may have got possession of Cabot's papers, map, globe, and log so mysteriously lost."⁷⁶ The same papers Puebla stole for Spain were stolen again for Portugal, and, after all, John Cabot himself freely gave a map to Spain. All the

maps of Columbus have disappeared, and yet nobody has been charged with stealing them ; but Cabot's maps are stolen twice over, and by men of different nations ! Too much has been said about these "mysterious" losses. Where are Cartier's maps, or the many maps of Alonzo de Santa Cruz ? Where is the great *Padron Real* ? Two maps at Weimar alone represent its features, and all official copies but these are lost. No document is so soon thrown away as an old map, for none are more useless. We do not miss them excepting in some controversy such as this. It is no wonder that Cabot's papers are lost by this time. We had nearly lost the discoverer himself out of our history, and we do not now know when either of the Cabots died or where they are buried. Bishop Howley charges Cortereal with palming off a false map,⁷⁷ when that great sailor was dead in some unknown region across the Atlantic. Who drew that map is not known, but it is certain that it was not Cortereal. If Soncino and Pasqualigo do not report in the direction of some favoured theory of the present day they are "not nautical men, and not particular to a point or two." If John Ruysch, in 1508, says he sailed no farther than 53° north it must be a misprint, for he should have gone to 58°. If La Cosa's map is inconvenient, the "distinguished Biscayan navigator and pilot" is transformed into "an old Spanish pilot who made a rude sketch and "studded it with names out of his own head," and, last of all, we take the map of the man who made maps which were hung up in the study of Juan de Fonseca, the Spanish minister of marine at that period—and, as if he knew nothing about maps, we take a piece out of it—a map made for the King of Spain—and wheel it up to an angle of 90 degrees, as if he, the celebrated Biscayan pilot, the greatest native Spanish sailor of the time, did not know west from north.

13.—Censorship over Spanish Maps.

It must not be supposed that an inquiry under this heading is of academic interest alone. It has a real and very important bearing upon the question ; first, as it may reveal the circumstances of Cabot's official life in Spain ; then, as affecting the publication of the map of 1544, and, consequently, the degree of importance to be given to the testimony of the map regarding the landfall at Cape Breton. "Sebastian Cabot," says Mr. HARRISSE, "certainly enjoyed a high reputation at least in Italy and England. The Mantuan gentleman said that he had not his equal in Spain "as a man versed in navigation. Guido Gianetti de Fano told Livio "Sanuto that Cabot was held in the highest esteem in England."⁷⁸ It will not do, then, to accept Judge Prowse's dictum "that his proved infamous character keeps him out of court." We are bound to judge him by the standard of his day, and to measure him with the measure of his contemporaries. We do not put Lord Bacon "out of court" because of

his ingratitude and treachery to his friend and benefactor, the Earl of Essex; or because he degraded the high office of a judge by pandering to tyranny and accepting bribes from suitors before his court; and, with all his faults, Sebastian Cabot was morally the better of the two. We must remember that Cabot was a man without a country—a foreigner in England as in Spain, and the holder of an official position in both countries, which imposed upon him definite official duties.

One fact stares us in the face at the outset, that, while maps were freely engraved and printed in all parts of Italy, Germany and France, none were printed in Spain—in the very country whose colonial extension required them the most. Kohl says, and Winsor adds his testimony, that not even an edition of “Ptolemy” was printed there.⁷⁹ The little map in the first edition of Peter Martyr quickly disappeared and was not reprinted. In 1549 there was a little map in Medina’s *Arte di Navegar*, and a little one in Gomara in 1554. These are all and they were useless, being insignificant in size and detail. In a list of 200 printed maps given by Ortelius⁸¹ in his great atlas in A. D. 1570, not one was printed in Spain, and among eighty makers of maps not one was a resident there. “This,” says Winsor, “shows how effectually the council of the Indies had concealed the cartographical records of their office.”⁸¹ The extreme rarity of the Peter Martyr map is attributed by Nordenskiöld to the “suppression of the small drawing by the suspicious Spanish authorities,”⁸² and Brevoort, commenting on the same fact, refers to the “jealous sensitiveness of Spain regarding her marine charts”⁸³ as the cause. Nordenskiöld mentions the three maps above cited, and adds “that, with the exception of some copies of mediæval maps which I suppose to exist in Spanish editions of classical authors, this seems to be about the whole contribution during the earliest period of printed cartographical literature from the countries from which the new world and the southeast passage to India were discovered, and from which hundreds of the most important voyages of discovery started during that period.”⁸⁴

“The kings of Spain,” says Kohl, “from the very commencement of the discovery of America, observed great caution and reserve, and gave strict orders about the safe keeping of the maps which their captains and conquerors brought home from the new world. All the originals of these maps were deposited in the archives of Seville, and copies of them were issued only to such Spanish sea captains and generals as could be trusted. No map of Columbus, none of Cortes, of Magellan, or any of the other innumerable explorers, was allowed to be engraved and published; and the consequence of this system has been that nearly all these interesting documents are lost to us forever.”⁸⁵

“There is,” says Dr. Winsor, “abundant evidence of the non-communicative policy of Spain.”⁸⁶ In this point, at least, I have the support of almost every writer of note, and the “liberal spirit which ani-

“mated the government,”⁸⁷ insisted upon by Mr. HARRISSE, is inconsistent with the records of history and with the genius and traditions of the Spanish nation. In my first paper I cited many authorities for my belief, and the testimony is almost unanimous; but while I feel that I am unfortunate in having to differ from Mr. HARRISSE on this point, I venture to think that on closer examination it will be found that the difference between us is more apparent than real.

In 1503 there was established at Seville, in Spain, an immense state institution called the *Casa de la Contratacion de las Indias*, charged with the administration of all matters relating to the new world, including licensing of pilots, making of maps, and supervision of all nautical matters. It was a department much resembling the English Board of Trade. In 1508, an official, or model, map was ordered to be compiled and kept there, to which all maps were to conform, and a commission was appointed to prepare and supervise it. All pilots were compelled, under penalties, to use copies of this official chart, and the grand pilot and certain others were appointed to prepare copies which they sold. KOHL remarks that they were kept in manuscript because the Spanish officials were desirous of preventing their discoveries from being known. The maps were stamped to witness their authentic character, and were kept locked up under two locks; the grand pilot had one key, and the other was in charge of another member of the commission. Mr. HARRISSE informs us⁸⁸ that the cartographers of Spain, *although* for thirty years under the immediate care of Sebastian Cabot, possessed no adequate geographical knowledge of the northeast coast of America. These Sevillian maps, he adds,⁸⁹ uniformly located the discoveries of the English far to the north of Labrador, and even, in some cases, in Greenland, from 56° to 60° north—that is, from the position of Nain northwards to Cape Chidley.

There was, therefore, in Spain an absolute intolerance of charts not copied by the official cartographers from the official map, and if any other person made a map it could not be used without first being submitted to the authorities of the *Casa de Contratacion* and approved by them. This was in effect a censorship, and Sebastian Cabot was for a long time the chief censor, and it was his duty to compel all Spanish maps to conform to the standard official map. If, then, the Spanish maps possess the general uniformity above stated, it is only what might be expected under the conditions then existing. One of the notes of that uniformity was the running of the English discoveries north of 56°. It is of little avail in this controversy to say that Spain was not jealous of other nations, because the essential point of the argument is practically admitted. Spain would only permit the contours of the model map to be issued to the world, and those contours were drawn in accordance with the public policy of the Spanish nation. “The official map (*Padron Real*) was apparently,” says Mr. HARRISSE (*Dis. Am.*, 263), “the object

“ of great solicitude on the part of the government, particularly when it was found to have bearing on political questions of great importance.”

Bearing this in mind, we will find it difficult to accept Mr. HARRISSE'S denial that Spain “ ever laid claim to the northeast coast of America.” My answer is that the Papal Bull of partition points to another conclusion. Briefly, for I need not dwell long upon the point, Portugal as well as Spain had made discoveries, and the Pope drew a line of demarcation to define the limits of the two powers, or, as we should now say, of the two spheres of influence. The line was afterwards shifted, by the treaty of Tordesillas, between the two nations solely concerned. It eventually happened that Nova Scotia, Newfoundland and Brazil fell to Portugal, and the rest of both continents to Spain, and Spain was directly interested in preventing all interlopers and in supporting Portugal. At the time of Cabot's discovery, however, Spain did make a claim, which will be found clearly stated in the warnings and letters of Puebla and Ayala in 1497 and 1498. Ayala had been one of the commissioners to draw the line of demarcation in the treaty of Tordesillas.⁹⁰ He had been talking with the discoverer in person, and, with Cabot's map before him, he wrote to Ferdinand that the land found belonged to Spain. The Baccalaos was soon after conceded to Portugal, and for that reason the earliest maps are Portuguese, and show the voyages of Cortereal and his successors.

All this is so clear that it seems to amount to a paradox to dispute it. The Cantino map (see p. 165, *ante*) has preserved for us a graphic delineation of the line of demarcation as it was supposed to exist in A. D. 1501-2. The policy of Spain is shown by the maps which are based upon the official map. On these maps the line of demarcation is laid down from north to south—from Brazil to Newfoundland—and it cuts the coast of North America a little east of Cape Breton. Such maps are the two at Weimar. That of 1527, whether it be by Fernan Columbus or by Nuño Garcia de Toreno, is considered to be an official copy; but the map of 1529 certainly is, as it purports to be, by Diego Ribero, and it shows the Spanish flag to the west and the Portuguese to the east of the dividing meridian. Ribero was cosmographer to the king, and such a map as he has handed down to us all Cabot's official maps, made in Spain, of necessity must have been. Ribero placed, on the Acadian coast, close to Cape Breton, the words, *Tiera de Estevã Gomez*, and claimed it as having been discovered for Spain by Gomez in 1525. Mr. HARRISSE, in commenting on a map by Diego Guthierez in 1550, is astonished at finding that it knows nothing of the Gulf of St. Lawrence and of Cartier's discoveries, which six years previously had appeared in the Cabot map of 1544, for Guthierez was a colleague of Cabot, and was appointed as his *locum tenens* by Cabot when he went to England. This circumstance, however, only brings out in stronger relief the fact that Spain did at that time lay a claim to the whole territory of North America up to the line of demarcation, and that the official map was witness to it.

The duty of Cabot, as chief pilot of Spain and one of the chief officials of the Casa de Contratacion, was to see that all maps under his control conformed to that standard.

Again, Spain *did* take steps to assert her claims on the northeast coast, though every attempt was abortive, for her strength was drawn away to the south. Navarrete tells us that King Ferdinand sent for Juan Dornelos in 1500,⁹¹ to plan an expedition to follow Cabot. In 1501 Alonzo de Hojeda was ordered to go on an expedition to the place⁹² where the English had made discoveries. Again, in 1511,⁹² Juan de Agramonte was commissioned to take royal ships to seek out the secrets of the new land. His instructions demonstrate the respective claims of the two nations to be as represented above. He was ordered to take with him Spanish sailors, but to procure pilots from Bretagne, showing that the place sought was where the Bretons by that time were accustomed to resort. He was ordered to make a settlement there, but to avoid infringing on the territory of Portugal. That shows it was near the line of demarcation, and the line of demarcation on the Spanish official charts cut the coast of Newfoundland just east of Cape Breton. No record remains of the results, but the Spanish claims are manifested by their instructions. Just about that time Cabot arrived in Spain, in the suite of Lord Willoughby, and Ferdinand secured his services at once because of his knowledge of Baccalaos—about which England cared nothing.

It would be tedious, and it is scarcely necessary, to prove that Spain was jealous of any third nation interfering in America. It is in all the books, but I will cite one of the most learned and most accurate of our own members. In the Transactions of 1890, the appendix C to a paper by Abbé Verreau shows the measures taken by Charles V. to prevent the settlement of Roberval in Canada; and, in the Transactions of 1891, the continuation opens with these words: "The Spanish ambassador at the court of Portugal, probably in obedience to the instructions of his master, besought King John to join the emperor in a united expedition against Cartier and his three vessels, to massacre the whole party, and deter the French for a long time, if not forever, of thinking of colonies beyond the Atlantic." We learn, moreover, from Mr. Harrisse⁹³ that, as late as 1541, Ares de Sea was sent to America to find out what Jacques Cartier was doing. It seems to me patent on the page of history that this jealousy existed. It was the Monroe doctrine of that day, but not so vague, and it had a written foundation in the papal bull, which, beyond doubt, was public law among Catholic nations at that time.

This was the reason, then, that none of the Spanish maps would admit the discoveries made by the English, and which, in truth, the English undervalued and neglected; and this would justify Cabot, as a Spanish official, in suppressing on official maps any private information traversing the public policy of his sovereign. Similar suppressions have

been made in later times for similar reasons, and the histories of boundary commissions afford many instances. The same political exigencies would compel Sebastian Cabot to withhold his name from a private map like that of 1544, and they would prevent him, while in Spain, from giving that map the colour of a Spanish official sanction, even though the laws in the other parts of the empire of Charles V. did not forbid the publication of non-official maps.

It is not fair to charge Cabot with falsehood for that. These were not days of geographical societies or of travelling scientific associations, and Cabot's duty was to his own master, the king of Spain. All that time King Ferdinand and his successor, the Emperor Charles, had in their possession La Cosa's manuscript map admitting that the northeast coast of America had been discovered by the English. Cabot was as much, and no more, a liar than his royal masters, who would have dealt in the summary methods then in vogue with any official airing private opinions, geographical or otherwise, contrary to the official views of the public interest.

Mr. HARRISSE, in order to prove that none of the Spanish maps recognized English discovery south of Labrador, cites the map sent in 1527 by Robert Thorne, an English merchant residing in Seville, to the ambassador of King Henry VIII. There are facsimiles of this map in Kretschmer, Winsor, Nordenskiöld, and in Brown's History of Cape Breton. It has been reproduced (Fig. 13) on the following page, and it demonstrates *my* thesis; not that of Mr. HARRISSE. On the northern extremity of the east coast there is, as he says, the inscription, "Nova terra laboratorum dicta," but there is also the inscription, "Terra hec ab Anglis primum fuit inventa." This latter is not on *its* seaboard from 50° to 65° N., but it extends along *the* seaboard from about 40°, as shown by the scale on the margin, and a line of latitude drawn across to Europe would cut the north of Spain. Thorne sent the map secretly, and begged that it should not be shown, for it would get him into trouble, as it was forbidden to make any but official maps.

My answer, then, to Mr. HARRISSE is that Cabot, in obedience to the policy of the country whose paid official he was, deliberately suppressed much of the knowledge he possessed of the northeast coast, and that it was his duty to do so or to resign his office, and I would add, moreover, that La Cosa's map proves that his master (Ferdinand) knew of the English discoveries, and Robert Thorne's map proves that there were pilots in Seville who also knew that these discoveries extended as far south at least as 40°, and Robert Thorne's letter proves that the map was known not to be in accord with the official map (for he could have bought a copy of that), and, therefore, he desired that it might be kept secret. It was not from motives of economy that an English merchant of Robert

Thorne's standing sent a rough draft like this to the representative of his sovereign if a copy of the Spanish official map would have suited the purpose.



FIG. 13.—ROBERT THORNE'S MAP, A.D. 1527.

14.—The Map of 1544.

As this map is discussed with a detail amounting to tediousness in the first paper of this series (R. S. C., Vol. XII., 1894), I may be excused from repeating what is there stated. Mr. Harrisse says of it: "The cartographical data, however, which served as a basis for these tabular explanations" (the legends on it) "were certainly furnished by Sebastian Cabot, or published with his assent, particularly as regards the configuration of the northeast coast of the American continent and the alleged landfall at Cape Breton." The legends, he says, were written about 1544 by "one Dr. Grajales," the type in a pamphlet which he has

discovered containing the same legends is the same type as was used in the legends pasted on the map, and, as these legends were extant and quoted in 1549, it is proved that they are contemporaneous with the map⁹⁵

Bishop Howley avoids the difficult problem presented by this map. He says that he has seen and examined the map in Paris; but he passes over this document, so supremely important, with the remark that it would require a lecture to itself. He says there is no date on the map itself. The date is, in fact, in one of the legends, which refer to numbers which are engraved on the map. The bishop says the printing is "evidently of a very recent date" (p. 28, note), forgetting that these legends are also extant from another copy dated A.D. 1549, and are to be found in the works of Chytræus. He quotes HARRISSE as referring the authorship of the legends to Grajales, but does not add that HARRISSE attributes to them the same date as the map, viz., A.D. 1544, nevertheless he relies on them (p. 29) to establish the date of the landfall, and (on p. 37) he quotes the Spanish version, "una ysla grande," from one of these very legends, which he says are "evidently of very recent date." He criticises HARRISSE very severely for having charged Sebastian Cabot with mendacity, and is sorry to see (p. 17) Mr. HARRISSE'S example imitated by others; but while admitting that the landfall at Cape Breton is indicated on this map, he does not accept it, but turns round upon Dr. Harvey and me as if we had invented the theory, and so escapes explaining how Cabot came to put it there in 1544, and why he himself does not believe Cabot's statement. Sir Clements Markham, who had accepted the map,⁹⁶ seems to have been shaken by the recent denunciations of Cabot's character, but does not very decidedly pronounce against it. TARDUCCI accepts it with all its consequences, but then he does not believe that Sebastian Cabot was a liar and a scoundrel.⁹⁷ Judge PROWSE rejects Sebastian Cabot and all his works. He is willing to take an inscription, based on an unknown authority on Mason's and DuPont's maps in 1625, in favour of Bonavista, but not one upon Cabot's authority on a map of 1544 in favour of Cape Breton. The legends, as Dr. Justin Winsor well observes, "interlink with the body of the map in such a way as to make it apparent that they belong to the publication."⁹⁸

The importance of this map is so great that it will be more satisfactory to give in his own words Mr. HARRISSE'S explanation of the Cape Breton landfall marked upon it. The map is dated 1544, and in 1547 Cabot removed to England. In the belief that Cabot was a liar and charlatan, he thinks Cabot falsely placed the landfall there. He says: "⁹⁹

"At that time (A.D. 1544) a great change had taken place in the relative importance of the northern coast of the new continent. The seas which bordered the Baccalaos region were no longer a common fishing ground frequented by the smacks of Portugal, Biscay, Nor-

“mandy and England. The successful explorations accomplished by Jacques Cartier from 1534 until 1543 had been followed by the planting of French colonies. The part selected was not Labrador, on which, in all maps of the period, was inscribed the uninviting legend, ‘No ay in ella cosa de provecho’ (here there is nothing of utility). On the contrary, the French had chosen the country around the Gulf of St. Lawrence and Cape Breton, which the reports of Cartier and Roberval to Francis I. represented to be a beautiful and fertile country, with rich copper mines, fine ports, and the most navigable waters in the world.

“Under the circumstances, the cartographical statement of Sebastian Cabot, as embodied in the planisphere of 1544, may well have been a suggestion of British claims and a bid for the favour of the king of England. To place near the entrance of the Gulf of St. Lawrence the landfall of 1497, was tantamount to declaring that region to be English dominion, as the discovery had been accomplished by vessels sailing under the British flag.”

Much of this is absolutely novel to Canadians. We know of no such colonies round the gulf or on the island of Cape Breton. What really happened is summarized in a sentence by Abbé Ferland¹⁰⁰—the most accurate of our historians: “Après le retour de Roberval en France, il s’écoula bien des années, pendant lesquelles le Canada semble avoir été complètement perdu de vue par la cour des rois très chrétiens. Néanmoins la grande baye et l’entrée du fleuve St-Laurent continuaient d’être fréquentées par les Malouins, les Normands et les Basques qui remontaient jusqu’à Tadoussac pour y faire la traite des pelleteries.”

The history of Canada as we know it, is that Cartier’s and Roberval’s expeditions were failures, and that the first successful colony inside of the gulf was led by Champlain in 1608, when he founded Quebec. The first settlement in Nova Scotia was at Port Royal, sixty years later than A.D. 1544, and as for Cape Breton, the old names of the bays—Baye des Espagnols, Havre aux Anglois, St. Anne’s bay, Niganis—show that English, French, Spanish and Portuguese fished in contiguous harbours. Settlement there was much later than at Quebec. The pages of Hakluyt show that vessels of all nations resorted to the Ramea islands in the gulf, and no exclusive claim is disclosed by England anywhere in Baccalaos until Sir Humphrey Gilbert, in 1583, forty years later, took formal possession of Newfoundland. They never claimed within the gulf. This is very clearly stated by Father Biard in the Jesuit Relations, A. D. 1611–16. He says: “The English lay no claim to all of New France. They do not dispute the shores of the gulf and river St. Lawrence. They claim up to Campseau and the island of Cape Breton.”

Returning, however, to the strictures of Mr. HARRISSE upon Sebastian Cabot in relation to this map of 1544, I would remark that it is mis-

understood by many persons because, in the books, an extract only can be given. That portion alone is shown which represents the eastern part of the continent of North America, and the majority of readers think that they have before them a complete map of what is now the eastern part of Canada and the United States, made *as such* by Sebastian Cabot. They are, indeed, told that it is a mappemonde, and, sometimes, that it is a planisphere, but often do not stop to think what these words mean. I am fortunately now, by permission of the Hon. Sydney Fisher, minister of agriculture and statistics, able to reproduce the whole map from a photographic negative procured by the Dominion archivist from Paris, and it will be seen to be a map of the world on an elliptical projection. No one knows what this map is better than Mr. HARRISSE. He has no misconception about it, but, just as another Cabotian scholar held a brief against the father, he would seem to hold a brief against the son, and he draws a bitter indictment against Sebastian for barefaced plagiarism in constructing this map.

Now, consider what the map is ; it is a map of the whole world, with geographical notes and remarks selected from all sources, ancient and modern. Suppose a publisher to-day makes a map, does he not draw from all sources as far as the copyright law permits ? Whoever made the map of 1544 did what Stanford, and Johnston, and Bartholomew are doing every day now. Jacques Cartier's maps were then accessible and contained the latest information, and they, as a matter of course, were made use of. Every map-maker is, and must be, a plagiarist. If Cabot had made an original map out of his own head, then there would be good ground for calling him a liar. Suppose he did copy Cartier for New France ; he copied others for other places—copied from the maps of the sailors who sailed there. A map is not, like a poem, spun out of one's own brains, but every one adopts from and improves on its predecessor. Cabot is by some, most unfairly, held to assert that all the North American geography laid down on this map is covered by the claim in legend No. 8. We say Columbus discovered America, and so he did ; but he did not discover the Mississippi. This map says that the Cabots discovered the Baccalaos, and so they did ; but it does not claim that they discovered the Saguenay, though laid down on this map under a barbarous distortion of Jacques Cartier's name. All Cartier's names are there twisted up in translations from French into Spanish and Portuguese by some one who, apparently, understood none of these languages, but compiled the information from maps of all these nations. Legend No. 8 refers to the number on the map. It is 3 there, by a palpable error ; for, as it has been often shown, the map is carelessly engraved, but the heading identifies the reference. The spot on the coast of the region in question first discovered is marked, in the same characters as the rest of the map, *Prima terra vista* (not *terra*), and we are informed in the legends when

and how the discovery was made. The description applies all over the region, and two bears are figured just under the Arctic circle, where bears are still, and yet some persist in bringing white bears down to the landfall, wherever they place it. That is not the fault of the map. It is plain enough there. Here, then, is positive testimony, and everything tends to corroborate it. If Sebastian Cabot marks in 1544 the same point on the coast as the "*prima vista*," that does not derogate from the statement of John Cabot on La Cosa's map in 1500. Let it be granted that Sebastian Cabot was a liar up to the n^{th} power of Ananias, the argument is unaffected. Suppose there was no such person, the evidence of La Cosa's map is sufficient. But if to this evidence be added the description given of the country and other particulars recorded by the contemporary letters, the presumption in favour of Cape Breton is very greatly strengthened. It is strangely assumed that, because Sebastian Cabot in 1544 said the landfall was at Cape Breton, *therefore* it was somewhere else—at Labrador, Bonavista, Cape St. John, Mount Squirrel—anywhere, in fact, but not where he said it was.



FIG. 14.—MICHAEL LOK'S MAP, FROM HAKLUYT'S "DIVERS VOYAGES," A.D. 1582.

In my first paper and in one of the appendices I discussed in detail the different editions of this map which existed in the sixteenth century.

Richard Eden, who was a personal friend and was with Cabot in his last illness, knew this map, and translated one of the legends in a work published two years before Cabot died.¹⁰¹ Then, in Hakluyt's "Divers Voyages," published in 1582, there is a map by Michael Lok with the inscription, "J. Gabot, 1497," upon Cape Breton, and in Hakluyt's "Western Planting," written in 1584, but published in print for the first time a few years ago, this map of Cabot's, identified by its legends, is referred to in detail. All these maps were of Clement Adams's edition, and Michael Lok, who in some important points followed Verazzano's map, must have got his Cape Breton landfall from Clement Adams's copy of the Cabot map; and it is worthy of remark here that Lok has placed the island of St. John off Cape Breton and in the Atlantic. Here, then, we have the plainest evidence that in 1544 and in 1582 the landfall was placed at Cape Breton by Cabot himself, and by people who had his maps before them, and, arguing from Lok's map, one might assume that upon the copy he followed not only was the landfall at Cape Breton, but the island of St. John was off the point and in the Atlantic.

It has been shown why Cabot could not print a map in Spain, and why the maps made in Spain of necessity were made to the official Spanish pattern. Mr. Harrisse has an elaborate theory to prove Sebastian Cabot lied when he placed the landfall at Cape Breton, and now I may be permitted, in reply, to develop a remark in my first paper and to formulate at greater length a theory that, in this matter, Cabot was neither a liar nor a traitor.

It has been shown in the previous pages that Spain did lay claim to the whole of the new world up to the line of demarcation, and that the king, by the attempts made, as well as by the engagement of Sebastian Cabot, meditated taking possession at the north. It was the special knowledge of Baccalaos which Ferdinand stood in need of, for Ayala informed him that the land Cabot had discovered adjoined the land belonging to Spain under the convention with Portugal. Cabot had, therefore, found land close to the line agreed upon in the treaty of Tordesillas, and the king would take possession of it.

But in the meantime long and heated discussions arose between the two courts in consequence of Magellan's discoveries in the far east, and commission after commission had vainly tried to determine the longitude of the Moluccas. The struggle was keen; for, as the line of demarcation passed through the poles, any land gained in the west would be lost in the east. Experts were examined, and the pilots falsified the maps exhibited in the interest of their respective nations, so that the Portuguese refused to accept the Spanish charts altogether, and this struggle was going on when Robert Thorne, in 1527, wrote to the English ambassador, for he describes it at length. There was no way of ascertaining the longitudes of the places in dispute, and it resulted in the

occupation of Baccalaos and Brazil by Portugal. The controversy settled itself, in fact, and Portugal asserted her rights by a grant to Fagundes in 1521. That grant covered the southern part of Baccalaos (Acadia); as for Newfoundland, it was from the first conceded to Portugal.

It is evident, from the efforts made by Charles V. to induce the King of Portugal (*ante* p. 190) to join in crushing the expeditions of Cartier and Roberval, that the territory was at that period regarded as belonging to Portugal, and, on the refusal of Portugal to take action, nothing was done. Portugal was, in fact, too deeply interested in the east and south, and did not stir or even protest against the expeditions of France to the western world. The region of Baccalaos was tacitly relinquished.

While Spain had claims in that region, and even while Portugal, her partner in the world division, strongly adhered to her rights there, a real duty devolved on Cabot to make no public statement of his special information which might in any way conflict with the public policy of his master; but when the whole territory was abandoned by Spain, no such necessity continued to exist, and although he could not alter the standard map nor, of himself, give out in Spain a different map, there was nothing to prevent him from communicating information to others in another part of the empire not under the local laws of Spain.

That the English had made discoveries in 1497-1498 was in fact known all the while in Spain. Ferdinand knew it, for he had La Cosa's map in A. D. 1500. Peter Martyr knew it in 1516, for he recorded then that Cabot had sailed south to the latitude of the Strait of Gibraltar. Robert Thorne knew it in 1527, for the map he sent from Seville showed the English on the coast down as far as 40° , and Gomara, in 1552, and Ramusio, in 1556, record reports of previous years, making Cabot's discoveries reach as far south as 38° . There was nothing new, then, in Cabot fixing, in 1544, a landfall at 46° ; there was nothing specially in that to make a claim for England, for Cabot had often previously stated that an expedition under the authority of Henry VII. had coasted south to 38° . He had not concealed it in conversation, but he could not, as a public officer of Spain, put it down on the official maps. When, however, the territory was, in fact, thrown open, by Portugal allowing her claims to fall into neglect, there certainly was no reason why he should abstain from stating the truth, for, as a matter of fact, in 1544, all exclusive claims had been abandoned and the whole of Baccalaos was open to the world, for vessels of all nations resorted there.

In giving information for this map, Cabot gave it to a subject of his own monarch, to be published in one of that prince's cities, probably Antwerp; it bore upon it the imperial arms, and express reference is made to Sebastian Cabot as chief pilot to his imperial majesty, and as being authority for the map. The map bears no printer's name nor imperial privilege, but no one would be likely to be bold enough to put the

imperial arms on the map unless he had some high authority to back him. The laws of Spain were not current in Flanders, and any publisher making a map would make as much use as possible of the name of the grand pilot of Spain to further the sale of his map, for the publishers of those days were as anxious to push their sales as publishers of our own times.

If this theory be accepted it will explain the deviations from the official Seville pattern on the map, without having to charge Sebastian Cabot with being a liar, a scoundrel and a traitor, and will account for the fact that he continued to be held in esteem by our own Edward VI. and by all in England to the day of his death. That Cabot did not see the proof of the 1544 map is clear from the gross errors in the spelling of the names in Spanish. Before passing to another point, I would invite special attention to the fact that the map refutes the theory that Cabot at any time entered Hudson's bay. Cape Chidley is not there, nor Cape St. John. The name of Bonavista is not found upon it, and the landfall is on the Atlantic coast.

15.—*Dr. Grajales.*

Those who have given close attention to this subject have often wondered how Sebastian Cabot communicated information for the map of 1544. In Mr. Harrisse's *Discovery of America*, p. 640, we find that indefatigable scholar had unearthed in the king's library at Madrid a MS. in Spanish, the title of which he thus translates :

“Explanation of the sailing chart of his lordship the admiral. It contains a treatise concerning the sailing chart made (or written *hecho*) by Dr. Grajales at Puerto Santa Maria, together with the use of two tables to ascertain the rising of the sun and the setting thereof from the altitude of 38° to 48°.”

All that is known of this matter is from Mr. Harrisse's books, and he tells us that he has found out nothing else about it. He speaks of the writer as *a* Dr. Grajales and *one* Dr. Grajales. This MS. contains, first, the account Columbus wrote of his third voyage ; and, second, a Spanish version of the twenty-two legends attached to the map of 1544. I presume the tables are there also. Later, in his last book (*John Cabot*), we learn that he had found a copy of a pamphlet printed in Spanish (he thinks in Belgium) containing the Spanish text of the legends in the same type as those pasted on the margin of the engraved map now at Paris. The connection between the map and the pamphlet is then clear—there is no date, nor author's nor printer's name, nor privilege, to give any clue to where or when the pamphlet was printed. Dr. Grajales, however, was, of necessity, an educated Spaniard, and he lived near Seville.

While there are some things to be noted in relation to this, there cannot be a long argument, as all the information is from Mr. HARRISSE'S own researches.

In the first place I would remark that Grajales may have copied the legends for his own information, because he certainly did copy out Columbus's account of his third voyage, and the first legend in the pamphlet, as on the map, continues the history, for it commences, "No. 1 of the Admiral." Why should he be supposed to have been the author of the legends bound up in the same volume with the letter of Columbus, and covered by the same title? Why one more than the other?

The question is not, however, important, for it has been admitted by Mr. HARRISSE that the information came from Sebastian Cabot. Dr. Grajales was then merely the instrument by which Cabot worked, and it is immaterial whether Grajales wrote the legends or not. Somebody beside Cabot wrote them, and it may as well have been Grajales as anybody else. He lived at Puerto Santa Maria, close to Seville, where Cabot resided. It brings the responsibility for the legends closer home to Cabot; that is really the outcome of the discovery, interesting as it is and creditable to Mr. HARRISSE'S powers of research. It will not do, however, to take Dr. Grajales too seriously. He is not more likely to have written the legends out of his own head than to have written, of his own knowledge, Columbus's account of his third voyage.

The conclusion I arrived at in 1894 concerning the celebrated map of 1544 was that, although it was not actually compiled by Cabot, it was largely based on information supplied by him. It seems to me impossible to deny that he had some hand in it, and yet the only copy now surviving was evidently not put forth under his immediate responsibility. Indeed, in 1544, he would not have dared to publish a map unofficially, for he was then holding an official position in Spain, and not long before he had suspended Guthierrez for doing something of that kind. There were, however, of a certainty, some widely known maps existing in England during his residence there, which were attributed to him without a disclaimer on his part, and upon them the information concerning the island of St. John did exist. It is the English maps—especially the Clement Adams's edition of this map, published in England when Cabot was alive and in high office there, which told of the date and place of the landfall three hundred years before this 1544 map was found, and three hundred and forty years before Mr. HARRISSE came upon the track of Dr. Grajales's private cosmographical studies.

16.—Cape Breton a Natural Landfall.

If any one will take the trouble to examine the map, he will see that if a vessel continue past Cape Race on a westerly course she will make Scatari island as her landfall. This is not in the least an original opinion. Judge Haliburton, in his "History," makes the same remark. He says (vol. 2, p. 213): "This island being usually the first land made by vessels from Europe to any of the colonies east of the Bay of Fundy, and from the common occurrence of vessels being ahead of their reckoning when steering to the westward, the first news of its propinquity being often given by the roar of its breakers or the concussion of its rocks; shipwrecks are of frequent occurrence, and few places on the coast of North America more obviously call for the protection of a lighthouse." He was writing sixty years ago, and a lighthouse has long since been built. It was in old days noted for fatal shipwrecks.¹⁰² The most celebrated of all was the "Chameau," a king's ship going to Quebec in 1725 with a number of distinguished officials on board.¹⁰³ Not a soul was saved, but the ship's papers were subsequently found, and they showed that no sight had been possible for several days from fog, and that Cape Race had not been seen. Going back farther it will be found that Hore's expedition,¹⁰⁴ sailing at the end of April, 1536, about the same time of year as Cabot, was two months out, and never touched land until they brought up at the point of Cape Breton. In like manner the "Bonaventure,"¹⁰⁵ early in May, 1591, did not see Cape Race, though they knew it was near, and they found their position, by the lead, on St. Pierre bank, and altered their course to the northwest for Cape Ray. Another voyage which throws light upon the question, is that of the "Marigold" in 1593. We learn from Hakluyt that she sailed for the island of Ramea (Magdalen). and being unacquainted with the locality, she beat up and down a long time, and at last "fell with Cape Breton." It has been stated in this discussion that there were no Indians on the Atlantic side of Cape Breton, and that they never fished there. That was not the experience of the "Marigold." Hakluyt's informant continues: "Here diverse of our men went on land upon the very cape." There is no mistake possible about the place—"where at their arrival they found the spittes of oke of the savages which had roasted meate a little before." It is Hakluyt I am quoting, although the passage reads as if it had been written specially for this controversy. Then the "Marigold" sailed on four leagues to the west and the crew went ashore for water. Hakluyt continues: "And passing somewhat more into the land wee founde certaine round pondes artificially made by the savages to keep fish in, with certaine weares in them made to take fish." This is clear proof that the very point of Cape Breton is a natural landfall; that there were Indians there, and

that they did fish there. The crew had reason to know it, for they had a fight with the Indians. Then the narrator goes on to describe the country: There were "goodly okes, fir trees of a great height, a kind of tree called of us quickbeame, and cherie trees and diverse other kindes "unknowne." The quickbeam is the mountain ash, and "they found "also raspeses, strawberries, hurtes (hurtleberries), and herbes of good "smell and diverse good for the skurvie, and grasse very ranke and of "great length." All this is very much to the point, and Hakluyt could not have supported my view better if he had written expressly to combat, on my behalf, the idea that Cape Breton was a desolation of rocks and morasses, abandoned even by Indians. The people of the "Mari-gold" in 1593 were favourably impressed by the place, as John Cabot was in 1497.

Again, in the *Discorso d'un gran capitano*, in Ramusio (III., 423), the next point to Cape Race is said to be Cape Breton, and they are said to lie east and west. Chabert, a naval officer, sent by the king of France in 1750 on a scientific expedition, to correct the charts, says of Scatari: "This island is the usual landfall for all vessels sailing to Louisbourg."¹⁰⁶ He also sailed in a thick fog from the banks to Cape Breton. Markham, also, in his introduction to vol. No. 86 of the Hakluyt Society, has no difficulty in recognizing that, in case of fog, the island of Cape Breton is a natural landfall, and it is so natural that, in Sir Humphrey Gilbert's sailing directions for the expedition of 1583, Cape Race was the first point of rendezvous, "And if we shall not happen to meet at Cape Rase, then the "place of rendezvous to be at Cape Briton, or the nearest harbour to the "westward of Cape Briton."¹⁰⁷

The above are instances from old voyages, and, on inquiry from those who have access to the logs of steamships sailing to the St. Lawrence, I am informed that in the month of June Cape Race is not visible three days out of four, because of the fogs which at that season are the rule rather than the exception, and that from the vicinity of Cape Race to St. Pierre island is the worst spot for fogs on the whole Newfoundland coast, for, unless the wind be either from the north or northwest, that coast in the summer months is wrapped in fog.¹⁰⁸ Any one may see for himself, who chooses to look at the pilot charts of the North Atlantic issued by the naval department at Washington, that such is the case. The weariness of this controversy is due to the singular fact that, no matter how absolutely trite any proposition may be, some one will be found to rise up and contradict it. Even the fog prevailing at Cape Race in June is disputed, and, to save a tedious discussion about that, I have given in Appendix C a table from the returns of the lighthouse-keeper at Cape Race, showing the number of foggy days in June during the last four years. Any one who knows better may contradict the lighthouse-keeper.

There is, therefore, no *a priori* reason why Cape Breton should not have been the landfall, and even the "infinite pains" expended upon Sir Clements Markham have not resulted in eliciting from him an opinion to the contrary. Dr. Justin Winsor said, in 1892, of Cape Breton: "It is quite possible that more satisfactory proofs can be adduced of another region for the landfall, but none such have yet been presented to 'scholars.'" ¹⁰⁹

On the other hand, there are strong documentary proofs in favour of Cape Breton, such as exist for no other place named. There is the map of La Cosa, which locates the *Cavo descubierta* on a course west by compass from Cape Race; the point of contact is thus located upon a definite line. We have, then, the Cabot map of 1544 definitely fixing the landfall on the northeast point of Cape Breton island. Here is the independent testimony of father and son at an interval of forty-four years. As to the meaning of *Cavo descubierta*, we have a clue upon the map itself. On the coast of South America, opposite Cape St. Augustine, we have the landfall of the expedition of Vincent Yanez Pinzon in 1499 set forth as follows: "*Este cavo se descubrio en ano de mily CCCCXCIX. por Cas-tella syendo descubridor Vincensians.*" (This cape was discovered in 1499 for Castile by Vincent Yanez.) On the south coast of Newfoundland, and on a course west by compass from Cape Race, the words *cavo descubierta* plainly tell us, was the landfall of the people who sailed in the *mar descubierta por Yngleses* prior to A. D. 1500. Moreover, the conditions recorded on group A of contemporary documents agree with Cape Breton better than with any other place mentioned. The landfall was in a temperate, pleasant region, where the land was good, and gave promise that silk and brazil-wood grew there. Though the point of the cape itself, like every ocean-washed promontory, is bare and rocky, the country near and especially around Sydney is very beautiful. There is nothing on the continent of North America to equal the scenery of the Bras d'Or, which is open from the sea close to Sydney harbour. In mid-summer the climate is perfect. Fogs are infrequent there compared with other parts of the coast, and the summer heat is tempered by the ocean. Even this has been contradicted, although the beauty of the scenery and the special charm of its climate in the summer months are the constant theme of the Intercolonial railway guide books and are the attractions for summer tourists. They are the commonplaces of the newspapers. To put Cape Breton in the same category with northern Labrador is to underrate the information of one's readers. A few notices of the summer climate of Cape Breton have been placed in Appendix D, and to that I would refer; for to digress here would confuse the argument.

In my first paper I stated at length my reasons for believing that Cape Breton and not Cape North was the landfall, and in Appendix C to my second paper I showed, by a careful tracing from a photograph of

the original map, that it was not Cape North, but Cape Breton, which is indicated by the map of 1544. I am now in a position to show this clearly by a magnified photograph (fig. 15) of that part of the map taken from the negative procured by the Dominion archivist. I remarked in the same paper upon the accuracy with which Mr. HARRISSE, in his first book, had read the meaning of the map and located the landfall at Cape Percy, only sixteen miles from Cape Breton, "at a small cape at the



FIG. 15.—PHOTOGRAPHIC ENLARGEMENT OF OUTLINE OF CAPE BRETON COAST FROM CABOT'S MAP OF 1544.

"eastern extremity of the promontory."¹¹⁰ Mr. HARRISSE's argument is worth citing in full, if for nothing else than for its admirable statement of the method of dealing with such documents—a method sadly departed from by many contributors to the present controversy.

"Le critique, cependant, n'a pas qualité pour corriger un monument graphique avec des hypothèses. Il doit prendre une carte telle qu'elle est, l'interroger le compas en main, noter les différences, relever les légendes et laisser les noms où il les trouve. Or, c'est bien sur la lisière de l'isle du Cap Breton, à la pointe extrême, au nord-est, qu'on lit la phrase ;

“*prima terra vista*, et c’est en cet endroit que nous devons la laisser.
 “La transposer plus au nord et à l’ouest, serait arbitraire, car rien ne
 “prouve que Cabot, comme la plupart des cosmographes et des marins du
 “XV^e siècle, ait noté, ou même jamais connu la longue aiguille, qui
 “partant du port Dauphin, s’élève en ligne droite, jusqu’au cap North.
 “C’est donc au cap Percé, et nulle part ailleurs, que selon la carte de
 “1544, Jean et Sébastien Cabot ont atterri; c’est là que, les premiers entre
 “les navigateurs de XV^e siècle, ils auraient foulé le sol du continent
 “Américain et planté les bannières de Saint-Georges et de Saint-Marc, le
 “samedi, 24 Juin 1497, à cinq heures du matin.”¹¹¹

Cape Breton, and not Cape Percy, is the very easternmost point, and Scatari island is the first point made from sea, for it stretches farther east. Still, there is little to choose between them; the capes are only sixteen miles apart, and no one can suppose that after a lapse of 400 years any spot could be located as a landfall within a few miles. I take my stand beside Mr. Harrisse of 1882, but it is too much, after converting me, for him to ask me now to go to Labrador. I might have to go to Cape Farewell next, or even to Spitzbergen, for the shortest line by great circle sailing to Japan from Bristol, is by Spitzbergen.

17.—*The Voyage of 1497.*

I shall not protract this paper by futile speculations about John Cabot’s doings upon this eventful voyage. I do not possess those powers of intuitive perception which enable some writers on the subject to follow the little “Matthew” on her lonely course. I do not know the extent of John Cabot’s general information, nor what difficulties he had in engaging his crew or in raising money for his outfit; nor do I know in any special way the nature and scope of his meditations. When I am informed that “he knew the position of Greenland,”¹¹² I do not dispute it, but I think it is a very bad reason for asserting he went there in May, 1497, when he set out for Cathay. When I am told that he “kept a daily log, and plotted out his courses and distances on a map made especially for the purpose,”¹¹³ I answer that all sailors have kept and still keep logs, and keep records in them of their courses; but whether he worked up his map every day or reduced his records into the form of a map when he returned, I do not know any more than I know where he could have got a map “especially made” of the unknown ocean he set forth upon. Columbus had Toscanelli’s, for which see *ante*, p. 152. Cabot might have had one like it. Mr. Harrisse is, no doubt, correct in saying that Cabot was sailing in the region of “the brave west winds,” for, in fact, his course lay through what Lieut. Maury called the zone of northwest winds,¹¹⁴ and westerly winds do prevail; but I would prefer saying that he sailed in the region of variable winds, because I remember that in the late fall of

1861 the wind blew east for twenty-five days in spite of Maury's book, and a ship I was sailing in took four weeks to get from Quebec to the longitude of Cape Race, which was not passed until December 9. For my part, I feel sure that Cabot had wind from all points of the compass, although more from the west than any other quarter, and probably, as it was June, a little more from the southwest than the northwest. I am not surprised that he told Soncino that he "wandered for a long time," and that leads me to think that Cabot's voyage was a greater trial of courage than the admiral's voyage in the sunny regions of the trades. Still, I like to believe in the uniformity of nature, and that, within certain limits of variation, the winds revolve in their courses as we read that they did in the days of King Solomon. As a refuge, then, from the eccentricities of controversy, when winds and currents are improvised to set ships on appropriate landfalls, I fall back on the pilot chart of the North Atlantic for last June, where the probable winds are laid down for the guidance of sailors by officials at Washington, reckless of Cabot and his landfall. There was nothing unusual about the June weather of 1897, and I find that the winds expected were northwest, 6 days; southwest, 9 days; calm, 2 days; variable, 13 days. Total, 30 days. We shall never get nearer than that, argue as we may.

A very good idea of the conditions of a voyage such as Cabot's may also be formed from Edward Haies's account of Sir Humphrey Gilbert's expedition in 1583. Haies was captain and owner of the "Golden Hind." The fleet set sail from Plymouth on June 11th, for Cape Race as its first rendezvous, and, missing that, the vessels were to meet at Cape Breton. He says: "From Saturday, the 15th of June, until the 28th, we never had faire day without fogge or raine and winds bad, much to the west-north-west, whereby we were driven southward unto 41° scarse."¹⁵ After saying that in March, April and May the winds are usually more favourable for western-bound vessels, he adds: "Also we were encombred with much fogge and mists in maner palpable, in which we could not keepe so well together." From this we may see that John Cabot must of necessity have followed his compass. He was sailing on an absolutely unknown sea, and there must have been long periods when he could not get an observation by day or even see the stars at night; therefore, as he intended to return to England, he had only his compass by which to retrace his course. We may also see how easily Cabot might have dropped south of Cape Race and have passed it in a fog.

For these very excellent reasons we may spare ourselves vain speculation as to Cabot's actual experiences upon the ocean. Still, we do know that there were, as there still are, certain invariable forces on the North Atlantic which exert a constant influence to divert southwards a vessel on a westward course. One of these, the magnetic variation, has already been discussed; the other is the Arctic current, and Cabot must have

entered into its influence at longitude 40° ; for there is the eastern limit on the chart of the drift of icebergs. I must now ask my readers to refer back to page 150, and they will see that Bishop Howley makes Cabot, sailing west from Cape Farewell, 345 miles to the meridian of Cape St. John, drop south to that cape through a distance in latitude of 600 miles. That is, as I observed there, a very immoderate use of the Arctic current. In my first paper I followed the Admiralty sailing directions and rated it, not at two miles, but at an average of one mile an hour. I submit, then, that all these influences must have carried Cabot well south of his proposed course, and that it is not "absurd," "ridiculous" or "preposterous" to conclude that the "Matthew" did pass Cape Race and make a landfall at Cape Breton—a natural and probable landfall, moreover, to which every indication of the contemporary documents (group A) points.

From what precedes in this connection it will be clear to the reader that it will be lost time to base any argument on the rate of sailing of Cabot's vessel. Bishop Howley fixes upon a rate of 140 miles a day, or nearly six miles an hour.¹¹⁶ His argument is that the navigators said on their return that, now they knew the way, they could sail the distance in fifteen days; then, taking the extreme distance, 700 leagues, as 2,100 miles, and dividing it by 15, he arrives at 6 miles an hour, or 140 miles as a day's sail. But such a loose statement is not a basis for a mathematical argument. To use it as a foundation of practical calculation is misleading, for it is arguing from the constancy of ideal conditions of weather. It is better to inquire what was in other known instances really and actually the average rate, and here the log of Columbus will be of assistance. Now, I hope that no one will say again that I am arguing *a pari*, for I am not. I am arguing *a fortiori*. Capt. Fox, U. S. N., has with great pains gone over the log of Columbus, and, with the authority of a professional seaman, has ascertained his average rate of sailing to have been 4.4 miles an hour. I find also that, while on seven days he made 140 miles and a little over, on seven days he made less than 50 miles. My argument, therefore, is that if Columbus, with fair winds, fair weather and a straight course, made only 4.4 miles an hour on his whole course, Cabot, in a region of variable and, probably, much contrary wind, must have made less. I shall not venture to say how much less, for fear that Mr. Harriese may again apply to a table of logarithms for a solution of the problem.

I come now to a really difficult point—to the varying statements given by the contemporary documents as to the distances reported by John Cabot, and here there must be some hypothetical argument, for the distances cannot be reconciled with the distances actually existent on the Atlantic, in whatever direction we may suppose the "Matthew" to have sailed. Before proceeding I would, however, observe that the word

"islands" in these old documents must not be construed too strictly. Humboldt warns the student against that. He says (Ex. Crit., i., 359) : " Dans les premiers temps de la conquête de l'Amérique on avait coutume de considérer chaque partie nouvellement découverte comme une île plus ou moins grande. Peu à peu on reconnaissait la contiguité de ces parties, et lorsque les observations manquaient, on hasardait sur les cartes de réunir et de prolonger les côtes d'après de vagues indications."

On examining the contemporary statements it will appear that Pasqualigo says that the distance sailed was 700 leagues, or 2,100 miles, "to the mainland of the country of the Grand Khan." The others indicate that some nearer land was at a distance of 400 leagues. Soncino says that two large and fertile islands were discovered, he does not give the distance, and adds then, "having, it would seem, discovered the Seven Cities 400 leagues from England to the westward."¹⁷ A reference to the original will show the distinction between the two propositions : "Et a ritrovato due insule nove, grandissime et fructifere, et etiam trovato le septe citade lontane da l'insula de Inghilterra lege 400 per lo camino de ponente." Weare's translation is more accurate than Markham's, "having likewise discovered." If the statements of Ayala and Puebla be now examined, they will be seen to agree that something had been found not more than 400 leagues away. In other words, they are chiefly dwelling on the point that there was land 400 leagues west of England; and Soncino says what was 400 leagues away was the Seven Cities, while Pasqualigo alone gives the landfall as being on the mainland of the Grand Khan. This particular point has been most clearly brought out by Archbishop O'Brien, and had not previously received sufficient consideration.

The difficulty is not with the 700 leagues; it is with the 400 leagues, and that is one of the reasons why Bishop Howley sends Cabot to St. Kilda's, in the Hebrides, straight north through seven degrees, or 420 miles, of latitude, in order to get him to a place where he would be 400 leagues away from something. St. Kilda's is exactly 1,135 miles distant from Cape Farewell, and it is 420 miles from Cape Clear. That will not solve the problem, for Cabot is made to sail 1,550 miles to Cape Farewell instead of 1,200, and it is not, moreover, in accord with fact to say that the distance of Cape Farewell is 400 leagues west of England. It is not correct either as to distance or direction. Archbishop O'Brien dwells upon the name "Seven Cities," and thinks that Chateau bay, on Labrador, is intended; but that will not help, because the theory introduces many new difficulties both as regards the Seven Cities (see Appendix B) and as to the distance, which is not 1,200, but 2,000 miles away.

Under these circumstances we must make a distinction between what was found at these two distances, and, as nothing exists upon the Atlantic so near to England as Cape Race, either that is intended or some error

has crept into the record. It is probable that, with the wish to minimize the distance from the nearest point of the new land, or from a real error, because of the inability at that time to compute longitude, or from having had a good run home with favouring west winds, Cabot stated the distance, not of the landfall, but of the new land, to be one-fourth less than it really is, and La Cosa's, as also the succeeding maps for a number of years, do in fact draw the east coast of Newfoundland a long way east of its proper longitude. On La Cosa's map, as before observed, it is drawn east almost to the longitude of the Azores.

There remains now, therefore, the statement of Pasqualigo that the landfall on the new land was 700 leagues, or 2,100 miles away, and in the table of distances calculated in view of a proposed line of steamships I find the distance between Milford Haven and Sydney to be exactly 2,186 miles. Milford Haven is near Bristol, and Sydney is near the easternmost part of Cape Breton.

I am well aware that all I have said of the 400-league distance is hypothesis, but that is unavoidable. The nearest point must be taken, unless, indeed, we restore the mythical island of the Seven Cities to its old longitude on the map and put it twenty degrees north of its old latitude. The only remaining difficulty is that Pasqualigo says Cabot coasted for 300 leagues. There seems scant time for that. The distance from Cape Race to Cape Breton is 300 miles. It is possible that Cabot may have coasted for some distance farther west along the shore of Nova Scotia before he turned to go back, and then counted the coasting twice as it really was, though in his outward course he did not see the Newfoundland coast. These considerations I put forward not as proved, but as hypotheses to reconcile the divergent statements which otherwise are irreconcilable, for it is impossible to get over the fact that nothing exists now across the Atlantic so near to England as Cape Race, and that it is far more than 400 leagues distant.

18.—*The Island of St. John and the Legends of the "Cabot" Map.*

In the first paper of this series, the legends on the map of 1544 were very fully discussed, and I would refer to that paper any one who may suppose that I am passing over this important point. It has, however, been necessary to make incidental mention of Legend No. 8, and some farther notice is required here in view of the more recent controversies. The statement in that legend on Clement Adams's map is, in effect, that the landfall was made early on the morning of June 24, and that there was an island, lying out before the land, discovered the same day, which Cabot called St. John. The landfall, if ascertained, will identify the

island ; or the island, if ascertained, will identify the landfall. The conditions are :

1st. The island was discovered the same day.

2nd. It was opposite and near the landfall.

3rd. The landfall upon the map, to which the legend refers, was at the northeastern point of Cape Breton.

I have shown (fig. 15) by a tracing from a photograph of the map of 1544 that Cape Breton was the northeastern point. I am not trying to demonstrate within a few miles where Cabot struck land. The fact, however, is undoubted that Cape Breton is the easternmost point ; that it was the first point to get a name ; that it was the best known point, and that it has an island opposite and near to it, which, inside of seven years after the first voyage and for 100 years subsequently, was called St. John. If I say that Scatari island is St. John's island, I am only, after all, repeating Pedro Reinel, who drew it on his map in 1505 with its name.

I would call attention to the fact that no other landfall mentioned complies so fully with the conditions as Cape Breton. The word "island" is in the singular number. If, then, near any place suggested there are a number of islands, that place does not comply with the specified conditions. In the version on the map engraved by Clement Adams, while Sebastian Cabot was exercising in England that supervision of nautical affairs which pertained to his office, nothing is said of the size of the island. It is simply "an island." The version on the 1544 map calls it *insulam quandam magnam*, and the Spanish translation on the same map, "una isla grande," shows that the island was by that writer supposed to be large. On the only surviving copy of all the various editions of Cabot's map, there is indeed a large island named St. John, which has been shown at great length in my first paper (1894) to be in reality the large central island of the Magdalen group. In the same paper, in Appendix F, I gave a series of tracings (repeated at the end of this paper) which I still think absolutely demonstrate the correctness of my view. I must refer the student to that paper, and remind him that I made no new discovery. The opinion had been held by Markham ; and Ganong in his most thorough investigation, had established it, and it was adopted by HARRISSE. This seems to me to be the clearest part of the whole controversy, and it may be reduced to absolute certainty (see App. F) without the help of assumptions, or postulates, or hypotheses of any kind whatever. To discuss that point here, however, would have the effect of a digression, and I must revert to the main current of my present argument and call attention to two important facts. First, that the island of the landfall was a single island, and while the coasts of Newfoundland and Labrador are studded with many islands, this single island in some way characterized the landfall ; and, second, that in the version

made five years after in London, during Cabot's life, the word *magnam*—"large"—was omitted. From this it may be fairly argued that it was purposely omitted.

Those who argue for a Labrador landfall can find no single island along the coast to mark any one place specially. The islands are numerous, and those who argue for Newfoundland are in the same position. Bishop Howley, when speaking of an island of St. Mark now existing on Labrador, incorrectly quotes Clement Adams as saying the island was *small* (Lect., p. 22). That island is probably one of the many islands near the latitude mentioned, about 55°. It is not on my maps or in the index of the "Labrador Pilot" but when, at page 37, he is objecting to Judge Prowse's islands in Bonavista bay, he quotes the other version to prove that it was a "large island," and decides that these are too small. The disputants take the islands as they find them at their landfalls, and quote either version as may suit. I, however, claim that the version made with Cabot's acquiescence is more probably right, and that he said nothing at all about the size of the island.

The position of the island in relation to the landfall is described by different but almost synonymous words and the fact adds emphasis to this indication. It is "appositam" (Chytræus), "oppositam" (Paris map), "ex adverso" (Clement Adams), "which lieth out before the land" (Hakluyt). Bishop Howley takes the Latin and Spanish of the Paris version to mean "an island which stood out in front of the land" and "not far off."¹¹⁸ The word "adversus" is defined in its relation to locality as "*Juxta, vel potius in conspectu; e regione*" by Ducange, "Lexicon Manuale" (Ed. Migne), from all which definitions I conclude that the English phrase, "over against," with a sense of propinquity, would fairly convey the meaning. It was not one out of a cluster of islands. It was single, opposite and near, to all of which indications Scatari conforms.

I come now to an objection which, as I previously pointed out, is based on a gloss of Hakluyt, and has crept into his translation of Clement Adams's Latin original. If the Latin be taken it will be seen that after the word *Baptistæ* is a colon and the next word, *Hujus*, commences with a capital letter, thus making it refer to the whole territory, to wit, *Bacallaos*, described in Legend No. 8. This was argued in detail at page 67 of my first paper (1894), and I think that Sir Clements Markham has scarcely weighed my argument when he charges (Journal Geog. Soc. for June, 1897, p. 608) Sebastian Cabot with asserting that there were plenty of white bears on Cape Breton island. A glance at the map will show that the bears were in the region *Bacallaos*, for there they are portrayed, two of them, walking along close under the polar circle, and they are still there and catch fish in the way described.¹¹⁹ The inscription there reads: *De la tierra de los bacallaos a tabla primera No. 3.* The figure 3

is an evident error for No. 8, because legend No. 8 does refer to Bacallaos and No. 3 to Mexico. Mr. Harrisse goes further, and puts the bears on the island of St. John,¹²⁰ and thus adds another count to his long indictment of Sebastian Cabot's mendacity. I feel sure that if Clement Adams's text be taken alone, and apart from all glosses, it will be seen that no such meaning is intended. All the misconception has arisen from reading the extract of the map—the American portion as usually pre-

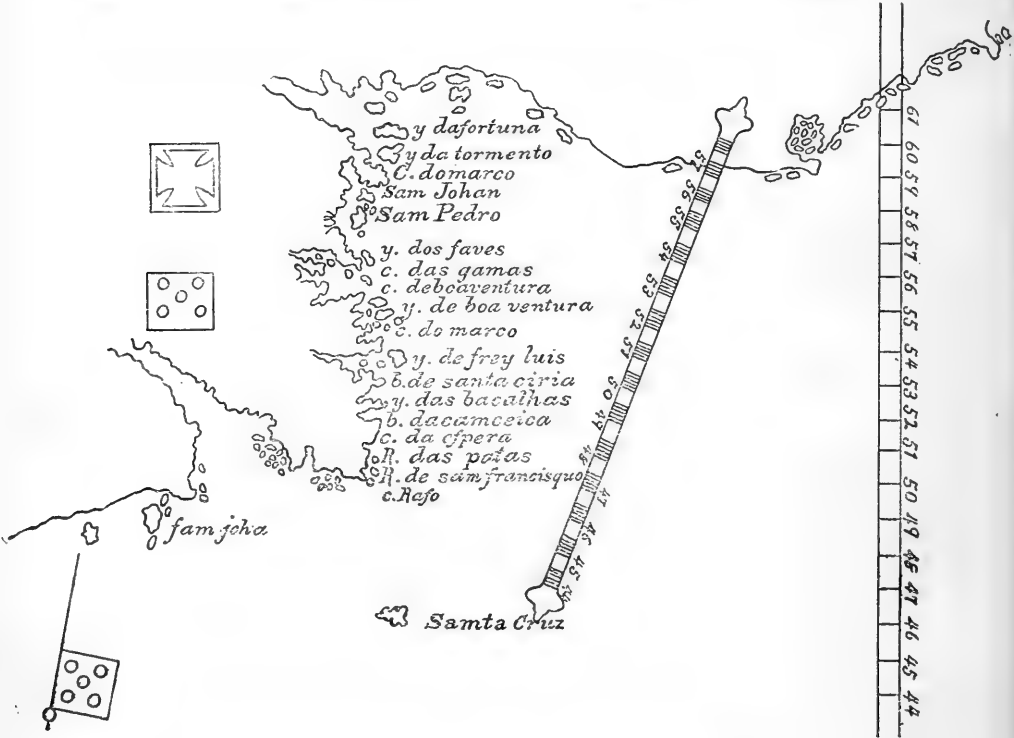


FIG. 16.—PEDRO REINEL'S MAP, A.D. 1505 (FROM KOHL).

sented—and not taking the map, as a whole, and referring legend No. 8 to its corresponding heading on the map, as every reader at once does with the other legends. Legend No. 8 covers all Acadia, Canada East, Newfoundland and Labrador to the farthest north.

I trust that the student of this question will refer to the map of 1544, given at the end of this paper in photographic facsimile. No other photographic copies of the complete map, excepting the twelve made for the late Dr. Deane, are known to me, and it is a great privilege to be able to publish this in easily accessible form. Close under the feet of the two bears will be found the reference in two lines:

De la tierra delos bacalla | os ue a tabla primera No. 3.

To make this clear I have repeated the extract of the American part of the map on a larger scale, and thus it will become plain that the information in the legend applies generally to the whole region, and is not an exception in that respect to all the others.

And, finally, I come to the positive portion of my argument, the persistency on the maps of an island of St. John in the Atlantic and close to the easternmost point of Cape Breton. In my first paper I dwelt upon this point at great length, and gave tracings of very many maps. Some of these are, for other reasons, repeated here (the Majollo map, p. 177; Lok's, p. 197). Mr. HARRISSE is a witness to this persistency. It is a fact, impossible to explain away, that from the very earliest period, A.D. 1505, for one hundred years, the east point of Cape Breton is laid down with an attendant island, which, when named, is always St. John. At page 107 of Mr. HARRISSE'S "John Cabot," the following passage confirms my proposition: "So far back as the map constructed by Pedro Reinel, in 1504 or 1505, we find to the east of the peninsula of Cape Breton, in the latitude of 49° according to its scale, a large isle denominated 'Sam' 'Joha.' This island, which as such is fictitious, may owe its cartographical origin to a misconception of the great peninsula which stretches into the Atlantic from the southernmost or Sydney region of Cape Breton island, to which it is joined by an extremely narrow isthmus. We find it in all Lusitanian maps and their derivatives, including those of Dieppe, and with the names of 'I de S. Joan' (Maggiolo of 1527); 'Y. de S. Juhan' (Wolfenbuttel B.); nameless in Viegas's, but Y de St. Jehā in the Harleian, and Sam Joam in Freire's portolano."

There was, indeed, a flying island called St. John Estevan far out in the ocean, and many others, as Antillia (the Island of the Seven Cities), St. Brandan and Mansatanaxio. They flew off the map eventually because they never had any objective existence, but this island of St. John never flew, and there it is yet, in the Atlantic, opposite Cape Breton where it always was. I cannot repeat the whole of my argument of 1894, but I would ask the reader to refer to what I have said there under this head, particularly to the argument from Lok's map of 1582. How utterly misleading, then, it is to talk of the Cape Breton theory as a new theory, and to associate with it Dr. Harvey's name and mine—to plead an immemorial tradition for two distinct places in Newfoundland—a tradition now French, now English, now Portuguese, when, in 1505, in 1527, in 1544, in 1582, in 1600, and in many intervening dates, the landfall of Cape Breton laid down in 1544 and 1582 is identified by the island of St. John.

19.—Date of the Landfall.

While the actual landfall has been long the subject of controversy, no one, until Mr. Harrisse has, so far as my reading goes, disputed the date of June 24th. When it is remembered that June 24 has been accepted for 350 years—that it was accepted in Queen Elizabeth's time and before that by men in England who personally knew Cabot in his later years, and that it has been challenged only in 1896, one naturally looks for some new fact, or some new document, with which to disturb a belief founded on the statement of a contemporary, a son of the chief actor and a partner in the letters patent of 1496. No new evidence is adduced, and the date seems now to be disputed on the general ground that Sebastian Cabot was no sailor, no geographer, but a humbug, an impostor, a charlatan and a liar. But even if that were true, he had nothing to gain by fixing upon June 24. No profound political import attaches to that day more than to any other day, and it is incredible that even such a man as some assume Cabot to have been, should have told a wanton lie about a matter of so little moment. How, then, according to Mr. Harrisse, did "this spurious date" ever come to be named. He says, in brief, that "one Dr. Grajales, living at Puerto Santa Maria about 1544, concerning whom we do not know anything else," wrote the "matter of the legends on the map, and that, when he saw on the map the name "Island of St. John, he may well have assumed that the landfall was on "St. John's day, and so wrote it down, because he knew of the almost "constant practice in those days of naming islands after the saints on "whose days they were discovered." Then, further: "That island "was probably supposed by Sebastian Cabot, in 1544, to be identical "with the one, also imaginary, when he (Cabot) then borrowed from a "French map, where it is inserted in the same place."¹²¹

Here is an aggregation of hypotheses upon which to challenge a date in history accepted for 350 years! Dr. Grajales, in this question, is an utterly superfluous person, inasmuch as Mr. Harrisse acknowledges that Sebastian Cabot supplied the information for the map and its appendages. The argument is really nothing more than that the date cannot be true because Sebastian Cabot is the authority for it. Mr. Harrisse accepts August 10, 1497, found in the public records of England, as the date of John Cabot's arrival in London, on his return from his first voyage, and he thinks that August 5 is a reasonable date to fix as that of his arrival at Bristol; and he believes also, from independent testimony, that the date of Cabot's departure was the beginning of May. If, then, we fix upon the 4th of May as the day of departure, whatever happened must have occurred within 93 days. If the day celebrated at Halifax be the right day, that will allow 50 days out and 43½ days for landing and the

voyage back. We know by experience that the outward voyage is usually longer than the return, and Cabot also had to face the prevailing westerly winds for he himself told Soncino "that he wandered for a long time until he hit on land." When, however, he turned to go home he had a straight, known course, and the chances are enormously in favour of his having had a continuously fair wind. Some actual examples will assist in forming an opinion as to the length of the return voyage and they will be taken from voyages under similar conditions. On June 19, 1536, Cartier left Cape Race and arrived at St. Malo on July 6, in 19 days. In 1603 Champlain made the same passage in 18 days; in 1607 he was 27 days from Canso to St. Malo. Canso is close to Cape Breton, and if we allow John Cabot the extreme 27 days and the landfall be at Cape Breton, he will have had 16 days to spare for landings and examination of the country, and for wood and water, and refitting. In speaking of the distance John Cabot himself put it at 15 days from land to land, basing it, no doubt, on his run home from Cavo de Ynglaterra. No one but Pasqualigo mentions coasting; but Mr. Harrisse takes his 300 leagues of coasting and doubles it, because he thinks that Cabot retraced his course and went twice along the Labrador coast. It seems to him so easy to saunter along there! The coasting need not have delayed him if his landfall was Cape Breton. The south coast of Newfoundland is high and the water bold in its whole length. Its features are clearly visible from a vessel sailing along, and Cabot was not making a survey, but a reconnaissance preparatory to a future expedition.

The 10th chapter of Mr. Harrisse's last book is headed, "June not the month of the landfall," and he throws it back into May. This navigation along Labrador, from Hamilton inlet to Cape Chidley (from 54° to 60°), was not, according to his last theory, late in June and early in July, but late in May and early in June, because in his opinion "Cabot and his crew rested a while, and devoted some time to refitting or repairing their diminutive craft, as well as taking in wood and water, and renewing the stock of victuals, which could be done only by hunting and salting game on shore."¹²² Very little wood could possibly be needed to cook the food of eighteen men. They might have filled the "Matthew" up in half a day. Water, no doubt, they required, and the rest of the day might have filled their casks; a pool on any iceberg off the coast of Labrador would have supplied them. He told Soncino that the sea swarmed with fish, and that they could be dipped up in a basket. What better food could he have than the food of the fishermen of the locality now? But then, at Labrador, he would be a month too early for the cod to strike in. Possibly he might have got ducks or geese, but as for caribou, they would not be down on the coast. Bears and seals, however, might have been numerous.

There is one strange thing about all this sailing up and down the Atlantic coast of Labrador—no mention is made in the contemporary

documents of ice. Of course, John Cabot would not have mentioned it if his landfall had been at Cape Breton on June 24, for the good reason that he would not see any, but Mr. HARRISSE sends him up to Labrador in 54° to 60°, and omits to take into account the ice there.

Let it be supposed that Mr. HARRISSE is right, and the landfall was, to quote his words, "between Cape Sandwich and Cape Chidley," we shall be in the midst of difficulty, for how did Cabot's little cock-boat, the "Matthew," get across the outer stream of Arctic ice, 50 to 100 miles wide, coming down along the Labrador coast, far outside of the ice which sets against the shore and fills the bays? (See Appendix A.)

Mr. HARRISSE himself suggests a solution of the problem when he says: ¹²³ "Either the landfall in 1497 was not effected on the 24th of June, or, *contrary to Sebastian Cabot's asseverations, both cartographical and descriptive, only a very limited portion of the coast of the new world was visited on that occasion.*" I accept the latter alternative, for I have maintained that the first voyage was merely a reconnaissance, only I cannot find that Sebastian Cabot said anything to the contrary, and in this passage is again evident the confusion of the two voyages, which I strove at such length to disentangle in 1894. The asseverations of Sebastian Cabot referred to the second voyage, and placed the landfall in a region of ice, and so tallied with his official duty in not compromising the Spanish view of the ownership of all the habitable portion of the western world up to the line of demarcation where the claims of Portugal commenced.

But, beyond all this, it is inaccurate to say that the date we are celebrating rests exclusively on a statement made by Dr. Grajales, or even on the map of 1544 at Paris; because the map was only discovered in 1843, and Dr. Grajales was only discovered in 1892. It has rested for 300 years upon numerous maps referred to by writers in Queen Elizabeth's time, and notably upon one map which hung up in the queen's gallery at Westminster. These maps were stated, by Hakluyt and all other writers of that day, to have been made by Sebastian Cabot. Hakluyt, in his "Western Planting," written in 1584, while Clement Adams was alive, says: "And the day of the moneth is also added in his (Cabot's) owne mape, which is in the queene's privie gallerie at Westminster, the copie whereof was set oute by Mr. Clement Adams." Mr. HARRISSE admits that Eden had seen the map when he wrote, and that Eden was personally acquainted with Cabot and published his work before Cabot's death, and, again, Clement Adams issued the map in 1549, while Cabot was alive and living in London. Here, then, is written evidence traced back to Sebastian Cabot and reduced to writing in his lifetime.

Again, it is misleading to vary the proposition slightly and say that the date is only to be found in the legends on the planisphere of 1544, when we know that later editions of this map existed, dated 1549, and that, while

they differed in the wording of the legends from the copy now extant, they agreed in this respect. Clement Adams's map was not an impression of the engraved plate from which the Paris map was struck, for it was re-engraved, and the legend which fixed the date of June 24 was copied by Hakluyt from *that* map, and thus had the authentication of Cabot while he was living in England. It matters not who wrote the words—the legend was hanging up in the queen's gallery on a map made by a royal officer, engraved by Clement Adams in the lifetime of that officer—Sebastian Cabot, to wit, whose duty it was to supervise the maps and examine the pilots of England.

The reader will, doubtless, notice that I have avoided reference to the interesting controversy going on between Mr. Harrisse, on one side, and Mr. G. B. Weare and Mr. G. R. F. Prowse, on the other, relative to the Fust chronicles and the records of the city of Bristol. That subject can be much better treated in Europe than in Canada, and it is in competent hands. It is not essential to my argument, and I am glad to leave it with those upon whom it has fallen.

20.—*Conclusion.*

And now, having, so far as my abilities permit, replied to my most estimable even if too hasty critics, I am suddenly brought up by a most unexpected deliverance of Judge Prowse in his criticism of Archbishop O'Brien's address. He says: "The real landfall of Cabot in North America must forever remain among the things that are unknown and "unknowable." O, most lame and impotent conclusion! Has all this historic heat, then, been spent for naught? Have all the names for stupidity in the English language been exhausted upon Dr. Harvey and myself for no practical utility? Has all this rhetorical energy coruscated in vain? It cannot be. The judge's illustrious disciples must not be left thus to wander amid the "unknowable," for not to that end were "infinite pains" bestowed upon their conversion. There must be a conclusion; so, putting aside all superfluities of language, let us address ourselves to that most desirable, nay, longed-for, result. It is true the great object has been achieved, and the name of John Cabot has been rescued from the obscurity in which for four centuries it had been enveloped; but something is still due to the irritated historical susceptibilities of the public, which will refuse to be satisfied by the "unknown," and, still less, by the "unknowable."

It will appear, upon a careful perusal of the preceding pages, that there is no physical or geographical reason *a priori* why Cape Breton may not have been Cabot's landfall, and that the voyage was intended to be upon a westerly course. It will also appear that all the conditions existing upon the North Atlantic tend to make a westerly course swerve to

the south, and that there is, therefore, a strong preponderance of probability in favour of a landfall at Cape Breton.

To that same conclusion the positive evidence of the strictly contemporary documents also points, and that same landfall was set forth eighty years before any other was specifically named. It has been shown that John Cabot gave to Pedro de Ayala, Spanish ambassador in London, a map of his discoveries on his first voyage, and that map was sent to Ferdinand of Spain late in the year 1498, before the second expedition returned. The same king employed Juan de La Cosa to make a *mappe-monde* in the year 1500, and that cartographer compiled it out of the materials then accessible. His *mappe-monde* contains the English discoveries on the northeast American coast, to wit, the discoveries of the Cabots, for there were none others made at the time, and the conclusion is, therefore, irresistible that La Cosa's map contains the results of John Cabot's first voyage.

It has been, moreover, made clear, and admitted by very high authority, that *Cavo de Ynglaterra* on that map is Cape Race, and it therefore follows that the coast discovered and named was the south coast of Newfoundland, and was directly west of Cape Race. At the end of the list of names is *Cavo descubierta*, in a position, and direction on a magnetic course, corresponding to Cape Breton. *Cavo descubierta* is a Spanish name, meaning "the cape discovered," and denotes, when put plainly, the cape of landfall.

Further proof is given that the landfall was a southern one in the despatch of Dr. Puebla to their Catholic majesties expressing his belief that the land found belonged to Spain. This belief is shared by De Ayala, who says that from the direction he is certain the lands belong to Spain, and because the map does not show the islands known to be the property of Spain, i.e., the Antilles, he thinks the map is false. This proves that the direction and discovery was well to the south and west, but also near to the line of demarcation; and the line of demarcation passed a little east of Cape Breton and cuts off Newfoundland and Labrador.

It is proved that the land of the first landfall was in a temperate, well-wooded, pleasant region, where the sea abounded in fish. This cuts off the whole northern region. There was no ice there, for ice was a novelty to sailors, and it is not mentioned. It is a region where brazil wood and silk might be expected to grow.

That is John Cabot's testimony to his landfall of 1497.

It has been proved that maps were made in the years 1544-49, if not by Sebastian Cabot, yet on information received from him, and one dated 1549 was cut by, or for, Clement Adams in England, when Cabot was at the head of the nautical affairs of that kingdom and the official examiner of all pilots.

On that map the landfall is expressly laid down "prima terra vista" at the northeast point of the island of Cape Breton. This is confirmed by Lok's map, in Hakluyt's *Divers Voyages*, published in 1582, while Cabot's map was hanging in the queen's gallery. Lok's map also gives, on the point of Cape Breton, the words, "J. Cabot, 1497," and places near it the island of St. John in the Atlantic.

It was shown that Pedro Reinel's map of 1505 placed an island of St. John at the point of Cape Breton—eight years only after the voyage of 1497, and that ever since that time an island has been shown to exist there.

If we may argue from Lok's map (which is supported by all the other maps), the island of St. John on Clement Adams's map of 1549 was also in the Atlantic, off the cape. On the only copy existing of the map of 1544, and on that alone of all the maps, an island of St. John is, indeed, inside the gulf, and occupies the place of the Magdalen group; it must, moreover, be held to be that group, because Prince Edward island was at that time, and for fifty years afterwards, supposed to form part of the solid continent. The geography of the gulf has been proved to be derived from Cartier, but Sebastian Cabot's evidence confirms that of his father as to the landfall on the Atlantic, and, if any persons in the world knew where the landfall was, they did.

These are the main conclusions I venture to submit, and until some new map be found, or some additional evidence be produced, I think that they are probable to the very highest degree attainable in such matters. After fifty years of discussion, Watling's island has been generally received as the landfall of Columbus, and a landfall for Cabot at Cape Breton is equally probable. There are, no doubt, difficulties in the case of Cabot, as, indeed, in that also of Columbus, but the weight of evidence is in favour of both. If, however, any one elects to turn his back upon the only positive testimony in existence, and to follow elaborately woven hypotheses; if he prefers to seek out new landfalls and propose them for general acceptance, the maps, at least, of this paper will assist the public to form a reasoned opinion concerning them. It is longer than I wished; but all the really important maps are now presented, and the leading authorities are clearly indicated, and, if my conclusions be not accepted, the materials for an independent judgment are now plainly set forth. The inquiry is worth the trouble, for the primal event in Canadian history is in debate. When all the capes on the northeast coast of America and the capes inside the Gulf of St. Lawrence have been exhausted, the general consensus of scholars will probably accept the only positive evidence in existence, and fine-spun hypotheses and short-cuts of conjectural geography will drop into the inevitable "budget of paradoxes" which awaits the close of every keenly fought controversy.

APPENDIX A.

THE LABRADOR COAST.

In both of the previous papers of this series I gave testimonies from the most unimpeachable authorities as to the real nature of the Labrador coast. I went back even to Jacques Cartier, and covered a period of 350 years, because it has sometimes been thought that the climate has deteriorated in recent times. Similar testimony could be cited to an endless length. I shall, however, add only a few more extracts, simply that they may remain in a place of convenient reference for those who, at some future time, may take up this inquiry. I would remark that it is no answer to this mass of evidence to say that sealing vessels enter the floe ice, or to postulate certain exceptional conditions or circumstances in which a vessel might get through the ice and reach the shore. No ice at all is recorded on John Cabot's voyage of 1497, and he reached the shore without mention of any trouble. The country he reached was of a temperate climate, and the sea swarmed with fish. On the contrary, in 1498, there was abundance of ice, and it is mentioned as something new and without precedent. Those who argue for Labrador must sweep the ice off the coast. They must find some proof that it does not exist—that somebody went there and saw no ice—and that the fisheries go on along Northern Labrador, as a usual thing, late in June and early in July. They must show that the climate is warm enough, and the soil is good enough to give promise of "silk and brazil-wood," and that the land is "fertile." It will not be sufficient to show that some vegetables may be grown in little plots in sheltered places, where they may be covered during frosts, but that they grow without any precautions in the open air. It will not be sufficient to show that at the heads of the deep inlets spruce or other sub-arctic trees may be found, but they will be required to show that the country is forested down to the shore, that the trees may be seen from a passing ship, and seen so that Cabot could have formed an impression that he was coasting along a fertile country, or, on landing, that he could have found, a few miles from the seashore, indications of the fertility he reported.

In my previous papers I made reference to the voyage of the "Alert," under command of Lieut. Gordon, R.N. A further account of the voyage will be found in "Good Words" for 1888, written by Captain (now Admiral) Markham, who accompanied the expedition. On the 1st of July the steamer rounded the eastern point of Labrador (latitude 53°), that is, south of the point supposed to be the landfall. "Icebergs innumerable lay stranded along the shore, some of them of very large dimensions." On July 2nd "snow was falling, the weather was gloomy, and the ship was surrounded by loose, drifting ice, whilst the temperature was down to freezing point." "One of the icebergs we passed was estimated to be at least two hundred feet in height and half a mile

“in length.” “The coast of Labrador—a bleak and inhospitable country —the utter sterility of which appeared its most noticeable feature; the summits of the hills and the valleys were still retaining their wintry garb of snow.” The following is a description of the coast off Cape Chidley on July 5th to 9th: “Our progress was sadly interfered with, and our movements hampered by ice and fog.” “On deck the scene was wild and dismal. The wind was howling through the rigging, snow was falling heavily, and the ship was entirely surrounded by ice, whilst the noise of the ice as it was broken by the irresistible pressure of the pack, mingled with the howling of the gale that was raging, was so great that it was absolutely impossible to hear people speaking close alongside. On the 9th of July we passed Cape Chidley.”

This is the testimony of Captain Markham, one of the commanders on the “Nares” expedition, and now an admiral in the Royal Navy. The following is the testimony of an expedition of United States scientific men which left St. John’s, Newfoundland, in the steamer “Miranda.” The extract will be found in a volume published by the Appletons, of New York, in 1896. It is entitled, “Greenland Icefields,” and is written by G. Frederick Wright, D.D., LL.D., F.G.S.A., and Warren Upham, A.M., F.G.S.A. Starting on July 15th from St. John’s, they intended to steam up along the coast of Labrador. On July the 17th they ran into an iceberg off Cape St. Charles, and had to go back to St. John’s to refit. The book is nicely illustrated, and the engravings will be an antidote to any idea of silk and spices on that coast. They met masses of floe ice and many bergs close to Belle-isle. The earlier chapters describe the conditions of navigation as follows:

Floe ice is crowded by the earth’s revolution on Labrador so “as greatly to interfere with navigation. Oftentimes a whole summer passes during which it is almost impossible to enter any of the northern ports on account of the ice, and sometimes it is difficult to get into any of the ports even as far south as Hamilton Inlet, until past the middle of summer.”

The following is a description of that part of the coast between Cape Charles and Hamilton Inlet, 50° to 54° latitude:

“Everywhere the aspect of the coast is barren in the extreme. No timber is in sight as one sails along the shore, and in the interior, what little there is in the lower valleys has small commercial value. Snow lingers throughout the entire summer in protected places, even down to the water’s edge, and a long, even line of water-washed rocks bear enduring testimony to the height and violence of the waves.”

An extract from Mr. Low’s description of the coast is given in Appendix A of my paper of 1896. The following extracts are from Dr. Robert Bell’s reports for the Geological Survey in 1885. He also was on the “Alert” expedition:

“Beyond the straits of Belle-isle numerous icebergs were passed every day, both in the open water and among the field ice. When in the latter position they were observed to be almost always, more or less, completely surrounded by a space of open water. On the voyage back from Newfoundland to the Straits, between the 27th of July and the 3rd of August, icebergs were again equally numerous, especially as we approached the Labrador coast, but on neither occasion did we meet with any of remarkable size or height, the great majority of them being comparatively small.” (D. D., p. 6.)

“ We entered Nachvak inlet on the 1st of August, and were informed by Mr. Skymner, who had been in charge of the observatory station there since the previous year, that the fixed ice of the inlet had only disappeared on the 12th of July.” (D. D., p. 7.)

“ In the months of June and July wide lanes of open water were formed between the field ice and the land. As far as could be observed, this ice was clear, or free from dust and rock-debris, as if it had been formed away from the land. The clear ice continued until the end of June, when foreign matter began to appear upon the slowly moving floes.” (D. D., p. 7.)

“ The annual precipitation at the present time is not great, otherwise small glaciers would probably form among these mountains, which lie between latitudes 58° and 60°, and which overlook a sea bearing field-ice for half the year, and from which bergs are never absent. Patches of snow, however, remain throughout the summer in shaded parts of the slopes and on the highest summits, which range from 4,000 to 6,000 feet above the ocean.” (D. D., p. 8.)

In a paper on the Labrador peninsula, contributed by Dr. Robert Bell to the *Scottish Geographical Magazine* for July, 1895, we read :

“ The Labrador peninsula, as a whole, may be said to be more or less clothed with forests, with the exception of a small area in the north-western extremity, and another along the northern part of the Atlantic coast, which may be called ‘barren grounds,’ like those north of the forests on the west side of Hudson’s bay.” In the map by Dr. Bell, appended to the report in 1888 of the select committee of the Senate of Canada, the whole coast from the Straits of Belle-isle north is coloured yellow, to show that it is part of the “barren grounds.” Such evidence as I have cited cannot be waived aside by mere confident assertions in a discussion. The ice is on the coast, and the trees are not, and it is now in order for those who praise the climate and fertility of Labrador to quote some authority to support their statements.

Let it be supposed that one of my readers wishes to go to Labrador—to the supposed landfall of Cabot there in 1497—to go now, in this year of commemoration. He would proceed first to St. John’s, Newfoundland, and there he would find that the Newfoundland Coastal Steamship Company would despatch the first steamer of the season on the first Tuesday in July (the 6th) and would be informed that she would go to Battle harbour (latitude 52° 17’) and as much further up the coast as the ice will permit, and that while she may reach Hopedale, it is not probable she will be able to go so far. He will learn also, in St. John’s, that the regular steamer on the northern route will proceed to the Strait of Belle-isle, on her first trip “on Labrador mail service,” on July 13th, 1897. We are called upon to believe that the little “Matthew” dropped upon this coast and navigated up and down, and the crew landed, and hunted, and salted game, and saw nothing unusual.

While the above lines were being written, the October, 1897, number of “The Toilers of the Deep” arrived, containing a narrative of the first trip this year of the mission steamer “Julia Sheridan” to Labrador. She was trying, from June 23rd to 26th, to get into Battle harbour—battling with the ice, and as she was specially built for such work, she drove in among the ice with sails set and every pound of steam on. A steam launch close behind had its bows stove in. But when the “Julia Sheridan” got into the harbour she could not reach the landing stage for ice.

Battle harbour is not more than twenty miles north of Belle-isle island—as near as possible in $52^{\circ} 17'$, and far south of the supposed landfall. On July 3 the harbour was again full of ice, and on the return of the vessel on July 8, the cod had not struck in at the Strait of Belle-isle. It was not until the steamer reached Blanc Sablon, inside the strait, that the fish were met. The pilot charts record “an endless number of bergs” off the coast in June; and, in July, they report the strait was full of bergs. I beg that it may be carefully borne in mind that these statements are not made on my authority. I have never seen any part of Labrador beyond the southern coast. They are the statements of men who have sailed, and are sailing and working along the coast. It will not avail to elaborate an ingenious hypothesis with “if,” and “perhaps,” and “possibly,” and “it may be supposed,” and “no man will doubt,” that Cabot might have slipped in through some opening in the ice, loosened by an off-shore wind, and got into the inner water and coasted between the ice and the shore; any one who reads the testimony cited in this and my previous papers—testimony of people not entangled in controversy, and with no Cabotian theories to support—will see that the physical conditions of the coast of Northern Labrador are irreconcilable with the records of the voyage of 1497.

This, then, is the coast which some insist answers to the contemporary reports as fertile (fertile), as fruitful (fructifere), as temperate (temperata), as endowed with excellent soil (terra optima), and with such a forest growth as suggests silk and brazil-wood. If it be necessary that John Cabot should have found his landfall there in 1497—if the documents say so and it can be demonstrated—then let us say that, by some happy stroke of luck, he got through the field ice and touched the shore, and that on his return he and the rest of his crew conspired to make a false report, and that he dared to take an expedition there the next year to make a settlement.

APPENDIX B.

THE SEVEN CITIES.

Among the mythical islands of the Atlantic was the island of Antilia, or the Seven Cities. The story is given shortly upon Martin Behaim's globe, made in the year 1492, and now at Nuremburg, to the effect that : In the year 734, after the conquest of Spain by the Mahometans, this island, Antilia, was discovered and settled by an archbishop from Oporto, in Portugal, who fled to it in ships with six other bishops, and other Christian men and women. They built there seven towns, from which circumstance it has also been called "Septemcitade" (the island of the seven cities). In the year 1414 a Spanish vessel came very near to it.

Behaim and Toscanelli place this island close to the Tropic of Cancer, but many of the maps put it a little further north, in the latitude of Lisbon. Everybody believed in this island for a long time after Cabot, and we have in the name "Antilles" a survival of this universal belief. The shape of the island as laid down on the maps is uniformly an oblong, like the annexed cut, which is traced from Benicasa's map (A. D. 1482), in Kretschmer. It is interesting to note that there are names on the map,

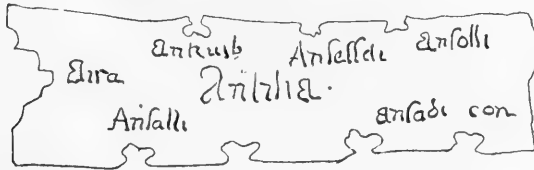


FIG. 17.—THE ISLAND OF THE SEVEN CITIES.—FROM BENICASA, A.D. 1482.

and notches at regular intervals along the coast, probably the harbours—all of which is encouraging to those who take these mediæval maps so seriously. As the island has disappeared, it is not worth while to spend time over the names. The chief value of the island in this discussion is that, as the latitude of the Seven Cities was never higher than 40° N., the indication is of a discovery in a low latitude. There were other islands to the north, laid down with equal precision. The Island of Mansatanaxio was the next farther north—the island of the hand of Satan—where, as some imagined, a great hand issued from the sea and dragged unfortunate mortals into the abyss. Others have supposed the name to be a corruption of San Athanagio (Athanasio), but the isle of demons which lingered on the maps for more than a hundred years longer on the Newfoundland coast was probably a transference of this island. North of this was the island of Brasil, west of Ireland, and Isla Verde¹²⁴ and Maida, both in the same part of the north Atlantic. All these islands have disappeared, but reminiscences of them lingered on the maps as uncertain dangers almost down to our own times, in names whose origins have been long since forgotten. One of the islands off the Cavo de Ynglaterra of La Cosa is the imaginary Isla Verde, and it is so named, although Archbishop O'Brien finds it to be an island northwest of Cape Chidley. It will be remembered that the abortive expeditions from

Bristol, prior to Cabot, were all in search, not of the Seven Cities, but of the island of Brasil. The search for the island of the Seven Cities had been long going on from the Canaries and Azores in more southern latitudes.

In the presidential address of this year attention is called to the mention of the Seven Cities, by Soncino, as having been found by Cabot at 400 leagues' distance, and Chateau bay, on Labrador, is supposed to be the place indicated, because of the basaltic cliffs which rise steep from the shore and form by their peculiar shapes a grand scene, suggestive of castles and turrets. The distance from England, however, is 2,000 miles, and the scenery, though imposing, is desolate, nor could the cliffs ever be mistaken for buildings, so that it is not easy to recognize in it any suggestion of the rich and populous island colonized by the seven bishops. The whole story and the island itself are merely Middle-Age legends, and the residue of fact germane to the present question is that the land found was to the west and well to the south, and that it was not over 400 leagues from England. The coast of Newfoundland, from Cape Race to St. John's, is the nearest land to England, but it also is far more than 400 leagues away. There is nothing about it to suggest the Seven Cities. I venture to think that, if Soncino had been an Englishman or an Irishman, he would have called the land Brasil or St. Brandan's; but, being an Italian, the legend most familiar first suggested itself to his mind. These early maps and first impressions of the new world will lead us astray if we interpret them as if they were authoritative statements of geographical truth. Humboldt says that in the Middle Ages conjectures were religiously inscribed upon maps, as is seen by Antilia, S. Brandon or Borondon, the Hand of Satan (Mansatanaxio), Isle Verte, Maida, and the immense continents of the south. The first chapter of Mr. G. E. Weare's recent book, "Cabot's Discovery of North America," gives a very interesting summary of the legendary lore about these imaginary islands.

APPENDIX C.

FOG OFF CAPE RACE.

Report of the Engineer at the Lighthouse at Cape Race for the month of June, in the years 1894-95-96-97.

JUNE.	1894.	1895.	1896.	1897.
1	Fog.	Fog, a.m.	Fog.	Fog and rain.
2	Fog, p.m.	Fair.	Fog, rain.	Fog and rain.
3	Fog.	Fine; rain at night.	Fog, a.m.	Fine.
4	Fog.	Fine.	Fog.	Fine.
5	Fog.	Fog, a.m.	Fine, N.E. gale.	Fine.
6	Cloudy, rain.	Fine, N.E. gale.	Fine, N.E. gale.	Fine.
7	Fog.	Fog.	Fog.	Fine.
8	Fog, a.m.	Cloudy; fog, p.m.	Fog.	Fine, a.m.
9	Fog, a.m.	Fog.	Fog.	Cloudy.
10	Fog.	Fog, a.m.	Fog, a.m.	Cloudy.
11	Fine.	Fog, a.m.	Fog, a.m.	Hazy.
12	Fine.	Fog, p.m.	Fog, a.m.	Fog and rain.
13	Fine.	Cloudy.	Fog, a.m.	Fog at intervals.
14	Fine.	Fog, rain.	Fine.	Fog at intervals.
15	Fine.	Fog.	Fog, a.m.	Fog, p.m.
16	Fog, p. m.	Cloudy; fog, a.m.	Fog, a.m.	Fine.
17	Fog.	Cloudy.	Fog, a.m.	Fine.
18	Fog.	Fine.	Fog, p.m.	Fog, a.m.
19	Fog.	Cloudy; fog, p.m.	Fog, a.m.	Fog, a.m.
20	Fog.	Fog.	Fog, a.m.	Fog, a.m.
21	Fog.	Fog.	Fog, p.m.	Fog, a.m.
22	Fog.	Fog.	Fog.	Fine.
23	Fog.	Fog, rain, storm.	Fog, a.m.	Fine.
24	Fine.	Gale.	Fog, a.m.	Fog, a.m.
25	Fog.	Fine, gale.	Fine, a.m.	Fog.
26	Fog.	Fog at intervals.	Fog, rain.	Fog.
27	Fog.	Fog, rain.	Fog.	Fog, p.m.
28	Fog.	Fog at intervals.	Fog.	Fog at intervals.
29	Cloudy.	Fog.	Fog.	Fog, a.m.
30				

APPENDIX D.

THE CLIMATE OF CAPE BRETON ISLAND.

If the question of the Cabot voyages were debated only in America, it would be unnecessary to say anything about the climate of Cape Breton; but the literature of the subject is studied by scholars in European countries, who have never had the opportunity of visiting the shores of this favourite summer resort of tourists. I have elsewhere portrayed the character of Labrador. Of Newfoundland I would only say that its farming lands and grand scenery are on the west coast. I shall confine myself to a few notices of the summer climate of Cape Breton by people not interested in this controversy, in order to show why John Cabot told Raimundo da Soncino "that the land is excellent and the climate temperate, suggesting that brasil and silk grow there." The attractiveness of the Cape Breton summer has become widely known on this continent since the Intercolonial railway opened up the island to travel. In the Badeker Guide (p. 87) the charm of this route is mentioned thus: "The chief attractions of Cape Breton to the tourist are its "delightful summer climate and the scenery of the Bras d'Or lakes." These are not lakes in the usual sense, but arms of the sea opening into the Atlantic, and the largest vessels may pass into them with ease. Sydney harbour is one of the best in America, and is a very beautiful spot; it is about twenty-five miles from Scatari island, and close to it is the opening into the Bras d'Or, a veritable golden arm of all beauty of sea and shore which the poet or painter could dream of.

The following is Charlevoix's description of the country around Ste. Anne's bay, where the French fishermen gathered in early days. It is a few miles beyond the opening into the Bras d'Or:

"La pêche y est très-abondante; qu'on y trouve quantité de bons bois, comme des érables, des hêtres, des mérisiers, surtout des chênes très-propres à la construction et des mâtères, qui ont depuis vingt-huit jusqu'à trente-huit pieds de haut; que le marbre y est commun, que la plus part des terres y sont bonnes, que dans la grande et petite La Bras d'Or, qui n'en sont qu'à une lieue et demie le terrain est très fertile et qu'elles peuvent contenir un grand nombre d'habitants." (Histoire et description de la Nouvelle France, vol. 2, p. 398. Paris, 1744.)

Bacqueville de La Potherie thus describes the island. He is writing of the Atlantic side of it:

"En éffet, c'est une très belle isle, a la côte de l'Acadie, vis-à-vis la pointe du Sud de l'Isle de Terre-Neuve, que forme l'entrée du Golphe de Saint Laurent. La terre y est admirable. Ce ne sont que Plaines, que Préries, que Forêts remplies de Chênes, d'Érables, de Cedres, de Noyers & des plus beaux Sapins du monde & des plus propres pour la Maturé. L'on pourroit y construire des Moulins à scier pour faire des Planches de Sapins, de Noyers, & de bordages de Navires, qui seroient d'un grand Commerce pour la France.

"L'on y feroit une seconde Normandie si l'on vouloit y planter des Pepins de Pommes, le Calville surtout y seroit d'un goût exquis comme celui de l'Acadie. Le Chanvre y vient naturellement, & l'on y en trouve des champagnes toutes remplies. Le Bled y seroit plus beau qu'à Quebec: le Houblon y viendrait aussi.

“ La Chasse aux Outardes, aux Oyes sauvages, aux Perdrix de France, aux Gelinotes de bois, aux Tourterelles, aux Canardes, aux Pluviers, aux Sarcelles, aux Beccassines, & a toute sorte de Gibier de riviere y régne de toutes parts. Je ne parle point de la Pelleterie du Canada, qui n’y manque point.

“ L’on n’auroit pas si loin à aller pour faire la pêche de la moruë comme à Plaisance, et l’on n’y courroit point le même risque, d’autant qu’elle s’y fait presque terre à terre tout le long de l’isle.” (Hist. de l’Amérique Septentrionale par Bacqueville de La Potherie, vol. 1, p. 20. Paris, 1753.)

The following is from Haliburton’s “History of Nova Scotia” :

“ Although the soil of the island has hitherto (1833) been worked by ill-instructed and careless cultivators, who, possessing abundance of land, take little pains to make it productive, yet the discovery has already been made that in fertility it is superior to any of the uplands of Nova Scotia.” (Vol. 2, p. 258.)

“ A line of coast extends from the great Bras d’Or, in a southeast direction, as far as Cow bay, about thirty miles, which may be denominated the coal coast, nearly the whole range being faced with perpendicular cliffs, streaked with veins of coal. The country on the summit of these cliffs is level, but becomes undulating in the interior. The land is well adapted for cultivation, and in the unsettled parts is clothed with timber of good size, except near the margin of the cliffs, where it is usually overspread with stunted spruce and other fir trees, all inclining landwards from the fury of the Atlantic storms, flattened at the top into the semblance of so many umbrellas. In the cultivated parts, however, the coast wears a very dissimilar aspect, the summits of the cliffs being arrayed in a green sward, gently rising as it extends backwards to the forest, which shows in the distance a wall of majestic trees, generally beech, birch or maple.” (Vol. 2, p. 204.)

Speaking of Sydney, Haliburton says: “ The surrounding land is a fine agricultural tract.” Between Sydney and Lingan “ the soil is fertile and well timbered both near the shores and in the interior.” Still continuing south, Haliburton says (p. 211) of Salmon river: “ The waters gush through a narrow channel, fourteen miles further, into the beautiful Miré bay, a crescent of fair sandy beach, well wooded and commanding a noble prospect of the ocean.”

Then follows, only five miles away, the point of Cape Breton and Scatari island. The soil from thence southwards is poor, beyond Louisbourg and along the coast, until it turns west at the Lennox passage. Cape Breton itself is the lowest part of the coast, and both it and Scatari island are exposed to the full sweep of the Atlantic. The coast there is rocky, and the rock is hard, being the terminal point of the hard Cambrian rock which skirts the coast of Nova Scotia. Haliburton says that the cape of Cape Breton is “ better known to the mariners of the coast by the name of Port Novy Land, from the small adjacent island of “ Puerto Nuevo.” This little islet is on the charts as Port Nova,¹²⁵ and the name is a survival of the earliest times of Portuguese voyages along the coast.

I have preferred to make quotations from these older writers, because in 1725 and 1833 the coast was less changed, and both Father Charlevoix and Judge Haliburton have been long gathered to their fathers, and are beyond the reach of adjectives or other rhetorical mis-

siles. The counties on the Atlantic are called Cape Breton and Victoria counties. An official description may be found in a small book, published with the authority of the lieutenant-governor of the province, as follows: "This county (Victoria) is 80 miles in length and only 15 to 20 miles wide. The northwestern part is mountainous and but scantily settled. The southwest is better adapted for agriculture, and the soil is particularly good in many parts." Of the other the description is as follows: "There is good land, suitable for agricultural purposes, in this (Cape Breton) county, but it is not in general well cultivated. Dairy farming is carried on to some extent, and a good deal of butter is exported to Newfoundland. A large number of the people are engaged in mining and shipping coal, and many earn a living by fishing."

Mr. Richard Brown resided on the island for many years as agent for some English mine owners. The following is his account of it:

"The summers of Cape Breton, say from May to October, may challenge comparison with those of any country within the temperate regions of the world. During all that time there are, perhaps, not more than ten foggy days in any part of the island, except along the southern coast, between the Gut of Canso and Scatari. Bright, sunny days with balmy westerly winds follow each other in succession week after week, while the mid-day heats are often tempered by cool, refreshing sea-breezes. Of rain there is seldom enough; the growing crops more often suffer from too little than from too much." (History of the Island of Cape Breton, etc., by Richard Brown, F.G.S., F.R.G.S., London, 1869, p. 6.)

The following is Charles Dudley Warner's description of the climate. Mr. Warner's writings are classic in America.

"There was an inspiration in the air that one looks for in the mountains rather than on the sea-coast; it seemed like some new and gentle compound of sea-air and land-air which was the perfection of breathing material. In this atmosphere which seems to flow over all these Atlantic isles at this season one endures a great deal of exercise with little fatigue, or he is content to sit still and has no feeling of sluggishness. Mere living is a kind of happiness.

"Certainly, as we glided out upon the summer waters and began to get the graceful outline of the widening shores, it seemed as if we had taken passage to the Fortunate Isles. It was enough to sit on deck and absorb by all the senses the delicious day." (Baddeck, by Charles Dudley Warner.)

The cape of Cape Breton is a projection of a band of Primordial rock protecting the Carboniferous basin of the island. It is five miles wide from the sea to a narrow band of Silurian three miles wide, and then the Carboniferous rocks succeed. There is an outlier of Carboniferous limestone on the south side of Mira bay, and at the north point the coal comes out on the shore in the Tracy seam. Scatari island is of Primordial rock also. It is seven miles long, of a remarkable triangular shape and deeply indented by the sea. The outer portion consists of high barren moors 100 to 150 feet above the sea, not marshy, but with shallow ponds, and the remainder is scantily wooded. The point of the cape consists of low moors with shallow ponds, backed by hummocky hills and thickly wooded with dwarf spruce. Only six miles distant from the point of the cape is Mira bay, into which the Mira river falls—"a noble stream which broadens a few miles from its mouth into a long, expan-

“sive lake surrounded by well-wooded hills, and is justly named Grand Mira by the people.” I have been particular in describing this point, because an attempt has been made to apply to the whole island the physical peculiarities of this rocky point, exposed to the full sweep of the ocean, much as if one should argue concerning the fertility of Spain from the specimens presented at Gibraltar, Cape St. Vincent or Finisterre. The quotations I have given are from old authors or from writers not interested in this controversy. It is not me my critics are contradicting; it is Charlevoix, Bacqueville, Haliburton, Brown, all of whom are dead; it is Charles Dudley Warner, who is a well-known living United States writer; and only the last sentence just preceding, in inverted commas, is by a living Canadian, Dr. Bourinot, who was born within twenty miles of the valley of Mira river. It is of no avail to say the point of Cape Breton and Scatari are rocky. Every promontory projecting into a wide and stormy ocean must be rocky or sandy. It was not the point Cabot wrote about; it was the general character of the country around.

APPENDIX E.

THE TANATS.

I am very much afraid that our president underrates, in his address, the extent of general information concerning ancient, and especially mediæval cartography, because, in fact, that subject has been worked up in many excellent treatises, during the last fifty years. I do not think the attentive reader will be impressed with the ignorance of those who have, for so many years, been discussing this question, and I think it will be very unsafe for any one to count upon them being unfamiliar with anything really important upon the subject. So far as the mediæval people are concerned, the case is very well put by Humboldt (*Ex. Crit.*, I, 120): "Le moyen-âge ne vivant que de souvenirs qu'il supposait classiques, et n'ayant foi dans ses propres découvertes qu'autant qu'il croyait en trouver des indices chez les anciens, a été agité, jusqu'au temps de Colomb, par tous les rêves cosmographiques des siècles antérieurs." They were in real truth excessively weak in geography, if their maps are the faintest reflex of what they knew, and until Ptolemy was (in 1409) translated into Latin their cosmographical notions were extravagant and fanciful; and even afterwards, when the science of the Greeks began to spread, it was only such intellectual giants as Friar Bacon, Cardinal d'Ailly and Albertus Magnus, few in number, who could apprehend it. The mass of men were of the order of mind which resisted Columbus for seventeen years. Still, in the manner of this special controversy there is much that reminds one of the Middle Ages, for the exceedingly strong mode of expressing dissent recalls the trenchant style of Cosmas Indicopleustes when he boiled over with indignation at those perverse ones who persisted in believing the absurd theory that there were antipodes, and that men could walk with their heads downwards, and that rain could fall upwards. That was indeed "absurd," "senseless," "preposterous," "puerile," "childish," or anything else disagreeable which the outraged common sense of that irritable writer could suggest.

The real state of geographical knowledge of that period is well expressed by Nordenskiöld: "During the next millennium after Ptolemy the art of drawing maps had become almost extinct among learned men and scholars in Europe. Yet some passages in writings from this long period may be cited showing that maps, of which a few are still to be met inserted in old manuscripts, were then in use." He then goes on to show that these maps were similar to the diagram fig. 18. He speaks of a map by Cosmas, which has survived, and of several others as "not deserving the name of maps," and says they exercised no more influence on the development of cartography than the wind-heads on the maps of the fifteenth and sixteenth centuries. He continues: "From the twelfth century the mediæval maps first become of general interest in the history of civilization through their greater fullness of detail, though they were, with the exception of the portolanos, in every respect inferior to the old work of Ptolemy." "Yet their only influence on the art of map-making was the introduction of the custom prevailing to the end of the sixteenth century, of adorning maps with drawings of

“ towers and temples, of kings sitting on their thrones in full attire, of
 “ monsters and ethnographic details, and with inscriptions of a doubtful
 “ geographical character, borrowed from the heathen mythology or
 “ Christian mythology.”

In my first paper I ventured to state that when Soncino said that John Cabot had reached the “ region of the Tanais ” he simply meant that Cabot had reached the regions of Asia on its northeastern side, and I will now give my reasons for that opinion. In inquiries of this kind it is before all things necessary to put one’s self as much as possible in the position of a person living at the period under consideration, and I therefore now give reproductions of some of the maps current at that time or anterior to it ; and here let me recall the fact that the time in question is previous to A.D. 1497, the date of Soncino’s letter. Naturally Soncino could not have been referring to maps published one hundred years later—in A.D. 1618, for instance.

Our own Alfred the Great, in his translation of Orosius, gave a summary of geographical opinion which held good until the discovery of America. He wrote : “ Our forefathers divided the orb of all this earth, “ saith Orosius, which is encircled by the ocean, which is called *Garsecg*, “ into three, and named those three parts Asia, and Europe, and Africa, “ though some men have said that there were only two parts, Asia, and “ the other Europe. Asia is bounded to the southward and eastward by “ the ocean, and this comprises half of all this earth from the eastern “ part. Then on the north part, that is of Asia, and on the right side, “ Europe and Asia join together in the River Tanais ; and then from the “ same River Tanais south along the Mediterranean, and west of Alex- “ andria, Asia and Africa join together.”

To illustrate this idea I give the following cut (fig. 18) from Norden-skiold.¹²⁶ It is from the *Orbis Breviarium* of Zacharias Lilius, printed in 1493—a very popular work at that time. This diagram, or something similar, is often found in old manuscripts, and in printed books down to and beyond the time of Cabot.

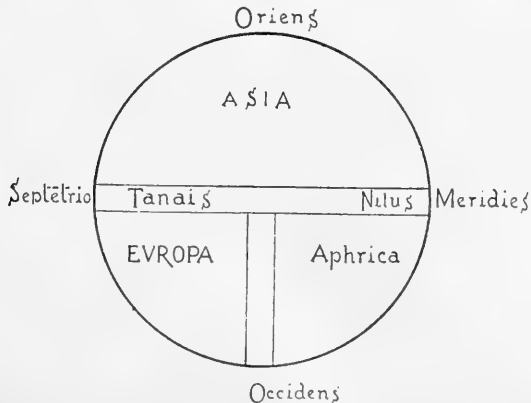


FIG. 18.—IT MUST BE TURNED HALF ROUND TO BRING THE NORTH ON TOP.

Fig. 19, on next page, is from a Codex of the eleventh century at Leipzig. It will, like most of the mediæval maps, require to be turned half round to be understood, because our method of drawing maps, with

the north pole at the top, was derived from Ptolemy. Tanais will be seen at the top and Nilus at the bottom. Troy and Jerusalem occupy the centre. The Mediterranean sea is the radius. The great ocean surrounds the world.

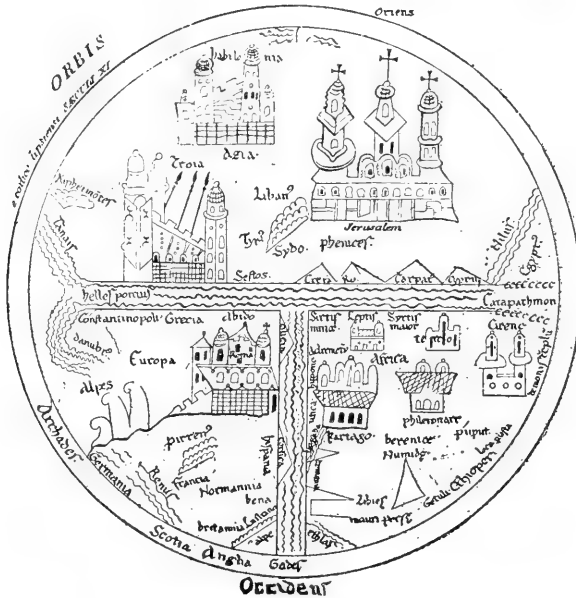


FIG. 19.—FROM A CODIX OF THE ELEVENTH CENTURY.

The next map (fig. 20) is from a Codex at Paris of the twelfth or thirteenth century. The *flumen Tanais* is seen marking off the whole of

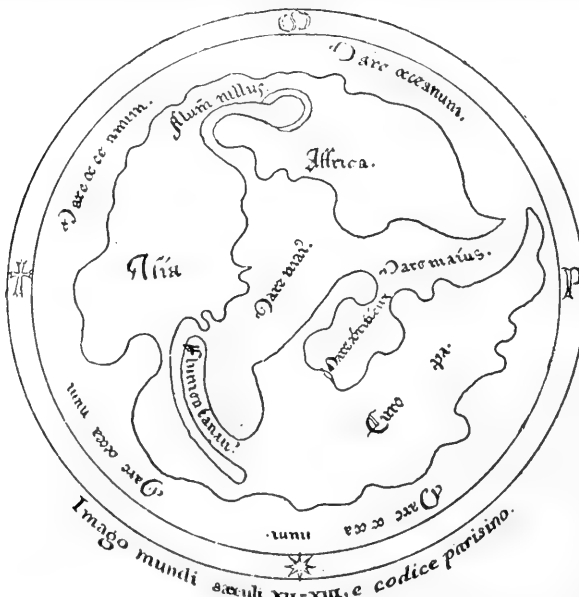


FIG. 20.—THIS MAP MUST BE TURNED UPSIDE DOWN TO GET THE NORTH ON TOP.

the northern part of Asia to the surrounding ocean. The *flumen Nilus* marks off southern Asia.

The following (fig. 21) is by Marino Sanuto (A.D. 1320). It is a fair map of the country round the Mediterranean and Black seas. At the end of the Black sea is the River Tanais flowing from the Riphæan mountains.



FIG. 21.—FROM MARINÒ SANUTO, A.D. 1320.

The next (fig. 22, p. 236) is from a Codex in the library of Rheims, and illustrates a manuscript of Pomponius Mela. The Tanais is seen there to be the dividing line at the north, as the Nile at the south. It is the western boundary of Scythia, a name synonymous with Tartary.

One of the most learned men of his day was the Cardinal d'Ailly. He wrote a book which was a great support to Columbus in his anxious moments. It was printed in 1483, long after the author's death. The map (fig. 23, p. 237) is his *Imago Mundi*, or map of the world. The word "thanai" will be found across the parallel of France and Rome, and Tanais is not a river but a region, and east of it are the Armenian mountains and the Caspian sea. While such maps as these are found in the more learned treatises, the general conception of the habitable world was expressed in a concise form, in such popular manuals as existed, by the diagram fig. 18, and this figure is so expressive of the views of the

whole period that Nordenskiöld has selected it as the characteristic adornment for the cover of his great work on ancient and mediæval geography. Whatever Asiatic land lay north of the line of the great central sea was, in a general way, associated with the Tanais, and whatever land lay to the south was associated with the Nile. The Mediterranean, as its name imports, was the great sea, central among the continents, and the most convenient and universally known standard for reference.

These are specimens of the maps upon which popular opinion was founded, and we see that while the Tanais was, no doubt, known to be a



FIG. 22.—IMAGO MUNDI, A.D. 1417.

river, the country of the Tanais was a region considered to answer to Scythia of the ancients. "Scythia was," says Heeren, "a vague name for the country in the north of Asia occupied by the Scythians, and for moderns, Mongolia and Tartary, and of it the Tanais was the western boundary separating it from Europe." Of this country Cambaluc (Pekin) was the capital. It was the northern capital of the Grand Khan of Tartary. Cabot sailed for that very country—the country of the Grand Khan (see Toscanelli's map, p. 152), and he thought he had found it and had sailed along its coasts, precisely as Columbus thought he had found Mangi. It is what we still call Chinese Tartary, and Cambaluc is still the capital. In 1403-6 Clavigo was sent on an embassy to the Emperor Ti-

mour, and Col. Yule (who edited his travels for the Hakluyt society) points out, in a note, that Grand Tartary extended from the Volga to the ocean, and from the Gihon to Siberia. "There was," says Kretschmer, "in the fourteenth and fifteenth centuries still the ground idea of the "Tanais and the Nile, and the end of the Mediterranean being the western "boundary of Asia," and the region as shown on the preceding maps was a very indefinite one. The notion that Canada was the extreme east of Tartary survived for many years, and Allefonsee, in his "Cosmographie," says of Canada: "Les terres tiennent à la Tartarie, et pense que se soit "le tout de l'Asie selon la rondeur du monde." In like manner Jacques

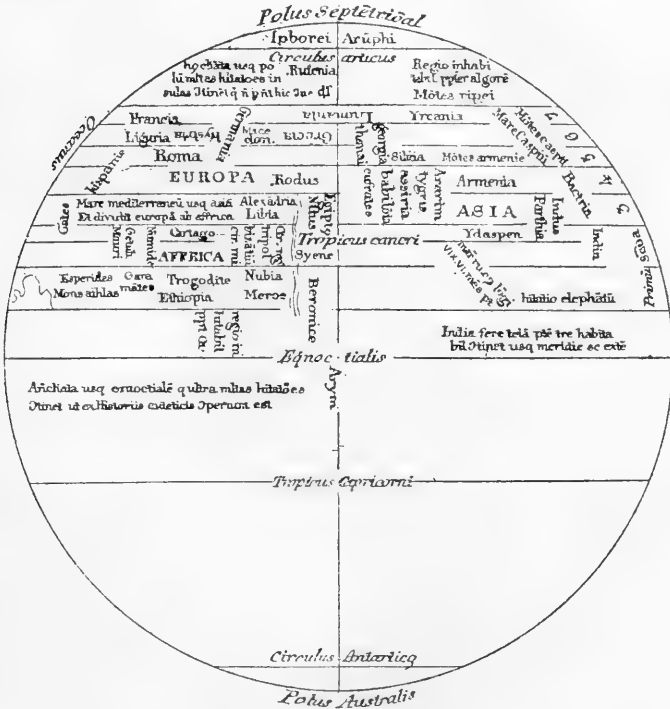


FIG. 23.—IMAGO MUNDI, D'AILLY, A.D. 1410. (See ante p. 235.)

Cartier's commission read: "Des terres de Canada et Ochelaga passant "un bout de l'Asie du cost de l'Occident." In like manner it is recorded that Columbus was encouraged by the tale of a sailor, who, when going to Ireland, was driven westward to a land which he thought to be Tartary. As a matter of fact, Tartary did then extend from the Tanais to the eastern coast of Asia, for the successors of Jenghis Khan ruled from Moscow to Peking. In his well-known book, "Cathay and the Way "Thither," Col. Yule illustrates this point as follows: "Thus Mela says "that the remotest east of Asia is occupied by the three races—the "Indians, the Seres, and the Scythians, of whom the Indians and the "Scythians occupy the southern and northern extremities, and the Seres "the middle. Just as in a general way, we might say still, that the ex-

“treme east of Asia is occupied by the Indies, China and Tartary, the three modern expressions which answer with tolerable accuracy to the India, land of Seres and Scythia of the ancients.” That such a vague idea was prevalent at the time is manifest in the ‘*Historia rerum ubique gestarum*,’ by Æneas Sylvius (afterwards Pope Pius II.). A copy of this still exists in the Columbian library, annotated by the admiral’s own hand, and the following passage has a number of his remarks on the margin. Mr. HARRISSE, in his “Notes on Columbus,” gives a photograph of the left half of the page, but the whole passage has been copied from another edition: “Scriptores alii Scytharum nomen multo majus efficiunt, quos a Germanico limite, usque ad ipsos Seras, et orientale pelagus occupare arbitrantur; et sicut habitabilis terræ australia Æthiopicibus tradiderunt, pari modo septentrionalia Scythis, quos cum Sarmatis confuderunt.”

Further on is related the origin of the Scythians from two brothers, the offspring of a being called Scythas, half snake, half woman. Their descendants conquered the regions west of the Tanais as far as Thrace, and then, turning their arms eastwards, reached the Nile, reducing all the intermediate nations, and their power extended to the Caspian sea and the Ocean of the East.

To suppose that the disputants in this discussion had not weighed these matters is a serious error, for HARRISSE¹²⁷ has cited the very same passage from Soncino’s letter to prove that the landfall was not south of Labrador, but on its northeastern coast. It was a mistake for any one arguing for Cape Breton to build on so narrow a foundation as the rendering of a word so indefinite as *assai*, and to take a general name like Tanais in a sense so restricted. The archbishop’s argument is as follows: That Tanais is not a broad or vague term, but a definite and well-known country, that region, to wit, inclosed within the great bend of the river Don and inhabited by the Tanaitæ. The city of Tanais, he further points out, was lower down, at the mouth of the river, not in the country of Tanais, but on the Asiatic side. He then locates this country between 48° and 50° N. lat., and he interprets Soncino to mean that Cabot considerably overpassed that country. He says that Cabot could not have overpassed its longitude, therefore he overpassed its latitude, and as Bristol is in 51° 30’, Cabot sailed south and, considerably overpassing lat. 48°, of necessity he made his landfall somewhere on the island of Cape Breton. He concludes: “The premises rest on unimpeachable authority, and the conclusion, therefore, emphatically and inexorably excludes Labrador, Cape St. John and Bonavista.” The argument relies much upon the translation of the word “*assai*,” and it is based on Ptolemy and upon the assumption that this definite country inclosed within the bend of the Don was south of 51° 30’ upon Ptolemy’s maps at that time—which is not the case.

It is necessary to remind the reader that, up to about A.D. 1569 or later, when Mercator and Ortelius broke frankly away from the traditions of the ancient geography, the faith of the learned in Ptolemy was unbounded. The great edition of Ptolemy is that published at Rome in 1478. The same copper-plates were used, unchanged, for the edition also printed at Rome in 1490. These very plates and no other could have been known to Cabot, Columbus, Soncino or anybody else before the year 1508. If these authorities referred to Ptolemy at all, that was the Ptolemy—the Greek Ptolemy of A.D. 141, and printed in 1490 or previously—the only Ptolemy existent for them. We learn from a note how

the archbishop got astray in this part of his theory. He was using the edition of Bertius, published in 1618-19, with Gerard Mercator's annotations, 120 years after the events now in controversy.

The Ptolemy maps then before the eyes of Soncino could be none other than those published at Rome in 1490, and these may be readily consulted in Nordenskiöld's facsimile atlas; but in it the great bend of the Tanais is not south, but north of Bristol. It is in latitude 56° not only on the special map of the region, but on the general map of the world. The city of Tanais is there, and, as the archbishop says, it is to the south, and not in the country, as he supposes, of the Tanais. In the text of his geography Ptolemy also gives its latitude as $54^\circ 40'$, three degrees north of $51^\circ 30'$, the latitude of Bristol; and the great bend of the Tanais, where the Tanaitæ were located, is expressly stated in the text of Ptolemy to be in lat. 56° . It is Cape Breton which the archbishop has inexorably excluded as well as Newfoundland, and he has inadvertently exploded his own landfall and assisted that of the advocates of northern Labrador. In fact he might carry us to Greenland, if the word *assai* be stretched as far north as he has stretched it south.

It will be interesting to trace the origin of this singular error, for in fact the great bend of the Tanais is in 56° in all the editions of Ptolemy. Kind and very learned correspondents have examined for me in the great libraries the series of Ptolemy atlases, and have sent me tracings, and it is certain that in the edition of 1511 (Sylvanus's), in that of 1535 (Servetus's), in that of 1542 (Munster's), in that of 1564 (Russelli's), the latitude is 56° . These are the chief editions until Bertius's. After Bertius's edition Ptolemy ceased to have any weight, for then the modern era had been firmly established, for it commenced in 1569 with Mercator.

But even in the Ptolemy of Bertius this whole region is north of Bristol. That edition is in reality a collection of geographical treatises in two volumes, usually bound together. It contains, 1st, The text of Ptolemy and the maps of Ptolemy; 2nd, Annotations on Ptolemy by Gerard Mercator; 3rd, The Itineraries of Antoninus Pius; 4th, The Peutingerian Tables; 5th, An Atlas of Maps by Ortelius. The work was printed by Hondius at Amsterdam and Leyden in 1618 and 1619. With the maps of Ortelius we have nothing whatever to do. The Ptolemy maps alone have any bearing on this question.

Whoever consulted this atlas on behalf of the archbishop was unaccustomed to such documents, for he did not observe, or did not report it if he noticed it, that by a palpable error of the engraver 50° was put for 56° , for 50° occurs below in its proper place. No expert could be deceived, because reading the latitudes upwards on the margin they follow thus, 54° , 55° , 50° , 57° , 58° , etc., etc., and the line of what is in reality 56° runs through the centre of the great bend of the Tanais. The edition of Bertius thus corroborates the latitude of 56° in all the other editions, and the same latitude of 56° is confirmed by the text of Ptolemy. Convenient reference may be made to Didot's edition (Greek, with a Latin translation), where the latitudes are as follows: Occidentale os Tanais fl. $54^\circ 20'$, orientale os $54^\circ 30'$, inflexio fluminis 56° . It will be seen then that the whole river is north of $51^\circ 30'$, the latitude of Bristol, for the mouth is at $54^\circ 30'$, and the great bend where the archbishop locates the Tanaitæ is at 56° . The oppidum (city) Tanais is in Ptolemy's text at $54^\circ 40'$.

The argument, therefore, of the address being based on an error falls to the ground, and, besides, on the very maps upon which the discussion

is turning the fact is apparent that the Tanais was supposed by everybody for 100 years after Cabot to be north of Bristol. Take La Cosa's map and follow the east and west line running through the great bend of the river. It passes to the north of Scotland and far north of the Cavo de Ynglaterra; nor will it help if the coast be wheeled up at right angles on the pivot of the last flag, for then the Cavo Descubierto, which the archbishop admits to be the landfall on Cape Breton, is still north of the bend of the Tanais and north of Scotland as laid down by La Cosa. The same is evident on the Cabot map of 1544 and on the great Dauphin map of 1546.

The passage in Soncino's letter which is the subject of this digression reads as follows: *Et andando verso el levante ha passato assai el paese del Tanais*. This is translated by Markham: "And proceeding towards the east he has passed as far as the country of the Tanais." Weare translates, "Has passed much of the country of the Tanais." Harrisse makes it, "Has passed far beyond the country of the Tanais." He states that the country of the Tanais "was a well defined coast bordering the eastern seaboard of Asia." It seems to me a little strong to call it "a well defined coast" on the east of Asia, but it is nearer the truth than to place it in European Russia and to inclose it in the bend of the river Don. I have given the Italian, and the reader may translate it for himself. It seems easy enough, and I had no hesitation in following Markham's translation, but the coasting along the region Soncino called the country of the Tanais will allow any reasonable extension of the word *assai*. The coasting is not said to be north and south, and was, as I have tried to show, east and west from Cape Race to Cape Breton, and applies to longitude and not to latitude.

A few words are necessary about Tana—the *oppidum Tanais* of the Latin version of Ptolemy at 54° 40'. There has always been a city at the mouth of the Don, and this one was called Tana by the Genoese, who had factories there until twenty-two years before 1497. It had been the chief western entrance to the dominion of the Grand Khan, and, although destroyed by Jenghis Khan, had been rebuilt. It was taken by the Turks under Mohammed II. in 1471, and the Black sea was in 1475 absolutely closed to all Christian powers, so that it was not so likely to be referred to as a standard of latitude as any of the large commercial cities of western Europe; and, indeed, it is of itself unlikely that a locality in the heart of the continent, the haunt of semi-barbarous tribes of Slavs or Mongols, inclosed in the bend of a Russian river, should be a standard of either latitude or longitude for a discovery upon the seaboard across the western ocean.

I return, then, to the ground I took up in 1894, and I repeat that the country of the Tanais was an indefinite region corresponding to the ancient Scythia and the mediæval Tartary, and that it was generally understood so in the manuals and books of the Middle Ages, of which figure 18 is a general type; that it was not in Europe, but in Asia; that the Tanaitæ of Ptolemy, if they ever existed as a distinct people, had been wiped out of human memory for a thousand years before 1497, as Soncino must have known; for Huns, Avars, Bulgarians, Mongols of every conceivable race had swept over that country because it was the gateway through which the hordes of Asia had precipitated themselves upon Europe from the remotest period.

APPENDIX F.

PRINCE EDWARD ISLAND NOT CABOT'S ST. JOHN.

I come now to a point of very great interest, not only in relation to the Cabot voyages, but to the early history of the Dominion, and on the threshold, I would express my indebtedness to Prof. W. F. Ganong, whose researches¹³⁸ on the cartography of the Gulf of St. Lawrence have cleared up a subject very much obscured by hasty assumptions and imperfect information.

The question has been raised anew in the president's address published at the commemoration, and to be found in permanent form in the "Proceedings" in the present volume. His position briefly stated is, that Cabot not only missed Cape Race, but passed through Cabot strait without seeing land; that he got to the south after passing the strait, and that he made his landfall near Mount Squirrel on the inside (or gulf side) of Cape Breton island. He supposes that Cabot remained on land for only two hours, and then sailed west at 8 o'clock a.m., and discovered Prince Edward Island about 6 p.m. on the same day, which island thus became his Island of St. John; that thereupon he sailed through Northumberland strait and went northwest, inside of Anticosti, which he circumnavigated, and passed out by Belle-isle, seeing Chateau bay as he passed and taking it to be the Seven Cities.

The reasons I gave in my paper of 1894 against a landfall at Cape North I still hold to be conclusive. Cabot's westerly course by compass would bear him to Cape Breton, and, as he was sailing on an unknown ocean, and had not seen land, there was nothing to suggest to him, at a certain point south of Newfoundland, to turn sharply to the northwest and strike the centre of Cabot strait. This is fully covered in my first paper, and nothing has occurred since bearing upon it, save the surveys of Mr. W. Bell Dawson, to be considered later on.

A careful consideration of the presidential address will reveal the highly theoretical bases upon which its conclusions rest. There are three conditions declared to be essential: First, the landfall must be west of Bristol—no one disputes that. Then, it must be south of the Tanais, which is assumed to be in 48° and south of Bristol, whereas a reference to Appendix E will show that, according to the knowledge of that day, as well as according to the authorities he has cited, the country taken by the archbishop to be the Tanais was in 56°, and north of Bristol. Then the landfall must be 2,100 miles distant from Bristol. This is near enough for an approximate distance; if, however, we are to make the landfall inside the Gulf of St. Lawrence at Mount Squirrel, we shall be compelled to add at least 125 miles, for we shall have to sail round the whole northern part of the island (if we can do so) without seeing land. The landfall inside the gulf fails, therefore, to comply as fully as a landfall at the cape with the condition of distance.

The archbishop, moreover, concludes that the landfall could not be on the Atlantic coast of Cape Breton, because no part of that coast complies with the required conditions of soil and climate. In answer to this

I would refer the reader to Appendix D, where I give, not my own account, but the testimony of a catena of authors far removed in time and space from this controversy. I would, moreover, observe that, as the whole northern promontory of the island is equally elevated above the sea, there seems very little difference in the conditions of a landfall on the Atlantic at the foot of Cape Enfumé, 950 feet high, or at the foot of Mount Squirrel, in the gulf, 1,220 feet high. It is exactly on the far side of the same tableland. The landfall I have suggested as that indicated by Sebastian Cabot is a low rocky point, within five miles of which the land is fertile continuously to where the beautiful harbour of Sydney opens up, and beyond where the mouths of the Bras d'Or permit ships to sail into the nearest approach to a summer paradise which this continent affords. From the point of Cape Breton to the commencement of the high table-land is a stretch of sixty miles, along which the interior carboniferous basin of the island opens upon the Atlantic in numerous capes, harbours and inlets plainly visible in a map on the smallest scale.

That it should have occurred to any one to suggest a discovery of America from the inside of a landlocked gulf like the Gulf of St. Lawrence is one of the strangest things in this remarkable controversy. Not only is it landlocked, but, at Cabot strait, and for a long distance, as the shores of Cape Breton and Newfoundland approach, the land on both sides is exceedingly high and bold. The height of these coasts is easily seen upon the Admiralty charts and the Geological Survey maps. Commencing at Cape Dauphin, where the northern promontory of Cape Breton begins, in a distance of 45 miles to Cape North are Cape Dauphin, 1,045 feet; St. Anne's mountain, 1,025 feet; Cape Enfumé, 950 feet, and in rear, the Sugar Loaf, 1,218 high; and a little further away is Cape North, 1,000 feet high. Turning westwards through the strait is Cape St. Lawrence, eight miles off and 1,000 feet high. The coast then turns south and a succession of capes follow, from 950 to 1,130 feet high, until at 35 miles distance from Cape St. Lawrence is Mount Squirrel, 1,220 feet high. The simple fact is that all this north extension of the island is a tableland, of which the outer edge is from 800 to 1,200 feet above the Atlantic on the east and the gulf on the west. It is everywhere visible from sea at a distance of forty miles.

The south coast of Newfoundland is bold, also. Table mountain, three miles in rear of Cape Ray, is 1,700 feet high. The cape is a very remarkable headland and is visible at a distance of 50 miles. While the strait is nearly 60 miles wide, St. Paul's island divides the distance. It is 14 miles from Cape North to St. Paul's island, and 42 miles from St. Paul's island to Cape Ray on the coast of Newfoundland. St. Paul's is 500 feet high and is visible for 30 miles from sea. For the purpose of this argument Cabot strait is, therefore, not more than 42 marine miles wide, and Cape Ray is visible all the way across. The time of the voyage was midsummer, when the weather is good and the nights are very short, and while the fog sweeps up from the south and frequently hides St. Pierre and Cape Race, the pilot charts for June show no probability of fog in Cabot strait at the western end of Newfoundland, and, in fact, there is very little fog in that region.

I have given the height of land from the Admiralty charts, and the well known laws of visibility from sea prove that the ranges of visibility of two coasts so high as these greatly overlap the mid-channel of a strait 42 miles wide. Therefore it is plainly impossible that a vessel, even if she

struck the very centre, could pass in anything like clear weather through the strait without seeing for many hours the land on one side or the other. For my part, while I have given the above details for the sake of those who have not sailed through the strait, I know, of my own personal knowledge, that the land is seen on both sides from the deck of a passing vessel. The circumstance of such a fact being disputed will justify this mention of a personal experience.

It was my fortune in May, 1882, to be returning home in the SS. "Peruvian," and on the 7th we entered field ice off St. Pierre island. While the vessel was slowly steaming through the openings, a small piece of ice passed unnoticed under the ship and stripped off all the flanges of the screw close to the boss. This happened at 5.20 a.m. and in broad daylight. We had met what is locally called "the bridge," for the last of the field ice coming down from the gulf, had filled up the strait.

The vessel was then precisely in Cabot strait; St. Paul's was 19 miles and Cape Ray 22 miles away on either hand, and there, in the very strait itself, she drifted about from May 8th until May 19th, so that for the space of 11 days I had the opportunity of studying at leisure the contours of all these surrounding lands—St. Paul's, Cape North, Cape St. Lawrence and Cape Ray. Being helpless we drifted close under the land in the bay between Cape St. Lawrence and Cape North (for the water is everywhere deep), and then, caught by the outward current, passed seawards between St. Paul's island and Cape North. All this while the land around was visible, and I am, therefore, in a position to be more certain than most people that for John Cabot to get through Cabot strait without seeing land was impracticable.

Let us consider the conditions involved in this new theory. John Cabot set out to sail due west and that course would bring him to Labrador. Magnetic variation is waived aside as being a merely "academic question," so he did not sail by his compass. Still, by the force of the Arctic current and perhaps the winds, he dropped south of Cape Race. He still sailed west and naturally one would expect him to strike Cape Breton, but he did not. He turned instinctively to the northwest, just at the point to strike the middle of Cabot strait. The inward current off Cape Ray carried him through and, although to be in that current he could not have been farther from the Cape than 10 or 15 miles, he did not see Table Mountain, 1,700 feet high, three miles in rear of the point of land. Then he changed his course and again sailed west, and the Magdalen Islands lay in front of him, but the other current running out through Cabot strait caught him and turned his course southwest until he saw Mount Squirrel, 35 miles south, on the Cape Breton coast. Here is another difficulty. Entry Island, of the Magdalens, was straight ahead, 580 feet high, and visible at a distance of 32 miles. There are only 45 marine miles between Entry island and the nearest point of Cape Breton, but he did not see it either, and thus having passed within 20 miles of land, 1,700 feet high, which he did not see, he saw land to the south far behind him, 500 feet less in elevation. It is understating the case to say that such a course is impossible in any arrangement of winds, tides, currents, or fogs, which can be imagined.

This very circuitous navigation, out of sight of land, is supposed to have been effected by currents in the strait, and we have at our hand at p. xvii. of the "Proceedings" in the front of this volume, Mr. W. Bell Dawson's summary of his surveys in the gulf during the past three years. On

reference to pp. xvii. and xviii. it will be seen that the main outflow of the St. Lawrence river is by Cabot strait on the side of St. Paul's Island, and that the circulation of the gulf is kept up by an inflow on the Cape Ray or northern side of the strait, and that there is a space of neutral or variable current between. As the strait between St. Paul's and Cape Ray is 42 miles wide a vessel to be influenced by either current must stand well in to the land. The current inwards turns round Cape Ray and flows, *not northwest*, but to the north northeast along the coast of Newfoundland, crosses the gulf to the north shore towards Cape Whittle, and thence flows westward to Anticosti, to the outflowing Gaspé current. In that way the circulation of the gulf is maintained. The hydrography of the gulf, as ascertained by the very latest surveys, thus shows that a vessel, in the influence of the current on the Cape Ray side, would be drawn to the north along the lofty coast of Newfoundland; if, however, she should be on the St. Paul side the current flowing out would set her on the Atlantic coast of Cape Breton, for as the whole discharge of the St. Lawrence passes out there, it is a well defined and persistent current and is often felt as far south as Scatari island (p. xviii).

The archbishop considers it very unreasonable to suppose that any one sailing along the Atlantic coast of America should not have seen and sailed through the entrances to the gulf. I have just stated the width of Cabot strait. The only other entrances are the Strait of Canso, eight-tenths of a mile across, and the Strait of Belle-isle, *not thirty but twelve miles* across, because a strait is measured where it is most strait. There is nothing surprising in the fact that the gulf was not opened up until Cartier's time. Similar things have taken place almost in our own day. In 1818 Sir John Ross mistook Lancaster Sound, 30 miles wide, for a bay surrounded by mountains, and he even named them the Croker Mountains, again, on the Pacific coast of the Dominion, precisely parallel cases occurred. Captain James Cook made a survey of that coast in 1778 and did not find out that Vancouver was an island. He touched at Nootka Sound on the west coast of the island, but missed both the Strait of Juan de Fuca and the Dixon channel. Fur traders had been for some years on the coast when Meares named the strait in 1788 which Barelay had discovered in 1787, and Dixon named the channel after himself, which he discovered the same year. Captain Vancouver conducted a scientific survey of the whole coast in 1792-3, and discovered and named Puget Sound and Burrard inlet, and was the first to circumnavigate Vancouver Island. But even Vancouver supposed the broad estuary of the Columbia to be a bay until after Captain Gray had entered it.

Then, again, it is the fact that the Bay of Fundy does not appear on any of the maps or in any description of the coast for a very long period. Cartier gives no hint of observing the entrance to the River St. Lawrence on his first voyage, but sailed from Gaspé to Anticosti. He entered by Belle-isle and sailed out the same way, not knowing then of the existence of Cabot strait. On his second voyage, however, he sailed out by way of St. Paul. If Cabot did, as the archbishop supposes, sail round Anticosti, how is it that he did not see the great estuary of the St. Lawrence leading to the west, for it is 81 miles wide, and the north shore is low, and not visible from the south shore until opposite Point de Monts? There is no "palpable absurdity" whatever in supposing the early sailors to have passed the opening of Cabot strait, and, moreover, we know for a fact that Stephen Gomez, in 1525, actually did so. He spent ten months on the

coast, searching from Cape Race to Florida for a westward passage; and in the account of Oviedo and the map of Ribero, we can trace his course from point to point along the coast and see where, from the Burgeo islands, he crossed to Cape North and thence to Cape Breton. It was a broad ocean they were all expecting, and such openings as these were taken to be bays.

But, after all, what can be more conclusive than the maps? There they are in the books, and many of them were reproduced in my preceding papers. They speak for themselves and declare that, until Gaspar Viegas's map of 1534, there was no gulf marked on the coast to represent in the faintest way the Gulf of St. Lawrence. This fact cannot be waived aside by generalities. Let some one produce a map before 1534, or cite an author before Jacques Cartier in the same year; but until that is done of what avail is it to multiply adjectives? Archbishop O'Brien wheels up the whole coast of La Cosa's map from what he assumes to be Cape Henry at an angle of ninety degrees, but he does not thereby open up the great inland sea of Canada, 500 miles long and 243 miles wide. The coast is still closed, and it remained closed to the outer world, until the Breton sailor opened it up. Again, we are told that the evidence is only negative. It is the only evidence possible. The makers of maps never positively state that such or such a bay or island does not exist. That would prove they had heard of it. They draw the coast to their utmost knowledge, and if a map of the gulf does not contain this or that island, it is conclusive proof that, for that cartographer, the island was non-existent. One wearies of a discussion where phrases like "absurd," "senseless," "ridiculous," "childish wilfulness," "puerile wilfulness," "bolstering up preconceived opinions," do duty for maps, or citations from acknowledged authorities. One map, one reference, is worth more in this, or in any similar controversy, than many pages of unsupported assertions or of contradictions without evidence to sustain them.

But, again, let us suppose the "Matthew" did first touch land at Mount Squirrel on the morning of June 24, it is most unlikely that Cabot left again two hours later, at 8 o'clock, to sail westwards. The difficulties multiply. He was short of provisions, and he started again westwards over an unknown ocean without knowing he would drop upon Prince Edward Island. The winds and tides swept the vessel through Northumberland strait and round Anticosti at the rate of 100 miles a day—but the west winds would not have helped him, nor the calm midsummer days, nor the tides, for they ebb as well as flow. The archbishop does not think with Mr. HARRISSE, that vessels in those days anchored at night, but thinks that soundings were taken, and depth of water and nature of bottom carefully recorded. Nor did they, he thinks, sail from headland to headland, but crept along hugging the shore at a distance of from two cables to half a league with lead in hand.

Cabot, by this theory, was passing through narrow seas, and although we know from Cartier's narrative that Indians were numerous then and, at that season, were probably fishing in their canoes, it is expressly recorded that he saw no man in all that inland navigation, nor is there any record of his landing on any part of that attractive coast.

Everyone who essays to form an intelligent opinion on this question must study the works of Mr. Henry HARRISSE. If he finds in them, as he will in abundance, extracts from maps or rare books or documents of any kind, he may rest assured that they are faithfully reproduced. Mr.

Harrisse does not claim infallibility, and when he draws deductions from these data his reasoning may or may not be conclusive to those who are conversant with another order of facts, but the student may implicitly depend upon the accuracy of the extracts, and reason for himself as confidently as if the documents quoted from were spread out before him in his own study. Now, if my readers will turn to page 94 of Mr. Harrisse's last book, "John Cabot," they will find a flood of light thrown upon the Cabot map of 1544 by the reproduction of a map by Desliens, made in 1541, three years previously. They will find by a comparison of these two maps there placed face to face, that the Cabot map was compiled from the same materials as the Desliens map, and that these materials were none other than Jacques Cartier's. Mr. Harrisse has completely demonstrated the main propositions laid down by Mr. Ganong and accepted by Mr. Joseph Pope and Bishop Howley. I do not think that the conclusions of these writers on Cartier's course will ever be shaken, excepting in some relatively unimportant details.

It is not my intention to go over Cartier's course. I merely wish to dwell upon what Cartier discovered between the undisputed points, Cape St. John (Cape Anguille) and Cap d'Esperance (Miscou Point). What he found there is on Desliens's map and is equally on Cabot's map. There is absolutely no other alternative; either the Cabot map is, as regards the gulf and river St. Lawrence, copied from Desliens, or both are copied from one prototype—to wit, the charts made under Cartier's own supervision. In that fact is an absolutely unanswerable proof, on Sebastian Cabot's own authority, that neither he nor his father ever passed through Cabot strait or entered the gulf. Every name but one is Cartier's, and that one is changed from the prototype, as Desliens's map witnesses and as Cartier's narrative establishes.

If we take now Appendix 2 of Mr. Ganong's paper (R. S. C. Trans. 1889) we shall find all the places mentioned by Cartier in order from Cape St. John. They are Isles de Margaulx, Ile de Brion; nobody disputes these to be the Bird Rocks and Bryon island. Then he came to Cape Dauphin, a goodly cape on a land "laquelle semble estre comme "une isle environnée d'islettes de sable noir." Cartier could not land because of the wind, but he coasted along this land for about ten leagues, and we learn that it lay west southwest.

I would now ask the reader to consider the following description of this land from Cartier's narrative in Hakluyt. He sailed ten leagues until "we came to a cape of redde land, that is all craggie, within the "which there is a bracke looking toward the north. It is a very low "country. There is also between the sea and a certaine poole, a plaine "field; and from that cape of land and the poole unto another cape "there are about 14 leagues. The land is fashioned as it were halfe a "circle, all compassed about with sand like a ditch, over which as farre "as one's eye can stretch, there is nothing but marrish grounds and "standing pooles. And before you come to the first cape, very neere the "maine land, there are two little ilands. About five leagues from the "second cape towards the southwest there is another iland very high and "pointed which we named Alezai. The first cape we named St. Peter's "cape, because upon that day we came thither."

A more graphic description of the Great Magdalen island could hardly be written, and I would ask the reader to compare the map of the island and the description from the Admiralty Sailing Directions.

(See pp. 247, 257.) Here are bold capes, a craggy cape of red land, and five leagues from one of the capes is Alezai, "a high and pointed island." The Admiralty Sailing Directions describe Deadman island as such a high and pointed island. "It is about 170 feet high, with steeply sloping sides "meeting at the summit like a prism, so that when seen end on it resembles a pyramid."¹²⁹ Of this island a drawing is given on the Admiralty chart, and it is stated underneath to be 13 miles distant from Grindstone island, and in order to press this upon the attention of the reader I give below a photographic reproduction of this drawing. The island Alezai (Alezai) is a very important point in the controversy.



Deadman Island.

Grindstone Island. 13 miles.

FIG. 24.—DEADMAN'S ISLAND.

Here, then, Cartier found a sandy island containing pools and lagoons and marked by bold capes. It lay N.E. and S.W.; near to the northeast point were three islands—Isles de Margaulx and Ile de Brion—and near the S.W. point was Alezai. It is of no avail to object that Alezai is a small island—so are the Bird Rocks (Isles des Margaulx). I give (fig. 25) a reproduction of the drawing on the Admiralty chart. The scale



North Bird.

Great Bird. 1½ mile.

FIG. 25.—THE BIRD ISLANDS.

is the same. We shall find the large central island so unmistakably identified by its unique physical characteristics, always on the maps, and no matter what its shape may be its axis is always N.E. and S.W., and its attendant islands stamp its name beyond mistake. On his second voyage Cartier called it "Les Araynes," and it will be found for 100 years under names, in whatever language written, conveying the same idea of *sands*. In French, Isle d'Arènes; in Portuguese, corrupted or translated into Isle Dorean, or Ile de Sabloës. This group of islands lies in the fairway from Cabot strait, and, excepting in thick weather, some of them must be seen from the deck of every vessel going to the River St. Lawrence.

Leaving this group of islands Cartier sailed for a day and a night, when he discovered a land which at first he thought was two islands, but afterwards found to be a low and plain land, "the fairest that may possibly be seen. full of goodly meadows and trees." He could find no harbour, "because it is full of shelves and sands." He described the country as very fair and sweet-smelling, with pines and cedars and ash, and many other trees. There were many birds, and, in Cartier's own language, "there wanteth nothing but good harborboroughs." So it is with the north shore of Prince Edward Island to this day. Cartier had to land in boats, and he named along that shore Cap d'Orleans, Ripuaire des

Barques and Cap des Sauvages, identified by Ganong, Pope and Bishop Howley as Cape Kildare, Richmond bay and the "North Point." From the Cap des Sauvages, Cartier followed the shore until he saw land on the north. That was the coast of New Brunswick, and he saw "that it did "joyne with the land abovesaid." He saw the interlocking headlands of Prince Edward Island and the mainland joining, as any one may see them now, and he thought it was a bay, and called it the Bay of St. Lunario. He thought it was "as deep as it was wide," and so, on the maps, it is laid down as a semi-cirele, which, in fact, it roughly resembles, for the opening of the strait is not seen, and Cartier did not see it, for he then followed the New Brunswick shore to Miramichi bay, which he correctly described as triangular, and from thence he went to Miscou Point (Cap d'Esperance).

What I wish particularly to impress on the reader is, that when Cartier struck land on Tuesday morning, after leaving the Magdalen, he thought it was the mainland from the Cap d'Orleans to Miscou Point. It was for him one long, continuous coast; and so, in truth, it was, for all cartographers, explorers, sailors and historians for nearly one hundred years after. The maps are unanimous on this point. No amount of rhetoric can dislodge this fact. A map of an earlier date would do it. A citation from an early writer would do it. In the meantime, until such a map or such a book be produced, it will not mend matters to charge me with "puerile wilfulness." It is not my fault that these people omitted to recognize Prince Edward Island. I have often passed through Cabot strait to Quebec, and I certainly never saw it on these occasions; but I have crossed from Pictou to Charlottetown and from Shediac to Summerside, and have seen the land closing in with long, low points overlapping on the far horizon, and then I saw how the error could have existed so long.

I am not singular in supposing that Cartier did not recognize the coast to be part of an island. I am following Ganong and Pope and Bishop Howley, but the archbishop himself admits it, and admits also that the maps of the Cartier group do not recognize Prince Edward Island. He gives it as a reason that Cartier entered the gulf by Belleisle and always subsequently steered for the north. We know, however, from Cartier's narrative, that on his return from his second voyage he did not steer north, but southeast, and passed through Cabot strait to St. Pierre Miquelon and Renews.

The point to which all this has been tending is that if any island be found in the gulf at all in these early maps, it can be no other than the Magdalen group, for no other is known in the narrative. I am not speaking of Anticosti and the Labrador, but of the bosom of the gulf. I would also point out that the axes of the Magdalens and Prince Edward Island lie nearly at right angles to each other. On these early maps Cartier's Prince Edward Island names, often disguised by blunders and translation, will be found, but always attached to the mainland.

Again, in so far as regards the gulf and river St. Lawrence, this Cabot map of 1544 is a map of the Cartier group, for it contains Cartier's names; but they are twisted by translations and errors so as to be nearly unrecognizable. Scarcely one is spelled right. Thus Lac d'Angoulesme becomes Laaga de Golesme, and Cap de Tiennot, C. de Tronot. It is in the highest degree misleading to interpret these old maps as if they were verbally and literally inspired documents, where a particle might modify

the meaning of a verb, or an *iota subscript* affirm or deny an important doctrine. Even Champlain's maps contain many errors, though they are French and were engraved in France. Thus *isles aux Margaux* become *isles aux Tangeux*, and even *isles aux gros yeux*. If the reader will turn back to fig. 12 (the Du Pont map) he will realize the difficulty of reading some of these documents—a difficulty not appreciated by those who are accustomed to lean on the modern helps of capitals and settled spelling. If such mistakes could occur in a French map engraved in France, it is no wonder that they should superabound, as they do, in the Cabot map based on a French document, translated into Spanish or Portuguese, and engraved far away in a Flemish city. On the map of 1544 Cartier's Prince Edward Island names—Salvayos (Cap des Sauvages) Rio de paris (Ripuair des Barques) C. de linaro (Baye de S. Lunario) are on the main land.

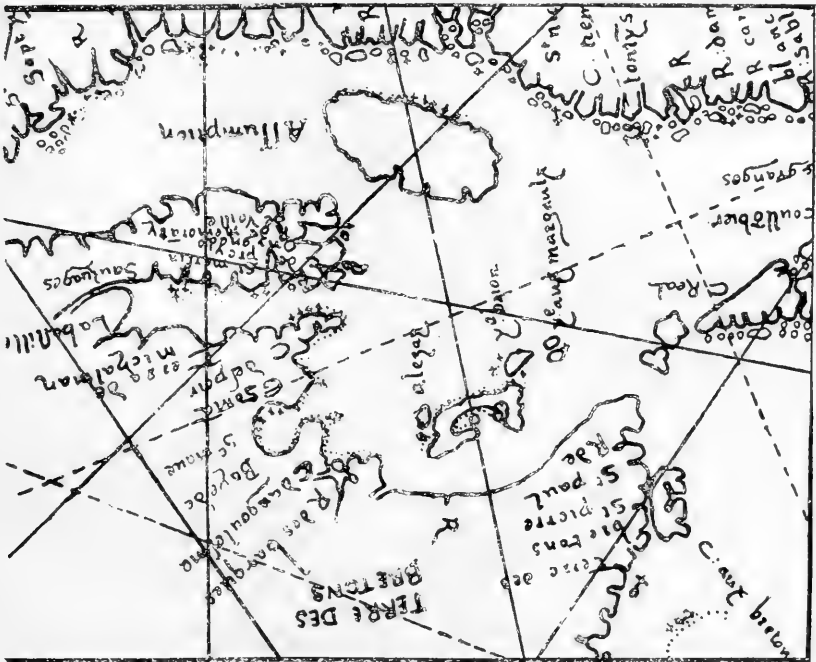


FIG. 26.—DAUPHIN MAP, A.D. 1546. (See p. 250).

Only one deviation from Cartier is found and that is *Les Araynes*, is called y de s. juan. This same island is plainly seen named on Mr. HARRISSE's photograph of Desliens's map of 1541 as *ysle des arènes*. It is a pity the map is so small, but that name may be plainly read with a magnifying glass. That it really is *Les Araynes* of Cartier is manifest on the Cabot map by the direction of its axis and the three little islands at the northeast point, as well as by its position. The error is apparent, and I am not bound to account for it. Still an explanation may be sug-

gested; the names are generally written in small italic letters. There are few or no capitals, and the words are often close together. In that way the Spanish transcriber or the Flemish engraver not understanding French well might have taken *isle defarenes* for *isle desanjean*, and on looking at legend No. 8, to which the map refers, he would be confirmed in his supposition, as the island appears to be near the *prima vista*; but, be that as it may, the name is shown to be wrong by the whole series of maps and by the fact that England never made a claim by discovery inside the gulf.

All this is confirmed by the Dauphin map (1546). I append an extract (fig. 26, p. 249). There the great Magdalen is identified by its shape and by the named Bird Rocks, Brion Island, and Alezay, as well as by its position in the fairway and the direction of its axis. It is, moreover,

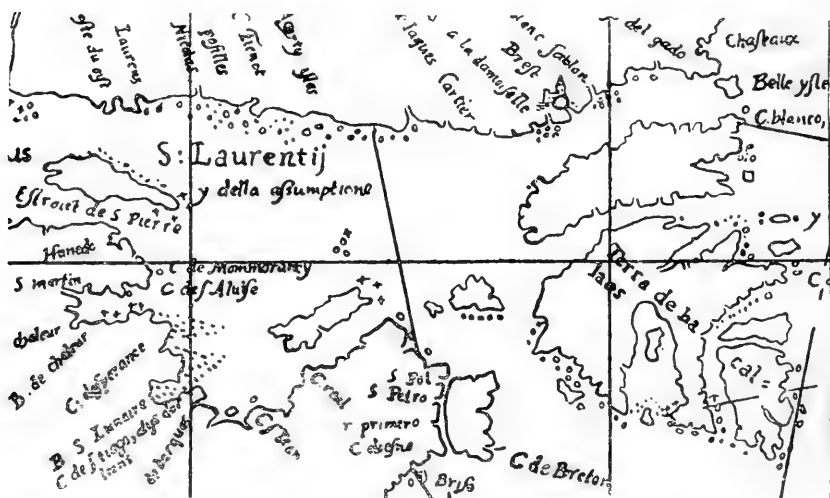


FIG. 27.—GERARD MERCATOR, A.D. 1569.

stamped beyond dispute by the little island in the jaws of the main island, which is the very remarkable position of Entry island (compare modern map, fig. 35, p. 257). On the mainland are R. des barques, C. d'angoulesme, Baye de lunarie, answering to St. Lunario, and on the same coast C. de d'esperance—the Cap d'esperance (Miscou) of Cartier. Prince Edward Island is adherent, therefore, to the mainland, and its north coast is seen extending from the semi-circular bay of St. Lunario down past the Rivière des Barques, to where a break in the coast line marks the inlet at the east end of the strait of Northumberland. Take now the map of Mercator (1569) also appended (fig. 27). There the island is identified as the Magdalen by its position, its axis, and the three islets on the northeast, and the Prince Edward names on the mainland are R. des barques, C. des



FIG. 28.—WHYTELIET, A.D. 1597.

Sauvages, and Bay St. Lunarie. The same indications are on the Whytflieet map (1597) (fig. 28)—there are Miscou (C. d'esperance) Bay de St. Lunarie, C. des Sauvages, R. des barques, and there, very plainly, as also on the Mercator map, is Cap de S. Jean, on that part of the coast where we shall see the real Isle de St. Jean separate away later on. Continuing, I append (fig. 29) an extract from Hakluyt's map (1600). On it the shape, the position, the axis, and the attendant islets, identify the island concave to the east as the Magdalen, and there is no other island there.



FIG. 29.—HAKLUYT, A.D. 1600.

This closes the series of 16th century maps. I come now to the works of the men who colonized New France, and I give an extract from the map (1609) of Marc Lescarbot (fig. 30). The names are indicated by numbers on the map. Only the more important are written out at length. The numbers refer to a table, and I cite only those bearing on this point.

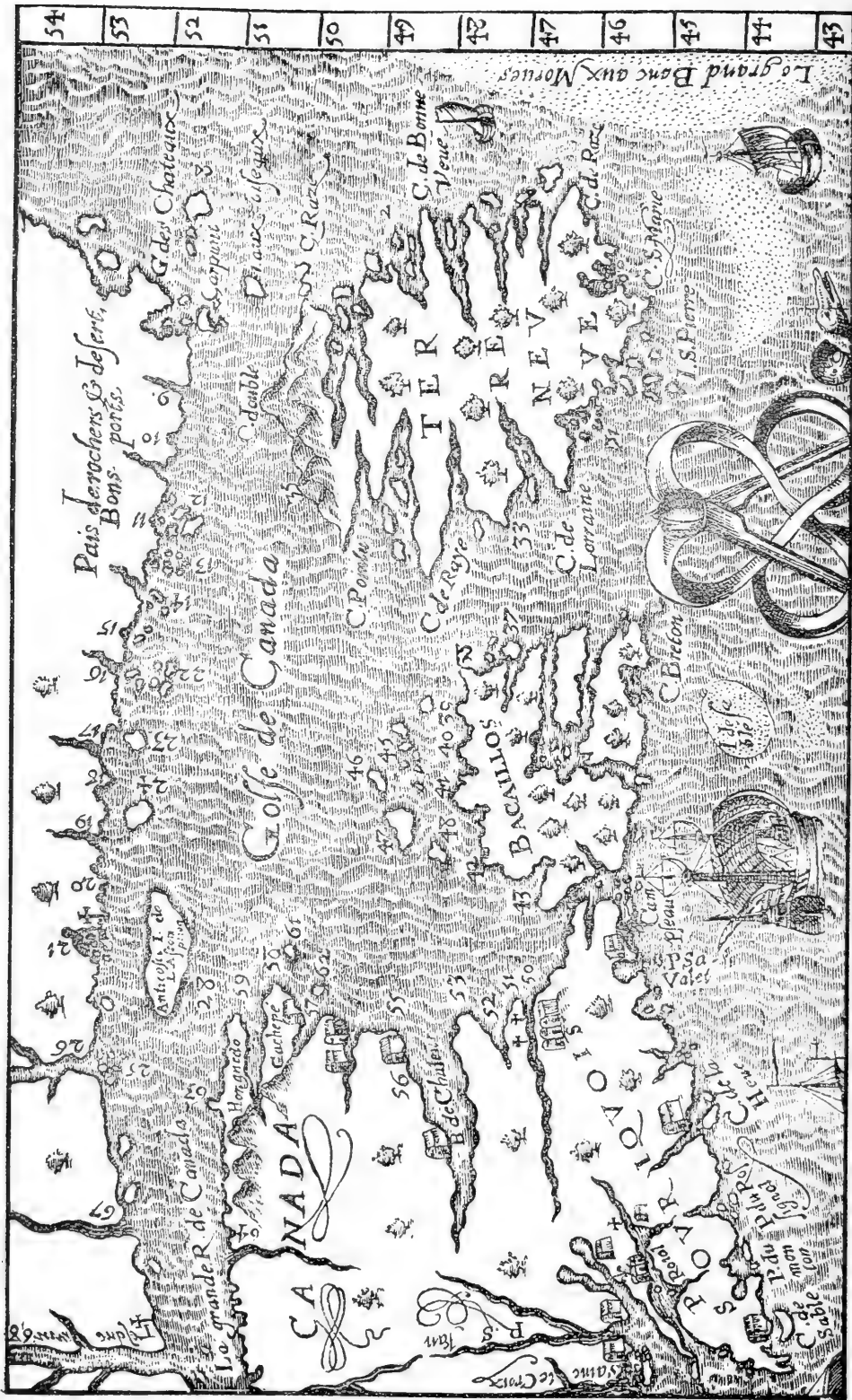


FIG. 30.—LESCARBOT'S MAP, A.D. 1609.

It will be observed that the only islands in that part of the gulf are, in Lescarbot's own words, Nos. 45, Iles Colombaires, alias Iles Ramées (which we know as the Magdalen); 46, Isle des Margaux (Bird Rocks); 47, Ile de Brion (Brion Island); 48, Ile d'Alezay—the sharp pointed rock of Cartier (Deadman's island). Then on the mainland are the Prince Edward Island names—50, Fleuve des Barques, 51, Cap des Sauvages, 52, Gulfe Sainet Lunaire. My point is that Lescarbot did not know of any island in the gulf which can be strained to do duty for Prince Edward Island. No. 53 is Cap d'espérance (Miscou Point).

I come now to Champlain. No. 1 (fig. 31) is his map of 1611. The only islands are the islets of the Magdalens, which are those he saw when sailing to Quebec. On No. 2, (fig. 32, p. 254) (1613) these islands of the Magdalen group are more developed, and are named, and here, just where on Whytflit, Mercator and other maps was placed Cap de St. Jean, Champlain has put Isle St. John, which marks the east end of



FIG. 31.—CHAMPLAIN No. 1, A.D. 1611.

Prince Edward Island, then separating from the mainland for the first time. This map is absolutely conclusive, for Prince Edward Island is given as Isle St. Jean, in addition to the other islands we have seen on the maps all along. We now see it begin to appear, and the proof is positive as well as negative. I give, as next in order of date (fig. 33, p. 255), Mason's map (1625). It is the mainstay of Judge Prowse's argument for Bonavista, but I place it here because, in the position of Prince Edward Island, he has plainly set down and named Nova Scotia. This map will require to be turned upside down to get the geography right. Lastly (fig. 34, p. 256), I give Champlain's map of 1632, on which the true Island of St. John—our Prince Edward Island—is shown for the first time so far as my reading goes. If there exist some map of an earlier date showing it, why does not somebody more learned than I produce it? I cannot prove an absolute negative, but until such a map be produced, rhetorical argument is wasted.

Before passing on, a few words are necessary concerning the Magdalen islands. In my paper of 1894 I collected, in Appendix F, a number of notices showing what they really are. Some who write on this question minimize the length of the main island to twenty miles. The following is the official description, extracted from the sailing directions published by the Admiralty:

“When first sighted from sea the Magdalen islands appear like several hilly islands with channels between, but, on nearer approach, they are seen to be all connected together, with the exception of Entry island, by a double line of sand bars and beaches inclosing extensive lagoons having very narrow entrances by which the tide finds access and egress.” (“St. Lawrence Pilot,” vol. 1, p. 41.)



FIG. 32.—CHAMPLAIN No. 2, A.D. 1613. (See p. 253.)

With regard to the length of the great Magdalen it will be seen on page 40 (vol. 1, “St. Lawrence Pilot”) that it is given as thirty-five miles, and the whole stretch of the group from southwest to northeast lies across in front of Cabot strait for a distance of fifty-six miles, from Deadman’s island to the Great Bird. This is not my measurement. It is that of Admiral Bayfield, and is on the Admiralty chart as well as in “The St. Lawrence Pilot.” Any one may read it there. Any one may measure it. (See map, p. 257.)

It is very evident that on its western and southern sides the gulf was very little known for a very long time; and the reason is plain. They

were fishermen, not farmers or explorers, who resorted to these coasts, and they found the cod swarming in all the Atlantic harbours of Nova Scotia, Cape Breton and Newfoundland far beyond their needs. Canso, in Nova Scotia, near by, was a great fishing station. On Cape Breton the English frequented the Havre aux Anglais (Louisbourg); the Spaniards, Baye aux Espagnols (Sydney); the French, Baye de Ste. Anne (Port Dauphin); and the Portuguese have left their traces in Port Nova island and Mira bay. The Magdalen islands were well known and frequented for hunting seals, walruses and whales by Basques and Bretons, and later by English, as has been shown in the voyages cited from Hakluyt. The fur traders to the St. Lawrence also passed by these islands and necessarily knew them. None of these people were searching

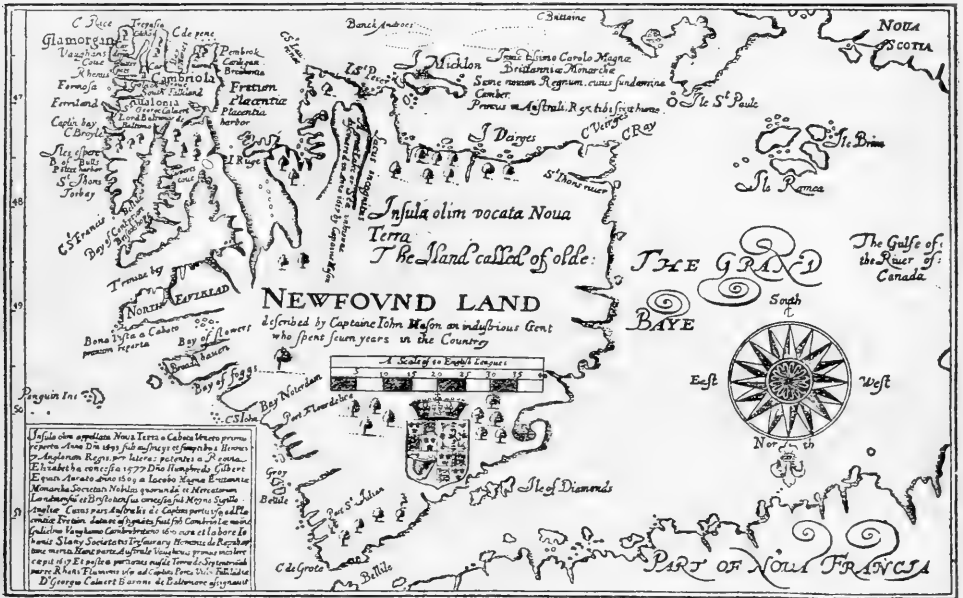


FIG. 33.—MASON'S MAP, A.D. 1625. (See ante, p. 253.)

(Turn upside down to get the north to the top.)

for farm lands to settle upon, and the rocks and sands of the Magdalen and its harbours gave them all the facilities they required for shelter and refitting, as well as for drying fish and trying out oil. This is expressly stated by Hakluyt in the voyage of the "Bonaventure" in 1591. He describes these islands, and sets forth the advantages of the good pebble beach for drying fish. The ship is said to have sailed with the "fleet" for Canada, and she had two consorts. They killed 1,500 morses or sea-oxen on the islands. All the vessels then came in the spring and went in the fall, and their object was purely commercial; not in the least agricultural or scientific.

In the pages of Hakluyt no knowledge of Prince Edward Island can be detected. There are voyages to the gulf, such as the voyage of the "Bonaventure" in 1591 to the island of Ramea, and that mentioned

in the letter of Thomas James, of Bristol, to Lord Burleigh the same year, and the voyage of the "Marigold" in 1593, and George Drake's voyage the same year; as well as those of Sylvester Wyatt and Charles



FIG. 34.—CHAMPLAIN'S MAP, A.D. 1632. (See *ante*, p. 253.)

Leigh. Then we read of the voyage of the "Grace," of Bristol, in 1594, to Naticotec (Anticosti) for whales, and of the "Hopewell" and "Chancewell" in 1597 to the island of Ramea for morses. These voy-

ages Hakluyt introduces by such headings as “a *discovery* of the island of “Ramea”—not in any such sense as we now use the word, but “because “they are the first for ought that hitherto is come to my knowledge, of “our own nation, that have conducted English ships so farre within this “gulf of St. Lawrence and have brought us true relation of the mani- “fold gaine which the French, Britaynes, Baskes and Biscaines do yearly “return from sayd partes.” Would Hakluyt have said that if he had thought that Cabot had sailed round the gulf, or if Cabot’s maps hanging

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FIG. 35.—MAGDALEN ISLANDS, TRACED AND REDUCED FROM THE ADMIRALTY CHART.

in the queen’s gallery had given any hint of such a thing? The language excludes any such idea, and if it had been written for this controversy it could not be more appropriate.

Having so far discussed the maps, I would observe that there are notices of the island of St. John in the works of early writers which prove conclusively that it was not within the gulf. In Appendix D to my paper of 1894 I called attention to the report of Estevan Gomez in 1525, as contained in notices by Oviedo and Cespedes. From these it appears, as indeed the map of Ribero shows, that he reported a continuous

coast and that the island of St. John was on the Atlantic seaboard and that the Cape of Cape Breton was upon it. A passage in the Cosmography of Jean Allefonsee (1545) expressly mentions these places. He says:—"Turning to the isle of St. John, called Cape Breton, the outmost part of which is in the ocean, in 45° from the Arctic pole, I say Cape of St. John called Cape Breton." That is surely precise enough. There is no need to follow it further. He knew nothing about any other island of St. John. Much more to the same effect might be cited, but it cannot be necessary further to prove what is so plain.

Before closing it is proper to advert to a passage¹³⁰ from the treatise of Galvao (Galvano), cited in the presidential address. The archbishop suggests that the discovery of the gulf by Cabot is indicated in it. He gives the original Portuguese: "Descobindo toda a baya, rio, enseada, p'ra ver se passava da outra banda." He then says: "Hakluyt translates it—discovering all the bay and river named Deseado to see if it passed on the other side." That is correctly quoted from the volume, but the conclusion is not justified when all the facts are known. The archbishop says that Hakluyt may have had reason to know that Enseada was the name of a bay and river. "Thus," he adds, "we have the name given by Cabot to the Gulf of St. Lawrence and to our noble Canadian river, for no other bay or river could be possibly meant. A beautiful and appropriate name in sooth. It is the desired or desirable." The meaning is correct of "Deseado," but not of Galvano's word, which is "enseada," for that is the Portuguese way of writing the Spanish "ensenada," creek or inlet; and the passage simply means in English, "searching every bay, river, and inlet, to see if it passed on the other side." Any argument founded on an evident mistranslation and substitution of words must fall to the ground. We know from Oviedo where the Rio de la Ensenada was, and it is put down on the great map of Alonso de Santa Cruz (1542), far away from the place where he has indicated the position of the Gulf of St. Lawrence. While upon this point I would observe that the presidential address seems to indicate a radical misconception of this matter, because Hakluyt expressly says that the translation he edited of Galvano was not his. In real truth he never had the original. He tells us that it was a manuscript which had been in his possession for twelve years—a translation made by "some honest and well affected merchant" whose name even he did not know. The original work was published, after Galvano's death, in 1563, and we are in a better position than Hakluyt to know what is in it, for a copy has recently been found and published by the Hakluyt Society, in connection with the translation Hakluyt acquired. Hakluyt says he annotated and supplemented the manuscript in places, but as he had not a copy of the original work he was unable to correct the errors of translation which evidently existed in it. There is no doubt about the meaning of *enseada*, for elsewhere Galvano mentions a *enseada de Bigala*—the Bay of Bengal—and elsewhere Galvano, in describing an island discovered by Columbus, calls it *Desejada*. The translation says: "Deseada, that is, 'the desired or wished island.'" I need scarcely add that *desejada* is a different word from *enseada*, and no argument based on a substitution, even by Hakluyt's well disposed merchant, of one for the other can possibly be valid.

My argument is now closed, not from want of matter, but from reluctance to occupy more space. The question is now placed before those who will give the time and attention necessary to understand it.

No one can regret more than I do the length of the paper, but if there is one duty more than another incumbent on the members of this section it is to see that the history of Canada is built upon a solid foundation. We must not leave it to be elucidated by scholars of other nations. Such questions as these cannot be set at rest by authority, nor by rhetoric. Long and patient investigation is absolutely necessary, and scholars of many nations have cheerfully given it. Many very learned men have joined in the discussion, and their learning has not been wasted, for much concerning the Cabots, which was obscure, has been solidly established. It is not erudition which has entangled this controversy, it is assertion and contradiction without evidence. Myth and legend are well in their places. They are interesting and poetical, but in a question of geographical history, such short cuts to knowledge are inapplicable.

NOTE ON JOHN CABOT'S PENSION.

The Marquess of Dufferin and Ava, in his address at the Cabot commemoration at Bristol on June 24, 1897, brought to public notice, for the first time, some original manuscripts of the accounts of the Collectors of Customs at that port, in which the name of John Cabot twice appears. The manuscripts were found in the Chapter House of Westminster Abbey by Mr. Edward Scott of the British Museum, and he, with the co-operation of Mr. Coote (also of the British Museum), deciphered the crabbed writing into plain Latin, translated the documents into English, and secured their reproduction by the autotype process. These documents are of much interest, for while they are not absolutely conclusive, they afford a presumption that John Cabot returned alive to England after his second expedition—that is, from the expedition which sailed in the spring of 1498. It will be remembered that up to October 28, 1498 (when William Purchas ceased to be Lord Mayor of London), the expedition had not returned, and also that no mention of its return has hitherto been found; nevertheless, Cabot's pension for that year would seem to have been drawn.

On December 13, 1497, in the thirteenth year of his reign, Henry VII. granted, during pleasure, to John Cabot, a pension of £20 per annum, charged upon the King's revenues at Bristol, to date back from Lady Day, or March 25th, the usual commencement of the year at that period. On January 28, 1498, this grant passed the seals. On February 22, 1498, another royal order was issued. It set forth that "Caboot" had been delayed in obtaining payment because the king's officers at Bristol had no funds. The order was, therefore, directed to the Exchequer to issue to "Caboot" two tallies for £10 each. Tallies so issued were available for payment of taxes or other moneys due to any public accountant, and when they came to final clearance were checked by being placed against the counterstock or other half of the split stick, when the notches would at once be seen to correspond, if no fraud had been committed.

The accounts of the collectors ran from Michaelmas, September 29, and they have been reproduced in autotype for the twelfth, thirteenth and fourteenth years of the king. The annexed phototype is a facsimile of a few lines of the account in the thirteenth and fourteenth years of Henry VII., or from September 29, 1497, to September 28, 1498. On the

fifth line is the entry : *Et in thesaurio in una tallia pro Johanne Coboot, xx Li.* : In the treasury in one tally in the name of John Coboot, £20. The presumption is that one tally was really issued for the whole amount, and that John Cabot negotiated it with some one who owed the king money for dues.

So far the transaction seems clear, for we know John Cabot was in England until May, 1498, during the currency of that account, but the account for the following year has also been reproduced (that is the year September 29, 1498, to September 28, 1499), and in it is also an entry to Cabot as follows—this time spelled right : In the treasury one tally in the name of John Cabot, £20. It would therefore appear that a tally for the second year of the pension was issued and negotiated, but whether it could have been issued, during Cabot's absence, to his representative, or whether, of necessity, it had to issue to him in person, some one more learned in such matters than I am must decide. The second year of the pension, it must be remembered, began to accrue on March 25, 1498, before Cabot sailed, although the tally was passed in after September 29, 1498. The point is, whether a tally could issue in advance against the second year of the pension, which really had commenced to be current while Cabot was straining his resources to fit out his second expedition. If that was not possible, Cabot must have returned after September 28, 1498, and have got the tally himself. The question is not easy to answer, for it demands a very intimate knowledge of the rules of the Exchequer at that time, and it is unsafe for any one in a new country to express an opinion upon such a subject without long and careful inquiry. No doubt every facility possible was afforded to Cabot, for the king advanced £30 to Thomas Thirkill and £30 to Thomas Bradley, as straight loans, and he gave a gratuity to John Carter of £40 5s in aid of their ventures "going to the new ile."

These autotypes came to hand just as this paper was closed, and hence are not referred to in their proper place. Only 150 copies were issued. (William George's Sons, publishers, Bristol.)

Mr. G. E. Weare, in his "Cabot's Discovery of North America" (London, 1897), published for the first time an extract from a statement of the accounts of the collectors of the port of Bristol, by which it appears that they had in their possession an acquittance for £10 paid to "John Calbot, a Venetian, late of the town of Bristol," on account of his annuity of £20 per annum, "to wit, for the term of the Annunciation of the Blessed Virgin Mary." Mr. Weare concludes that the term referred to was up to and inclusive of the 25th of March, 1498, and that therefore John Cabot sailed on his second expedition at some time after that date. Other considerations lead to the same conclusion. Questions concerning the history and antiquities of Bristol will, however, be more appropriately left in the hands of those who, like Mr. Weare, have made an especial study of them upon the spot. The materials for forming a sound judgment do not exist in Canada.

2/4 floor
 Adhuc quod tempore et tunc a meipso tolli p[ro]sum et sube
 regis ibi. a festo ad magis a p[ro]p[ri]o d[omi]no q[ui] regis immo
 p[ro]p[ri]o idem festum ad magis tunc p[ro]p[ri]o regis p[ro]p[ri]o tempore et a

In the m in tall	q[ui] respice regis	6 6 6
Q[ui] in the m in tall	q[ui] p[ro]p[ri]o	q[ui] p[ro]p[ri]o regis
Q[ui] in the m in tall	q[ui] ex sin toll	q[ui] p[ro]p[ri]o
Q[ui] in the m in tall	q[ui] p[ro]p[ri]o l[oc]o toll	q[ui] 6 6
Q[ui] in the m in tall	q[ui] p[ro]p[ri]o p[ro]p[ri]o	q[ui] 6 6
Q[ui] in the m in tall	q[ui] p[ro]p[ri]o p[ro]p[ri]o	q[ui] p[ro]p[ri]o regis

TRANSLATION OF ANNEXED EXTRACT.

	£	s.	d.
Bristol.—Arthur Kemys and Richard ap Meryk, collectors of the King's Customs and Subsidies there, from Mich, 13th y ^r of this king, to the same feast next following, render their account of 1282		8	11 $\frac{3}{4}$
In the treasury in three tallies in the name of the King's household.....	600	0	0
In the treasury in two tallies in the name of Eastmarch	121	12	5
In the treasury in three tallies in the name of said collectors	169	0	0
In the treasury in one tally in the name of Thomas Lovell, Kt.....	100	0	0
In the treasury in one tally in the name of John Coboot.....	20	0	0
In the treasury in one tally in the name of John Heron.....	13	6	8
&c., &c., &c., &c.			

NOTES.

- 1.—(Page 139). Collections of the Nova Scotia Historical Society, Vol. 9, 1893-94. The paper was read Nov. 14, 1893, and is entitled "The Voyages and Discoveries of the Cabots."
- 2.—(Page 141). Cabot's Voyages; a Lecture delivered at St. Patrick's Hall, St. John's, Newfoundland, January, 1897, by the Rt. Rev. Bishop Howley. St. John's, N.F., pp. 29.
- 3.—Trans. Royal Soc. Can. for 1894, Sec. 2. First paper of the series of Cabot papers, pp. 55.
- 4.—Jean et Sébastien Cabot par Henri Harrisse. Paris, 1882.
- 5.—The Discovery of America by Henry Harrisse. London, 1892.
- 6.—(Page 142). Letter, Sept. 5, 1896, to Evening Telegram, St. John's, N.F.
- 7.—Magazine of American History, Vol. 26, p. 267.
- 8.—Letter, Jan. 27, 1897, to St. John's Telegram.
- 9.—The Forum for June, 1897, p. 473. New York.
- 10.—This paper was published in the Morning Chronicle, Halifax, N.S., May 13, 1897. Capt. Smith commanded for many years steamships of the Allan Line. Valuable tables of ocean distances and courses are given.
- 11.—(Page 143). Presidential Address before the Royal Society of Canada, published in the Halifax Herald, June 26, 1897, and in the Proceedings at the commencement of the present volume.
- 12.—Morning Chronicle, Halifax, N.S., Aug. 7, 1897.
- 13.—Letter in Evening Telegram, Sept. 19, 1896. St. John's, N.F.
- 14.—The Earth and its Inhabitants. Appletons, New York. See the volume on America. Translated from the original Paris edition.
- 15.—(Page 144). Life of Columbus, p. 342.
- 16.—St. John's Evening Telegram, Jan. 26, 1897. Letter criticising Bishop Howley's Lecture.
- 17.—St. John's Evening Telegram, Jan. 26, 1897.
- 18.—*Ib.* Same date.
- 19.—(Page 145). Lecture, p. 36.
- 20.—(Page 148). *Ib.*, p. 16.
- 21.—*Ib.*, p. 13.
- 22.—(Page 149). *Ib.*, p. 13. John Cabot had heard this during his travels in the earlier part of his life. As the Christian names are not given in this passage, the personalities of the two Cabots are confused.
- 23.—*Ib.*, p. 17.
- 24.—(Page 150). *Ib.*, p. 22.
- 25.—(Page 151). See Art. 13 of the Treaty—conveniently in Prowse's History, p. 258. The error is, doubtless, a slip of the pen, for the fact is well known to everybody in Newfoundland. It was not until 1783 that Cape St. John was fixed upon by the Treaty of Versailles.
- 26.—Lecture. Note at p. 28.
- 27.—(Page 152). Answer to Archbp. O'Brien in Halifax Morning Chronicle, Aug. 7, 1897.
- 28.—Newfoundland and Labrador Pilot, p. 349. London, 1887.
- 29.—(Page 153). *Ib.*, p. 16, and p. 381.
- 30.—(Page 154). Forum, June, 1897; and "John Cabot," p. 63.
- 31.—Toronto Globe, Sept. 22, 1896.

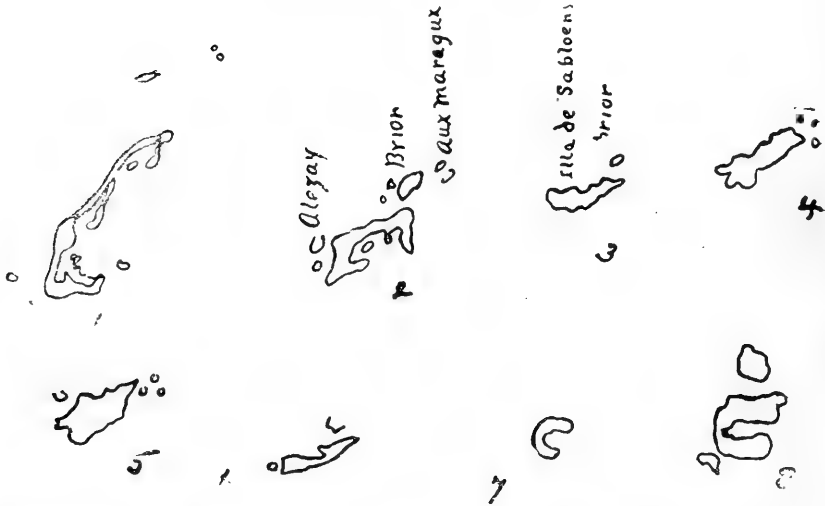
- 32.—(Page 154.) John Cabot, p. 63. London, 1896.
- 33.—(Page 153.) Fabyan's Chronicle.
- 34.—(Page 156.) Maxwell's Newfoundland and Labrador Pilot, p. 17. "It is better to make nothing on leaving the channel. The New York sailing packets and the autumn sailing vessels now go up to 55° to make the Gulf of St. Lawrence." In the Newfoundland and Labrador Pilot, published by the Admiralty, 1887, it is stated at p. 17, that "Admiral Lavand, of the French navy, observes that the best route to follow on leaving the English Channel is to make a little northing." Cabot could not have known all the reasons which now dictate this course, but he did know well that he was sailing on a globular, and not on a plane surface.
- 35.—Introduction to Vol. 86 (1893), Hakluyt Society, p. xv.
- 36.—(Page 158.) Discovery of North America, p. 451.
- 37.—See Appendix A to my paper of 1894 for a translation of this valuable and apposite treatise.
- 38.—(Page 159.) The Discovery of North America by John Cabot, the alleged date and landfall; also, the ship's name, the "Matthew," a forgery of Chatterton. Third edition, revised and enlarged, with a supplement—Mathematical Demonstration of the Fallacy, etc., etc. London, B. F. Stevens, 1897.
- 39.—(Page 162.) United States Coast and Geodetic Survey. Report for 1880, p. 414.
- 40.—*Ib.*, p. 407.
- 41.—(Page 163.) Discussion following the reading of Sir Clement Markham's paper.
- 42.—Halifax Morning Chronicle, Aug. 7, 1897.
- 43.—(Page 164.) The Cabot Controversies, p. 12. Cambridge, Mass., 1896.
- 44.—(Page 168.) The Discovery of America by John Fiske, Vol. 2, p. 14.
- 45.—*Ib.*, Vol. 2, p. 16.
- 46.—*Ib.*, Vol. 1, p. 447.
- 47.—Dr. Justin Winsor (Cabot Controversies, p. 12) says there is good reason to believe that Ruysch used Cabot's charts.
- 48.—(Page 169.) Facsimile Atlas to the early History of Cartography, by Baron A. E. Nordenskiöld. Stockholm, 1839.
- 49.—Examen Critique, Vol. 4, p. 161.
- 50.—(Page 170.) Lecture on Mediæval Maps.
- 51.—(Page 172.) History of Newfoundland, p. 13.
- 52.—Newfoundland and Labrador Pilot, p. 27.
- 53.—(Page 174.) Halifax Morning Chronicle, Aug. 7, 1897.
- 54.—*Ib.*
- 55.—(Page 175.) Report and Editorial in London Times.
- 56.—Letter in St. John's Evening Telegram, Sept. 14, 1896.
- 57.—(Page 176.) *Ib.*
- 58.—*Ib.*
- 59.—Magazine of American History, Vol. 26, p. 287.
- 60.—Trans. R. S. C., Vol. 12, Sec. 2.
- 61.—(Page 178.) The best facsimile of this important map is in HARRISSE'S Discovery of America, p. 217. It is reproduced twice in Winsor Narr. and Crit. Hist., in part Vol. 2, p. 219, and fully in Vol. 4, p. 38, where the features noted in the text will be found. Kretschmer's facsimile is defective on the coast of Greenland in not indicating *ille ferme*. Terra or Tierra firma is not found in any of them.
- 62.—Discovery of Newfoundland by John Cabot, St. John's, N.F., 1897, pp. 10. A facsimile of Mason's map is given on p. 253 *ante*.
- 63.—(Page 180.) Letter to Evening Telegram, St. John's, N.F., Jan. 27, 1897.
- 64.—History of Newfoundland, p. 60.
- 65.—Edward Haies's Account of Sir Humphrey Gilbert's Expedition in Hakluyt's Principal Navigations.
- 66.—(Page 181.) Lecture, p. 35.

- 67.—(Page 181.) Lecture, p. 37.
 68.—(Page 182.) John Cabot, p. 115.
 69.—Letter to St. John's Evening Telegram, Jan. 28, 1897.
 70.—Halifax Morning Chronicle, Aug. 7, 1897.
 71.—Rejoinder to G. E. Weare—Notes and Queries, Aug. 14, 1897.
 72.—(Page 183.) Examen Critique, Vol. 5. p. 152.
 73.—John Cabot, p. 88. Note.
 74.—Cabot Controversies, p. 14.
 75.—Divers Voyages. Quoted also in HARRISSE, John Cabot, p. 373, and in WEARE, Cabot's Discovery of North America, p. 251.
 76.—Lecture. Page 11 for Puebla's theft, and p. 35 for Cortereal's.
 77.—(Page 186.) Lecture, p. 25.
 78.—John Cabot, p. 281.
 79.—(Page 187.) Life of Columbus, p. 627.
 80.—*Ib.* These statements are the veriest commonplaces, but they may be seen here at a glance.
 81.—*Ib.*, p. 639.
 82.—Facsimile Atlas, p. 68.
 83.—Notes on the Verazzano Map. Journal of the New York Geographical Society, Vol. 4, p. 240.
 84.—Facsimile Atlas, p. 51.
 85.—Lecture on Mediæval Maps.
 86.—Life of Columbus, p. 531.
 87.—(Page 188.) Discovery of America, p. 267.
 88.—John Cabot, p. 86.
 89.—*Ib.*, p. 80.
 90.—(Page 189.) *Ib.*, p. 16.
 91.—(Page 190.) Discovery of Maine, p. 193. (Vol. 1, Maine Hist. Soc.)
 92.—*Ib.*, p. 193—HARRISSE, Jean et Sébastien Cabot, pp. 266, 272, 274.
 93.—John Cabot, p. 279.
 94.—(Page 172.) *Ib.*, p. 112.
 95.—(Page 193.) Forum, June, 1897.
 96.—Introduction to Journal of Columbus, p. XXI. (Hakluyt Soc., Vol. 86.)
 97.—John and Sebastian Cabot, pp. 7, 51, English translation. Detroit, 1893.
 98. Cabot Controversies, p. 13.
 99.—Forum for June, 1897.
 100.—(Page 194.) Histoire du Canada, Vol. 1, p. 58.
 101.—(Page 197.) Arber's Three First Books on America, p. 350.
 102.—(Page 201.) St. Lawrence Pilot, Vol. 2, p. 304. One of the causes of these wrecks, before the lighthouse was built in 1839, is stated to be the prevailing current setting out of Cabot Strait upon the starboard bow of vessels on a westerly course. This was pointed out in my paper of 1894.
 103.—Histoire de la Nouvelle France, Vol. 2, p. 409. Further particulars will be found in a Note to Charlevoix's Letters.
 104.—Principal Navigations.
 105.—*Ib.*
 106.—(Page 202.) Voyage par ordre du Roi, p. 41. Paris, 1753.
 107.—Principal Navigations.
 108.—Newfoundland and Labrador Pilot, p. 8.
 109.—(Page 203.) Life of Columbus, p. 342.
 110.—Jean et Sébastien Cabot, p. 64.
 111.—(Page 205.) *Ib.*, p. 66.
 112.—Lecture, p. 13.
 113.—*Ib.*, p. 11.
 114.—Geography of the Sea, by Lieut. Maury, U.S.N.
 115.—(Page 206.) Principal Navigations.

- 116.—(Page 207). Lecture, p. 15.
 117.—(Page 208). Hakluyt Society, Vol. 86, p. 202.
 118.—(Page 211). Letter to St. John's Evening Telegram, Jan. 27, 1897.
 119.—Decades. (A.D. 1516.)
 120.—(Page 212). John Cabot, p. 77.
 121.—(Page 214). Forum, June, 1897.
 122.—(Page 215). *Ib.*; John Cabot, p. 63.
 123.—John Cabot, p. 68.
 124.—(Page 225). Examen Critique.
 125.—(Page 229). St. Lawrence Pilot, Vol. 2, p. 302.
 126.—(Page 233). Facsimile Atlas, p. 38.
 127.—Page 238). Discovery of America, p. 407.
 128.—(Page 241). Mr. Ganong's papers are: Jacques Cartier's First Voyage, R. S. C. Trans., Vol. V., and Cartography of the Gulf of St. Lawrence, R. S. C. Trans., Vol. VII.
 129.—(Page 247). St. Lawrence Pilot, Vol. 1, p. 51.
 130.—(Page 258). The Discoveries of the World, by Antonio Galvano. Hakluyt Society, Volume for 1862.

THE MAGDALEN GROUP.

As represented on the earliest maps.



1. Magdalen Island correctly drawn.
2. From the Henry II. or Dauphin map of 1546. Alejay is Deadman's island, les Isles aux Margaux are the two Birds, and Bryon island has retained its name until now. Entry island is shown. All are in their relative places and the concave shape of Magdalen island is clearly shown.
3. From Homem's map (Portuguese), 1558. The island is identified by its name. Ille de Sabloens—isle of sands, and by Bryon island close to it. The axis is right, but the concavity is turned the wrong way, as in many of the Portuguese maps.
4. From Mercator's map, 1569. Here it is identified by the three small islands on the north.

5. From the map of 1544. The three small islands (on the north and Alezay) Deadman's island) on the west identify it as the Magdalen. The Prince Edward Island names are away on the main land.
6. From the Vallard map of 1513. This map is Portuguese. The Magdalen is shown by Alezay on the west and Bryon on the north. The concavity is reversed, as in No. 3.
7. From Rotz's Globe, 1543. The author was French and embodied Cartier's discoveries on his maps. The Magdalen is indicated by its shape, concave in the right direction, as in the other French map, No. 2.
8. From Hakluyt's map; the scarce map of 1600. Here the shape marks out the Magdalen and Deadman's island (Alezay), and Bryon island further identify it.

Various as the above are in shape, it will be seen that their axes are all in the same direction and are at right angles to the direction of the axis of Prince Edward Island, and their positions on their respective maps are the same—that is, in the fairway to the St. Lawrence river. The sequence may be continued by referring to Champlain's map of 1613, (see *ante* p. 254) where the Island of St. John (Prince Edward Island) begins to separate from the main land. At p. 256 will be found Champlain's map of 1632, where the island appears in its correct shape and position for the first time.

THE MAPS.

I. MAP OF JUAN DE LA COSA.

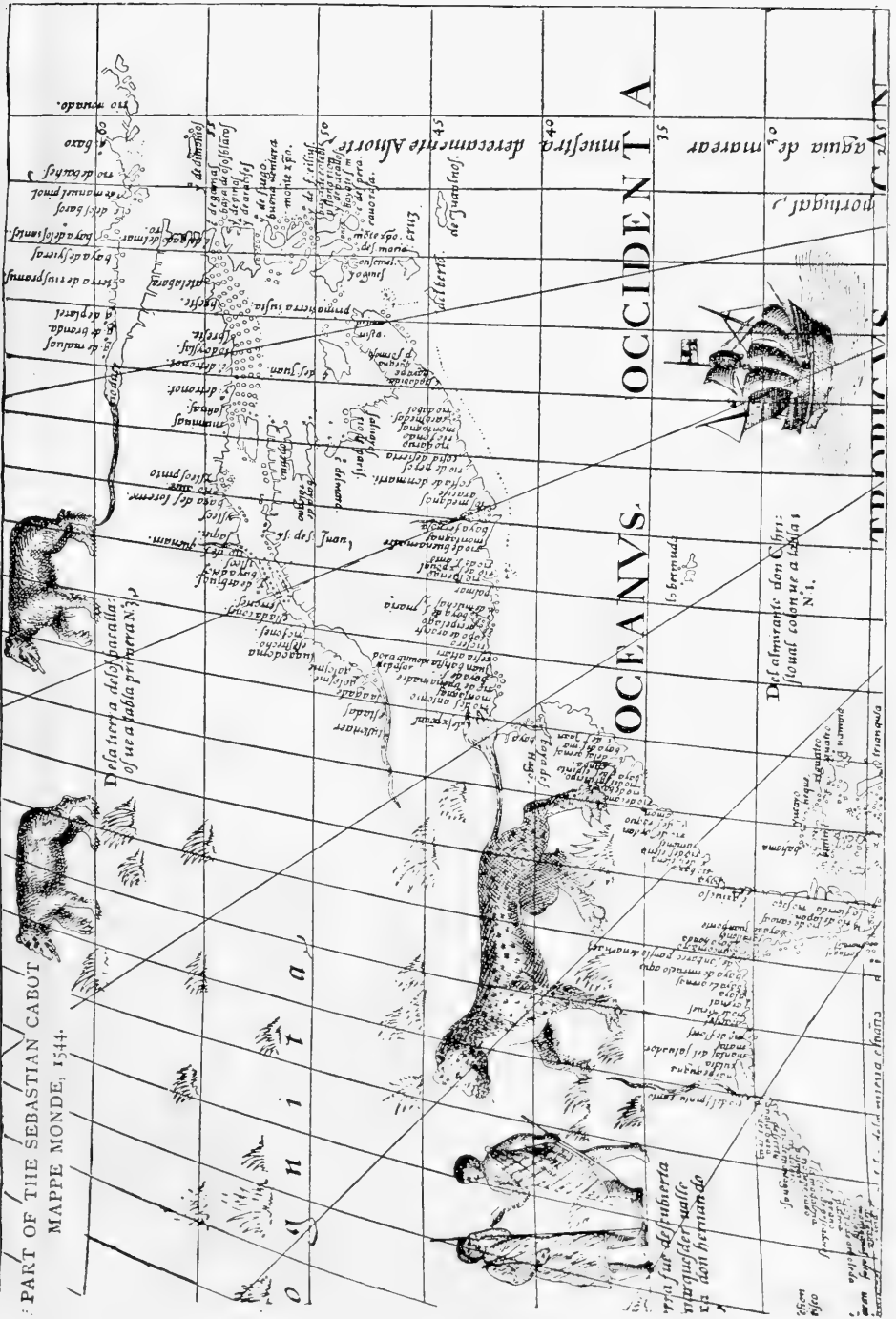
This has been reproduced from the facsimile in Jomard's "Monuments de la Géographie," because, being in black and white, it was less costly to reproduce than the facsimile in colours by Vallejo and Traynor published at Madrid in 1892. There have been many reproductions of the American portions of this map. That portion may be conveniently referred to in the following books—Kohl, History of Maine; Winsor, Narrative and Critical History; HARRISSE, Discovery of America; Markham, Hakluyt Society, Vol. 86; Kretschmer, Atlas; and in two previous papers in Vol. 12, R. S. C., 1st series, and Vol. 2, R. S. C., 2nd series. Both Jomard's and Humboldt's copies have omitted the second island off Cabo de Ynglaterra. This has been inserted in its place, on the present copy, after the Madrid facsimile. It will be found, also, in HARRISSE, Winsor and Markham.

The scale is a little less than half the size of the original. Those who may wish to see the American portion on a larger scale will find tracings elsewhere in the present volume.

II. THE MAP OF 1544 (CABOT'S).

There is a facsimile of this map in Jomard; but, inasmuch as a photograph of the original at Paris was available through the courtesy of the Minister of Agriculture, it has been possible to give the members of the society the privilege of studying this important document with as much certainty and more conveniently than if they were in Paris. The scale is a little less than one-half, but with a reading glass the lettering may easily be made out. Extracts of the American portion of this map are easily accessible, but in order to make the present volume as complete as possible one of these is reproduced here on a larger scale, and at p. 204 is a magnified outline of the region of the *prima vista*. The extract now given shows the names in the Gulf, and is taken from Vol. 3 of Winsor's Narrative and Critical History. The best reproduction of an extract on a large scale is in HARRISSE's Jean et Sébastien Cabot. The present photographic reproduction is, however, the true image of the original, untouched by hand, and all these extracts may be taken as commentaries.

The legends are in Spanish and Latin. The student will see they are welded to the map by the numbered references. He will find No. 3 under the feet of the two bears, and be able to see for himself that the reference is to No. 8, on the margin, inasmuch as Bacallaos is the subject of both, and No. 3 refers to Central America, and he will also see that these legends cover widely extended regions. In order, however, to include in the present volume a complete *apparatus criticus* on the Cabot question, it has been thought desirable to give a translation of the legends, as an appendix to Section 2. In Volume 6 of the Proceedings of the Massachusetts Historical Society, Second Series, this work was done once for all and cannot be improved upon. The translations were made under the direction of the late Dr. Charles Deane, and formed part of a paper written by him. As the volume is not easily accessible, the reproduction of the translations will assist greatly in forming a reasoned opinion on this difficult question.



PART OF THE SEBASTIAN CABOT
MAPPE MONDE, 1544.

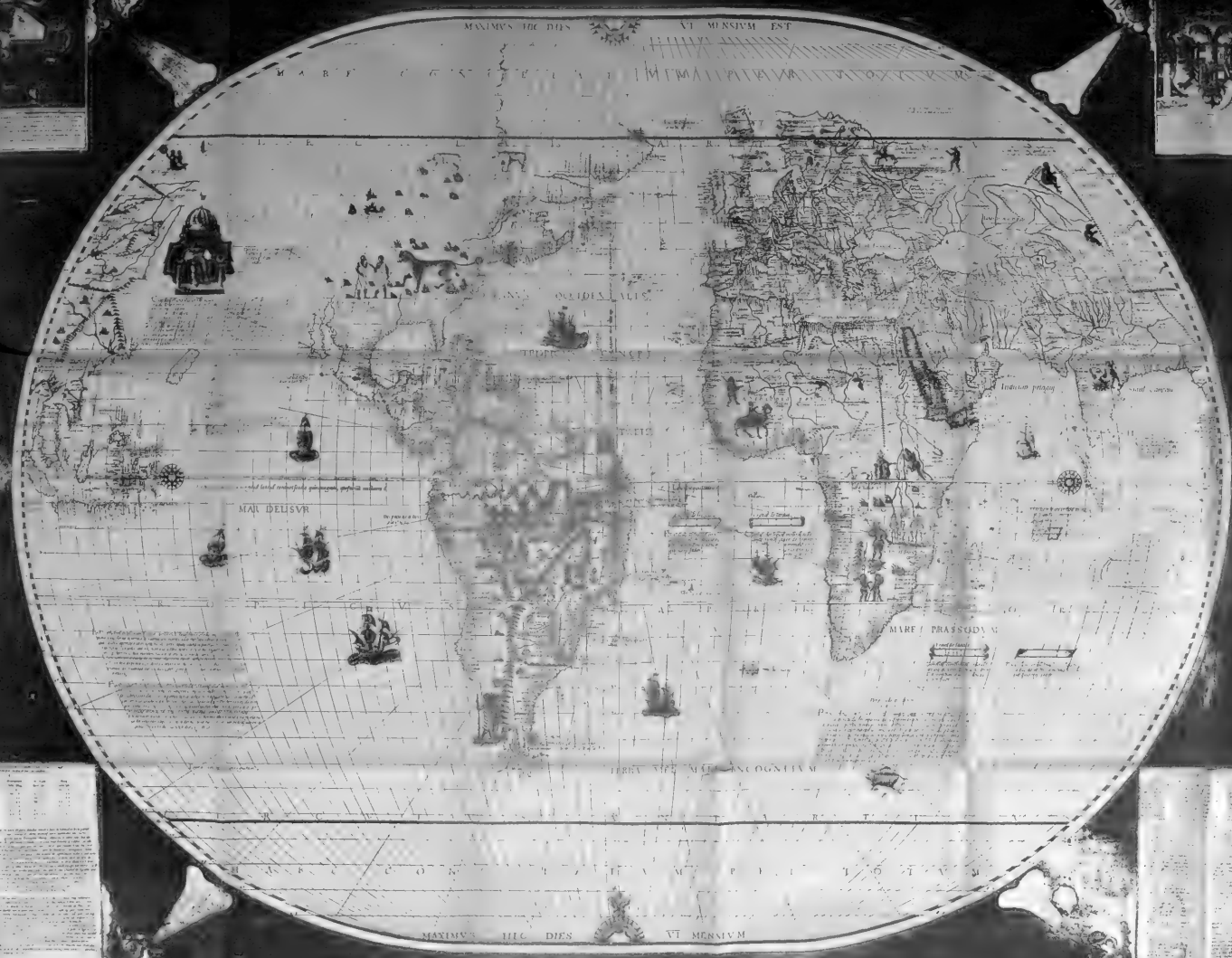
NORTH AMERICAN PORTION OF THE CABOT MAP OF 1544 (FROM WINSOR, NARR, AND CRT. HIST. VOL. 3, P. 22).



WORLD MAP OF JUAN DE LA COSA, A. D. 1500.

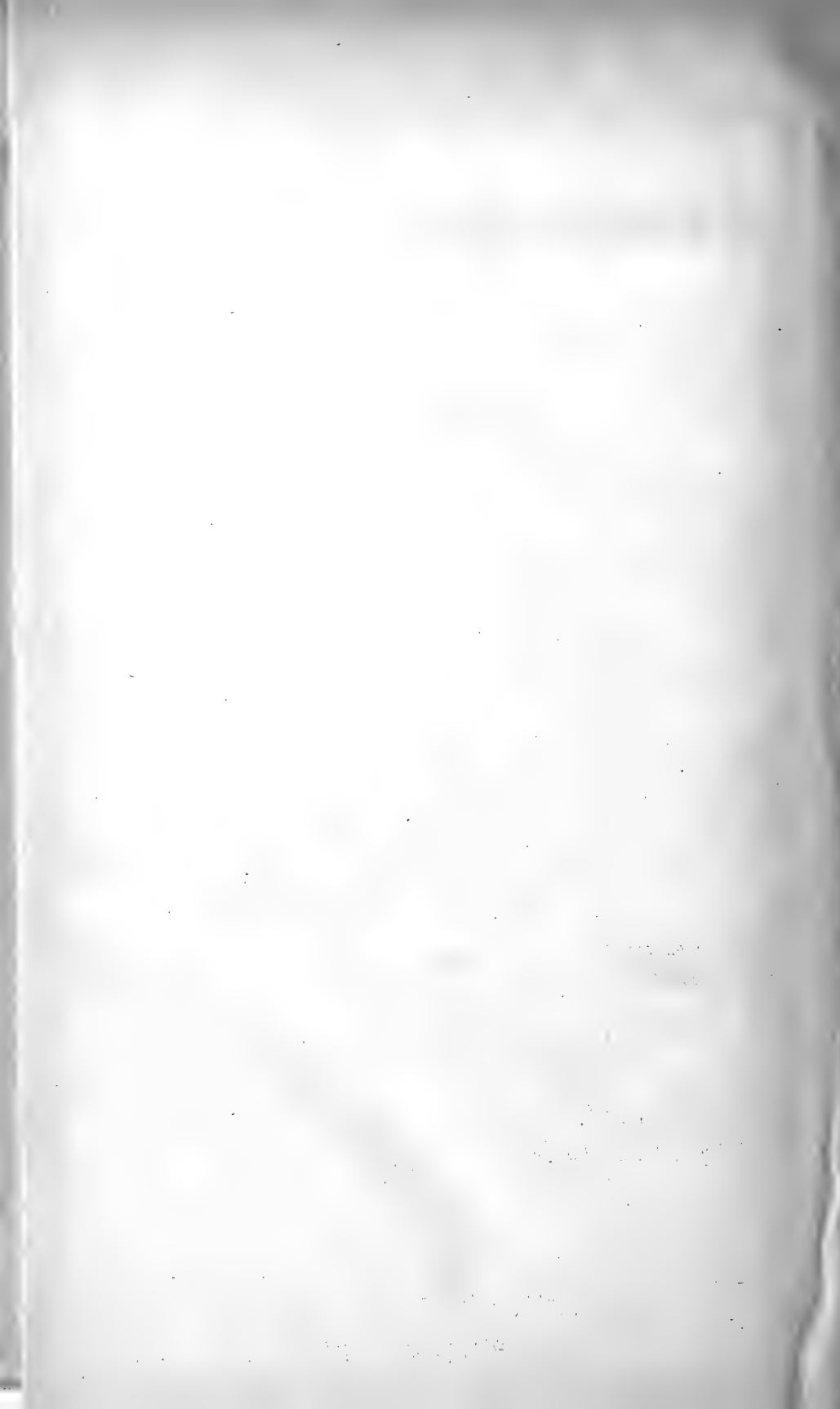
Reduced by Photo-Lithography to a little less than half-size from the fac-simile in Jomard's *Monuments de la Géographie*.





WORLD MAP OF A. D. 1544. (The Sebastian-Cabot Map.)

Reproduction of the original map from the National Geographic Society's collection.



VII.—*The Historical and Miscellaneous Literature of Quebec—
1764 to 1830.*

By BENJAMIN SULTE.

(Read June 23rd, 1897.)

The literature of all nations began with poetry, or, at least, with versification, and the form of song is generally the first to appear. Such was the case amongst the French Canadian people.

Their settlement on this side of the ocean is altogether confined to the period of 1633–1680, when books were rather scarce throughout Europe, especially in country places, and it is well known that Canada received only few families from towns and cities at that time. Curious enough, though most of the women who came during those fifty years could read and write, and before thirty of them were here, they had a school open for girls. The men, as a rule, were indifferent in that line of business.

The literary knowledge imported by that little group of toilers of the soil was merely the popular current songs of the northern and north-western (Brittany sent no settlers to Canada) parts of France, where they came from, but they were songsters themselves, and all loved to sing and to play some kind of musical instruments. It is still one of the most remarkable features of that race.

The fur trade started about the same date as colonization, and the "habitant," or actual settler, soon got interested in that new life. The songs of old France were carried to the Great Lakes; they passed afterwards to the Mississippi and the Northwest plains, where they are to be found nowadays, wherever the French Canadians have penetrated through this continent. Their number is immense. One would think that if he knows the series of those that have been printed in book form or other publications he has nothing more to learn in that direction, but every week will bring to his ear a fresh supplement of that inexhaustible stock.

A people who is given to such culture may be expected to produce many works of merit, and stamp them with its own peculiar mark, as, for instance, the characteristic traits belonging to a colony. We could here mention what several high critics in modern France have said about the literary capacities of the French Canadians, but the compliments paid to the latter only reflect on the present writers, and the critics referred to have never read any of our productions previous to 1850.

We wish to draw attention to even an older period, that of 1764–1830, the very infancy of our small literary world. The germs that existed in the domain of the song-makers of the 17th and 18th centuries have only

recently developed themselves into large-sized trees, notwithstanding the shrubs observed here and there on that field soon after the conquest.

Even before the conquest there was a prepared ground for studies and literary displays. Beauharnois, Hocquart, La Galissonnière, from 1725 to 1750, kept the elite of the colony well posted with the contemporary works of that nature. Poems were written which circulated in manuscript for want of a printing office, and most of them were no doubt lost for the same reason. We may quote the composition of Jean Taché relative to his trip across the Atlantic, and the one from the able pen of Abbé Etienne Marchand, both of 1736 or thereabouts. Marchand's *Troubles de l'Eglise* is well worth reading, inasmuch as it deals with a purely Canadian subject.

The first printing establishment in Lower Canada was that of *The Gazette*, Quebec, 1764, but neither the English nor the French population made use of it at first in a literary sense. Their early publications bear strictly on topics of immediate call, as were the following: "Case of Canadians at Montreal, distressed by a fire on the 18th of May, 1765"; "Catéchisme du diocèse de Sens, Québec, 1765"; prayer-books and alphabets printed for Father Labrosse, Jesuit, 1766-67; "Trial of Daniel Disney, 1767"; "A compendium of laws concerning the religious communities, 1768"; observations of J. F. Cugnet on the proposed plan of F. Maseres for a new constitution, 1771; "Lettre sur la ville de Québec, 1774."

L'Adoration perpétuelle, Montreal, by Fleury Mesplet, 1776, is the first book printed in that town. Mesplet had procured a press and some type from Philadelphia during the winter of 1775-76, and immediately issued several small volumes from Chateau Ramezay, Montreal, where he had settled for that purpose. A compilation of sacred songs, in French, 1776, is the second known work out of his press. Most of these poems are paraphrases and imitations of obsolete operatic compositions, with very pretty tunes and rather poor verses. These canticles became so generally known by heart, that every individual could sing one or more of them a short time after they were introduced.

Mesplet published in 1778 the narrative of St. Luc de Lacorne concerning the wreck of *L'Auguste* in the Gulf St. Lawrence, 1761. Same year, 1778, he founded the *Gazette* of Montreal, half English, half French—still in existence in English.

Quebec had a *Cercle Littéraire*, so called, but it must have been a reading-room. Anyway, it was a beginning of something.

Mesplet started in 1779 a satirical paper styled *Tant pis, tant mieux*, which lived about twelve months and got into difficulty with Governor Haldimand, who put the editor under lock and key. The name of that writer was Valentin Jotard an advocate by profession.

The almanac issued by Mesplet in 1783 is styled by him, "curieux et intéressant." In 1786 (Montreal) was published a description of a certain

disease prevailing at Bay Saint Paul. A volume devoted to "La Sainte Famille" came out of the press of Mesplet in 1787.

A large book printed in London, 1784, but written by a Canadian, has a special history in the events of those days. The author, Pierre Ducalvet, was just out of the hands of Governor Haldimand when he issued his "Appel à la Justice," which is a criticism of the administration of the colony, rather personal, somewhat excessive also, but an invaluable record of certain facts connected with the state of Canada during the American Revolution.

In 1788 Mesplet launched *La Gazette Littéraire* at the request of a certain number of Montreal gentlemen. The same year, James Tanswell started *Le Courrier de Québec*, but only issued two numbers of that publication.

A public library was opened at Quebec in 1785, and was a far more serious undertaking, for it kept well for a long period of years. There was decidedly a movement towards three or four branches of studies since peace had been restored to the country. Dramatic associations existed in Montreal and Quebec. They played Molière and some light comedies of the time of Louis XV. The man who seems to have inspired principally these efforts was Joseph Quesnel, a poet, a musician, and a person of good society. His comedy, *Colas et Colinette*, became the great attraction of the day in Montreal (1790), whilst the people of Quebec boasted of a troop of amateurs who could not be surpassed in any colony, as they believed. His Royal Highness the Duke of Kent, accompanied by lieutenant-governors Clarke and Simcoe attended the performance of *la comtesse d'Escarbagna* and *le Médecin malgré lui* in Quebec, on the 18th February, 1792. The Prince had arrived there during the previous summer and felt quite at home amongst the lively Quebecers. He was present at the banquet given on the 29th December, 1791, to celebrate the granting of a new political constitution to Canada, and, as a matter of course, he heard several songs composed for the occasion, including two specially prepared to welcome him, and which MM. Baby and Amiot rendered in a most happy manner.

There was a spirit of literature in the air. Canadian pamphlets could be seen in the hands of many who had never experienced that sort of pleasure before. *Papiers sur l'Angleterre* referred to the administration of the United Kingdom, and such reading was apropos of our new constitution. A long letter from Bishop Bailly upon the necessity of a university gave rise to discussion and méditation. *L'ancienne et la nouvelle constitution du Canada* is another commentary of a political importance, but indicating also that the Canadians were able to express their ideas before the world. *La nouvelle constitution de France* followed the above, and the whole province roused to listen to this display of opinions. To crown the whole came *Le Magasin de Québec*, a repertory of literature and science. The *Quebec Gazette* also modified its old dull

system and opened the door to several communications concerning the questions of the day. That coincided with the creation of *The Upper Canada Gazette*, published at Newark in 1790.

Contrary to what is generally believed, books were not unknown to the French population of the colony during the second half of the 18th century. It is stated that there were at least 60,000 volumes in the private libraries about the year 1765, and many others were received after that date; so that we may fairly say that there was one volume for every soul of the population in the province. Any one conversant with the habits of the best families of the period in question understand readily that those people were educated not only in manners and outside politeness, but equally by reading and by that practice of conversation and "*causerie de salon*" which is so much French—a great school for learning what you have not yet gathered from books. The literature of the reigns of Louis XIV. and Louis XV. (1660 to 1760), therefore, composed the main elements of a Canadian library by the end of the 18th century. Its influence is visible on every page written in those days, either for the public press or in private letters. We know, besides, nearly all the books then to be found in Canada, because a great many of them have been preserved by the descendants of the owners and handed down to us.

At the outbreak of the French Revolution a movement was noticeable amongst the politicians in France to favour "the English system of government," in other words, the constitutional administration, but this could not be made clear for the masses, unless some written explanations be furnished. A lawyer by the name of De Lolme (a French Swiss) seems to have sounded the correct note, and his work became classical at its first edition. No sooner had a copy of it been received in Canada, than the members of the Legislative Assembly, who were forty-two French speaking men out of a total of fifty, turned their attention to that Alcoran, but as the session was drawing near to its end, it was thought better to arrange for a series of meetings in Quebec, Three Rivers, Sorel, Chambly and Montreal, where the members could gather by small detachments and examine the "book of revelations" at ease. This was done, and it produced a good effect, inasmuch as it allowed some practical information to make its way through the heads of our representative men.

The spirit of the times is indicated by the insertion in the *Quebec Gazette* of several articles clipped from Parisian newspapers, and all necessarily of a "high tone" at that hour, when the Convention reigned supreme at Paris. We dare say no French Canadian publication would have been allowed to do the same thing. Such was again the spirit of the times. A French Canadian could not be otherwise than a bad subject!

The Duke of La Rochefoucauld, who visited Upper Canada in 1795, says that the people there were not so eager for news as the inhabitants

of the United States. "The only paper in the province is printed at Newark, and the government covers the three-quarters of its expenses for want of subscription from the public. It is a weekly paper containing very short extracts from the New York and Albany publications, and all in the views of Governor Simcoe. In brief, its usefulness is that of an official gazette."

La Rochefoucauld adds that the *Upper Canada Gazette* had no subscriber in Kingston, but that the *Quebec Gazette* had two there!

The first serious agitation in favour of liberty of the press in England only dates from 1795, when the following toast was drunk at a Whig dinner: "To the liberty of the press, without which we could not breathe."

From 1764 to 1795 no less than thirty works were printed in the province, and about ten others in London, but written by Canadians. For a moment these figures may be considered meagre; we wonder if it is any better in our own days, comparing the increase of the population. Sciences proper were much neglected, and continued to be so for fifty years afterwards.

William Smith, who lived at Quebec in 1785, says that a public library was established there in that year, and that the books came from London. La Rochefoucauld (1795) observes that the only library of that kind in Lower Canada was at Quebec. "It is a small gathering of books and nearly all French, sustained by subscription. We are rather puzzled at the choice of some of them, knowing, as we do, the political dispositions of the directors of the institution, for it contains the printed papers of the National Assembly of France." As late as 1824, Vassal de Monviel speaks of the interesting searches made by him in the Quebec library, which is supposed to be either that of 1785 or the one belonging to the legislature. By that time, 1824, schools had been opened in several localities, and the Nicolet college was in a first-class state of activity, as well as the Quebec and Montreal colleges. Reverend Dr. Jacob Mountain wrote some remarkable letters (1798-1801) in which he proposed a plan of public education for all classes.

The agitation which followed the discovery of the Genest scheme to drag the United States into a war against Great Britain was marked by various publications, it seems, but two only are known to us: "Extract from Minutes of Council containing His Majesty's late Regulations, &c., Quebec, 1798;" "Avis au Canada à l'occasion de la crise importante actuelle, Québec, 1798."

Joseph François Perreault was the champion of elementary schools at the end of the last century. In 1803 he published a treaty of parliamentary practice; in 1803 a dictionary of the same nature; in 1813 a hand-book for the bailiffs; in 1822 a course of elementary education; in 1824 extracts from the judgments of the prevotal court from 1727 to 1759; in

1830 a work on large and small agricultural pursuits ; in 1831 a plan of general education ; then closed his career by a history of Canada from the discovery.

François Joseph Cugnet, the best French legist from 1760 to 1789, published five or six treatises concerning law matters ; Justin McCarthy, a French lawyer, gave an excellent dictionary of the old civil code of Canada (1809) ; William Vondenvelden, a French engineer, and Louis Charland, issued a compilation, being a sequel to Cugnet ; same year, Jean Antoine Bouthillier published an arithmetic for the schools. Several other names must be omitted here for want of space.

The *Quebec Gazette*, as a rule, refrained from attacking the French Canadians, and this was considered a lack of patriotic energy on the part of that paper by parties who wished to keep up a lively skirmishing against that population. The *Mercury* came to light in January, 1805, ready to open fire on the whole line. It soon found an occasion to satisfy its desire. Pierre Bedard, the leader of the French Canadian party in the Legislative Assembly, laid a motion before the speaker to inquire as to the author, printer, &c., of the *Montreal Gazette*, who had published, April 1st, 1805, a "false, scandalous and malicious libel, highly and unjustly reflecting upon His Majesty's representatives in this province." The editor and the printer were accordingly ordered to be taken into the custody of the sergeant-at-arms, but not being found by those who went to Montreal in quest of them, the matter was dropped. The *Mercury* then came to the front trying to throw upside down the party forming the majority of the Legislative Assembly, but the sergeant-at-arms being sent to the editor, this gentleman apologized and was released. Later on, the House objected to another article from the same source, and Mr. Thomas Cary could not be found, because he had concealed himself in a secret room in his own house, from where he continued the fight in each number of the *Mercury*. Mr. Bedard finally saw that his action was against the liberty of the press, and abandoned the proceedings.

A new political organ was launched at Quebec in November, 1806, under the title *Le Canadien*, with a full programme for a constitutional government. This paper contained a series of historical documents referring to Canada, which was a new phase in the journalism of the province, and also numerous original literary productions. The *Mercury* went for its neighbour, and they had a long spell of cross-firing on the administration of public affairs.

In literature *Le Canadien* did very well. It is visible that its contributors were men of knowledge gifted with talent. From that moment the French writers of Canada have always formed a group in regular activity, and their development has been a constant fact until the present day.

The *Mercury* had adopted against *Le Canadien* a policy of insinuation. When the latter, for instance, entered into a criticism of the

doings of Napoleon, its neighbour would declare that the object was to blind the readers, because the material with which the paper was printed had been furnished by General Turreau, the French ambassador at Washington. The poor *Canadien* replied that its shabby appearance was not indicative of the munificence of a great prince, and we know how miserable he looked, but this was considered by his rival as another piece of duplicity.

Two or three of the contributors to *Le Canadien* were rather witty. "Light, headed men," said *The Mercury*.

"With goose-quill armed, instead of spear."

The epigrams flashed in all sorts of ways on both sides for many months. It was a literary exercise that must have afforded the young writers of the period a chance to test their natural resources. Songs were put in circulation, and some of them reflecting on the attitude of the Americans in regard to Canada, for there was a belief all around that the diplomatic difficulty then existing could not be settled except by war.

Let us mention here a book published in Quebec at the beginning of the war of 1812, entitled: "Resources of the Canadas or Sketches of the Physical and Moral Means Which Great Britain and her Colonial Authorities will Successfully Employ in Securing These Valuable Provinces from Open Invasion and Invidious Aggression on the Part of the Government of the United States of America, by A. Querist."

But there was also a French Canadian party called the "office-seekers," (les bureaucrates), which intended to participate in the government patronage. They started a paper, *Le Courrier de Québec*, in Jan., 1807, with Dr. Jacques Labrie as chief editor. Labrie had been educated in Canada; afterwards he had studied medicine in Edinburgh, Scotland, and he was greatly given to matters concerning the history of Canada. His paper opposed *Le Canadien* firmly in politics, and also published several documents relating to the previous thirty years, in connection with our country, but it is not sure whether the intention of Labrie was to counteract the notions spread by *Le Canadien* in the historical field. The purpose of the bureaucrats was more in the direction of securing good government berths for their folks than to indulge in sentiments upon things of old. Labrie, nevertheless, made his mark in the circle of those who were given to literary and historical pursuits.

From that conflict of interest between the *Mercury*, *Canadien* and *Courrier* sprung the practice of advertising the merchants' goods, which the *Quebec Gazette* had always neglected. This is another form of literature not likely to perish, although quite unknown to our forefathers.

When the *Courrier* died, in June, 1807, *Le Canadien* expressed much regret at its departure, stating, in a sarcastic manner, that the best enemy

it could have had was a badly written paper. The *Mercury* was delighted; it said the defunct looked like a parent of *Le Canadien*. In all that squabble, many young men handled the pen and acquired a practical understanding of the art of putting their thoughts in black and white. This was really the first school of that kind in Canada.

Some debating clubs existed in the meantime, where such personalities as Louis J. Papineau, Debartzch and Bourdages gained a fame before coming out openly as public men.

Dr. Labrie gave an impulsion towards the study of the history of Canada. So did George Heriot, in his works published during those years. The Montreal press helped a great deal in that direction by the writings of Viger, Bibaud, Mermet, Saint-George and O'Sullivan. The literature of Canada was born by this time. Lambert, who visited the country in 1806-8, does not say much about it, for he only saw the incipient state of things, and cannot be expected to have foreseen the future. Here are his observations: "The state of literature and the arts did not improve very rapidly after the conquest. The traders and settlers who took up their abode amongst the French were ill-qualified to diffuse a taste for the arts and sciences, unless, indeed, it was the science of barter and the art of gaining cent per cent upon their goods. For many years, no other work was printed in the colony than an almanac. . . . Of late years, the Canadians have appeared desirous of establishing some claim to a literary character. . . . The publishing of six newspapers weekly is a proof of the progressive improvement and prosperity of the country, though it may be but a fallacious symptom of literary improvement. Four of the newspapers are published in Quebec and two in Montreal. These, with an almanac, and the acts of the provincial parliament, are all the works that are printed in Lower Canada." It is obvious that Lambert was unaware of other publications, such as schoolbooks, songsters, treatises upon the seigniorial tenure, commentaries on laws, discussions of political and historical matters, and amateur theatricals, which, in a colony, are always a form of intellectual development worth mentioning. He continues: "Two of the newspapers have been established fifteen or sixteen years; one of them is the *Montreal Gazette*, and the other the *Quebec Gazette*." The *Quebec Gazette* was then 44 years old, and the *Montreal Gazette* 30 years. "They are published in French and English, and contain the governor's proclamation and edicts, the advertisements of the sheriff's sales, merchants' stores, public auctions, &c., together with a selection of the earliest intelligence extracted from the English and American papers. . . . The *Gazettes* seldom interfere with the morals or manners of society; those objects are left for the other weekly papers, which are published on Saturdays and Mondays. These papers consist of the *Quebec Mercury*, published entirely in English, by Cary, on Monday afternoon, and has been established about eight years." Say three years. "The *Canadian Courant*,

also published in English at Montreal every Monday by Nahum Mower, an American from the States, who set up the paper about six years ago. The other papers are wholly French, and have been established since the year 1806. The one called *Le Canadien* is conducted by some disaffected or rather dissatisfied French lawyers and members of the House of Assembly." These men only invoked the application of a constitutional government in the colony, therefore they were reformers, not a set of malcontents for the sake of agitating the public mind, but true patriots, such as were seen afterwards in this country. "It is the only opposition paper in the province; but the 'habitants' either cannot read it, or pay very little attention to the complaints which it contains against the government." How can this be compared with the repeated elections of that remarkable period, by which Sir James Craig's policy was four times disavowed by the people in less than three years? It is visible that Lambert never suspected the existence of an intellectual movement in Canada during his visit, and that not only he derived his information from a clique composed of anti-colonists, but was unable to read French and to appreciate by himself the contents of the newspaper he so candidly stored into the back room. "The writers in *Le Canadien*, however, abused the liberty of the press to such a degree, in the course of the year 1808, that Sir James Craig thought proper to divest some of those gentlemen of the commissions which they held in the French militia, one of whom was a colonel." The reading of the revolutionary articles alluded to by Lambert would make any one of us laugh in 1897, but Sir James was not advancing with the times—far from that! "The other French paper, called *Le Courrier de Québec*, is of very small size, and published every Saturday at two dollars per annum. This little paper is conducted by two or three young French Canadians, for the purpose of inserting their fugitive pieces. These gentlemen have recently established a literary society, which, though it may not contain the talent of a national institute or of a royal society, is, notwithstanding, deserving of all the encouragement that can be given to it by the Canadian government. The first dawn of genius in such a country should be hailed with pleasure." Let us remark that the first dawn of genius is anterior to 1808 in Canada, as already shown in this paper. "The *Mercury* and *Canadian Courant* are devoted to news, and all the various ephemera which usually appear in periodical works of that description. The original essays which appear are merely of a local nature, and are generally the offspring of party disputation, acrimony and slander; and are, of course, generally written in 'wit and sense and nature's spite.'"

"The only public library in Canada is kept at Quebec, in one of the apartments of the bishop's palace." Was that the library of 1785? It looks very much like it.

Sir James Craig having suppressed *Le Canadien* (1810), another periodical was started in Montreal. This time the political feelings were

set aside and *Le Spectateur*, *L'Aurore*, *Le Courrier*, *La Bibliothèque*, *Le Magazin Littéraire*, *L'Observateur*, *L'Encyclopédie*, all published in Montreal (1813–1830), are historical and literary reviews, with a touch of science in them. To complete this series up to 1830, we must mention a large history of Canada and the *Voyages* of Franchère by Michel Bibaud, the valuable works of Jacques Viger, the archæologist, the poetry of the same Bibaud and J. J. D. Mermet, the classical books of Joseph Bouchette on Canada, the pamphlets of Dr. E. P. Taché on various subjects, the Quebec and Montreal literary societies, flourishing from 1817 to 1830, and up to the present date. A French critic, M. Le Plée, on visiting the province in 1821, says the rising of its people in the field of intelligence is most remarkable, and exceedingly promising for the future.

The men who first studied the history of this country, commented on the laws and parliamentary practices, composed works for the schools, cultivated poetry and the current art of writing for the public, deserve more gratitude from us than those who came after them, and accomplished marvels, no doubt, but found the way open and new means of development already prepared.

VIII.—*The Cabotian Discovery.*

By JOHN BOYD THACHER.

(Communicated by Dr. Bourinot, and read June 23, 1897.)

A people may acquire territory by discovery, by conquest, by purchase. Title by discovery is said to be original. Title by conquest or by purchase is said to be derivative. In the law of nations the title of discovery confers sovereignty. It recognizes the warrant to extinguish the rights of native occupants by conquest or by purchase. Sovereignty which is shared can not be real sovereignty. To be real it must be exclusive. Whenever, in the progress of civilization, new conditions have been introduced, the nations have almost immediately formulated some principle to govern those conditions and their consequences. The principle has been announced and accepted before consequences could bring dispute or disaster. In the nation itself, among the individuals, disputes or disasters have preceded laws. But in the family of nations certain new and unfamiliar conditions have suggested the possibility of certain effects or events, to guard against which laws, written or unwritten, have been proposed and allowed. With the discovery of the new world this principle was established. It is true that before the middle of the 15th century, two Popes had authorized Spain to send expeditions westward and Portugal to make discoveries to the southward, and it is true that Alexander VI., in 1493, drew a line from north to south, one hundred leagues west of the Azores (subsequently increased by treaty to three hundred and seventy leagues west of the Cape Verde islands), and gave to Spain whatsoever lands she might first discover west of that line; but it is also true that, in after time, Spain presented as her strongest title to new territory the abstract fact of prior discovery, and not the authority of the papal bull.

Discoveries have generally been made by expeditions sailing under the directions and authority of some European nation, and the first ceremonious act of the discoverer has been to plant upon the strange shore the standard of his country. Thus, Columbus, immediately upon landing on Watling Island, unfurled the royal banner of Spain and took possession for the king and queen. A discovery made by a private person, in the prosecution of a private enterprise, would bestow sovereignty on the nation to which he held fealty. That discovery would exclude any other individual, or any other nation, from the possession of that territory. After a land has once been seen by a discoverer, whether voyaging for his king or for himself, whether equipped with a royal warrant or sailing upon his own adventure, it is manifest that it can no longer be

discoverable. Its title is forever pre-empted, and will be sustained by the law of nations.

Title by discovery is so strong that it is not necessarily abrogated by failure to occupy and colonize. An unoccupied island may be seized by an expedition and be held until a standard or monument is found, or until some other proof of prior discovery is presented, and then, according to the usage of nations, possession must be given to the discoverer. A failure to occupy is presumptive evidence of abandonment, but this presumptive proof would yield as against positive proof of first discovery. One may question the moral right of a man to possess land which he will neither occupy himself nor allow another to occupy, but if his legal title is good the state guarantees him possession. Morally, a great nation ought not to claim territory it can not or will not occupy, but the waving of a piece of bunting from a single flagstaff will secure title in the court of nations.

On the acquisition of territory in America, the principle was declared that discovery by a European or civilized nation extinguished the rights of the native and heathen occupants of that territory. Spain, Portugal, England, France, Holland, each heartily accepted this principle. The United States, as holder of derivative titles from these nations, claims exclusive power to extinguish the right of occupancy possessed by the Indians. If it were to be held that the right of occupancy conferred upon the Indians the right to sell their property, then the tribes still living could convey their title to lands in New York and in other states to Great Britain. The latter being a civilized state, with an active and competent government, could then proceed to introduce its laws, customs and practices into such lands in New York and other states as it might acquire from the Indians. We at once see the absurdity of arguing that any absolute, complete and exclusive right to territory can reside in the Indians. The exclusive right to the territory, within its borders, belongs to the United States to-day, just as it belonged to Spain, and England, and France, when they discovered it.

Another principle adopted by the nations was that the title of the discoverer should not be confined to the exact spot or place visited, but might be extended to contiguous territory. The discovery of a part of an island covered a claim to the whole island. No one would have disputed the claim of Spain to the whole island of Cuba, although it was not circumnavigated until after the death of Columbus. The discovery of the mouth of a river generally covered with a vested interest the region watered by it, even to its source, and often including its affluents. Finally the principle was adopted that the discovery of a specific domain upon the east coast of North America should give title to a continuous territory running westward to the Pacific ocean. These principles were adopted in council and applied in war. In the treaty made at Paris, in the year 1763, and which terminated a long and bitter war, England's

claim to territory westward from the Atlantic coast was limited to the middle of the Mississippi river. The claim of England was original title by discovery long prior to French occupation. The claim of France was discovery of a limited coast, strengthened by explorations and settlements. France ceded to England Acadie and all Canada. England ceded to France all her possessions from the Mississippi to the Pacific ocean. Each nation parted with something it believed it owned, and each nation received something from a hand which it regarded as entitled to affix the seal of conveyance.

We have thus endeavoured to sketch the significance of discovery as affecting the title of the discoverer to territory in the new world. Mere curiosity or antiquarian interest would not justify me in preparing, or you in listening to, a lecture on the first English westward voyages. The owner of a manor, at least once in his life-time, draws forth the deeds of his estate and studies with care the title they confer. You and I,—you of Canada and I of the States,—are citizens and part owners of the fairest domain on all the earth. When we study the first westward sailings of hardy English navigators we are only reading the title deeds to our own beloved countries.

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It is an October day in London, in the year of our Lord one thousand four hundred and ninety-seven. It is morning, but not yet noon. Thames street, on the north side of the river, from which it takes its name, is gay with throngs of slow promenaders and busy with swiftly passing men who go about affairs. They pass by the residences of the rich, the houses of the prosperous merchants and of great lords, for we are on the upper part of the street and beyond where Chaucer's father once had his wine shop. Stately barges move up and down the river, disdainful on their way the innumerable smaller craft which contribute to the action of the scene. On the broad way between the river and the part occupied by the pedestrians are gayly dressed horsemen, knights, soldiers and esquires, while now and then there passes a lady fair on a white palfrey. The martial spirit is not abroad. Lancaster is king and he fights no more. All who travel this London street to-day seem bright in colours and rich in garments. These garments are made of the rainbow. Every hue that cloth and light can assume attracts the eye. Scarlet, purple, Lincoln green, coventry blue, glittering cloth of gold, flash in and out of the throng like threads in a variegated garment. It already is twenty years and more since Parliament was petitioned against the inordinate display of apparel by men and women, but the matter has grown worse and nothing better. Laws have been made providing dress for degrees and stations. No knight, unless he be a lord of great degree, may wear a stomacher worked in gold or sable, nor may purple cloth of silk cross his shoulders. No girle nor dagger can be worn save its wearer hath twenty pounds of

yearly income. Nor may a yeoman pad his doublet after the manner of knightly dress, under penalty of fine. But the spirit of the time is too splendid to be repressed. Trade with the continent and the far east has bred elegance. Cunning artificers work in gold and silver and copper. Linen comes from Flanders and Brabant. France sends her velvets and Venice her embroideries. The further nations bring damasks and silks and satins. Husbandry is dying. It is the age of the artificer.

Splendour and richness, after all, are relative. There are degrees even to the stars. And there is now passing a figure which catches every eye and halts every step. Tall and commanding in form, broad of shoulder, dignified and calm. His beard and hair are long and white like snow. He wears a doublet of purple velvet, and inside and on the border is ermine like his beard. The doublet is laced up in front and the sleeves are puffed and slashed to display a shirt of the finest lawn, and the lacing is of silver and the fastenings are of gilt. His hat is made to match his dress and sits upon his head as if a crown. His hose is puffed and slashed like the sleeves of his doublet, and his stockings are of embroidered silk. His shoes are broad in the toes and mark the new fashion coming in from the land of France. Around his neck is a broad chain of brightest gold, and about his waist is a girdle of silver from which hang a purse of velvet and a dagger in a sheath of red. At his side is carried a jewelled sword, a strange and foreign weapon. A servant walks behind, while at his side, but a step backward, to signify a lesser degree, is a companion or attendant. The passers-by do more than stare—they follow him and whisper among themselves. We hear them say, "It is he; it is the admiral; it is he who has found the new lands." This man, then, is John Cabot, but lately returned from his first voyage of discovery, and the companion at his side is his barber and favourite, upon whom, out of the riches of his new world, he has royally bestowed an island as a gift.

It is a glorious thing to recognize a great event and to honour him who contributes to its occurrence. But this glory is oftentimes a passing glory. Columbus once sat at dinner with a king, and then he sat alone in chains. The sun can give no security that the heavens will never obscure its face, and there is no form of human glory that is permanent and sure. The interesting figure before whom London is prostrating itself to-day is soon to have his fame obscured for nearly four hundred years and the curtain which will hide him is to be drawn by the hand of his own son.

The voyage of discovery we are now to consider was one said to have been made by John Cabot sailing from Bristol, England, in May, 1497, discovering land on the feast day of St. John the Baptist, June 24, and returning to England early in August of the same year. Before we engage in an attempt to describe this voyage and to disentangle threads of truth from the skein of misapprehension, it may be profitable to inquire

as to previous authentic transatlantic voyages. They are three in number, two by Christopher Columbus, made respectively in 1492 and 1493, and one by Americus Vesputius made in 1497. The first voyage of Columbus resulted in the discovery of the new world. The landfall is practically settled as having occurred on Watling Island, one of the Bahama group. After examining three others of this group and the large island of Cuba, Columbus established on the north side of the island of Santo Domingo, the first European settlement. The second voyage of Columbus opened to the world the lesser Antilles, the island of Guadalupe, Marigalante, Santa Cruz, Porto Rico, a large part of the island of Cuba, and returned the expedition to La Navidad, the settlement on Santo Domingo, only to find it a mass of ruins and not one soul living of the forty Europeans left there the previous year. Thus far only islands had been found, and no European foot had trodden on continental land. On the 10th day of May, in the year 1497, an expedition, of which Americus Vesputius was a member, sailed from Cadiz. In about ten days, or on May 20, it arrived at the Canaries, where it halted eight days. Departing about May 28, it reached continental land in thirty-seven days, which would land the expedition on July 4. In the record of the voyage given by Vesputius, he declares that the landfall was in 16 degrees north latitude and 75 degrees west of the Canaries, or at some point in the Gulf of Honduras. The Canaries were the fortunate isles of the time of Ptolemy, who began to count the degrees of longitude eastward from their meridian. Vesputius then made his way around the Gulf of Mexico, coasting always around the point of Florida, and so north as far as Cape Hatteras. It was the 15th of October, 1498, when the fleet of Vesputius returned to Spain. In his third voyage, begun in 1501, Vesputius reached about 52 degrees of south latitude, and I have on another occasion endeavoured to point out that while Columbus certainly is entitled to the honour the world willingly pays him as the first discoverer, negatively, at least, there is no great impropriety in having called the new world after Americus, since he explored and laid open some ninety degrees of its coast, or the fourth part of the earth's circle. It is evident that there is before us a serious dispute as to the priority of continental discovery. If Cabot found continental land on June 24, 1497, he preceded Vesputius by just ten days, and to England and not to Spain belongs the honour of this discovery.

The evidence upon which we must rely, in studying the Cabotian voyages, is neither satisfying nor conclusive. John Cabot has spoken no word, directly, to us as he passed. He has left no written memorandum of his voyage. Columbus kept an account of his voyage, in which he gave some information. Vesputius recorded a few important events as they occurred. But no paper or diurnal has come to us from John Cabot. The explorer, to-day, who goes to the "Farthest North" breathes over again in his journal his entire voyage. He gives to us the daily

latitude and longitude of his ship; the daily temperature of air and water; the drift of the ice and the force of the wind, and then he tells us when he had tapioca pudding for dinner, and when the orchestration played the minuet from Don Juan. There are, however, a few contemporaneous documents which will throw some light on our inquiry. Perhaps the most satisfactory method to follow will be to consider the evidence in its chronological order, reserving for ourselves the right to turn aside, from time to time, and to venture into the fields of inference and speculation.

In the Public Record office in London are two documents, the first of which reads:

“To the Kyng our Souveraigne lord,—

“Please it your highness of your moste noble and haboundant grace to graunt vnto Iohn Cabotto, citezen of Venes, Lewes, Sebestyan and Sancto, his sonneys, your gracious lettres patentes vnder your grete seale in due forme to be made according to the tenour hereafter ensuyng. And they shall during their lyves pray to God for the prosperous continuance of your moste noble and royale astate long to enduer.”

To which the king, the Seventh Henry, made answer:

“Be it knowne that we haue giuen and granted, and by these presents do giue and grant for vs and our heires, to our welbeloued Iohn Cabot, citizen of Venice, to Lewis, Sebastian, and Santius, sonnes of the said Iohn, and to the heires of them, and euery of them, and their deputies, full and free authority, leaue, and power to saile to all parts, countries, and seas of the east, of the west, and of the north, under our banners and ensignes, with fiue ships of what burthen or quantity soeuer they be, and as many marines or men as they will haue with them in the sayd ships, vpon their owne proper costs and charges, to seeke out, discouer, and finde whatsoever isles, countries, regions or prouinces of the heathen and infidels whatsoever they be and in what part of the world soeuer they be, which before this time haue bene vnknownen to all Christians; we haue granted to them, and also to euery of them, the heires of them, and their deputies, and haue given them licence to set vp our banners and ensignes in euery village, towne, castle, isle, or maine land of them newly found. And that the aforesaid Iohn and his sonnes, or their heires and assignes may subdue, occupy and possesse all such townes, cities, castles and isles of them found, which they can subdue, occupy and possesse, as our vassals, and lieutenants, getting vnto vs the rule, title, and iurisdiction of the same villages, townes, castles, and firme land so found.

“Yet so that the aforesaid Iohn, and his sonnes and heires, and their deputies, be holden and bounden of all the fruits, profits, gaines, and

commodities growing of such nauigation, for euey their voyage, as often as they shall arriue at our port of Bristoll (at the which port they shall be bound and holden only to arriue) all manner of, necessary costs and charges by them made, being deducted, to pay vnto vs in wares or money the fift part of the capital gaine so gotten."

The document was executed at Westminster on March 5, 1496, in the eleventh year of the reign of King Henry VII. We find several interesting facts in this document. First, John Cabot is called a citizen of Venice. He was a citizen of Venice, but not a native. In 1472 the Doge Nicola Trono decreed that citizenship should be conferred on a foreigner only after a residence of fifteen consecutive years. In 1476 the privilege of citizenship was granted John Cabot. It was the custom to grant two degrees, or, perhaps, more properly speaking, two kinds of citizenship called "privilegium de intus," conferring privileges local in character, and to be enjoyed within the republic, and "privilegium de extra," conferring certain commercial rights beyond the republic, and the privilege of sailing under the flag of St. Mark. The citizenship conferred upon John Cabot included both these degrees or kinds. It was the duty of an official to write opposite the name of the applicant for citizenship the country and place of his nativity. Unfortunately, the imperfectly kept records in Venice do not disclose the original nationality either of John Cabot or of several other recipients of these privileges, whose names occur near to his own as recorded in the great "Book of Privileges." The entries disclose that names were inserted at times where blank spaces occurred. Thus the six names previous to that of John Cabot are recorded as receiving their privileges in the year 1484, while Cabot's name is recorded under the year 1476. Moreover, while every other name is recorded with the full date of year and month and day, Cabot's name has only the year. Therefore, it is conspicuous in an imperfect list as the most imperfectly recorded, although it is also conspicuous as the only name of the list remembered to-day in history. Henri Harrisse, the foremost authority on early American discoveries, and whom, for a certain distance at least, every student must follow, believes that John Cabot was, like Columbus, a native of Genoa. The Spanish ambassador, De Puebla, who was employed to arrange the match between Catherine of Aragon and Prince Arthur, and who lived in London for many years, repeatedly in despatches referred to Cabot as "another Genoese like Columbus." Another Spanish diplomatist, De Ayala, who had been sent a few years before to the king of Portugal, in reference to the line of demarcation established by Alexander VI., in May, 1493, three several times alludes to John Cabot as having been born in Genoa. These particular witnesses were trained diplomatic agents, and trained diplomatic agents are likely to be exact when communicating news to their own courts.

Next we find that John Cabot has associated with him as grantees his three sons, Lewis, Sebastian and Santius, and we infer three circumstances :

First, that Sebastian was his second son ;

Second, that he was arrived at his majority ; and,

Third, that he was a Venetian citizen.

The first conclusion is natural, from the order in which they are named, Lewis probably being the eldest of the three, and Santius the youngest. These two sons we never meet again. The second conclusion is based upon the usual practice of not making minors parties to a contract. This grant was a contract. If the king agreed to give Cabot and his sons certain powers and authorities, they agreed on their part to give the king certain prospective fruits, profits and gains. If these sons had been minors, the grant would have been made to "John Cabot, his heirs and deputies." Instead, they are recognized as equally capable of receiving and imparting benefits as the father himself. If, then, all three sons have arrived at their majority, Sebastian, the second son, must have been at least twenty-two years of age. This brings us by a logical step to our third conclusion, that Sebastian was a Venetian. If he was twenty-two years of age in 1497, he was born as early as 1475 ; and if he was born as early as 1475, his father, with his family, was living in Venice, his fifteen years of probationary residence not having been completed until the following year, 1476. When the republic adopted John Cabot, it adopted his sons, and it is probable, from certain contemporaneous references, that his wife was herself a Venetian woman. Peter Martyr, whom we are soon to meet, and who knew Sebastian Cabot intimately, declares that the latter told him he was born in Bristol, but taken by his father, at an early age, to Venice, and later returned to England. To offset this witness, the Venetian Ambassador (Contarini) who had an important interview with Sebastian Cabot on the 30th of December, 1522, the next day reported to his government that Sebastian had said to him, "To tell everything to your lordship, I was born in Venice, but was brought up (nutrito) in England." There is an official tone in this statement which makes it quite credible. Moreover, in the year 1501, King Henry, in a grant to another expedition, referred to the Cabots as *extranei* or foreigners, making use of the plural form, and thus including Sebastian as well as the father. Thus we see that while the expedition was sailing under English authority, and while the discovery was to be made under English auspices, the discoverer or discoverers were Venetian citizens, and, therefore, we shall not wonder when we behold John Cabot fixing in the earth of the new world, next to the banner of St. George with the Dragon, the standard of St. Mark with the Lion.

We find from this document that Cabot and his sons were to make the voyage "upon their own proper costs and charges," and we may infer

that John Cabot, if he was "another Genoese" like Columbus, was not impecunious like Columbus, and we can understand that he had a right upon his return from the new world, to dress in purple and fine linen—also probably "at his own proper costs and charges."

Another important fact learned from this document is that the expedition was limited in its powers of discovery; it was authorized to sail to the "East, the West, the North; to seek out, discover and finde whatsoever isles, countries, regions or provinces of the heathen and infidels whatsoever they be, and in what part of the world soever they be, which before this time have been unknowne to all Christians." It might not sail to countries whither Spain had been. It might not find regions to which Portugal had gone before. It had no warrant to go to the South. Thus, in a royal grant, did King Henry accept the principles already announced, and which had already become a law of the nations, that discovery of new territory by a Christian people gave a title which another Christian people must observe and honour. This document reveals to us the very fabric of the dream which the Venetian wove for the king. The expedition is to set up the king's banners and ensigns in every town, city and castle. What did Cabot and the king think to find in the heathen lands? They were drawn by the same load stone which had drawn Columbus. They looked for the islands of the Blessed, for the island of the good St. Brandon, for the Seven Cities, for Cathay, for towns with streets of gold and battlements of shining metal, for precious stones, for costly silks, for rarest spices. They sought the kingdom of the Grand Cham. John Cabot had once been to Mecca, if what he told was truth, and in the far east he had seen innumerable caravans returning from a further east, and the tales that were told were like the spices they bore, fragrant with a strange perfume. Cabot was a Venetian, and he might have told the king that for two hundred years the children of Venice had heard the wondrous story of how one day there came back to Venice three men who had been gone long years and had returned from the province of the Great Cham, and how these men were in rags and in apparent sore distress, and, then, how having won the pity of their friends and neighbours, they took knives and sharp daggers and tore away the seams of their frayed garments, letting fall upon the floor diamonds and pearls, emeralds, sapphires and rubies, until the richest Venetian stood poor before them. And the king remembered in the days before he went to war, that he too had read of Marco Polo and of his father and of his uncle. A king hath an appetite and a longing, even as hath a man without a sceptre, and King Henry was hungry and avaricious beyond any of England's kings. Cabot found a new land, but he found neither castle nor city; and if there was prophecy in the dream of the king, it was not to be fulfilled in far Cathay.

There is one more item of interest in this document of the grant. John Cabot and his sons were to "be holden and bounden of all the

fruits, profits and gaines, and commodities growing of such nauigation, for euery their voyage, as often as they shall arrive at our port of Bristoll, (at the which port they shall be bound and holden only to arriue.") For centuries Bristol has been famous for its nautical enterprises. Its merchants had traded for years before the period of which we are speaking, with Iceland, and Columbus himself is said to have gone in a Bristol ship, in the year 1477, to a point one hundred leagues beyond, i. e., to the westward of the island of Thyle. It was a Bristol ship which brought back to civilization Juan Fernandez, the Robinson Crusoe of De Foe. Here was built the famous "Arethusa" of song and story, the saucy frigate which beat the four French sail in the English channel :

The fight was off the Frenchman's land,
We drove them back upon their strand ;
For we fought until not a stick would stand
Of the gallant Arethusa.

The "Great Western" was built here, and was the first steamship to make the western transatlantic voyage. As Bristol was the first city in England to send a ship to the shores of America, so she was the first English city to establish steam communication with the western hemisphere. There is said to be in the hands of a Bristol bookseller an ancient manuscript which for several generations, at least, had been in the possession of a neighbouring family. It purports to give, in the form of a chronicle, an account of happenings in Bristol. Under date of the year 1497, is said to be the following passage :

"This year, on St. John the Baptist's day the land of America was found by the merchants of Bristowe in a ship of Bristol called the Matthew, the which said ship departed from the port of Bristowe the 2nd of May, and came home again the 6th of August following."

It is plain that this entry was not contemporaneous, for America was not baptised until 1507, and its name was not generally accepted until the middle of the 16th century. If the manuscript is genuine, and if it was contemporaneous, or sufficiently so as to come within the testimony of eye-witnesses, it would be of the greatest importance, for no document or witness suggests the exact date of the discovery until the year 1544. It is generally believed that this particular manuscript belongs to a famous group of Bristolian manuscripts, dating two hundred years after the discovery of America, but pretending to great antiquity. When we speak of rare and ancient Bristol manuscripts, our minds immediately revert to the strange career of Thomas Chatterton, who produced the famous Rowley forgeries and deceived the very elect of English antiquarians. Mr. William Barrett published: "The History and Antiquities of the city of Bristol, compiled from original records and authentic manuscripts in public offices or private hands." He

hands." He quotes from this manuscript in private hands as follows: "In the year 1497, the 24th of June, on St. John's day, was Newfoundland found by Bristol men, in a ship called the Matthew." The phraseology differs from the quotation as made by the Bristol bookseller, and the land discovered is denominated Newfoundland. This William Barrett was the employer, friend, and confidant of Chatterton, and it was to him that Chatterton consigned his manuscript.

Although the grant was made as early as March 5, in the year 1496, the expedition did not sail until the beginning of summer in the following year. Even in these days of despatch and experience, months and years are consumed in equipping and preparing an adventurous journey. Therefore, we are not surprised that more than a year passed before the ship from Bristol spread its sails toward the beckoning west.

The next chronological stone in the structure of our story, is a document preserved among the manuscripts in the British Museum, and which contains the account of the king's privy purse. Under date of August 10, in the 12th year of Henry VII., which is the year of our Lord 1497, is this item:

To hym who founde the new isle, L. 10.

This has always been interpreted as a voluntary award to John Cabot by King Henry, for having discovered this new territory. It was voluntary, because no award was denominated in the bond. The discovery must have created a wild excitement in England, and the entry indicates that even the king was excited, and gave to the discoverer, from his privy purse, the munificent sum of ten pounds. This Henry practised such frugalities in his own expenses, that his coffers groaned with the burden of their deposits. Hume tells us that reckoning silver at thirty-seven shillings and six-pence a pound, the hoardings of the king, consisting of one million eight hundred thousand pounds, were not less in value in the time of Hume than three millions of pounds. But this king, though he heaped up great treasures, was no mean prince. Francis Bacon called him the Solomon of England.

We learn from this entry in the king's privy purse that the expedition had returned by the 10th day of August in the same year of its departure. It must have returned to the port of Bristol several days prior to the 10th of August, perhaps a week before, and John Cabot hurried across to London to report to the king. What report did he bear to Henry?

Venice in the 15th century had its commercial agents in every capital in Europe. Its great commercial houses employed representatives and correspondents abroad. Commerce and diplomacy had brought to London quite a Venetian colony. One of its regular agents, a certain Lorenzo Pasqualigo wrote a letter home to his brothers, Alvise and Fran-

cesco, under date of August 23, 1497. In it he announces the return of the expedition and gives us the first tidings of its discoveries :

“The Venetian, our countryman, who went with a ship from Bristol in quest of new islands, is returned, and says that 700 leagues hence he discovered land, the territory of the Grand Cham (Gram Cam). He coasted for 300 leagues and landed; saw no human beings, but he had brought hither to the king certain snares which had been set to catch game, and a needle for making nets; he also found some felled trees, wherefore he supposed there were inhabitants, and returned to his ship in perplexity.

“He was three months on the voyage, and on his return he saw two islands to starboard, but would not land, time being precious, as he was short of provisions. He says that the tides are slack and do not flow as they do here. The King of England is much pleased with this intelligence.

“The king has promised that in the spring our countryman shall have ten ships, armed to his order, and at his request has conceded him all the prisoners, except such as are confined for high treason, to man his fleet. The king has also given him money wherewith to amuse himself till then, and he is now at Bristol with his wife, who is also a Venetian, and with his sons; his name is Juan Cabot, and he is styled the great admiral. Vast honour is paid him; he dresses in silk, and these English run after him like mad people, so that he can enlist as many of them as he pleases, and a number of our own rogues besides.

“The discoverer of these places planted on his new found land a large cross, with one flag of England and another of St. Mark, by reason of his being a Venetian, so that our banner has floated very far afield.”

At the same time there was in London, as an ambassador from Ludovico Sforza, called the Moor, the usurping Duke of Milan, whose evil fortune was soon to turn over his kingdom for a few years to the French crown, a certain Raimondo di Soncino. He was a faithful servant and correspondent, and kept his master well informed on passing events in England. He wrote a letter on August 24, 1497, the very day after Pasqualigo wrote to his brother. I quote a passage from this:

“Also some months ago his majesty sent out a Venetian, who is a very good mariner, and has good skill in discovering new islands, and he has returned safe, and has found two very large and fertile new islands; having likewise discovered the seven cities, 400 leagues from England, on the western passage. This next spring his majesty means to send him with fifteen or twenty ships.”

This letter is followed with one dated December 14, 1497, which is of even more importance :

“Most Illustrious and Excellent My Lord :

“Perhaps among your excellency’s many occupations, it may not displease you to learn how his majesty here has won a part of Asia with-

out a stroke of the sword. There is in this kingdom a Venetian fellow, Master John Caboto by name, of fine mind, greatly skilled in navigation, who, seeing that those most serene kings, first he of Portugal, and then the one of Spain, have occupied unknown islands, determined to make a like acquisition for his majesty aforesaid. And having obtained royal grants that he should have the usufruct of all that he should discover, provided that the ownership of the same is reserved to the crown, with a small ship and eighteen persons he committed himself to fortune; and having set out from Bristol, a western port of this kingdom, and passed the western limits of Hibernia, and then standing to the northward, keeping (after a few days) the north star on his right hand; and having wandered about considerably, at last he fell in with terra firma, where, having planted the royal banner and taken possession on behalf of this king, and taken certain tokens, he has returned thence. The said Master John, as being foreign born and poor, would not be believed if his comrades, who are almost all Englishmen from Bristol, did not testify that what he says is true. This Master John has the description of the world in a chart, and also in a solid globe, which he has made, and it shows where he landed, and that going toward the east he passed considerably beyond the country of the Tanais. And they say that it is a very good and temperate country, and they think that brazil wood and silks grow there; and they affirm that that sea is covered with fishes, which are caught not only with the net, but with baskets, a stone being tied to them in order that the baskets may sink in the water. And this I heard the said Master John relate, and the aforesaid Englishmen, his comrades, say that they will bring so many fishes that this kingdom will no longer have need of Iceland, from which country there comes a very great store of fish which are called stock-fish. But Master John has set his mind on something greater; for he expects to go farther on toward the east (Levant) from that place already occupied, constantly hugging the shore, until he shall be over against an island, by him called Cipango, situated in the equinoctial region, where he thinks all the spices of the world, and also the precious stones, originate; and he says that in former times he was at Mecca, whither spices are brought by caravans from distant countries, and that those who brought them, on being asked where the said spices grow, answered that they do not know, but that other caravans come to their homes with this merchandise from distant countries, and these again say that they are brought to them from other remote regions. And he argues thus, that if the orientals affirmed to the southerners that these things come from a distance from them, and so from hand to hand, presupposing the rotundity of the earth, it must be that the last ones get them at the north toward the west; and he said it in such a way, that, having nothing to gain or lose by it, I, too, believe it; and what is more, the king here, who is wise and not lavish, likewise

puts some faith in him; for (ever) since his return he has made good provision for him, as the same Master John tells me. And it is said that, in the spring, his majesty aforementioned will fit out some ships, and will, besides, give him all the convicts, and they will go to that country to make a colony, by means of which they hope to establish in London a greater storehouse of spices than there is in Alexandria; and the chief men of the enterprise are men of Bristol, great sailors, who, now that they know where to go, say that it is not a voyage of more than fifteen days, nor do they ever have storms after they get away from Hibernia. I have also talked with a Burgundian, a comrade of Master John's, who confirms everything, and wishes to return thither because the admiral (for so Master John already entitles himself) has given him an island; and he has given another one to a barber of his from Castiglione-of-Genoa, and both of them regard themselves as counts; nor does my lord the admiral esteem himself anything less than a prince. I think that with this expedition there will go several poor Italian monks, who have all been promised bishoprics. And, as I have become a friend of the admiral's, if I wished to go thither I should get an archbishopric. But I have thought that the benefices which your excellency has in store for me are a surer thing; and, therefore, I beg that if these should fall vacant in my absence, you will cause possession to be given to me, taking measures to do this rather (especially) where it is needed, in order that they may not be taken from me by others, who, because they are present, can be more diligent than I, who, in this country, have been brought to the pass of eating ten or twelve dishes at every meal, and sitting at table three hours at a time twice a day, for the sake of your excellency, to whom I humbly commend myself.

“Your Excellency's

“Very humble servant,

“RAIMUNDUS.”

On the 13th day of December, 1497, a pension of twenty pounds per annum is granted by King Henry VII. to John Cabot, and the customs and subsidies of the port of Bristol are charged with the payment of the same.

On the 3rd day of February, in the 13th year of Henry VII., 1498, a second royal grant was made, the original of which is preserved in the Public Record office in London. This grant is made to John Cabot alone, and no mention is made of Sebastian or of any of his sons. It grants “to our well-beloved John Cabot, Venetian, sufficient authority and power, that he by him his deputy or deputies sufficient, may take at his pleasure six English ships to any port or ports, or other place within this our realm of England or obeisance, so that and if the said ships be of the burden of two hundred tons or under, with their apparel requisite and necessary for the safe conduct of the said ship, and them

convey and lead to the land and isles of late found by the said John in our name and by our commandment."

In the privy purse account of Henry VII., preserved in the British Museum, and to which allusion has already been made, are the two following items, under date of March 22, 1498: To Launcelot Thirkill, of London, upon a Prest—present—for his ship going toward the new ilande, £20. Delivered Launcelot Thirkill, going toward the new ile, in Prest. £20.

Under date of April 1, 1498, are two other items: To Thomas Bradley and Launcelot Thirkill, going to new isle, £20. To John Carter going to the new isle in reward, £40 5 shilling.

We have before us now every contemporaneous account of the voyage of discovery. There are three other important printed documents to be consulted before we close our subject and pass final judgment, but these documents are not contemporaneous. The first is Peter Martyr's account of what Sebastian Cabot told him of the voyage, and which was first printed in 1516; the second is an engraved map, generally called Sebastian Cabot's own map, published first in 1544; the third is a gossipy account of a conversation between Sebastian Cabot and an anonymous Mantuan gentleman, first printed in Ramusio's "voyages," under the date of 1563. These three documents give us much information and much misinformation. They have served, when taken by themselves, to confuse the question of the discoverer and the discovery. Documents written or printed long after the occurrence of an event are dangerous authorities. The opportunity for chance or design to alter or modify earlier and contemporaneous statements, is too great to permit history to accept those statements without scrutiny and caution. Therefore, confining ourselves for the present to the contemporaneous accounts, the letter of the Venetian, Pasqualigo, and the two letters of Raimondo di Soncino, and the several state papers, we can get tolerably approximate bearings. We must remember that both Pasqualigo and Soncino knew John Cabot personally, while the latter says he became quite intimate with him. Two of the three descriptive letters were written the same month of Cabot's return, and the third was written in December of the same year. We are now in the possession of the following facts: First, the expedition consisted of one ship with eighteen men, under the charge of John Cabot, a Venetian citizen, and sailed from Bristol, England, in May, or three months previous to its return in August, under the authority and by the commandment of Henry VII., King of England. The expedition was seeking Cathay by going to the northwest. The course steered was north and west, and not at any time south. This information as to the starting point and as to the direction is of the utmost importance. The expedition, on sailing out from Bristol, passed the western limits of Ireland, and then began to steer to the north-

ward. Ireland runs almost directly north and south, its southernmost point being in 51 degrees and 26 minutes of north latitude; therefore, under any circumstances, the expedition never got further south than this line, unless it was pulled southwardly by some mysterious current or influence. The purpose of Cabot was to sail north of west. The account says: "Standing to the north, he began to steer eastward, keeping, after a few days, the north star on his right hand." Of course, you will understand the expression *eastward* is used for the Levant, which Cabot expected to reach by going westward until he arrived on its shores. Therefore, the expression is equivalent to saying that the course steered was first north and then west, keeping, after a few days, the north star on the right hand. Before voyages to the new world were undertaken, the natural course for a vessel going from England would be *east*, in which case the north star would be on the left hand, or *north*, in which case the north star would be just ahead, or *south*, in which case the north star would be directly behind. But here is a course going to the west, and the north star is on the right hand, a matter so unusual as to occasion special mention. There is an expression of great importance here. The north star did not get upon their right hand until "after some days." They sailed north after leaving Ireland, and, therefore, for some days the north star was directly ahead of them. After some days they turned to the west, and then the north star was on their right hand, and was kept on their right hand for the rest of the voyage. If a line were drawn due east and west from the southerly point of Ireland, it would very nearly strike on its western journey the extreme southerly point of Labrador, which point is washed by the Straits of Belle-isle. If, instead of drawing the line from the south end of Ireland, we draw it from the north end—and the account gives us the privilege of guessing at what point, after passing the westerly limits of Ireland, a northerly course was begun—the line would strike half way up the Labrador coast. If we allow Cabot about five degrees of northing beyond Ireland, his course would have taken him into Hudson's straits. The declination of the magnetic needle has been introduced by the scientists to further complicate this question. You will recall that consternation got hold of Columbus and his followers, when, on the broad Atlantic, the magnetic needle, instead of pointing a little east of the true or astronomical north, stood pointing directly north for a time and then deliberately began to veer around to the west. That has always seemed to me to be the most trying moment in the voyage of Columbus. He was sailing out into the sea of darkness, dreaded by the ancients. If the world were round, would there not be a place where the mighty ocean, the unknown seas, would rush down as into a vortex, drawing any ship which ventured within reach of its capacious maw! When, then, he found the magnetic needle, the one true, constant thing in nature, fickle and erratic, his heart must have quaked

within him. But the scientific soul asserted its sway, and he knew he was in a region where the needle varied a little to the west, as it had long been known in the old world to vary a little to the east. Columbus then discovered, not the magnetic variation of the needle, but its declination toward the west. John Cabot must have known of this phenomenon. It is popularly believed that Sebastian Cabot had discovered it for himself independently, and in ignorance of what Columbus had observed, and an elaborate calculation has been made, and an imaginary agonic line has been drawn by some scientists based on the supposed course of this first voyage, as laid down on the map of 1544. Columbus, upon his return from his first voyage, told of his own observation of the compass, and a fact like that, interesting and vital to all navigators, must have reached the ears of Cabot in a period of four years. Some of the most distinguished writers believe that while Cabot thought he was sailing due west, the declination of the needle drew him so far in a southerly direction as to land him on Cape Breton, several degrees south of Ireland. It must be remembered that during the first portion of the voyage, Cabot's vessel was subject to the easterly deviation of the compass, thus carrying him north of west, and this would probably balance or counteract the westerly deviation of the compass, to which the vessel may have been subjected during the latter portion of the voyage. It is nearly certain that Cabot was acquainted with the variation of the compass in Europe and the east, and that he was also informed of the experience of Columbus in finding its variation in western waters. Prof. Charles A. Schott, of the United States Coast and Geodetic Survey, perhaps the foremost authority in the world in this branch of scientific inquiry, writes me that he does not believe any useful argument can be based on suppositions involving the management of the compass by Cabot.

There are three places, or rather regions, which contend for the honour of first receiving the feet of the English discoverers. Cape Breton is one, and the most southerly of the three. It is an island. Newfoundland is another. It, also, is an island. Therefore, if Cabot landed on either of these sites and returned without further landing on the mainland, he could no more claim the honour of continental discovery than Columbus, when he landed on Watling Island. The third site is in the neighbourhood of the extreme north end of Labrador, near Cape Chudleigh.

We have a measurement given us in Pasqualigo's letter, which may aid us in this inquiry. You will recall he wrote to his brother on August 23, 1497, that "the Venetian, our countryman, who went with a ship from Bristol in quest of new islands, is returned, and says that 700 leagues hence he discovered land, the territory of the Grand Cham." If we can determine how far from Bristol, or, generally speaking, from England, the landfall was, we may be able to locate it with some degree

of assurance, or, at least, we may be able to assert of some particular claimant that it is *not* entitled to that honour. Pasqualigo was an Italian, and writing to his brother, who was also an Italian. When he reported that land had been found at a distance of 700 leagues, he evidently had in mind the Italian league, and this differed considerably from the English league. The Italian league was equal to four Italian miles. An Italian mile was equal to 4,842 feet, or less than a statute English mile by 438 feet. Thus we find that 700 Italian leagues would be equal to 2,568 English miles. Plotting a course of this length on a great globe and following due west a meridian, in which Bristol is situated, a vessel would pass into the Straits of Belle-isle, and reach the east end of Anticosti island. In other words a course of 2,568 miles from Bristol would carry a vessel far beyond the westerly end of Newfoundland. It is difficult to see how Cabot could have reached Cape Breton without seeing Newfoundland, unless he had been coming from the south. If he had first reached Newfoundland he would have discovered land at least 360 miles short of his 700 leagues. If we allow John Cabot a northing, after he left the west coast of Ireland, sufficient to have carried him to the 55th parallel, and then send him due west for 2,568 miles, he would strike the coast of Labrador somewhere near Maggarvieck bay, but he would have been obliged to travel several hundred miles inland, or as far as Meshikeman lake, to have completed his 700 leagues. This course, however, on the 55th parallel, would have cleared the southern point of Greenland. If we carry Cabot as far north as the 60th parallel, and then bid him speed westward, his course of 2,568 would have taken him into Hudson straits, on the south side of Resolution island. But this course, if followed on a straight line, would have carried him on to the southern point of Greenland. Raimondo speaks of Cabot's having likewise seen, on his westward journey, at a distance of 400 leagues, the Seven Cities. It is possible that he had caught sight of land when at no great distance from Greenland, and had thought it to be the Seven Cities of legendary fame. If he had sailed not so far north as on a parallel with the southerly end of Greenland, and had kept somewhat south of Cape Farewell, he still might have been caught by the powerful currents which sweep around that point, and so up a ways into Davis straits. Thence sailing west he would have been carried into Hudson straits. In the second letter of Raimondo, he makes the Bristol sailors assert that "now they know the way, the voyage is not more than fifteen days." This is a story of the sailors, not of the careful and skilful navigator. A voyage of fifteen days for vessels of that period, is inconsistent with any transatlantic distance. There is a passage in this second letter which may strengthen this view of the northern land fall. Raimondo says: "But Master John has set his mind on something greater; for he expects to go farther on toward the east (that is toward the Levant) from that place already occupied, con-

stantly hugging the shore, until he shall be over against an island, by him called Cipango, situated in the equinoctial region, where he thinks all the spices of the world, and also the precious stones, originate." Hudson's straits presented to him a further opening to the Levant, and by hugging the shore he may have thought to have come out into the Levant, though certainly not in the equatorial regions. This was the purpose of the voyaging. To reach Cathay was his single object. He saw no human beings on this voyage, only certain tokens which indicated the presence of man, such as snares, a needle for making nets, and some felled trees. He saw abundant fishes, so that the sea seemed covered with them. It is said that at present the cod, which doubtless was the fish seen by Cabot, has its regular scheduled time for going northward up the coast, and that it is not due in northern Labrador until August 15, or at least a week after Cabot's supposed return. If it could be proved that the stockfish Cabot saw, observed, at the end of the 15th century, the same times and seasons of the cod of the present day, it would serve as a sound argument against the extreme northern landfall. "They say," continues Raimondo, "that it is a very good and temperate country, and they think that brazil-wood and silks grow there." This brazil-wood is a wood used for dyeing, and was known by that name in commerce long before the discovery of Brazil, the country. We have seen what use the gaily-dressed Englishmen made of richly-dyed garments, and the discovery of such a useful commodity would have meant much to them. But the brazil-wood, the *cæsalpinia* of botany, is not known north of the Tropic of Cancer, and there is no tree or shrub native to Greenland or Labrador, to Newfoundland or Cape Breton, which could possibly be mistaken for any species of that tree.

Pasqualigo reports that Cabot said the tides were slack, and did not flow as they did in England or in Bristol. This statement affords a very strong argument in favour of the Cape Breton landfall theory. The probable rise of tide on June 24, 1497, at Cape Breton Island, was $4\frac{1}{2}$ feet, while it was $6\frac{1}{2}$ feet at Cape Race, in Newfoundland, and 5 feet at Cape Chudleigh. As the probable rise of tide at Bristol was 37 feet, increasing in the spring of the year to forty feet, the conditions of the rise of the tide in the three sites in the new world would, in any one of them, attract the attention of the Bristol sailors. It was the velocity of the flood in the Bristol channel, and its apparent slackness in the new world, that occasioned Cabot's remark. In King Road, in the Bristol channel, the flood stream reaches a velocity of five knots per hour. At Cape Breton Island there is scarcely any tidal stream. In Gay strait, which is the passage between Cape Chudleigh and Britton islands, the average velocity of the tide reaches five knots per hour, as in the Bristol channel. The force of this argument is weakened by our uncertainty as to whether Cabot is speaking of his observation at the site of the landfall, or at some points of his subsequent explorations.

The account of Pasqualigo says that Cabot coasted for three hundred leagues. It seems impossible that Cabot could have sailed a distance from England of 2,568 miles, besides the uncertain wanderings and necessary tackings, explored 300 leagues, or over 1,100 miles of the coast, none of which distance could have been made at night, and made the return voyage all within the short period between the first part of May and the first part of August. It would have required a daily speed of seventy miles, accepting the date of the old but suspicious chronicle which gives May 2 as the day of departure and August 6 as the day of return.

Thus relying solely upon contemporaneous and apparently authentic documents, we think we may conclude that John Cabot, a Genoese by birth and a Venetian citizen by adoption, sailed from Bristol early in May, 1497, passing the westerly end of Ireland, sailed to the northward some days, and thereafter sailed to the westward, finding land at a distance from England of 700 Italian leagues, or 2,568 English miles, and that the land first seen was somewhere in the neighbourhood of Hudson's straits.

There was a second voyage, made in 1498, according to the letters patent granted John Cabot. The importance of this voyage was greater than the first, for it was the voyage of exploration. The immediate records of it are exceedingly meagre. In an old chronicle an entry is made of notable events under the London mayoralty of William Purchas, who held office from October 28, 1497, to October 28, 1498, and a reference is made to an expedition which "departed from the west country (Bristol) in the beginning of the somer, and of which is this maiors time returned no tidings." At all events, it establishes the fact of a second voyage, and gives us a frame into which to set the picture as it develops under the pencil of story and of legend.

And now we may examine the three later documents, which have had much to do with establishing the prevailing notions regarding Sebastian Cabot's part in the great event. There were several men of fame called Peter Martyr in the fifteenth century. One wrote on medicine, one wrote on religion, and one—our Peter Martyr—wrote on history. He had been the friend or associate of Columbus, Vespuccius, Sebastian Cabot, Vasco de Gama, Magellan, and Cortes. He wrote a series of decades, or "De Rebus Oceanicis," publishing the first in 1511, the first, second and third together in 1516, and the entire eight decades in 1530. It is in the first three decades, published at Alcala, in 1516, that we find this story of Sebastian Cabot. It is written in Latin, and Hakluyt translated it into English, in 1589, in his "Principal Navigations." As I have compared this translation with the original Latin edition, and found it correct, and as students are commonly referred to Hakluyt for this and like translations, I have preserved it here with all its quaint phraseology.

“These North seas haue bene searched by one Sebastian Cabot, a Venetian borne, whom being yet but in maner an infant, his parents carried with them into England, hauing occasion to resort thither for trade of merchandise, as is the maner of the Venetians to leaue no part of the world vnsearched to obtaine riches. He therefore furnished two ships in England at his owne charges, and first with 300, men, directed his course so farre towards the North pole, that euen in the moneth of Iuly he found monstrous heapes of ice swimming on the sea, and in maner continuall day light, yet saw he the land in that tract free from ice, which had bene molten by the heat of the Sunne. Thus seeing such heapes of ice before him, he was enforced to turne his sailes and follow the West, so coasting still by the shore, that hee was thereby brought so farre into the South, by reason of the land bending so much Southwards, that it was there almost equall in Latitude, with the sea Fretum Hereuleum, hauing the North pole eleuate in maner in the same degree. He sailed likewise in this tract so farre toward the West, that hee had the Island of Cuba on his left hand, in maner in the same degree of longitude. Sebastian Cabot himself named those lands Baccalaos, because that in the seas thereabout hee found so great multitudes of certaine bigge fishes much like vnto Tunies, (which the inhabitants called Baccalaos), that they sometimes stayed his ships. He found also the people of those regions couered with beastes’ skinnes, yet not without the vse of reason. Hee also saieith there is great plentie of Beares in those regions which vse to eate fishe: for plunging themselues into the water, where they perceiue a multitude of these fishes to lie, they fasten their clawes in their scales, and so draw them to land and eate them, so (as he saieith) the Beares, being thus satisfied with fish, are not noisome to men. Hee declareth further, that in many places of these regions, hee saw great plentie of Laton (copper) among the inhabitants. Cabot is my very friend, whom I vse familiarlie, and delight to haue him sometimes keepe me companie in mine owne house. For being called out of England by the commandement of the Catholike king of Castile, after the death of king Henry, the seuenth of that name, king of England, he was made one of our counsell and Assistants, as touching the affaires of the new Indies, looking for ships daily to bee furnished for him to discouer this hid secret of Nature.” “This vyage is appoynted to bee begunne in March in the yeare next folowynge, beinge the yeare of Chryst M.D.XVi. What shall succeade, youre holynes shal be advertised by my letters if god graunte me lyfe. Sume of the Spanyardes denye that Cabot was the fyrst fynder of the land of Baccallaos: And affirme that he went not so farre westwarde.”¹

¹ The last three sentences are found in the “third decade” of Peter Martyr printed at Alcalá in 1516, and also in Richard Eden’s English translation printed at London in 1555, but they are omitted by Hakluyt.

This, then, is our first introduction to Sebastian Cabot. We have made it clear that he was born in Venice, and that probably he was taken in early life to Bristol, which gave the foundation for a very natural story—that he was a Bristol man by birth. We find no record of his having been with his father on the first voyage, nor is there any contemporaneous record of his having been in charge of the second voyage of 1498. Henry VII. died in 1509, and the young king, Henry VIII., hastened to ally himself with King Ferdinand of Spain against Louis XII. of France. In the spring of 1512 Henry sent an expedition, under Lord Willoughby, into Spain, to aid his father-in-law with his struggles against the French king. Sebastian Cabot accompanied the expedition. He must have already acquired a name for himself, since we find King Ferdinand asking for his services. There are now records of his being called to court. He was appointed naval captain on the 20th of October, 1512. In the fall of 1515 he was created pilot to the king, and in 1518 he received his appointment as pilot major of Spain. This account of him, by Peter Martyr, was written in 1515, when Sebastian was officially associated with him and was his "familiar friend." So far as we can judge by the narrative, Peter Martyr, the historian, never heard of John Cabot, the discoverer. He never heard of a strange Venetian coming, year after year, from Bristol to London, following the court from Westminster to Woodstock, servilely seeking the acquaintance of the powerful, receiving rebuffs with the patience of a brave heart, sustaining the pain of misery with a calm mind, humbling himself before the great, putting each adversity behind him like a forgotten thing, unfolding ever his plans, exposing his hope to noble, to merchant, to seaman; pushing further into confidence, rising higher into favour, until, at last, the king hearkens and the king grants. This was the work of years, and the man who writes the first history of the new world never hears his name! *Sic vos non vobis!*

From this story, told by Sebastian to Peter Martyr, we learn that he furnished two ships at his own charge, and, with three hundred men, sailed towards the north pole, and to such a high latitude that, in the month of July, he found icebergs and almost perpetual day. Then, impeded by the ice, he sailed to the south, until he reached the latitude of the straits of Gibraltar and the same longitude as the island of Cuba. This would correspond with the location of Chesapeake bay. He found people covered with the skins of wild animals, and he called the land *Baccalaos* because of the fish he found there. And he found "in maner continuall daylight." On the 22nd day of June the sun is visible during the entire twenty-four hours in latitude $65^{\circ} 43'$. In latitude 60° , at the entrance to Hudson straits, the sun would be above the horizon for something over nineteen hours, and the short night would be clear.

The famous Giambaptista Ramusio, who wrote a narrative history of early voyages, in the preliminary discourse, and writing under date of

June 22, 1553, makes the following statement: "As many years past it was written unto me by Signor Sebastian Cabot, our Venetian countryman, a man of great experience, and very rare in the art of navigation and the knowledge of cosmographie, who sailed along and beyond this land of New France, at the charge of King Henry the seventh of England. And he advertised me that, having sailed a long time West, and by North beyond those islands unto the latitude of 67 degrees and a half, under the North Pole, and at the 11th day of June, finding still open sea, without any maner of impediment, he thought verily of that way to have passed on still the way to Cathaia, which is the East, and would have done it, if the mutinie of the shipmarkers and mariners had not hindered him and made him to returne homewards from that place." Some writers make this account refer to the supposed voyage of Sebastian Cabot in 1516 or 1517. I do not believe such a voyage ever occurred, for several reasons, one of which, in particular, I will shortly give. The land of new France was the country viewed by Jacques Cartier and others from 1534 to 1543, and which was taken possession of in the name of the French king, Francis I. This would corroborate the Cape Breton land-fall theory, as the lands of new France were in that region, and Sebastian is made to say he sailed "along and beyond this land." If an early navigator failed to report a mutiny on board his ship, the historian was in duty bound to introduce it. It was recognized as an essential feature in the drama of navigation. Columbus, in his diary, wrote, two days before he saw land, "The crew complained of the long voyage," and Washington Irving, in his life of Columbus, proceeded to indict every man for mutiny. There is no contemporaneous authority for the story of the mutiny on Cabot's ship.

Ramusio has recorded the story of Sebastian Cabot, as told to the gentleman from Mantua. This, too, was translated into English, and appears in Hakluyt. The anonymous Mantuan gentleman is supposed to be speaking:

"Doe you not vnderstand, sayd hee (speaking to certaine Gentlemen of Venice), how to passe to India toward the Northwest winde, as did of late a citizen of Venice, so valiant a man, and so well practised in all things pertaining to Nauigations and the science of Cosmographie, that at this present hee hath not his like in Spaine, insomuch that for his virtues he is preferred aboue all other pilots that saile to the West Indies, who may not pass thither without his licence, and is, therefore, called *Piloto Maggiore* (that is), the grand Pilot. And, when we said that wee knew him not, he proceeded, saying that, being certaine yeeres in the city of Siuil, and desirous to haue some knowledge of the Nauigations of the Spaniards, it was told him that there was in the citie a valiant man, a Venetian borne, named Sebastian Cabot, who had the charge of those things, being an expert man in that science, and one that could make

Cardes for the Sea with his owne hand, and that by this report, seeking his acquaintance, he found him a very gentle person, who intertained him friendly, and shewed him many things, and, among other a large mapp of the world, with certaine particuler nauigations, as well of the Portingals, as of the Spaniards, and that he spake further vnto him in this effect." From this part on Sebastian is speaking :

"When my father departed from Venice many yeeres since to dwell in England, to follow the trade of merchandises, he tooke me with him to the citie of London, while I was very yong, yet hauing nevertheless some knowledge of letters of humanitie, and of the Sphere. And when my father died in that time when newes were brought that Don Christopher Colonus Genuese, had discovered the coasts of India, whereof was great talke in all the court of King Henry the 7, who then raigned, in-somuch that all men with great admiration affirmed it to be a thing more diuine than humane to saile by the West into the East where spices growe, by a way that was neuer knowen before, by this fame and report there increased in my heart a great flame of desire to attempt some notable thing. And vnderstanding by reason of the Sphere that if I should saile by way of the Northwest winde I should by a shorter tract come into India, I thereupon caused the king to be aduertised of my deuise, who immediately caused two caruels to bee furnished with all things appertayning to the voiage, which was, as farre as I remember, in the yeere 1496, in the beginning of Sommer. I began therefore to saile toward the Northwest, not thinking to find any other land than that of Cathay, and from thence to turne toward India, but after certaine dayes I found that the land ranne towards the North, which was to me a great displeasure. Neuerthelesse, sailing along by the coast to see if I could find any gulfe that turned, I found the lande still continent to the 56. deg. vnder our pole. And seeing that there the coast turned toward the East, despairing to find the passage, I turned backe againe, and sailed downe by the coast of that land toward the equinoctiall (euer with intent to find the said passage to India) and came to that part of this firme land which is now called Florida, where my victuals failing, I departed from thence and returned into England, where I found great tumults among the people, and preparation for warres in Scotland: by reason whereof there was no more consideration had to this voyage. Whereupon I went into Spaiene, to the catholike king, and Queene Elizabeth, which being aduertised what I had done, intertained me, and at their charges furnished certaine ships, wherewith they caused me to saile to discouer the coasts of Brasile, where I found an exceeding great and large riuier, named at this present, Rio de la plata, that is, the riuier of silver, into which I sailed and followed it into the firme land, more than sixe score leagues, finding it euery where very faire, and inhabited with infinite people, which with admiration came running dayly to our ships. Into this riuier runne so many other riuers, that it is a maner incredible.

“After this I made many other voiajes, which I now pretermit, and waxing old, I giue myself to rest from such trauels, because there are nowe many yong and lustie Pilots and mariners of good experience, by whose forwardnesse I do reioyce in the fruits of my labours, and rest with the charge of this office, as you see.”

Sebastian Cabot is here made to declare that his father died in or about the year 1493, in the early spring of which year Columbus brought back the news of his discovery. The two public royal grants disclose the falseness of this statement. But, if the son was trying to appropriate the glory of the father, it was more natural, or, perhaps, you will say, more unnatural for him to make his father die before the expedition was conceived than to share with him in the fame of its success. We have three statements from Sebastian Cabot,—the first given by the historian, Peter Martyr, his familiar friend, and published at the time it was made, in which he makes no mention of his father, and in which he does claim to have directed an expedition from a point far north in the new world to a point near our Chesapeake bay. At this period Sebastian was about forty years of age and in high office in Spain. In the second statement, made directly to Ramusio by letter but many years previous to 1553, Sebastian does not mention his father, but does claim to have made a voyage “along and beyond this land of New France,” into a latitude of $67\frac{1}{2}$ degrees. In the third statement, made to the Mantuan gentleman, Sebastian distinctly declares that his father died in 1493, and that he made the voyage of discovery and coasted from a region far north, at least 56 degrees, and, perhaps $67\frac{1}{2}$ degrees, as declared in the second statement, to a region southward, toward the equinoctial, to that part of the firm land which is now called Florida. This last statement was made when Cabot was an old man. Nowhere, and at no period of his life, does he acknowledge the part his father bore in the discovery. The grandson of Columbus brought suit against the crown of Spain to establish certain family rights, and on the 31st day of December, 1535, Sebastian Cabot testifies that he did not know, of his own knowledge, if the mainland extended north from Florida to the region called Baccalaos. This is a public record, and no gentleman from Mantua can take away its weight. I have always thought this testimony partially corroborative of Cabot's claim to have gone as far south as the parallel of the straits of Gibraltar. He was called as an expert witness, it being evidently thought he knew the entire country. He could not say he had been as far south as 25° , but he might have said he came within 11° of it, or to Chesapeake bay.

The last document we are to consider is the famous “Cabot map.” It was what geographers call a planisphere, or a globe projected on a flat surface. It contains, like many of the earlier maps, legends descriptive of the various parts of the globe. These legends are given first in Span-

ish and then in Latin. Across the map, in the region of Hudson straits, is legend No. 8, in Spanish, which reads as follows:

"This land was discovered by Juan Cabot, a Venetian, and by Sebastian Cabot, his son, in the year of the birth of our Saviour, Jesus Christ, 1494, on the 24th of June, in the morning, to which they gave the name of 'First Land Seen' (*Prima Tierra Vista*); and to a large island which is situated along the said land they gave the name San Juan, because it had been discovered the same day. The people of it are dressed in skins of animals. They use in their wars bows and arrows, lances and darts, and certain clubs of wood, and slings. It is a very sterile land. There are in it many white bears, and very large stags, of the size of horses, and many other animals; and likewise there is infinite fish."

The Latin version of the legend agrees in the main with the Spanish, except that the 24th day of July, instead of June, is given as the day of discovery, and the specific hour of five o'clock in the morning is mentioned, instead of "early in the morning," as in the Spanish. In both legends the year of discovery is 1494; in the Spanish it is written in Roman numerals, in the Latin it is written in Arabic numerals. The four is made by writing four straight lines, as on the face of a watch. It is thought that the hand which inscribed the Roman numerals intended to make a V or five, but left the first two lines separated. At all events, no one seriously contends that the year of discovery should be 1494 instead of 1497. There is but one copy of this map known, and that is preserved in the National Library in Paris. In 1549 an English reproduction of the map was made by Clement Adams, copies of which, says Hakluyt in his 1589 edition, were to be found in the "privie gallerie at Westminster and in many other ancient merchants houses." Hakluyt in this same 1589 edition quotes the date of the discovery recorded in the map as 1494, but in his subsequent edition of 1599 he corrects the date to 1497. No copy of this map exists to-day. In the region now known as Cape Breton Island are the three Spanish words, *Prima tierra vista*. Close to the land is an island named St. John. The geographers have been puzzled to reconcile the position of this island with the statement of Sebastian Cabot regarding its discovery and its baptism on St. John the Baptist's day. John Cabot nowhere refers to this island or to St. John the Baptist's day. These things are mentioned for the first time in the map of 1544, as it is certain the Bristol chronicle was composed long after this date. If the landfall was on Cape Breton, the only large island which could possibly be Cabot's St. John would be Prince Edward Island, and that would be nearly 130 miles from the landfall. The account says the island was seen and named the day of the landfall, and no ship in those days could have made 130 miles in the sixteen hours of daylight. Accepting the map and considering it by itself, one would seem justified in calling Cape Breton the site of the first landfall, and in accepting St. John the Baptist's day,

or the 24th of June, as the day of discovery. Considered in the light of documents and public papers contemporaneous with the event, this land-fall does not seem possible. Not only was John Cabot deliberately seeking a point far north of Cape Breton, not only do the reports show he sailed toward that point and purposely mapped a course on a short circle, but nearly all the early maps showed the first Cabotian discoveries near the 60th degree of latitude. It is evident that the printed documents—Peter Martyr's account, Ramusio's story, and the map of 1544—all confound and include the two Cabotian voyages made respectively in 1497 and 1498. I do not believe that Sebastian Cabot made any subsequent voyages to the northeast coast of America. There is a passage in Peter Martyr's "Decades," immediately following the account I have read you, in which he uses the words: "Some Spaniards deny that Cabot was the first finder of the Baccalaos, and affirm that he went not so far westward." His own adopted countrymen likewise suspected him. You will remember we found England toward the close of the fifteenth century a country of artificers. Trades were well defined, and each had its own organization, guild or corporation, until they grew and developed into the twelve great livery companies of London. In March, 1521, Henry VIII. proposed to Sebastian Cabot that he should lead an expedition, and the twelve companies were expected to contribute toward the expense. The important Drapers' Company protested to king and council against the proposed expedition, and used these words:

"We thynk it were to sore avent'r to joperd V shipps wt men and goods unto the said Iland (the newe found land) uppon the singular trust of one man, callud, as we understand, Sebastuan, which Sebastyan, as we here say, was nevr in that land hymself, all if he makes reports of many things as he hat heard his father and other men speke in tymes past." Such words as these would not have been officially used if Sebastian had made the voyage of 1516 or 1517, and it is hard to believe such a charge would have been made by a responsible corporation if it were a matter of public notoriety that Sebastian had made the voyages.

The outlook we have obtained ought to disclose two distinct voyages made by John Cabot—the first sailing from Bristol in one ship in 1497, between the beginning of May and the beginning of August, discovering land near Hudson straits; the second leaving Bristol in the spring of 1498, and exploring the northeast coast from above the 60th parallel of north latitude, along the entire coast of the present Canada and the coast of our own Canada down to the region of Chesapeake bay.

And now with abounding patience you have followed me in a historical inquiry over a region as cold and sterile as the coast of Labrador. We have picked our way through great ice-fields of doubt, and drifted with currents of speculation and uncertainty. But there is one spot on which we stand, with a green field beneath our feet and over our head

the light of perpetual day. An English ship first ploughed the waters which wash the north coast of America. English feet first trod the island and the mainland. English hands first planted a national ensign on this part of the new world! It matters not if the leader's name be John or Sebastian! It matters not if he be of Venice or of Bristol! It matters not if one portion of the land was first seen in 1497 and another in 1498! The flag that was first fixed in the earth of North America was an English flag. The manual which gave warrant and protection to men and to ship was the signet of an English king. And this territory was not Labrador alone, but the land to the south; the land of Newfoundland and of Acadie; the New England coast and the shores of the middle states, and the land that drinks of the Chesapeake bay. And the title to all this goodly territory runs from ocean to ocean. And this land belongs to English-speaking people forever.

The dream of a king leadeth to foolishness. The fortunes of a people are ordered in heaven. The seventh Henry dreamed of an eastern country, of its spice and precious stones. His vision was Cathay, its fulfilment is America. In Cathay men still bow down to wooden gods. In America men worship a living God. The civilization of Europe, amended and improved, is ours. Cathay sits throned in superstition. In Cathay famine stalks, a familiar figure. Peace and plenty abide in America. In Cathay the individual drags a chain. In America the light of freedom falls upon his forehead. In Cathay the precious stone is uncut and imperfect. In America every face of the gem shines like a star. In Cathay the odour of the spice dies on the air. In America the fragrance of liberty perfumes the world. In Cathay a wall shuts in its people. In America the brotherhood of man is marching to and fro with open banners.

“Better fifty years of Europe
Than a cycle of Cathay.”

LETTER OF HENRY VII. TO PHILIP OF BURGUNDY, KING
OF CASTILE [1506].

(Rendered and translated by Reverend E. G. Porter, A.M.)

Mon bon filz | a vous de fort bon cueur Je me Recō
 mande | Jay Reccu voz lettres escriptes de vostre
 main a buenavente [Benavente] du dernier de Juny et par
 quelles mespriment | par le double du dernier trai
 ctie fait entre vous | et le Roy vostre beaupere
 J entend de vostre bonne umoy [umor] et concorde | de
 quoy veritablement suys tresioreulx | et me
 semble que voz amiz vse de tresgrande prudence
 Et J apparcoiz bien que ledict traictie est grandement
 a vostre honneur et louenge | esperant que beau
 cop de meilleurs choses sen ensuyveront en
 ladicteueir | Et Je suys tres grandement console de
 veoir que par vostre sceur et bonne discession vous
 auez mis voz affaires depardela en bonne paci
 ficacion | au gre et contentement du Roy vostre
 dit beaupere | et de touz les grands princes et
 aultres voz subiectz depardela | et en les bien
 traictant | ce vous donnera toujours occasion
 de longuement prosperer | et de bien en quoy
 myeux contynuer | ce que de ma part je de
 sire singulierement || Je vous ay advertes par aultres
 mes brefs de la registre qui ma fait naymes vostre
 lieutenant generall pour voz affaires depardeza
 et les choses que luy ay offert faire en vostre absence
 pour vous complaire et faire plaisir | come a mon
 bon et cordial filz | Et a tant vous diz adieu que
 mon bon filz vous domt ce que vostre cueur desire
 A Richemont | le xxiii jour de Jullet de la main
 de vostre bon frere cousin et bon pere

HENRY REX.

TRANSLATION.

My good son, With a good heart I recommend myself to you. I have received your letters written in your hand at Benavente of the last of June by which they explain to me in double about the last treaty made between you and the king your father-in-law. I hear of your good feeling and concord for which I am very happy, and it seems to me that your friends use great prudence and I also perceive that the said treaty is greatly to your honour and praise hoping that many better things will follow in the same direction. And I am very greatly consoled to see that by your sure and good discretion you have put your affairs there in good peace to the satisfaction and contentment of the king, your said father-in-law and of all the great princes and others your subjects there and in treating them well that will give you always occasion long to prosper and what is better continuously which for my part I desire singularly. I have advised you by others of my briefs from the registrar who has named me your lieutenant general for your affairs here, and the things that may offer themselves to be done in your absence to oblige you and give you pleasure as to my good and cordial son. And now adieu. May my good son give you what your heart desires.

At Richmond the 23d day of July by the hand of your good brother cousin and good father,

HENRY REX.

Mon boy filz a bone de fait bon enme 70 milles
munde / Jay keou voz lettres estées de brie
man a brenamey du dorey de / moy et par
cathes mesmesmet par le double du dorey
fitie fait entre bone / et le roy nre seigneur
poutens de nre bone vney et zordis / di
kroy vortablenet sup tresvoubis / et mo
double 7 y, anz nob de trisrande pordenon
Et apparoyz boy 7 led traditus est prezandemet
a nre gombenz est lenemen / sberant 7 bean
cep de moulens esol / 7 y shynozent on
laduene / Et sup tresgrandmet console de
noou 7 p nre sbris et bone dycessoy vous
anz nre voz affmes d p d la ish bone par.
ficatoy / an gll et contzandemet du roy brie
du beampere / et de touz les ozand pemez et
autres voz subutz d p d la / et en les boy
trantant / le bone dorey tansios occusoy
de longanemet p perez / et de boy on
myrube contzandemet / et de ana part de
sire puzandemet / le boy an aditus par ande
ment les de la nre 7 ma fait nre brie
lomete p d d d d d d d d d d d d d d d d
et les esol 7 luy an esol fave / ish 7 d d d d
p le boy ce impluz et fave pluz / come a moy
boy et contzandemet / Et a tant boy d d d d
may boy filz boy d d d d d d d d d d d d
de r gombent le boy 7 de indet de la man
de nre boy fave consuy / et boy p d d

AUTOGRAPH LETTER OF HENRY VI.
(From the original in the possession of Hon. John Boyd Teacher of Allahoy. Written at Richmond,
22 July 1506, addressed, "A mon bon filz le Roy de Castille." This was Philip of Burgundy who
married Joanna of Castile, and became the father of Charles V. Henry and Philip were intimate
friends, and called one another father and son.)

IX.—*Materials for Canadian History—The Annals of Towns, Parishes, &c., Extracted from Church Registers, and other sources.*

By SIR JAMES M. LE MOINE.

(Read June 23, 1897.)

In my recent presidential address before the Royal Society of Canada, I drew attention to the wealth of historical information yet unrevealed to the general public—in our archives office—over which our colleague, Dr. Brymner, watches with such paternal care—pointing out how valuable—nay, I may say—how indispensable the knowledge of its contents is to all those engaged in historical pursuits.

There are, however, other sources of information quite as valuable—as indispensable, I may say, to the compiler of the annals of each province of the Dominion—which I omitted then to mention, and which with your permission it will be my mission to briefly supply; I mean the chronicles of towns, counties, villages, townships, parishes, etc, as disclosed by reliable church registers, charters, land patents, &c.

Such histories, not only throw light on ethnological inquiry into the origin of the divers races, constituting the component elements of our population, but also help to illumine the onward path of the general historian and of the statist in their arduous quest.

This field of research, especially that based on the contents of church registers, has been for close on fifty years most industriously cultivated in the province of Quebec.

It may be said to have originated in that province with the late historian, Ferland, who, after an exhaustive examination of the dry-as-dust and crabbed old parish church registers at Quebec, published the results in a volume which has gone through more than one edition.

His example was followed by many minor lights in literature—whose works are to be found in our public libraries for consultation.

The mantle of the learned man fell to a worthy successor—the Abbé Tanguay,¹ one of our colleagues—who has devoted twenty years of his life, travelling through Canada, consulting every available church register previous to publishing his voluminous Genealogical Dictionary—a comprehensive record of the early emigration to Canada—in fact the genealogy of French Canadian families, from the foundation of Quebec, in 1608, to our own day.

The abbé has accomplished his gigantic task with the patience and industry of a Benedictine monk of long ago.

In the province of Quebec, church registers, from the regularity with which the entries are made daily, in the handwriting of the parish priest,

¹ Dictionnaire Généalogique par Mgr. C. Tanguay—7 volumes.

are invoked in innumerable transactions of social life—births, marriages, deaths, &c.

At Quebec the earliest register of R. C. marriages was opened in 1621.

A lacuna, however, occurred in 1640 by the conflagration, on the 16th June, 1640, of the parish church, *Notre-Dame de Recouvrance*. The record of births, marriages, and deaths, shared the same fate; the entries, however, were restored from memory; the population being very scanty, the process was comparatively easy.

From 1640 to the present time no break occurs.

There were 40 births and 22 marriages from 1630 to the 15th June, 1640.

I purpose recording here the leading publications on this subject :

Notes sur les Registres de Notre-Dame de Québec, par l'Abbé J. B. A. Ferland, 1850.

Notes Historiques sur Sillery, près Québec, par l'Abbé J. B. A. Ferland, 1850.

Etude Biographique sur le Commandeur Noël Brulart de Sillery, par l'Abbé Louis Bois, M.S.R.C., 1850.

Histoire de l'Isle d'Orléans, par l'Abbé Louis Bois, M.S.R.C., 1850.

Notes sur les archives de Beauport, par M. Jean Langevin, prêtre, ancien curé de Beauport, 1850.

Histoire de l'Isle d'Orléans, par L. P. Turcotte, Québec, 1869.

Histoire de la Visitation de l'Isle Dupas par l'Abbé Plinguet, 1867.

Histoire de la paroisse de Saint-Roch de l'Achigan, 1867.

Histoire de la paroisse de Saint-Hermas, 1867.

Histoire de la paroisse de Ste-Philomène.

Notes sur la paroisse de Ste-Anne de la Pocatière, par l'Abbé O. Paradis, 1869.

Histoire de la paroisse de St-Eustache, par M. de Bellefeuille, 1873.

Histoire de la paroisse de la Pointe-aux-Trembles, 1873.

Chroniques de Rimouski, par l'Abbé Chs. Guay, 1874.

Notes sur la paroisse de la Baie St-Paul, par l'Abbé C. Trudelle, 1879.

Histoire de l'Isle aux Coudres, par l'Abbé Mailloux, 1879.

Notes sur le Canada par Paul de Cazes, M.S.R.C., 1882.

Histoire d'une paroisse (Rivière-Ouelle) par l'Abbé H. R. Casgrain, M.S.R.C., 1884.

Le Premier Colon de Lévis, par J. Edmond Roy, M.S.R.C., 1884.

Mon voyage à Tadousac, par J. Edmond Roy, M.S.R.C., 1884.

Histoire de la paroisse de St-Augustin, par A. Béchar, 1885.

Histoire de la paroisse de Charlesbourg, par l'Abbé C. Trudelle, 1887.

Histoire du Cap Santé, par l'Abbé Gatién, 1887.

Histoire de la paroisse de St-Jean de Matha, par l'Abbé Prevost, 1888.

Notes Historiques sur la paroisse de St-Thomas, par Raoul Renault, 1889.

Notes sur les Trois-Rivières, par Benj. Sulte, M.S.R.C., 1889.

Notes de la paroisse de St-Jean et du siège du Fort St-Jean, par Lucien Huot, 1889.

Notes de la paroisse de l'Île Verte, par Chs. Gauvreau, 1889.

Histoire de la paroisse de Longueuil et de la Famille de Longueuil, par Alex. Jodoin et J. L. Vincent, 1889.

Histoire de la paroisse des Trois-Pistoles, par C. Gauvreau, 1889.

Histoire de la paroisse de St-Nicholas, par E. T. Paquet, 1889.

Histoire de la paroisse de Ste-Anne de la Pérade.

Histoire du Vieux Lachine, par J. C. and D. Girouard, 1890.

Histoire de la paroisse de St-François de la Beauce, par l'Abbé Dumas, 1891.

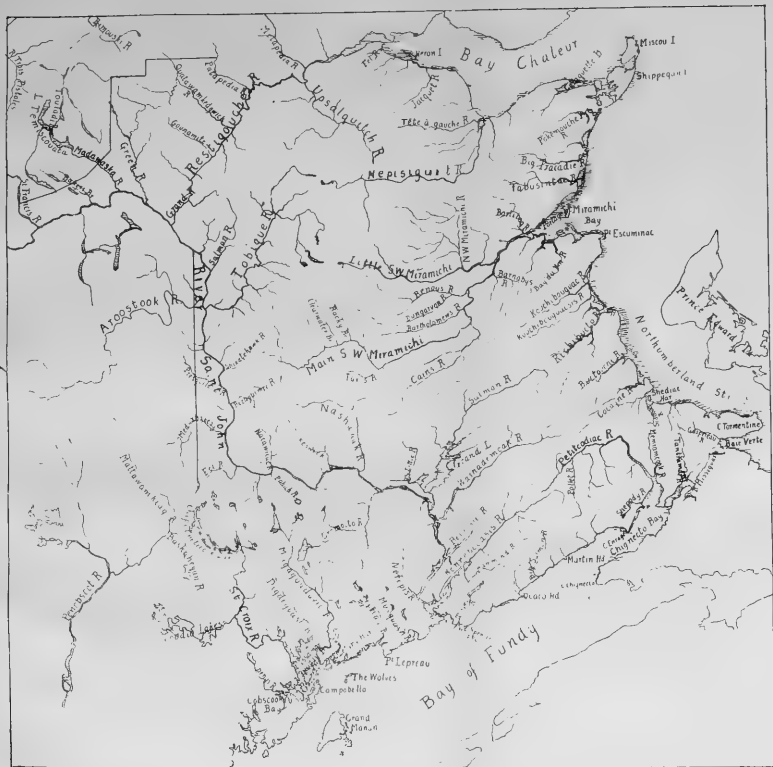
Histoire de la paroisse de Yamachiche, par l'Abbé Caron, 1892.

Histoire de la paroisse de Berthier et du Comté de Berthier, par l'Abbé Moreau, 1893.

Notes Historiographiques sur Charlesbourg, par l'Abbé C. Trudelle, 1896.

Histoire de la Seigneurie de Lauzon, par J. Edmond Roy, M.S.R.C. —p. 600—Lévis, 1897.

Such are the leading publications issued of late in the province of Quebec—precious materials for historical, ethnological, and statistical studies.



(Frontispiece.)

FIG. 1.—SKETCH MAP OF NEW BRUNSWICK.

36 miles = 1 inch.

X.—*A Monograph of the Cartography of the Province of New Brunswick.*

(Contributions to the History of New Brunswick, No. 3.)

By WILLIAM F. GANONG, M.A., PH.D.

(Presented by Dr. J. G. Bourinot, and read June 23, 1897.)

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INTRODUCTION.

Of the diverse antiquarian phases of the study of history, none is in higher favour and better repute than cartography. Maps are the graphic records of the influence which geography has exerted upon the course of history, of the progress of exploration and settlement, of the evolution of present-day political boundaries ; and not rarely they contribute new knowledge where other records are wanting, and settle questions which without them would remain in doubt. It is hence natural that from all sides their scientific study should be viewed with much approbation.

Great masters in their investigation have arisen whose labours are winning principles which are raising map-study into a science, are elevating cartography into cartology. Moreover, there is every reason for believing that the methods and principles of cartographical study are as applicable to small as to large areas, and likely to lead to results relatively as rich. In these days then, it is not necessary to explain what one can find in maps to induce him to devote to them the most exhaustive possible study, however wide or however limited may be the field of his interests.

In addition to its more obvious and widely-recognized values, cartography is an unusually attractive study from the purely subjective point of view. Not only do its materials often possess great intrinsic interest from the beauty and intricacy of their workmanship, and great attractiveness from the difficulty of their acquisition, but at the same time those of any region taken collectively offer a fascinating study in evolution. One who knows something of the influences at work in organic evolution may here find paralleled with curious and often startling exactness, the familiar phenomena of variation, adaptation and survival of the fittest. He can see heredity, the old features, coming into conflict with new knowledge, representative of environment, and the result of the struggle is always a compromise, as it is in Nature. When heredity is too strong for the environment to influence it, there results the persistence of an old type, whose extinction is only the more certain in the end. Selection, here the choice by men of the best, in the long run always preserves the best adapted, i.e., the most accurate, which in its turn can be replaced only by one yet better. The analogy fails in one respect, it is true, in the sudden transition from one type to another; but in most respects it holds good. It is not needful to follow this subject farther, but I may add that in some stages of this study I have been so much influenced by the evolutionary aspect of this subject as to contemplate classifying my maps, not under types as I have done, but into families, genera and species, a plan which has been abandoned chiefly because of practical difficulties in carrying it out. Or, looking at the subject from another point of view, it is a matter of extreme interest to follow the gradual crystallizing out of a given region from the great homogeneous undifferentiated mass of which at first it is an unrecognizable part, and to trace, in the light of its causes, the gradual unfolding of its outlines and the definition of its boundaries.

In this study I have viewed the whole subject from the standpoint of local history, rather than from that of scientific cartography. I have been interested less in what New Brunswick maps illustrate of the principles of cartography, than in what they teach about New Brunswick history. Hence there are some points in which my study is weak, such as discussion of evolving latitude and longitude, different kinds of projections employed in the maps, etc. On the one hand, I have not found

these features of importance from the historical standpoint, though under some circumstances they may well be so,¹ and on the other their discussion seems to belong rather to the more general subject, upon which there are learned essays and books later to be referred to.

In the preceding memoir of this series, I have tried to treat the placenomenclature of New Brunswick in a scientific fashion. Logically, that subject were better treated along with this, of which it is properly a division ; and, indeed, it were yet better if both together, along with a consideration of the historic and physiographic factors influencing the geographical distribution of settlements, a study of the evolution of boundary lines, and the determination of the exact sites of leading historical places and events, were to form a single work—the geographical history of the province. But the most logical plan is not always practically possible, and these various divisions of one subject I must be content to treat in separated papers.

PART I.

ESSAY UPON THE STUDY OF LOCAL CARTOGRAPHY.

In this essay it is not my intention, even were it within the compass of my knowledge or abilities, to attempt to present an analysis of the principles of Cartography in the abstract, worthy the attention of those learned in that subject. But in the course of my studies on the Cartography of the province of New Brunswick, into which field I have gone farther than any one else up to the present time, I have noted some facts and principles about maps and their interpretation which may be of use to others who contemplate a like venture into the same or similar fields ; and to present these is the limit of my ambition in the present essay.

In the general field of American Cartography, he must indeed possess assurance, who, without half a lifetime of preparation, can expect to glean much that is new, where Kohl, Winsor and Harrisse have harvested. Here and there the diligent amateur, especially if he be personally familiar with the localities he studies, may find a wisp or even a sheaf which has escaped those scholars, but, in general, in their field any new knowledge is to be gained only at great cost of labour and time. This is, however, true only for the general field of East American Cartography, but not at all true for the exhaustive monographic study of limited areas, which can hardly be said to have been yet begun. The leaders I have mentioned are like topographers who have gone over the entire country and correctly laid down its leading features, its seas, great rivers and mountain chains, upon a scale which, though correct, is small ; there still remain for others, the tracing and mapping of details, even to every hill,

¹ Compare Dawson, *Voyages of the Cabots*, 66 et seq.

pond and rivulet. This latter discipline is one which requires a high degree of local knowledge and local affection, combined with the insidious and persistent curiosity of the true investigator, and the patient devotion of the antiquary. The reader of this paper will be surprised to find how large an amount of material exists upon the Cartography of New Brunswick, but I have no reason to suppose that this province is unusually rich in this respect; and it is altogether probable that every older province in the Dominion, and every older state of the Union, may be made to yield results equally rich.

1. On the Scarcity of Old Maps.

One may almost say that the chief characteristic which old maps have in common is their scarcity. Many great libraries possess but an insignificant number, and one often has to search through many for a single copy of a map which once existed in far larger editions than did many of the books upon their shelves. As Kohl has said: "There is no class of historical documents on which the 'tooth of time' has been more busy, more cruel and destructive, than on old maps,—those compiled, as well as those made from actual survey, the manuscript, as well as the engraved and printed. We could point out some maps engraved and printed only a few hundred years ago, and then existing in hundreds or thousands of copies, of which now scarcely a copy is left, which is valued by amateurs at its weight in gold."¹

The destruction of maps is, perhaps, due chiefly to the fact that, unlike books, their shape makes them difficult to store and keep accessible. This is well illustrated by one of the "don'ts" in a booklet issued some years ago for librarians, which read: "Don't try to find a convenient way to keep maps—there isn't any;" a truth to which any of us who possess collections are ready to testify. In our houses and offices, too, a map for which there is not wall-room, when superseded by a better, is not placed in the library, but its awkward shape is disposed of in the garret, whence its way lies through dust to destruction. Moreover, old editions of maps are regarded as of little value when newer ones appear, thus differing somewhat from older editions of books, which are generally preserved. This is true, also, to a considerable extent, of the original maps of the earlier explorers; and after these were used for the compilation of the general maps, they were thought of no farther value. But how precious would be the original sketches of Cabot and Cartier to us!

In modern times, of course, original maps of explorers and surveyors are carefully preserved, and where there is a central depository for such maps under government supervision there is likely to be a rich collection.

¹ Discovery, 25.

Such was the case, and still is, in France, where the *Depôt des Cartes de la Marine* contains rich materials; and, in Canada, the Crown Land offices contain materials of priceless cartographical and historical value for the periods since their foundation. It is probable that in the older states of the Union which do not possess this system, it may not be possible to recover as much of the cartographical history as is possible in the Canadian provinces.

2. *On the History of Map-Making.*

Like other subjects which are the result of an evolution, Cartography had no definite period of beginning, but had its roots deep in other human interests. From the first rude sketches of water-courses drawn with a stick on the sand by one savage for the information of another, down to the productions of the British Ordnance Survey, is a long step; but every intermediate stage exists, through the crude sketches on skins, which gradually became the beautifully illuminated manuscript maps of three hundred years ago, through the rough wood-cuts of the early days of printing, the fine copper-plates of a later period, and the manifold processes, including photography, of to-day. But the history of the subject is essentially a part of the broader field of the Science of Cartography, and not of a very local section of it, and the reader who is interested may find references to the literature of the subject in a later part of this paper. I need give here but the briefest sketch. American Cartography does not begin until after 1492, a time when map-making was a well advanced art. The earliest map of any interest to our present subject is that of *La Cosa* of 1500, beautifully painted on an ox-hide. For a long time afterwards the principal maps were in manuscript. This was partly due, no doubt, to the expense of engraving and other purely business reasons, but chiefly to the fact that the great exploring nations were extremely jealous of their knowledge, and unwilling that it should prove of advantage to their neighbours. By some rulers it was strictly forbidden to communicate maps to foreigners, and, of course, one of the best ways to prevent this was to forbid their publication, and allow of the circulation of but a few manuscript copies.¹ The earliest known engraved map of the world is in Ptolemy's *Geography* of 1478, and the first showing any part of America was that of Ruysch, 1508, but the first one to represent the Northeast coast in any detail was that of Sebastian Cabot of 1544, engraved on copper. But for a time even after Cabot most of the important maps were in manuscript, and it was not until after the great

¹ Compare Kohl, *Lecture*, 101-102; Dawson, *Voyages*, 68, which gives references to HARRISSE. HARRISSE, at first held that the transfer of maps was strictly forbidden, but lately has written differently; see *Discovery*, 801. There is a very interesting reference as to how map-makers kept materials from one another in the last century in Green's *Explanation for the new map of Nova Scotia*, 1755, p. 13.

map of Mercator of 1569 that the more important maps were generally engraved. Many of these early maps, both manuscript and printed, are remarkable for the great beauty of their execution, and, in the case of those in manuscript, for the beauty of their colouring and elaborateness of their illumination. Blank spaces were filled with historical scenes, animals and other natural productions supposed to live in the different countries, and this custom prevailed down to the time of Champlain. These early maps showed, also, the many different ways in which the makers attempted to overcome the difficulty of correctly representing a globe upon a flat surface, and the study of these methods alone is an extensive and difficult one; amongst them the most important is the projection of Mercator, still so widely used. Along with the improvements in map-drawing went advances in methods of determining longitudes and latitudes; finally came the era of trigonometrical surveys, giving the possibility of the formation of maps of perfect exactness. With the improvements in engraving, removal of government restrictions and freer communication between nations, map-making rapidly advanced, as it has steadily to the present. In the last century under Delisle, Bellin and D'Anville, the French were the leaders in map-making, and they were aided by the wise policy of their government, which not only established a central depository for maps, but sent out expeditions for the gathering of cartographical data. What map making is to day it is not necessary to inform my readers.

3. On the Proper Spirit of Study of Old Maps.

Cartography¹ is essentially a subject requiring the scientific inductive spirit for its investigation. Its successful pursuit demands minute observation of all obtainable facts, the grouping of these together according to the degrees of their likeness and unlikeness, and deduction therefrom of what is common and essential, and what individual and unimportant. It requires critical judgment to weigh evidence and estimate what is logically proven, what is probable, and what is only possibly true. Even a certain kind of experiment has here its place, the kind which has to do with the testing of hypotheses. It is, therefore, essential that one shall not allow preconceived notions to unbalance his judgment, nor local pride to lead him unconsciously to distort facts or evidence to the magnification of his own subject or locality. Winsor has said: "Nothing is more seductive than to let a spirit of dogmatism direct in the interpretation of early maps, and there is no field of research in which predisposition to belief may lead one so wrongly."² The early

¹ This word is at present used in different senses—sometimes as equivalent for maps to bibliography for books, sometimes for their scientific study, for which cartology would be better, sometimes even for map-making. A differentiation of the term is desirable.

² America, IV. 33.

maps are so generalized and distorted that one may find in them support for almost any theory he desires to establish, and, as in all other departments of human activity, cartography has many aberrations to show, whose interest is greater to the psychologist than to the cartographer himself.

4. *On the Sources of Error in the Interpretation of Old Maps.*

Amongst sources of error in map-study must be placed first of all the fact, that the men who made the maps and those who are studying them belong to different ages, nations and professions, each having customs, superstitions, and political surroundings of its own distinct from those of the other ; and it is impossible for the student to place himself in the mental attitude of the mapmaker, a condition which is necessary for a full understanding of many of the things which the latter did. Equally difficult is it for students in their well-appointed libraries, with perfect modern maps before them, to understand why explorers acted in the remarkable way they sometimes did, coasting past the open passages they were seeking, missing important features of the topography, and locating land where none existed. We forget the entire ignorance of the sailor of the land he is exploring, how short a distance men can see from a ship, how deceptive fogs are,¹ how completely high land hides everything behind it, how hard it is to tell headlands from islands, and bays from straits ; how differently the same feature looks from the opposite directions.² We forget that the explorers did not look down upon a country as we do on a map, but at a tiny bit of it edgewise.³ In interpreting the maps of explorers, the student needs to try to project himself into their mental condition, something which he can do the better if he is himself something of an explorer, or at least has himself gone over the route of those whose voyages he is investigating. How different does a place seem to one when he visits it, after having formed his image of it through reading or by viewing its site upon the maps. How unsafe a guide, then, to the sensations of an explorer is a modern map !

¹ For cases in which explorers have been deceived by fog-banks, see these Transactions, VII., sect. ii., p. 21, foot note, Kohl Discovery, p. 46, and the very striking case mentioned by Nansen in his Farthest North, American Ed., II., 548-550. Also see Nature, LVI., 595.

² As to the different discoveries made by sailors going in one direction, as compared with those going in the other, Kohl (Discovery, 276) says: "A discoverer sailing along our coast from south to north would be likely to make different discoveries, to enter different ports, to be arrested by different impediments, from one sailing from north to south."

³ Even so great a student as HARRISSE sometimes trips in this regard, as when he identifies Fagundes' Auguada Bay with the entrance to the river St. Lawrence. (Discovery, 185 ; compare Dawson's Voyages, 52.)

Sources of error in the maps themselves may be classified as follows :

1. *Errors of copyists.* In the early maps we often find that copies made from the same original differ widely. This is due chiefly, no doubt, to the carelessness of an uncritical age, but partly also to the individual carelessness of copyists, who probably knew well enough that the originals were themselves even approximately correct only in the main points. HARRISSE has said : "The ignorance or carelessness of copyists to whom the work was entrusted, it does not matter where or by whom, is the principal cause of geographical errors and enigmas which the critic cannot ever hope to solve entirely."¹

The use of tracing and transfer paper, and of systems or instruments for enlarging and reducing, seems to have been unknown, and the copies were made freehand ; and this, combined with the habitual carelessness, produced most distorted results. Now and then, of course, arose a master like Desceliers or Mercator whose copies were made with fair accuracy, though even theirs, taken from the same originals, differed much from one another. Doubtless, too, there is much difference between the work of the map-makers themselves and that of the hired copyists ; the former would be much better than the latter. Another important class of errors, wonderfully prevalent on the old maps, arose from the misprinting of names. By copying from written, and not always clearly made, letters of words belonging often to a foreign tongue, similarly-made letters were constantly confounded. Little attention was paid to the terms cape, river, etc., which were exchanged very readily. Moreover, it was the custom to translate foreign words into the tongue of the maker of the copy, when their meaning was understood, and when it was not, they were often, on the well-known principle of familiarization,² altered to a form resembling familiar sounds. The result of all this, combined again with indifference on the part of the copyist as to whether they were correct or not, made the names very different from the originals, and those on different copies by the same copyist, different from one another. If now these were again copied, new errors came in, and a series of four or five copyings might make an entire series unrecognizable, except for a few very clearly marked and unmistakable ones. Probably this has been the fate of the names given by Cabot on Newfoundland, which upon La Cosa's map of 1500 have, with two or three exceptions, become meaningless. One has but to tabulate the names of a series of maps of the fifteen century, applied to some one coast, and all derived from one original, to see how wonderfully changed they may become from copy to copy. It is possible that some of our most important names, such as Acadia, have originated in such changes.

¹ Discovery, 175.

² Discussed in these Trans. (N. S.) vol. II., sect. ii., 183.

2. *Errors of imperfect knowledge of the makers.* This is so obvious a source of error as hardly to need discussion. Cartier mistook the head of Northumberland Strait for a closed bay ; hence Prince Edward Island was thought a part of the mainland, and for nearly a hundred years after Cartier it was thus represented on the maps. He similarly mistook the passage between Gaspé and Anticosti for a closed bay, and it thus appears on some maps, but he himself corrected this error later. The early explorers missed the Bay of Fundy entirely, and it does not appear clearly on the maps until about 1600.

3. *Errors from the effort to reconcile erroneous features of the older maps with new knowledge.* As is well known and will be later discussed, the cartography of a given region advances not evenly, but by leaps. When new knowledge, brought home by some explorer, was added to the older maps, frequently it contradicted something already there. In such cases the map-maker, with that same deep-seated reverence for the older, especially if backed by the authority of some great name, which still prevails among us, did not reject the old, but attempted to reconcile it with the new facts. A good example of this is to be found in Mercator's map of 1569, in which along with a fairly correct representation of our eastern coasts, he tries to retain the old Drogeo and Estoilant of earlier maps as well as numerous islands which have no existence ; and, indeed, examples of this kind of error are common enough. Combined with this was the natural effort to keep as much information as possible on the maps, no doubt an excellent principle from a business point of view. Thus islands, occurring upon the earlier maps, were retained long after it was shown that they did not exist where they were marked, and they were simply moved to a new position. Thus an island of Claudia, a name given by Verrazano to Block Island, wandered up and down this coast for more than a century before it finally disappeared. It was probably this same effort to retain all possible information and to leave no blanks, which led to the repetition or doubling of sets of names, which is not infrequent on early maps. Another phase of these errors is to be seen in cases where names placed on an island supposed to be a part of the mainland, are retained on the mainland when the island is added to the map. Thus, Cartier's names, R. des barques, C. des Sauvages, etc., applied on Prince Edward Island when it was supposed to be a part of the mainland, were kept on the mainland when the island was shown separated from it on the maps ; and hence they appear upon the New Brunswick coast. Homem's attempt to combine the Bay of Fundy and the Penobscot on his map of 1558 is an example of the same error.

4. *Errors from change of scale.* Upon the early maps of the explorers, no matter how small the scale, every place of importance had to be marked, and plainly enough to be seen. Thus it would happen that some capes, lakes, mouths of rivers, would occur upon them on a scale enorm-

ously too large. When now these maps were copied by others upon a larger scale, these features were enlarged in the same proportion, as the copyist had no means of knowing, even had he cared, that the features were out of proportion on the earlier maps. Thus, brooks might become great rivers, and islands, really very small, might, upon enlarged maps, become far too large; it is in this way that the Magdalene group, as shown in the early maps, is represented so large that many students have mistaken it for Prince Edward Island. Of somewhat similar nature are the errors arising from copying from one kind of projection to another.

5. *Errors from wilful misrepresentation.* Two causes for such errors are imaginable; first, political reasons; second, personal or business ones. As to the first, some students think that we have an example in the placing of the inscription, "prima terra vista," on the Cabot map at the north of Cape Breton Island, this being supposed to be an attempt on the part of Cabot to establish a claim for England of discovery in that part of the continent. As to the second, we have examples in the deliberate adding of invented names to maps to make them seem more complete or more recent than those of other makers. Kohl says: "I do not believe that the Spanish, Italian, and German map-makers of the time of Columbus and soon after him, were in the habit of inventing new names. They gave them as they found them. A little later, when elegant maps were much sought after and became fashionable, and when great numbers were fabricated in Italy and elsewhere, unknown countries may sometimes have been embellished with merely fanciful names."¹ Under this head, perhaps, comes the name Isle St. John, applied to the Magdalenes on the Cabot map. Related to this is the deliberate omission of dates from maps, and the reissue of old maps with later dates, a custom very prevalent at the close of the sixteenth century.²

6. *Errors from attempts to make maps from narratives.* Of this kind of error I know of but a few instances, one of them a prominent one. In the middle of the sixteenth century we find a series of marvellously distorted Italian maps showing the voyages of Cartier. As I shall show later, these are perfectly explained by the fact that the Italian map-makers had the narratives of Cartier, but not his maps. Their efforts to fit his narratives to their earlier imperfect maps, gave us these curious productions.

¹ Discovery, 162.

² "The general atlases at this time [sixteenth and seventeenth centuries] becoming familiar to Europe were unfortunately made up on a thrifty principle, little conducive to keeping the public mind abreast of current discovery,—so far as America, at least, was concerned,—and very perplexing now to any one studying the course of the cartographical development of American geography. Dates were sedulously erased with a deceitful purpose (which is not yet gone into disuse) from plates thus made to do service for many years, and united with other dated maps, to convey an impression of a like period of production." (America, IV., 369.)

Probably the remarkable straits and passages shown by Homem on his map of 1558, in the region of Bay Chaleur and the St. Lawrence, are the result of an imperfect understanding of the text of Cartier's narrative, possibly due to an imperfect knowledge of French on the part of Homem, for, as Kohl says, he puts a passage wherever Cartier says he looked for one. It is probable, also, that this attempt to add to a map information obtained from a narrative, gave the name Isle St. John to Prince Edward Island. Mercator, in his map of 1569, certainly had Cartier's narrative, for he uses the form Cap Desperance, which occurs only in the narrative, but not on other maps, which always use the form C. Despoir. Cartier's narrative locates C. Real and C. St. John, both really on Newfoundland, so indefinitely, and, moreover, gives the impression that they are so much farther south than they were, that Mercator naturally placed them down on the Nova Scotia coast. Now, just in front of C. S. Jean on that map lies a small island, and this island is as nearly as possible in the position of the little Isle St. Jean of Champlain's map of 1612, which doubtless became the large Island of St. John on his 1632 map. This C. S. Jean appears on several later maps, as Wytffliet, 1597; John Dee, 1580, and others, and was, therefore, on the maps used by Champlain.

5. *On the Nature of the Evolution of the Cartography of a Special District.*

One does not go far in the study of the maps of a particular district before he perceives that they do not fall into a series gradually improving from the earliest to the latest, but, on the contrary, form a series of steps where a sudden advance alternates with a long period not only without improvement, but with a marked tendency to degeneration. These intermediate forms, as a rule, follow the latest ones which mark the advance, hence are of the same types; and we may say that, in general, the maps of any given region fall into a series of a few successively improving types. The type maps it is usually easy to trace to their origin, and when this is done, they are found to be the products of actual exploration, and frequently are the work of the explorers themselves. The map-makers of Europe had no source of information except the reports of those who had been in the new countries, and they eagerly seized upon these and made the most of them; but between the explorations there was nothing to be done but to copy the latest maps accessible. Now, in making the successive copies they rarely copied anew from the originals, but, like the small boy and the lines in the copy-book, they copied the latest copy; and thus, with no new knowledge, and with an accumulating series of copyist's errors, the maps grew steadily worse until a new type suddenly appeared, after which the process was repeated.

This sharp division into types is naturally most distinct in the earlier maps; in the later ones, with increasing care in their preparation, a more critical spirit in their making, freer communication, and a nearer approach to accuracy in the maps themselves, the distinctness of the types steadily diminishes until it gradually merges over into a system of continuous improvement. These principles are very clearly shown in the maps of New Brunswick, as will presently appear.

While, as a rule, the intermediates are less accurate than the types, and contain nothing not upon them, there are at times exceptions. There may be a survey of some special feature, a single river, or a line of coast, giving rise to sub-types. A map-maker may obtain from sailors a bit of information which the explorer did not have. Thus, on Homem's map of 1558, the Bay of Fundy is fairly well shown, and very differently from the Ribero type which Homem followed, but such cases are rare and generally fail to affect others of the intermediate maps. It is, of course, true, that the actual knowledge of the geography of a country is much greater than shown by the maps, for not only do the maps lag behind exploration in time, but fishermen, traders, missionaries, etc., have much geographical knowledge which never gets upon the maps. Thus, in his Narrative of his Voyage of 1603, Champlain describes the Bay of Fundy and refers to the St. John river, though there was then no map which showed the latter. Again, between 1675 and 1700 numerous seigniorial grants were made along the St. John by the French government, and the accuracy with which the bounds of these are described, shows that the authorities at Quebec possessed a knowledge of the St. John river far more minute and accurate than any map known to us would imply. Again, many of the intermediates did not show fully the knowledge accessible to their makers. Thus, the Delisle map of 1703 follows very closely the Franquelin map of 1686, but it does not give a tenth of the names nor half of the fairly accurate topography of the latter, and for the reason that the scale was too small for more to be shown. To this very day the lumbermen and hunters have a knowledge of the interior of New Brunswick far more minute and accurate than is expressed on any map. But such knowledge is scattered and inaccessible, and of little use to the map-maker. It is altogether probable that this personal knowledge of the country, independent of maps, explains the persistence of old names which have never occurred on, or have disappeared from the maps. Thus the old French names about Passamaquoddy, *Delute*, *Letite*, are not found upon any maps prior to English occupation, and it is probable that they were preserved through their use by pilots from New England, who visited this region continuously from early times, and passed along their nomenclature continuously from one to another. We have, probably, another example of this in the name *Saint Tooley*, applied to a cape just east of Quaco; it does not occur upon any chart, but is universally used by the sailors and by

the people in the vicinity. Champlain gave the name *R. St. Louis* to one of the streams at Quaco, and it seems probable that this name has persisted in the speech of pilots down to the present time, and has been corrupted by the English to its present form.

Though, in general, the maps fall into their proper places under the types, there are some exceptions, due on the one hand to the persistence of old types long beyond their proper limit, and on the other to the appearance of aberrant forms resulting from other causes. There was also a tendency for certain types of maps to issue from particular localities, the map-makers there, no doubt, working together. Thus it becomes possible to divide them into groups, as Harrisse and G. R. F. Prowse have done, such as the Dieppe, the Lusitano-Germanic, Sevillian, etc. The persistence of old types is most common amongst the earlier maps. Communication was then slow and uncertain, and it often required many years for a new type to reach a foreign country, even if not far distant. Thus the Italian maps of the middle and latter half of the sixteenth century either showed no trace of Cartier's explorations, or else showed the old topography with some of Cartier's names, taken from his narratives, added. No doubt older types were also sometimes copied in ignorance of the existence and accessibility of later and better, especially from those which map makers had issued from old plates simply redated. Even in our day old features persist. I have seen a good English map of 1885 which uses the name Liverpool for Richibucto, though this name was officially abandoned in 1832, and had scarcely come into use at all. Names thus often remain long on the maps after they have gone entirely out of use, and, indeed, very many names placed upon maps have never been in use at all. Such was the case with many of those placed upon DesBarres's charts in the last century, and many of those on the Admiralty charts at present. The other aberrant types appear through various causes, such as a new mode of projection, or through the making of a new map based upon personal knowledge and independently of earlier ones, as in that of Denys, 1672, and through other causes.

It is, of course, true that the types of the series are not of equal value, some being of great importance, very different from their predecessors and long persisting, while others are little different from the preceding and soon superseded by others. Markedly contrasting in this respect are the types of Cartier and Delisle in our New Brunswick cartography. Moreover, a new type for one part of the country is not always a type for the whole, but may retain an old type in some parts. It was thus with the Cartier type, which gave us a new form for the North Shore only, the Bay of Fundy coast remaining of the older Ribero type until after the time of Champlain.

There is, of course, the closest relation between the importance of a territory, and the number and excellence of the maps devoted to it. Thus

boundary disputes result in a great abundance of maps of which many are based upon new surveys; and about regions to which public attention is in any way called, the map-makers exert themselves to obtain the most accurate information.

PART II.

SYSTEMATIC CARTOGRAPHY OF NEW BRUNSWICK.

The influences which have determined the evolution of the cartography of New Brunswick are in brief the following: First of all is its geographical position, its outline, and its physiographic contour. No part of its coast is exposed to the eastern ocean, for Nova Scotia lies before its southern coast, and its northern is within the Gulf of St. Lawrence; and of the gulf coast, a part is covered by Prince Edward Island. Our north shore is nearer to Europe than is our southern. In the interior are everywhere interlocking rivers navigable for canoes, one of which, the St. John, forms the natural highway from countries on the east to countries on the west. Corresponding with these geographic facts we find that the gulf coast north of Prince Edward Island, was the first part to be laid down on the maps; the Bay of Fundy came next, the St. John next, then the gulf coast inside the island, and finally the other and less important rivers. Further details of the relations of the physical geography of New Brunswick to the progress of its cartographical development, will be found in the proper connection later. Next come the historical causes at work. In 1497 and 1498 Cabot explored a part of the east coast, and for the first time placed on the maps a country of which New Brunswick was at first an entirely undifferentiated part. And so it remained despite many other explorations which showed the outer eastern coasts in considerable detail, until Cartier came in 1534. This type we may call the *Pre-differentiation type*. Cartier, on his first voyage, laid down our North Shore north of Prince Edward Island, but no other explorer came to this coast and none to the Bay of Fundy until Champlain in 1604, so that for all this time there persisted the *Cartier type*. Champlain explored the Bay of Fundy, and for the first time placed it distinctly on the maps, and laid down the general course of the St. John, and later he correctly showed the north coast inside of Prince Edward Island. The type he gave, the *Champlain type*, persisted nearly a century. But after him came many traders, and especially missionary priests, who explored the interior and made maps which they sent home to France; and in 1686 an official voyage of inspection was made through the country by the Intendant. All of these accumulated data for another type, showing the interior, and this first appeared in a published map in that of Delisle, of 1703, giving us the *Delisle type*.

Explorations of this kind continued, and from the added data a great map-maker, Bellin, constructed in 1744 a map which gave a new type far surpassing any that preceded it, the *Bellin type*. After the middle of the century the country passed into the hands of the English, and they began exact surveys of the coasts, introducing the *Modern type*, chiefly founded on the surveys of Morris, Wright and DesBarres. But these surveys were disconnected, and it remained to gather them into one map, showing the province as a whole laid down according to all the correct data, and this was done on the map of Bonnor of 1820, which thus gave a basis for that steady improvement which has characterized the advance of our maps since then, and which, therefore, we may call the *Complete type*. But surveys pieced together do not give accurate maps; these can be based only upon trigonometrical surveys, which have not yet been made, but when they are, they will give us the *Exact type*.

At first New Brunswick was but a part of maps of very wide range and small scale, usually maps of the world; later it was part of maps of North America, later of New France, later of Acadia, and it is only in this century that we have large-scale maps devoted to it alone.

It is plain that the cartographical types do not correspond to the natural periods of our history. The Pre-differentiation, Cartier, and Champlain types all belong to the Period of Exploration; the Delisle and Bellin to the French Period; the Modern to the New England and Loyalist periods; the Complete to the Post Loyalist Period, while the Exact type has not yet appeared. But these types and the influences controlling them will now be considered more in detail.

TYPE No. 1.—THE PRE-DIFFERENTIATION TYPE.

LA COSA, 1500, TO BEFORE CARTIER, 1534.

New Brunswick a part of an undifferentiated mainland, which has an almost unbroken and often nearly straight coast-line, with no trace of the Bay of Fundy, and but a small indentation for the Gulf of St. Lawrence; hence no part of the New Brunswick coast is distinguishably shown. Began with the Voyages of the Cabots (1497, 1498) shown on La Cosa of 1500, and ended with the first voyage of Cartier (1534) first shown on Desliens of 1541.

From a strictly local New Brunswick standpoint, this type has little direct interest, for probably no part of the province appears upon any map of that time. Nevertheless, since the cartography of this period strongly influenced that of the one next following, which does directly concern our present subject, it must receive some treatment here, though this need be but in brief outline. The subject is one of great impor-

tance in connection with the history of the discovery and exploration of North America, and on this account has been thoroughly investigated by Kohl, Winsor, HARRISSE, and others. It must possess also great interest to the monographer of the cartography of Nova Scotia and Newfoundland, and although it has received some attention from Howley, Prowse (father and son), and Patterson, it is not at all likely that it has yet yielded all that it contains of local interest and value. Kohl's admirable treatment of it for Maine, however, leaves but little to be said upon that part of the subject.

If one turns to this study with the different periods of our history in mind, he naturally asks first whether maps made by Indians have played any part in our cartography. No doubt sketches made by them for the early explorers gave much information about places the explorers could not visit, and it is not unlikely that such sketches are the originals of some features upon early maps ; in fact there is no other imaginable source from which accurate information could have been derived where the explorers did not themselves visit the places. But from our present standpoint, the Indian period has not affected our cartography.¹

First amongst the explorers of the eastern coast of North America were the Northmen, though in this sentence we have expressed nearly all that is certain about their relation to the subject. It is, however, of interest to note that there exist maps, which, though of comparatively late date, are believed to show the results of the early Norse voyages to America from original sources of information, and one of the best of these is that of the Icelander, Stephanius of 1570. (Fig 2.) As interpreted by Kohl, *Helleland* is Newfoundland, *Markland*, Nova Scotia, and *Promontorium Vinlandiæ*, Cape Cod. There are other Icelandic maps discussed by Kohl, who also describes the still earlier map of Antonio Zeno of 1400, which, however, belongs really much later, but which is of some interest for the introduction of the names Estotiland and Drogeo, which long persisted on American maps. But it is not until after the voyages of the Cabots that we reach the true beginnings of our cartography.

¹ Though these Indian maps have not in the slightest influenced our cartography, they are worthy of some attention. Frequent references occur in books of travel elsewhere to maps drawn on bark or skin by Indians, but the only ones known to me made by Indians in our region which have been preserved, are three or four drawn about 1797 by Passamaquoddy Indians for the Boundary Commissioners, and preserved among the manuscripts in the library of the Maine Historical Society. One of these has been published in the *Magazine of American History*, XXVI., 264, and may be compared with the modern map of the same district on p. 262 of the same paper. It is very crude, as are the others in the same set, but probably no more so than would be the case if made by white men under the same circumstances. I do not think they represent the best an Indian can do at mapmaking. I have a map of the Tobique River, drawn for me by a Maliseet Indian, which, except for a distortion obviously due to the size and shape of the paper, is surprisingly accurate, but as the maker had been to school, it can hardly be viewed as aboriginal.

The first explorer of our northeast coast, of whom we have positive knowledge, was John Cabot, a Venetian, who made voyages to this region under the patronage of Henry VII. of England, in 1497 and 1498. Neither narratives nor maps of his exist, and his landfall and subsequent

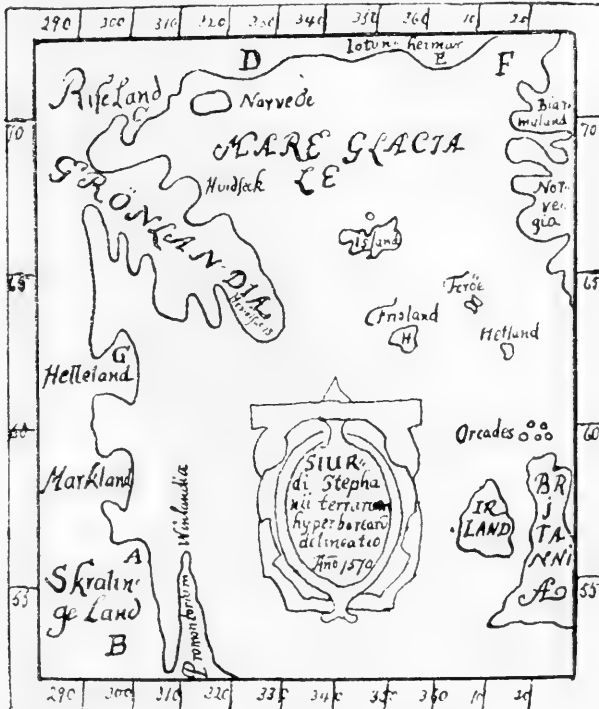


Fig. 2. STEPHANIUS, 1570.
From Prowse; full size.

course are unknown. It is generally agreed, however, that his voyages are the source of the representation of this part of the continent on the map of the Spaniard La Cosa, of 1500 (Fig. 3), which is the first dated map to show any part of the northeast coast of America, laid down from actual exploration.¹ It is not certain what part of the coast is represented on this map, but the most reasonable view seems to be that of Dawson, Kohl, and some others, which is that it represents the south coast of Newfoundland and a part of the island of Cape Breton. *Cavo de ynqlaterra* being Cape Race or near it, and *Cavo descubierta* being on Cape Breton. This entire Cabot exploration is most obscure, despite its

¹ Both Harrisse and G. R. F. Prowse believe there were other voyages to this coast between 1497 and 1500, which are unknown to us directly, but which are suggested by some features of the early maps.

great historic importance, and a copious literature has grown up upon it, which the Canadian student may best trace through the works of Dawson, and by help of the new Cabot Bibliography.¹ One theory of the Cabot voyages holds that he circumnavigated the Gulf of St. Lawrence, which, if true, would connect the subject more closely with New Brunswick; but it is all too uncertain and too remotely connected with our present subject to require further notice here.²

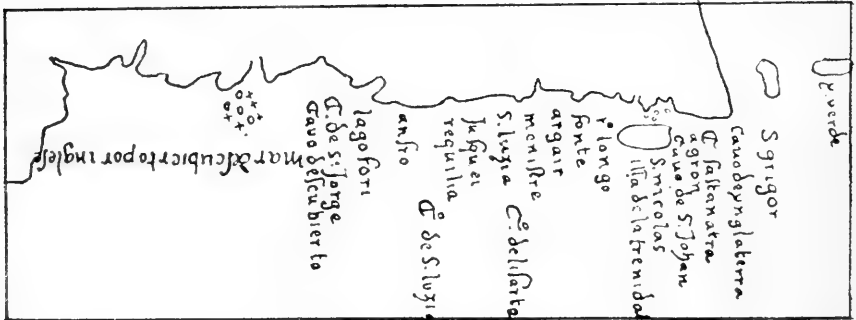


Fig. 3. LA COSA, 1500.
From Kretschmer; full size.

The names on La Cosa do not certainly occur upon any later map, nor are any of them extant,³ nor does the topography reappear. While La Cosa's map is, therefore, the first of this period, it by no means establishes a type, as do the leading maps of the succeeding periods.

The Voyages of the Cortereals, Portuguese sailors sent out by the King of Portugal, in 1500, 1501, with their representation upon the maps of Canerio (1502), Reinel (1505), and Ruysch (1508) concern Newfoundland and Labrador rather than our own coasts. In 1521, Joam Alvarez Fagundes, a Portuguese, was sent by the King of Portugal to this region, and is supposed to have explored the Gulf of St. Lawrence,⁴ but the map usually adduced as evidence of this voyage is purely of the Cartier type. But there can be little doubt that he visited

¹ Cabot Bibliography. By George Parker Winship. Bulletin Providence Public Library, June, 1897.

² At least one effort of no small interest has been made to apply Cabot's name to the region of which New Brunswick is a part. In 1814, John Purdy, an eminent hydrographer of England, published an excellent map of eastern Canada, under the title "A Map of Cabotia" (see list of maps in Part III.), and in the notes he makes it plain that he wished thus to honour the memory of Cabot. The name Cabot Strait has recently been applied to the passage between Newfoundland and Cape Breton. (Geogr. Journ., June, 1897, 609.)

³ It was once suggested to me by a Canadian student that the *Cavo de Ynglaterra* may be the original of *Cape Breton* (Britain) changed to its present form by early French map-makers. Probably cartographical and other evidence could be adduced to disprove this.

⁴ HARRISSE, *Discovery*, 182.

became extinct and are no longer even identifiable.¹ One of the most persistent of these names is a *Terra de multa gente*, which appears on Maggiolo, and persists as late as Gutierrez, 1562, where it occurs near the present Miramichi, and possibly may have some connection with it. On Gastaldi, however, we find a sudden advance in the representation of the gulf, though not in its nomenclature. We do not know the source of his information; it has been surmised to be from the map of Jehan Denys, of 1506, but there is no evidence therefor. We find the same representation on the map of Mercator, of 1538. Possibly the voyage of Fagundes was the source of this topography, for it seems plain that he visited the gulf, though the map usually attributed to him belongs after the time of Cartier. Bold as the outlining of Gastaldi is, however, it is altogether too inaccurate to make it worth while to attempt to identify the places shown.

It is worth noting, that on this map most of the names of the Atlantic coast are taken from Maggiolo, on which the names *Angoulesme*, *Flora*, *Paradis*, *Real*, *Refuge*, all occur, though in a very different order. From this time onwards, almost to Champlain, we can trace two series of maps—an Italian series, with these names following Maggiolo, and another series, Spanish, Portuguese, and French, following Ribero. The comparison of the order of these names on the two maps is enough to show the futility of attempting to identify the places to which they were applied, and of course disposes of Kohl's theory that Angoulesme represents Passamaquoddy Bay, etc.,² a mistake he would never have made had he known of the Maggiolo map, which he did not. Probably many of these names were never applied to any places at all, or if they were originally, their subsequent transposition was due either to carelessness or perhaps whim, on the part of later map-makers. There is another similar map by Gastaldi of 1548, interesting as giving the first known use of the name *Acadia*,³ and Gastaldi's influence is plain in Ruscelli of 1561. The same names are on the Ulpius Globe of 1542.

The different names applied to the territory of which New Brunswick is a part, were successively,—by the Northmen probably a part of *Markland*, by the brothers Zeni, *Estotiland* or *Drogeo*, by Cabot, perhaps a part of the *New Found Land*, by Verrazano, *Nova Francia*, also *Ver-*

¹ HARRISSE (Discovery, 600) thinks *R. das poblas* of Viegas may be Bay Chaleur or the mouth of the St. Lawrence and *Rio Pria*, the latter or the Saguenay—but it is all very doubtful.

² The same objection applies to Rev. Mr. Patterson's efforts to identify these places and locate them on the coast of Nova Scotia (Portuguese in North America, p. 152). *Port Real* and *Refuge* are on Maggiolo in positions which make it quite impossible that they could have been in Nova Scotia. That they are there on Gastaldi is but one of the shifts of the map-makers.

³ For a discussion of the origin of this important name see these Transactions, (N. S.) II., ii., 216.

razana, by Gomez, *Tierra de Estevan Gomez*, and upon different maps, *Terra de los Bretones*, *Terra de Norumbega* and *Bacalaos*.

Such was New Brunswick cartography at the close of this period. No part of our present province is certainly recognizable, and of our two coasts, the Gulf of St. Lawrence is but placed, not outlined, while the Bay of Fundy is not even located.

TYPE NO. 2.—THE CARTIER TYPE.

DESLEIENS, 1541 (ROTZ, 1542), TO BEFORE CHAMPLAIN, 1604.

The north coast of the province from the head of Northumberland Strait to the Restigouche clearly laid down from actual exploration; south of that, Prince Edward Island remains merged with the mainland; the Bay of Fundy, as in the last period, not shown, or but in one map, and faintly indicated near the end of the century; nothing whatever of the interior known. Began with the first voyage of Cartier (1534), shown on Rotz, 1542, the Harleyan, 1542, and Desliens, 1541, and ended with the voyages of Champlain (1603, 1604).

With this period the cartography of New Brunswick proper begins, though it is concerned only with a part of the northern coast, which was the first part of the province to be explored.

The first explorer of the Gulf of St. Lawrence of whom we have any authentic record, was Jacques Cartier, on whose first voyage in 1534 there is a considerable literature. Formerly his course in the gulf was obscure, but the studies of Mr. Joseph Pope, Dr. N. E. Dionne, Bishop Howley, and others, have left scarcely a doubtful point in his entire voyage.¹ Cartier was sent out by the King of France to explore this land and to seek for the western passage. He entered the gulf in June through the Straits of Belle Isle, and after coasting Labrador and the

¹ In particular Bishop Howley's paper, the latest and most complete of all, seems to me to say about the last word on the subject in every point except one; I cannot agree with him in identifying Cartier's Alezay with Entry Island. I still think it was Deadman's Island. The narrative is not clear on this point, but the facts of cartography are against his view. Thus we all agree that the Desceliers map of 1546 faithfully reflects Cartier's voyage, and that the Magdalenes are there clearly shown. (See these Transactions, VII., ii., 31.) On this map Alezay is a small island off the southwest corner of the Magdalene group, which is exactly where Deadman's Island is, and not where Entry Island is.

It is striking how slowly the results of investigation upon special subjects gain a place in general works. The amount of technical literature is becoming so enormous that general writers cannot work over it all, and continue to take most of their facts from older standard works, which, no matter how excellent in general, are apt to be wrong in detail. Though Cartier's course has been made clear, the newer histories still repeat old errors. Some new device is needed to force on the attention of general writers the results of new research.

west coast of Newfoundland, visited the Magdalenes, and thence sailed westward. On June 30th he sighted land, which his description locates as near the present Grenville on Prince Edward Island. He entered a shallow river, which he named *Ripuiere des Barques*, the present Richmond Bay. He then coasted northward, named the present Cape Kildare, *Cap d'Orleans*, and North Cape, *Le Cap dez Sauvaiges*. He next entered the head of Northumberland Strait, which he mistook for a closed bay and named *La Baye Sainct Lunaire*. He did not enter the Miramichi, but refers to it as a triangular bay all ranged with sands. Coasting northward he rounded Point Miscou, naming it *Cap d'Espérance*, and entered Bay Chaleur, which he explored to its head along its north coast, and to which he gave its present name (*La Baye de Chaleur*). He spent some days at the present Port Daniel, called by him *La Couche Sainct Martin*. The remainder of the voyage does not concern our present subject, nor did he again visit this coast. This scant outline, ample for our present purpose, gives no idea of the great interest, accuracy, and importance of Cartier's original narrative; these, however, together with the critical discussion of his entire route, are so fully treated in the easily accessible works referred to, that the interested reader may there find full satisfaction.

This first voyage of Cartier is of immense importance to the cartography of the entire Gulf of St. Lawrence. I have elsewhere¹ propounded and defended the thesis—*The correct interpretation of Cartier's first voyage is the key to the cartography of the Gulf for almost the subsequent century*. Further study has but confirmed this opinion. It is perfectly true for the New Brunswick coast. The maps after Cartier, and until Champlain, reflect the former's influence only, and the nearer to him they are, the better; they degenerate steadily until the new type appears.

It is known that Cartier made maps of the places he visited,² but these are entirely lost, though happily his narratives are extant. The first maps to appear after his voyages, show his travels very clearly and must have been based upon his own. A careful comparison of them with one another has suggested certain features which Cartier's maps probably showed, i. e., they were on a larger scale than any of those copied from them, contained legends descriptive of the country, inhabitants, etc., bore place-names not mentioned in the narratives, recorded the days of saints on which discoveries were made, and left coasts undefined which he did not himself visit. No doubt also he made several maps, the first showing the first voyage only, and the later ones adding what he found out in the subsequent ones.

¹ These Trans., VII., ii., 17.

² These Trans., VII., ii., 27, 42.

distance west of Anticosti, and would show the region south and east of the Magdalenes undefined, or as nearly as possible as in the older maps, which showed this whole region as solid land. Precisely such a map we have in that of Rotz (or Rose), (Fig. 7), a Frenchman in the service of the English king, contained in a MS. work dated 1542. The entire topography answers exactly to the narrative of Cartier's first voyage without the slightest trace of influence of the second. The Magdalenes, which may be recognized by comparison with the Desceliers map, to be

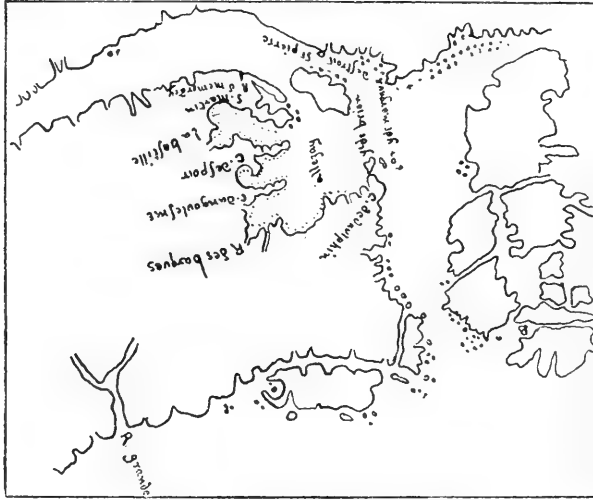


FIG. 8.—HARLEY, (1536) 1542.
From Prowse; full size.

given later, are shown merged with the mainland to the south, and Anticosti is joined to the coast on the south.¹ If one will compare, moreover, the exact lining of this map with the Desceliers map (Fig. 10), he has no difficulty in identifying all of the localities upon our North Coast.² This map of Rotz is then really the oldest known to us showing the voyages of Cartier. Closely following it is a beautiful map, the "Harleyan" of 1542³ (Fig. 8), which shows Cartier's second voyage in the distinctness of Anticosti, and in the representation of the St. Lawrence River, but it still shows the Magdalenes fused with the coast to the south, suggesting that this error was not cleared up until the third voyage in 1540. So far as concerns our own North Shore, however, it corresponds on this map so very closely to Cartier's narratives, that we can scarcely doubt

¹ And hence not "omitted by a simple lapsus" as HARRISSE states (Jean et Sebastian Cabot, 203.)

² Fully identified, with figure, these Trans., VII., ii., 29.

³ A Dieppe map of the school of Pierre Desceliers, but not by him. HARRISSE, Discovery, 647.

of King Francis I., who was Charles of Orleans, Count of Angoulesme. *Baye de Se. Maue*, at the head of Northumberland Strait, doubtless, *Sainte Marie*, is probably an alternative name for St. Lunario, for Cartier was in this bay on the 2nd of July, the day of the visitation of the Virgin Mary. *G. Somā*, probably Miramichi bay, I cannot explain; it is not in Cartier's narrative, nor does it appear on any other map. *Terre de Michalman* is, I believe, connected with the present Miramichi.¹ *La Bastille*, also, is not in the narratives, and I cannot explain it; but, perhaps, an inscription on the original is its source. One of Cartier's companions on his second voyage was of this name. This map is followed by Mercator, 1569. The type map of this period is Cartier's own, and, since that is lost, this of Desceliers, or else the Harleyan, must stand as its nearest representative.

Returning now to the Desliens map (Fig. 9), of which the inferiority is manifest, we find the topography markedly inferior to the Desceliers, and the names all corrupted. Moreover, it belongs to an entirely distinct series, and is more closely related to the Portuguese maps than to the French. All names are, however, recognizable, except *tronce de damas*, which is new, and which I cannot explain; it occurs, also, upon several other maps. Professor B. H. Nash, of Boston, has kindly sent me the following suggestion upon these words: "You will allow me to call your attention to two words (not found in these technical meanings in the general dictionaries of the Spanish language, but given in the Royal 'Diccionario mari'time Español.') These are, '*Tronco-el meridiano graduado en las cartas de marear; que se llama tronco de latitudes.*' '*Damas, es el título o' aditamento con que se distingue la parte del Océano Atlántico en que reinan las brisas o'vientos constantes del Este, y por donde en consecuencia se dirigen las derrotas desde Europa a' la América septentrional.*'" The word may, therefore, not be a place name, but refer to a nautical figure on an original map.

From this time on until the end of the period there are very numerous maps showing the topography more or less distorted, and the Cartier names more or less corrupted, with never a sign of an improvement, but always degeneration. There were no new expeditions, and hence no new facts, and the successive copyings accumulated and intensified the errors. It is not profitable to attempt to examine these maps in detail, and I shall but note the peculiarities of a few of the more important.

In 1544 a map was published in Spain in the name of Sebastien Cabot, which is now generally considered to be, if not a forgery, at least altogether unworthy of its alleged author. There is a copious literature upon it in works treating of the voyages of the Cabots. For our present purpose it is enough to state that it is purely of the Cartier type in the Gulf of St. Lawrence, though in a corrupted state. HARRISSE is of opinion

¹ Fully discussed in these Transactions (N.S.) II., ii., 252.

tion of de Lunario), and *rategno* is a Spanish equivalent for Chaleur. I cannot find that this map is followed by any other whatever, which is remarkable, considering the fact that it was not MS., but published, and shows either that it was unknown to, or held in suspicion by, contemporary map-makers.

An excellent map of the time is that of Joannes Freire, a Portuguese, of 1546. Its names are intelligible; *Allmadias* is, doubtless, the Portuguese *almadia*, meaning "an Indian boat," and hence the equivalent of the French *barques*. In *Ro. de pazis* and *I. de baqua* we have both the French original and its Portuguese corruption, the latter, however, transferred to an island often shown in this region (see on Desceliers); *Delimargi* seems to be the equivalent of Cartier's C. des Sauvages, while the other names are on Desliens. This map is followed with an altogether rare fidelity by the Dourado map of 1573, which, indeed, is nearly identical with it.

Of some importance is the Vallard map of 1547, of uncertain authorship. It has no names upon our north coast (at least in the accessible reproductions of it), but it shows a curious slender form of the Cape Breton peninsula, which reappears in others, as that of Simon, of 1580, which, likewise, has no names in this region.

A map, famous for its excellence, is that of Mercator of 1569, which, however, closely follows the type of Desceliers in topography, though apparently with some effort to make the Cape Breton peninsula conform to the Vallard shape. The form, C. Despérance, which is given in Cartier's narratives, but which on Desceliers and the Harleian is C. Despoir, makes one think that Mercator had the narrative before him in making this map. It has *C. de Stiago* (i.e., St. James) as alternative for Orleans, followed on some other maps; this name I cannot explain.¹ A map by Guillaume le Testu, of 1555 or 1566, has some of the names so corrupted as to be unrecognizable.

Of a purely Cartier type is the map of Lazaro Luis of 1553, without names in our region, but which has been cited as evidence of a pre-Cartier exploration of the Gulf by Joam Alvarez Fagundes in 1521. In the map itself, however, there is nothing not derivable directly from the voyages of Cartier, and on our North Shore it is very close to his narrative.

Later in the century, and indeed down to the coming of Champlain, maps of the Cartier-Ribero type continued to appear, none of them show-

¹Cartier sighted Cape Orleans June 30th. With reference to a Saint James, whose day is celebrated June 30th, Rev. Father Jones, of St. Mary's College, Montreal, has had the kindness to make search, and writes me: "I find in L. B. Francœur's 'Théorie de Calendrier' a St. James on June 23rd. The octave of this feast, if it had one, would fall on June 30th. But who this saint is I have not been able to ascertain."

ing any advance and some of them showing extreme degeneration. Chief of these maps are those of Ortelius, 1570; Thevet, 1575; Dee, 1580; Judaeis, 1593; De Bry, 1596; Wytfliet, 1597; the Molineaux Globe of 1597¹; Quadus, 1600; Botero, 1603, and others of the same set referred to by Winsor² and Harrisse.³ And there were yet others of the same type which appeared later, even long after the publication of Champlain's maps.

Viewing together all of these maps which show Cartier's voyages, we find they fall into two series: First, the French Harleyan-Desceliers series, agreeing very closely with the narratives of Cartier, but with some differences, such as *C. Despoir*, instead of Desperance, and *Angoulesme*, instead of Orleans. Later these were superseded by Mercator, who uses *C. Desperance*, as written in the narrative, and *C. de Stiago alys dorleans*, and he is followed by Dee and Wytfliet. Second is the Portuguese-Spanish series, to which the Desliens map, despite the French name of its maker, belongs. These use *Baye St. Marie* for St. Lunario, and have the word *damus* in some kind of combination, near the Miramichi. To this group belong Cabot, Freire, Dourado and several others. Probably the different names on these two series are the result of copying different parts of inscriptions from Cartier's originals.

The degeneration of the maps of the period is well shown in those of Judaeis, 1593, Wytfliet, 1597, Quadus, 1600 and 1608, and especially Hœius, 1640, which show the end of the period and the condition at the time of the coming of Champlain. They contain nothing new, and what they do contain is far less accurate than is Desceliers, nearly sixty years before.

In some of these later maps the nomenclature remains much more accurate than the topography, which is probably because Cartier's narratives were accessible, while his maps were not. As in other periods, some maps of this extend over into the next, so far as date is concerned, though with no improvement in topography, such are those of Oliva, 1613, 1650, and Sanchez, 1623.

Naturally in this period there are some very aberrant types. Of these, one of the more important and less extreme is that of Homem, of 1558. (Fig. 11). In its nomenclature it has nothing peculiar, except in the Portuguese form given to the names, and the use of *bestus* (Portuguese *besta*, a brutish man), for "Sauvages," but in the topography it is unique. As Kohl says: "Our author appears to have had a great passion for islands and a strong belief in northwest passages. He put down a strait in every place where Cartier, in his report, had said he had

¹ A photograph of this Globe, sent me by Mr. Prowse, differs considerably from the sketch of it in Winsor, III.

² America, IV., 95, 101.

³ Jean et Sebastien Cabot; Discovery.



FIG. 12.—AGNESE, 1560 (?).
From Kretschmer; full size.

France, of about 1560, given in Müller's Atlas. Indeed, in general, it may be said that the Italian maps of the middle and latter part of the sixteenth century are of this combined Gastaldi-Cartier-narrative sort. In this combination we have the solution of the puzzle of these maps, which has so perplexed cartographers.¹

Probably this type disappeared in Italy as soon as Cartier's maps or copies from them became accessible there.

Aberrent in another way are the maps of Allefonsce, companion and pilot of Cartier and Roberval. His sketches of the gulf are made entirely independently of any other maps, and though of some interest in the general cartography of the gulf, are of no importance to our present inquiry.

So far in this period we have traced the cartography of the Gulf of St. Lawrence coast only ; we must now turn to the Bay of Fundy. The cartography of these two coasts in this period, as subsequently, was largely independent of one another. This part of our subject is, however, brief. At the opening of the period, as we have seen, the map of Ribero was the type followed by most maps for this region. This, though with many minor alterations of the coast line, and with many and often great corruptions of the names, some new ones added and old ones dropped, continued to be followed through the entire series mentioned above, and indeed throughout the period; and no new type was introduced until the time of Champlain. It is possible that a minute comparative tabulation of the names on the numerous maps in this region would give results of interest, though this is more likely to be of philological, than of historic, value, and it is quite foreign to our present purpose.² All through these maps the Bay of Fundy is wanting, as in Ribero, and it is only towards the close of the century that it puts in a hesitating and almost uncertain appearance. On the Mercator map of 1569, however, the coast is given a contour which suggests a more accurate knowledge of the form of Nova Scotia, but the bay is not shown.

In this region, in most of the maps, a *rio Hondo* or *Fondo* is marked, which on a map of about 1540-1550, given by Kohl (315, No. 2), and on the Italian maps (see fig. 12) is a prominent locality, but it is not until a map of 1594³ that we can clearly locate this river as the present Bay of Fundy, and it is similarly given on de Bry, 1596. These map-makers must have had accurate information upon the presence of the bay. What is probably the bay, though it is not certain, is shown even more plainly, and for the first time as a bay, though without name, on the Molineaux

¹ Winsor speaks of the puzzling character of these maps. *America*, IV., 93, 95.

² On Wytfliet and some other maps occurs one name which may be connected with New Brunswick, i.e., R. Seguido. This has been supposed by De Costa to be possibly the St. John. *Mag. Am. Hist.* IX.

³ In "Histoire de la Navigation de Jean Hugues de Linscot."

or Hakluyt map of 1600, and this map represents its highest development up to the time of Champlain. Possibly some of these features on those maps resulted from an expedition spoken of by Hakluyt, which in 1583 it was proposed to send to explore the coast southwest of Cape Breton.¹

The map of Homem has been spoken of as an aberrant type for the Gulf of St. Lawrence, and it is likewise so for this region. It produced no effect upon any which came later. The very large bay which it shows has been taken by Kohl² and others for the Bay of Fundy. Kohl considers that the western side of this bay represents the New England coast north of Cape Cod, but this view introduces great difficulties and inconsistencies, and seems to me to be contradicted by the cartographical evidence at hand. The nomenclature of this coast on Homem is of the Ribero type, though corrupted. If one now will compare these two maps (figs. 5 and 11), he will find *C. de muchas yslas* on both, and moving eastward the first name in common is *Golfo*, then *R. de Montanas*. Taking account of the distance between these two names, and the configuration of the coast, it seems to be undoubtable that the great bay on Homem and the river of the many islands of Ribero are the same. The great size of Homem's bay, however, and its branching at the end, and some other features, do strongly suggest the Bay of Fundy, and I am inclined to think are meant for it. In other words the simplest explanation seems to be that Homem did have knowledge of the Bay of Fundy, gleaned, perhaps verbally, from the fishermen, but supposed that the big river then on the maps was meant for it, though made too small and wrongly shaped. We can imagine Homem unable to believe that so great a bay as that of Fundy was omitted altogether from the maps. He then simply made the river the full size and shape for the bay, and the map is explained.

It is, perhaps, the most remarkable fact in the whole history of our Cartography, that so conspicuous a feature of east-coast topography as the Bay of Fundy appears only in the uncertain way it does on the maps throughout this period of exploration. The subject still requires a satisfactory explanation, which can only be given by a study even more minute than Kohl has made, of the cartographical history of the coast from Cape Breton to Cape Cod.

Thus does this period end. The Gulf of St. Lawrence is on the maps to remain, though but poorly drawn; the Bay of Fundy is but little more than suggested.

¹ Coll. Maine Hist. Soc. iii., 228.

² This river, commonly considered to be the Penobscot, I have more than once almost concluded, is the Bay of Fundy, and I am not sure but that a more minute study of this region will show this to be the case. This seems to be sustained by No. 157 of the Kohl Collection at Washington.

TYPE No. 3.—THE CHAMPLAIN TYPE.

CHAMPLAIN, 1612 (LESCARBOT, 1609), TO BEFORE DELISLE, 1703.

The Bay of Fundy explored, and, upon a small scale, mapped; the entire earlier nomenclature of the Atlantic coast finally abandoned, and a new introduced; on the north shore, Prince Edward Island separated from the mainland, and the entire coast laid down; of the interior, only the general courses of the St. Croix and the St. John laid down, with the lower parts of some others; towards the close of the period some improvement resulting from the reports or maps of the missionaries, but these simply added to the old type. Began with the voyages of Champlain in 1603 and 1604, shown on Lescarbot of 1609, and his own map of 1612, and ended with the journey of DeMeulles, in 1686, which gave the data for the map of Delisle, 1703.

The preceding period was characterized by an advance in the cartography of the Gulf of St. Lawrence without any improvement in that of the Bay of Fundy. This period opens with a sudden and great improvement in the latter, and throughout shows but little improvement in the former.

The life and work of Samuel de Champlain, the causes of his voyages, which meant so much to Canada, and the results in exploration which he accomplished, are all so well known that no reference to them is needed here. It is necessary to speak only of his work as a map-maker, of his proficiency in which, considering his circumstances, it is impossible to speak too highly. Not only was he an accurate observer of topography, but he drew his maps with considerable skill; and entirely independently of tradition, placed on them only what he himself saw or learned directly upon good authority from others. He is the model explorer. As a result his maps not only mark a distinct type in our cartography, but that type is the most important and pronounced of any in the whole range of our subject. No other map-maker has made so great and important an advance over his predecessors as has he, and it is with him that modern, and one may almost say scientific, cartography began, so far as our region is concerned.

Champlain made a voyage to Canada in 1603, and during a visit to Gaspé heard many particulars from the Indians and others about our north shore. He speaks of *Bay Chaleur*, *Miscou*, *Tregate* (Tracadie) *Misamichy*, a river *Souricoua* (probably one of those between Wallace and Pictou), of the head of the Bay of Fundy, of the St. John, and of *Arcadia*.¹

¹ Always spelled thus in 1603 narrative. On the origin of this word see these Trans. (N. S.), II., ii., 216.

He knew also of *l'isle de Sainet Jean* (Prince Edward Island), which he says is thirty or thirty-five leagues long, though on his 1612 map he draws it as very small. In 1604, in company with the *Sieur de Monts*, he set out from France April 17th, sighted La Heve May 5th, coasted around Acadia to the *Baye Françoise* (Bay of Fundy), which he explored to Cape Chignecto, whence on June 20th he crossed to the New Brunswick shore. As his maps show, he named a small river, *St. Louis*¹ (for the day of St. Louis de Gonzague, June 21, on which he arrived there), now called Vaughan's Creek, and an island near it, *Isle perdue*, now doubtless the small island at Quaco Head. Farther west he named a cape *C. de Mines*, and a cape at the entrance of the St. John, *Cap rouge*, now Red Head. He named the *St. John* for the saint on whose day (June 24th) he arrived there. He did not ascend it, but obtained much information concerning it from the Indians, and passed to the westward, visiting the Wolves, which he named *isles aux Margos*, or *Oiseaux*. He refers to *Manthane* (Grand Manan) and entered the river called from the natives who lived there, *R. des Etchemins*, now the St. Croix. Here they founded a settlement, the sad history of which has been so often told. That autumn they explored along the New England coast, and in the spring made a still longer voyage to the southward. In 1605 they removed the settlement to Port Royal, and Champlain returned to France and never again in all his voyages visited this part of Acadia. In his maps, this voyage and no more is clearly reflected.

Champlain's first published map is dated 1612, but there exist at least three earlier ones which show his influence. In 1606 there came to Port Royal a useful busybody named Lescarbot, who published in 1609 a "Histoire de la Nouvelle France," of considerable value, even though almost all of his matter is second hand. In that work is a map (Fig. 13) based upon data which must have been supplied by Champlain, but it is badly drawn. It has an incidental interest in the writer's efforts to show on it the identity of the places mentioned in the narratives of Cartier,² but these identifications, as is to be expected from his very imperfect data, are quite valueless, and the claim of the map to notice rests entirely upon the fact that it is the first known published map of the new type. In the collection of M. Harrisse is a fragment, supposed to be in Champlain's own hand, showing the St. Croix region, and dated 1607, with an 8 written over the 7. Of much interest, also, is a large map of 1610, given in Brown's "Genesis of the United States," made by an un-

¹ This name probably persists corrupted in *Point St. Tooley*, the universal local name (though on no chart), for the eastern headland of Quaco Bay. It was probably handed down through successive generations of pilots.

² Another interesting early effort to trace Cartier's course is shown on a map by Bellin in the Parkman MS. (Abenakis, I., 88), in the Library of the Mass. Historical Society, but it is erroneous. Genest's Historical Map of 1875 is well known, but is likewise in error at several points.

known Englishman, and which mirrors Champlain's explorations fully as well as his own 1612 map, so that it could only have been made from a draft supplied by Champlain himself. In 1613 appeared Champlain's "Voyages," containing his two maps, one of 1613 upon a small scale, and that of 1612 (Fig. 14), which is the type for this period. This map

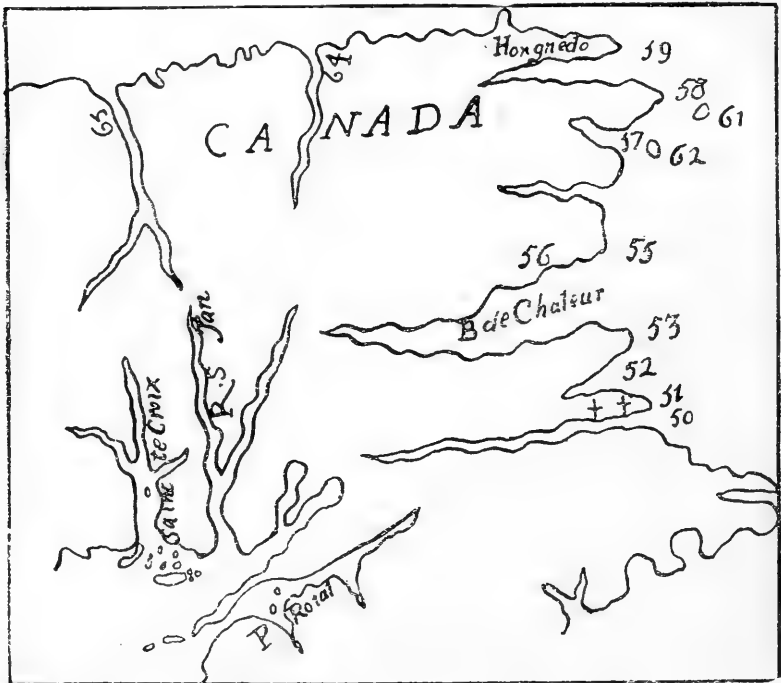


FIG. 13.—LESCARBOT, 1609.

From reprint; full size.

- 50. Fleuve des Barques, que je prens pour Mesamichis.
- 51. Cap des Sauvages.
- 52. Golfe Sainet-Lunaire, que je prens pour Tregate.
- 53. Cap d'Esperance.
- 54. Baye on Golfe de Chaleur.
- 55. Cap du Pré.
- 56. Sainet-Martin.

agrees exactly with the narrative in every respect, except that the former has on it some names not mentioned in the latter. There is not in our entire cartography another case in which we have a type map made by the explorer himself and accompanied by a minute account of the data on which it is based.

Champlain's 1612 map (Fig. 14) is remarkable not only for its advance over all earlier maps, but for its almost entire independence of

them. He made little or no attempt to reconcile new truth and old error, but records the new truth only. Not only does he sweep away at one stroke from the Atlantic coast the elaborate but highly corrupted nomenclature of Ribero, which had prevailed for nearly a century, but even on the north shore he abandons all of the nomenclature of Cartier except a single name, Baye de Chaleur, whose preservation to our day is probably due to its retention by him; and instead of copying from older maps, which it is impossible to suppose he was not familiar with,

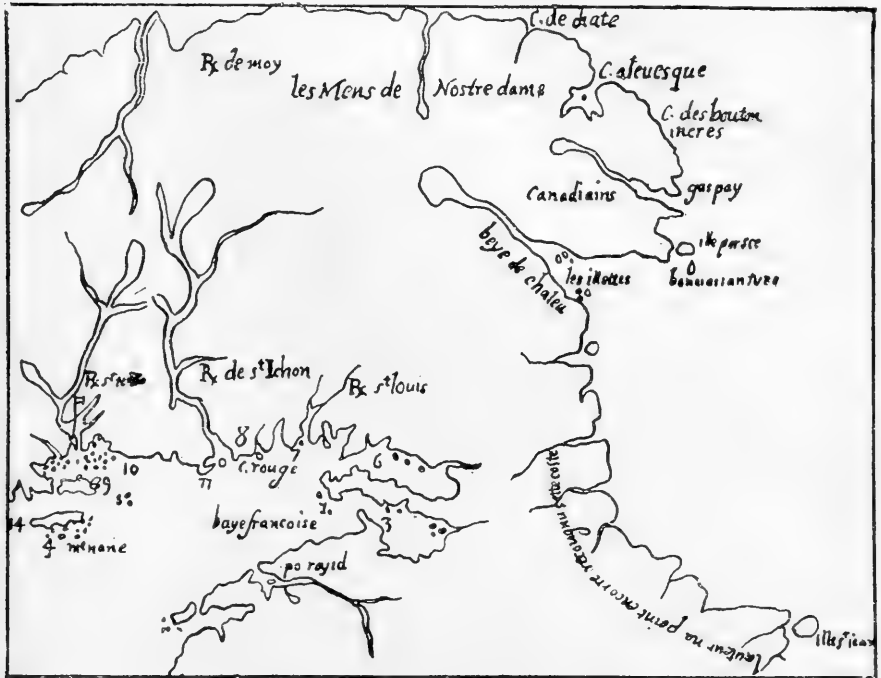


FIG. 14.—CHAMPLAIN, 1613. TYPE.

From Quebec reprint; $\times \frac{9}{10}$.

- | | |
|--------------------|------------------------|
| 4. Ile gravee. | 9. Port aux coquilles. |
| 6. Baye de gennes. | 10. Illes iumelles. |
| 7. Ile perdue. | 11. Cap St. Jean. |
| 8. Cap de mine. | 14. Illes rangees. |

he writes the honest legend, "L'ateur na point encore recougnu sette coste." Indeed, I have tried in vain to trace in this map any influence of the earlier ones so far as topography is concerned, and except for Baye Chaleur, and I. S. Jean, earlier referred to in this paper, it seems to be all quite new in this region.¹ In his Voyages, there is also a smaller

¹ Possibly another case is found on the 1632 map in the Cap d'Espoir (73 on the map) which he says in the explanation is "proche de l'Isle Percée." This has now become Cape Despair. It is difficult to believe that it is any other than Cartier's Cape d'Espoir or Cap Desperance, accidentally displaced by Champlain.

map, dated 1613, but of no special interest except for the form of the cross he gives to the St. Croix. In 1632, in the collected edition of his works, appeared his second important map (Fig. 15), which, while a great

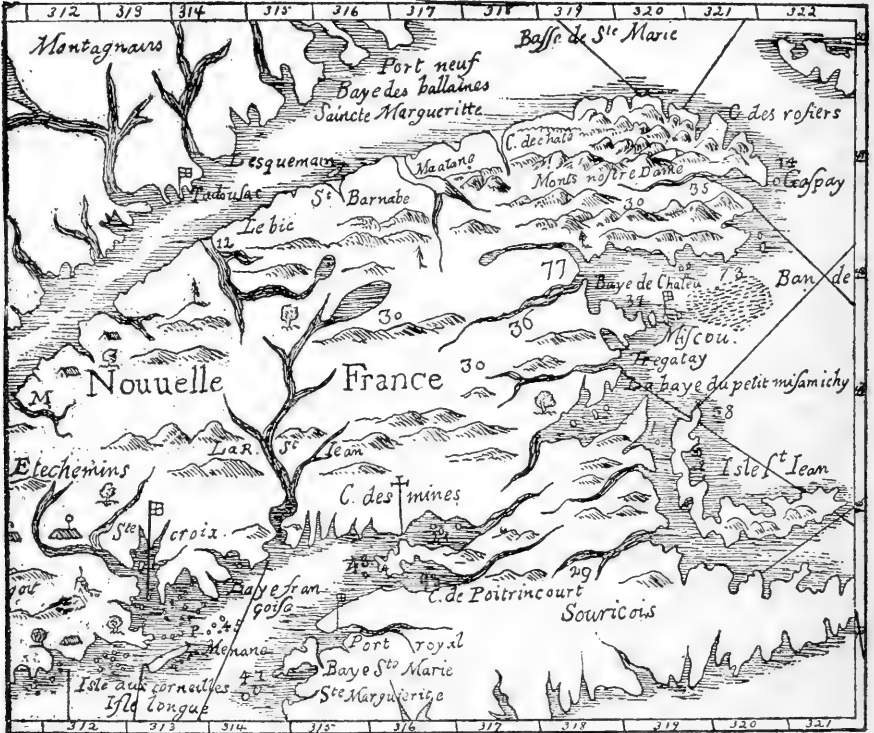


FIG. 15.—CHAMPLAIN, 1632.

From Quebec reprint; $\times \frac{5}{8}$.

- P. Port aux Coquilles, qui est une isle à l'entrée de la riviere S. Croix
bonne pescherie.
29. Riviere par où l'on va à la Baye Française.
30. Chasse des Eslans.
35. Riviere de Gaspay.
36. Riviere de Chateau.
37. Plusieurs Isles près de Miscou, comme est le port de Miscou entre
deux Isles.
38. Cap de l'Isle saint Jean.
47. Petit passage de l'Isle Longue.
48. Cap des deux Bayes.
73. Le Cap d'Espoir, proche de l'Isle Percée.
74. Forillon, à la pointe de Gaspay.
- [24, 45, 77, 93, not explained.]

improvement upon the Gulf of St. Lawrence coast, is actually much poorer for the Bay of Fundy than the 1612 map, an excellent illustration of the degeneration of maps where no new knowledge is available.

There is nothing in his works to show that Champlain had visited Northumberland Strait himself, but his numerous voyages through the Gulf, and his position as Governor of Quebec, gave him the best of opportunities for learning from others who knew the region well.

From the great publicity given at once to Champlain's maps by the publication of his works, it was to be expected that his influence would at once make itself felt in contemporary cartography. Still it was several years before the old types died out, as the maps of Sanchez, 1623,

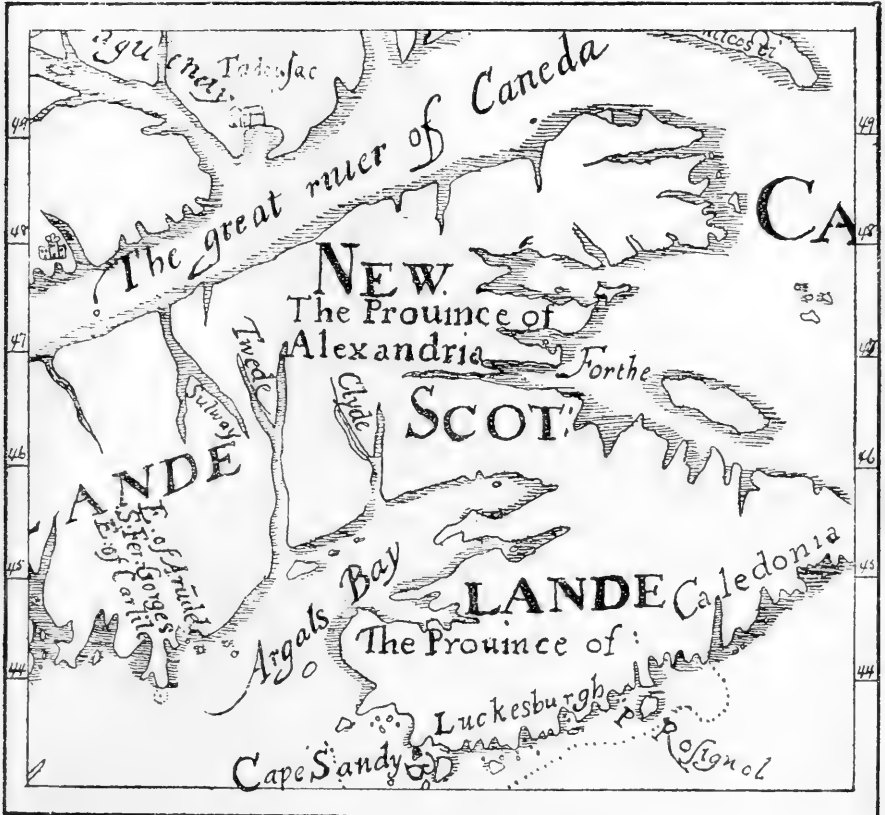


FIG. 16.—ALEXANDER, 1624.

From Prince Society; full size.

Oliva, 1650 and others show, and Winsor mentions many of date later than 1613 which retain the older types. The first to adopt the new is that of Jacobez, of 1621, which is simply a transcript of Champlain. A map by Hondius after 1613 and by Briggs of 1625 also shows this influence. The 1612 map, with, however, some more accurate information about the size of Prince Edward Island, is the origin of the well-known Alexander map (Fig. 16), which, perhaps, for its novel nomen-
Sec. II., 1897. 20.

Sauvages were on Prince Edward Island, and hence he left them on the mainland and simply added the island, bringing them as we see on the map, and this curious error is followed by several others. It is quite possible, as I have elsewhere argued, that this name *C. des Sauvages* became fastened to the coast near Baye Verte, and survives altered in the present Cape Tormentine,¹ but this is little more than a guess, and I have



FIG. 18.—SANSON, 1656.

From original; full size.

no proof of it to offer. De Laet was not only a careful compiler and copyist of maps, but he read Champlain's narratives with care, and in his book he remarks on searching through Champlain's narrative for a mention of the name St. Louis, which of course he did not find.² De Laet is closely followed by Visseher. (Fig. 21.)

The publication of the 1632 edition of Champlain caused it to supersede that of 1612, and its influence appears in the Sanson map of 1656 (Fig. 18), in which, however, a new word, *Regibouchou* for the first time appears, taken, no doubt, from the Jesuit Relations, in which it occurs in that of 1646 spelled *Regibouctou*. In other maps, however, Sanson goes back to the earlier type, restoring *C. des Sauvages*.

It is Sanson chiefly, though with some new information from the missionaries, which Creuxius follows in his map of 1660. (Fig. 19.) The

¹ These Trans., VII., ii., 18.

² DeLaet, though he places St. Lunaire as a bay on his map, in his work speaks of it as a strait, which it really is.

names have a Latin form, and several are new, as *I. perdicū* (Partridge I.), *Nepegequitius pagus*, (land of Nepisiguit), and *pipechiquiatius* (probably Belledune Point). The name *Pr. Fodinarū* (Cape of Mines) is interesting from its suggestion of Fundy. But this map of Creuxius seems not to have influenced any others. Closely following Champlain is the map of Van Loon of 1661, and the *Tabula Novæ Franciæ* of 1663.

In "The English Pilot" of 1702 occurs a map of considerable importance, whose date must be much earlier. (Fig. 20.) There is an edition.



FIG. 19.—CREUXIUS, 1660.

From original; full size.

of this work as early as 1671, but I have not been able to see it. In its water passage to the St. Lawrence it shows a connection with Dudley's chart of 1657, presently to be considered; but its chief interest lies in the remarkable set of names it bears, to the origin of which I have not the slightest clue. Thus, on the Bay of Fundy, are *Shell Har.* (P. aux Coquilles of Champlain?) *Ascrion, Belle, Labor or Oyster B, Naporo* (perhaps the Napraux of Franquelin of 1686). On the North Shore appear the new names *Sauveur, Platta, Randingo, Burselle, Ligene, Bastus* (compare *bestus* of Homem, probably only a coincidence). These names are new, while older ones are misspelled. *Caraqui* is, no doubt, *Caraquet*, and occurs on Denys, 1672, and *Sauveur* suggests Denys' *Saumon*. I think there must have been some other map which is now lost, from which these names are taken, for it can hardly be supposed that so elaborate

nothing new, for New Brunswick cartography at least. Through this maze it is happily not necessary for our present purpose to attempt to thread our way, but he that is interested will find Winsor's chapter, "The

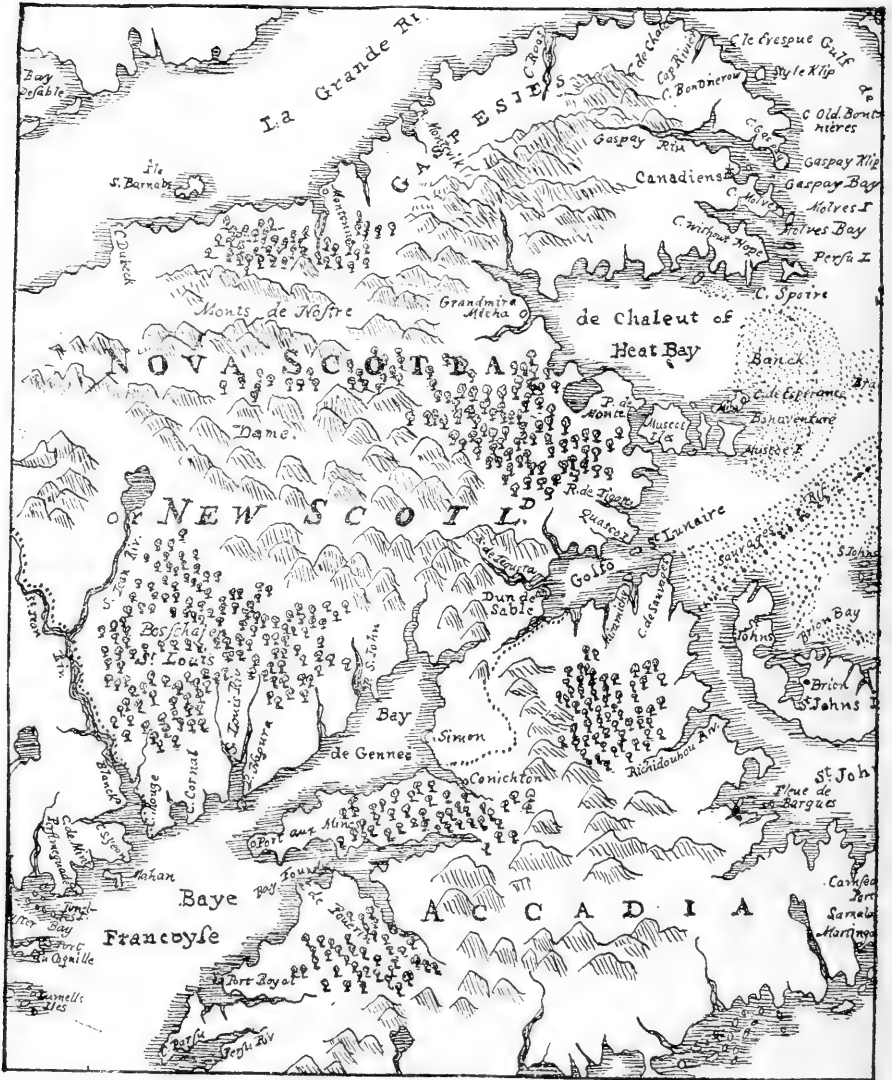


FIG. 21.—VISSCHER, 1670 (?).

From original; x $\frac{1}{10}$.

General Atlases and Charts of the Sixteenth and Seventeenth Centuries,"¹ most valuable. But we must at least note here the names of the makers of these atlases, of whom the principal were Mercator, Ortelius,

¹ America, IV., 369.

Quadus, Hondius, Blaeu, Sanson, Visscher. Atlases of Sea-Charts were made by Jacobez, Dudley, Colom, Doncker, Van Loon, Goos, de Witt, Jaillot, "The English Pilot."

In this period, as in others, we find certain aberrant types, of which two are of particular importance. In 1647 appeared the curious chart of Dudley, with its many repetitions of names all turned into Italian. It follows, however, Champlain, with some additions from his narratives; it makes a sea-passage from the St. Croix through to the St. Lawrence, in which it follows the Hakluyt-Molineaux map of 1600, and it is followed by the map of 1702 in the English Pilot, already referred to. Still more remarkable is the map of Nicolas Visscher (Fig. 21), of uncertain date, but of about 1670. On this there are curious repetitions and other remarkable features. The Passamaquoddy Region is given with greater fulness on Homann's *Nova Anglia*. (Fig 22.)

The entire topography of Visscher is taken with a fidelity altogether rare in these early maps directly from De Laet, except for new errors about Grand Manan, and his names, also, are adopted exactly as far as they go, but, in addition, many new ones appear, which are the same as those on the English Pilot map, already referred to. One might at first suppose that these names on the latter were taken from this map of Visscher, but that is hardly possible, for the topography which accom-



FIG. 22.—HOMANN, 1670 (?).

From original; $\times \frac{1}{2}$.

panies them is entirely different in the two cases. By comparing Visscher with De Laet (Figs. 17 and 21) it will be seen that Visscher follows the topography of De Laet very exactly, and adds these curious names to it, while the English Pilot map has no trace of the De Laet topography, and hence could not have been copied from Visscher. Moreover, the entire series of names on the two maps on the north shore is quite distinct, again showing that one has not influenced the other, but both have taken their information from other sources. The Visscher names on the North Shore, *Grandmira Micha*, *P. de Monte*, *Quasco*, *Tequsta*, *Dun de Sable* are new and do not reappear, except that the word *Quasco* is on a map of 1722, by Edward Wells; otherwise Visscher's map has had no influence, and it remains another cartographical puzzle.

Another aberrant map of much importance is that of Nicolas Denys, of 1672. This was made from his personal observations, and is largely independent in details of topography and in nomenclature from all

Thus the period closed, with our entire sea-coasts laid down, though from hasty traverses, not true surveys, and with the interior hardly at all represented.

TYPE No. 4.—THE DELISLE TYPE.

DELISLE, 1703, TO BELLIN, 1744.

The beginning of the representation of the interior, based upon maps made by the Jesuit and Recollect missionaries, and by the Intendant De-Meuilles, after a journey of exploration ; the entire courses of all the principal rivers, except the St. Croix, shown, but with much error ; no improvement in the coasts at first, but later a survey by Blackmore, improved somewhat by Southack, gave a better type for the Bay of Fundy. Began with Delisle's map of 1703, based on Franquelin of 1686, and ended with the appearance of Bellin's map of 1744.

The preceding period had shown practically nothing of the interior of the province ; in this, without much improvement on the coasts, the interior begins to differentiate. In 1703 appeared Delisle's map (Fig. 24), which, for the first time, showed with some approach to correctness the courses of our larger rivers. Guillaume Delisle (1675-1726) was an official map-maker of France, and, of course, had access to the best sources of information. What these sources were, we must now examine.

From about 1613 both Jesuit and Recollect missionaries were pursuing their noble work among the Indians of New Brunswick, and from references in the "Relations" and elsewhere there is no doubt they made maps of the places visited by them, which they sent home to France¹, and to some extent these influenced the maps of the preceding period, such as those of Creuxius and Coronelli. But the earliest of these missionary maps of any importance that I know of, is the fine one of 1685, by Emmanuel Jumeau, Recollect (Fig. 25), which establishes a new nomenclature for the Gulf of St. Lawrence coast, and one which largely persists. Its topography, based on personal observation, is far more accurate than in any of its predecessors. I have tried to give a full analysis of these names, and, indeed, of all others occurring upon our maps, in my "Monograph of the Place-Nomenclature of New Brunswick," where they may be found discussed under their modern equivalents. Some of the names on this map seem to be miswritten, as a result of many copyings ; thus, no doubt, on the original *pakmouet* is written *pokmouch* ; *eravudi*, is

¹ Le Père Aubéri left a map of Acadie in 1720. Dionne, *Le Can. Français*, II,

tracadi; *huan*, is *heran*; these are easily transposable letters. Of the other names, some are extinct, some have appeared on other maps, but not a few occur for the first time, such as *pakmouet* (Pokemouche), *Chipigan-chich* (Shippegan), *tabochimkek* (Tabusintac), *potaye* (Portage), *echkou-*

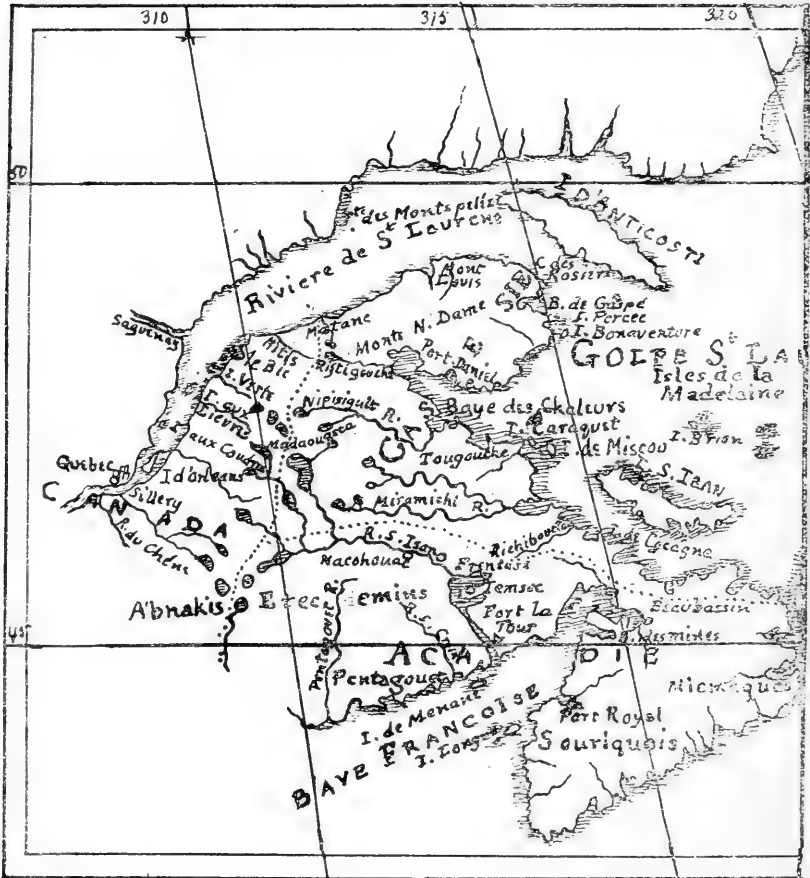


FIG. 24.—DELISLE, 1703. TYPE.

From original; full size.

menak (Eseuminac), *chédiak* (Shediak). A very important point is the application of *chiendi* to Barnaby's river, where it belongs (from the Miemac See-quah-dik), for this name persisted long and gradually became transferred to the main Miramichi itself. The presence of the crosses and the reference in the title to the reverence of the Indians for the sign of the cross form a puzzle in our early history¹.

¹The title is as follows: La grande baye de S. laurens en la nouvelle france mise dans un jour ou elle n'auoit jùqu'icy parue, l'exactitude, la curiosité et la



FIG. 25.—JUMEAU, 1685.

From copy in Library of Parliament, Ottawa ; x $\frac{2}{3}$.

justesse y aiant esté observées autant qu'il a esté possible et que Ces mémoires des habitans du même lieu ont pû fournir jointe à cela la propre connaissance du géographe qu'il à de plusieurs endroits notamment de la ruière de Ste croix, où faisant la mission il à eu l'honneur d'adover plusieurs fois de grandes croix arborées au milieu des déserts et des bois par les fauages nationaux nommés porerois aiant

Closely following this map came that of Franquelin of 1686, made to illustrate the voyage of M. De Meulles of 1686. (Fig. 26.) There is no map in our whole history which is of greater interest than this. No other up to that time had been made upon nearly so large a scale (about 8 miles to 1 inch), and hence none had allowed of so much detail, and the great abundance and accuracy of the names make it a treasure to the student of the origin of our place-nomenclature. Nearly all of the many Indian names are easily recognizable by comparison with the names used for those places by the Indians to-day, as I have shown fully in my "Monograph of Place-Nomenclature." It is plain that the Gulf of St. Lawrence coast is taken from Jumeau; a few names are added, a few omitted, the spelling of some misspelled on the copy of Jumeau is given here correctly, but, in the main, topography and nomenclature are the same. But the Bay of Fundy and all of the interior are new, and happily, we know in part, at least, their origin. In the year 1686 De Meulles, the intendant, visited Acadia, and made a thorough inquiry into the condition of the country. His account of his voyage is extant, but I have not been able to see it, and I do not know how much of the topography of this map was laid down as a result of a personal visit from him; how much from explorations made by Franquelin, the engineer who drew the map; how much was obtained from traders and missionaries, and how much from the Indians. The great abundance and accuracy of the Indian names show that these, at least, could have been obtained only from the Indians themselves. On the Bay of Fundy some of the names (whose fate may be followed in my "Monograph") have disappeared, but the following, which have persisted, appear for the first time on this map: *ha ha*¹, *arag * (Enrag ), *Ariquaki* (Quaco), *Michepasque* (Mispec), *Menagoniche* (Meogenes, or Mahogany), *micheoarcors* (perhaps Musquash), *Napraux* (Lepreau). But in the interior everything is new, and all of the names along the St. John, Indian and French, excepting only *Medawoasca*², *Ramouctou* (Oromocto), and *Canib qu chiche* (Kenebecasis) *freneusse*, *n repisse* (Nerepis), are new; and the same is true of the abundance of Indian names on the other rivers. One of the most defective parts of the map is the region about the head of the Bay of Fundy, which is very poorly given. The course of the Miramichi is shown with the

re ue la croix diuinement du ciel longtems auant l'arriu e des fran ois ence pays. faite par Le R. p re Emmanuel jumeau recollect missionnaire en Canada. 4 oct. 1685.

I think there can be no connection between the P. S. Croce of the Italian maps and the name St. Croix, applied to Miramichi; it is, doubtless, a mere coincidence. On this name applied to the Miramichi, see Shea's translation of Le Clercq's "Establishment of the Faith," and Dionne, Jacques Cartier, 234.

¹Now a lake in Albert, partially traced in my Monograph.

²The symbol 8 was used by the French for the sound expressed by oo in moon. It was chosen because the sound they wished to express is well rendered by the initial sound of huit.



FIG. 36.—FRANQUELIN (DEMEULLES), 1686.

From copy in Library of Parliament, Ottawa; x 1.

most surprising accuracy, as is that of the Nepisiguit. There is, however, a great error in the upper part of the St. John, and one which powerfully influenced all maps for over a century. The Tobique, *négoott*, is shown correctly at its head, with a double branch, one heading with the Little Southwest Miramichi (*Mtotoo*), and another now called Nictor, heading with the Nepisiguit (compare Fig. 26, modern map Fig. 1), and the accuracy of these headings, even to the correct number of the lakes and the portage (oniguen) is wonderfully correct. But just below the forks of the Tobique the river is made to flow into *Lac Medaooasca* (Temiscouata), a most unaccountable error, but one which, as we shall see, strongly influenced the maps of the next hundred years. Had this map been published and generally accessible, it would, of course, have formed a distinct type in our cartography, but no trace of it appears in any printed map until that of Delisle of 1703, which, being accessible and copyable, therefore became the type.

Franquelin was a map-maker of great skill and immense productivity, but far less known than he deserves to be, principally for the reason that few of his maps were published. Properly he established our fourth type, though its publication by Delisle makes it necessary to refer to it by his name. Franquelin, according to Marcel (Catalogue), was appointed hydrographer of France in 1686, and probably died in 1697, though there is a map by him dated 1708. His map of 1684, and several others of his, so important for other parts of North America, is of little importance for Acadia, which is laid down very erroneously on it. But his 1686 map, to which I have so fully referred, gave him new data, which are fully used in his map of 1708. This map differs somewhat from that of 1686, as in the omission of L. Madawaska, the use of *Chichiegoui* for Cheminpic, and the presence at the mouth of the St. John of *Fort la Tour* on the east side of the river, and on the west, *F. Martignon*. The latter is, of course, for Sieur Martignon, who received a large seigniorial grant on the west side of the mouth of the river in 1676. Marcel (Catalogue, No. 279) speaks of this as a "Réduction de la Carte de 1682," which, however, for Acadia it is not.

Of other manuscript maps after Franquelin-De Meulles, there are but two that I know of. One is a map of New England, already reproduced in these Transactions (IX., ii., 70), dated 1680, but certainly belonging later (1685?). Its topography on the upper river recalls that of Franquelin, but is simpler, and it, or its original, is followed by Moll, 1715¹. Another is that of Guillaume de Rozier of 1699, which, while very erroneous as to the lower river, has the upper part and the St. Croix and Magaguadavic remarkably well drawn, far better indeed than any other map until a hundred years later, but it was not followed by any other that I have seen.

¹ Le Clercq's *Carte générale* of 1692, on too small a scale to be of much use, marks the Recollect Missions of Miscou and La Valiere.

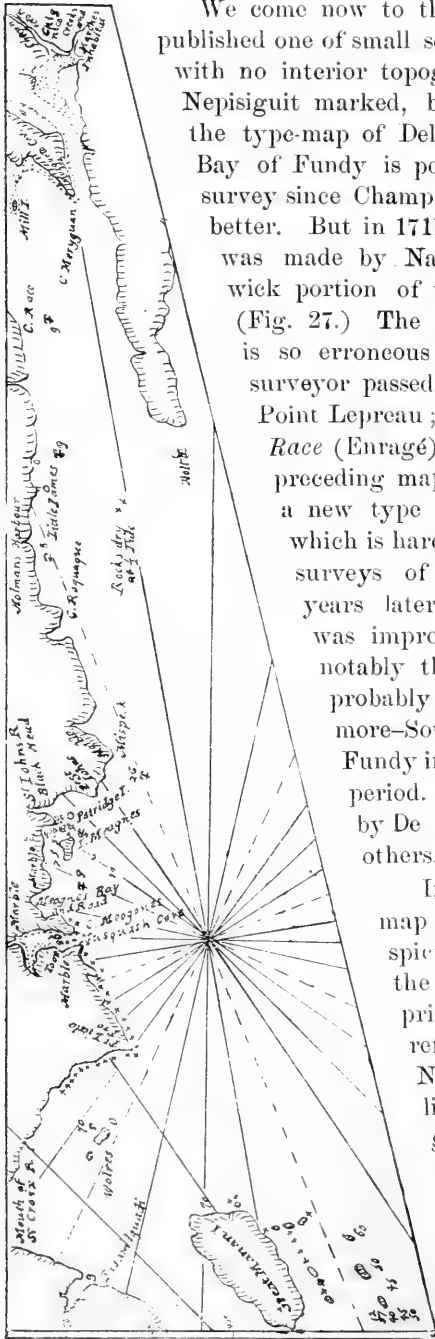


FIG. 27.—BLACKMORE, 1713.
From original; $\times \frac{1}{2}$.

We come now to the maps of Delisle. In 1700 he published one of small scale, but mostly of the old type, with no interior topography, and the Restigouche and Nepisiguit marked, but transposed. Passing now to the type-map of Delisle (Fig. 24) we note that the Bay of Fundy is poor, for there had been no new survey since Champlain, and copies grow worse, not better. But in 1711 and 1712 a survey of the bay was made by Nat. Blackmore, the New Brunswick portion of whose chart is given herewith. (Fig. 27.) The portion west of *Pt. Little Pro* is so erroneous that it must be supposed the surveyor passed directly from Grand Manan to Point Lepreau; the remainder of the coast to *C. Race* (Enragé) is laid down better than in any preceding map, and E. of Lepreau it establishes a new type for the Bay of Fundy region, which is hardly superseded until the excellent surveys of Wright and DesBarres, sixty years later. The Passamaquoddy region was improved somewhat in later charts notably those of Southack (Fig. 28), and probably by him, and this improved Blackmore-Southack is the type of the Bay of Fundy in the English maps of the next period. This map of Delisle is followed by De Fer, 1705; John Senex, 1710, and others.

In 1715 appeared the remarkable map of Moll (Fig. 29), which is conspicuous for its attempt to combine the topography of several earlier printed maps, and shows but little reference to Delisle. The entire North Shore shows no sign of Delisle, Franquelin or Jumeau, but goes back to a much earlier and still unknown type, of which I have already spoken (See Fig. 20), as witness the old names, *Sauveur*, *Plata*, *Randingo*, *Burselle*, *Ligene*. The Bay of Fundy is taken from

Blackmore almost exactly, but with one important difference, namely. Moll makes the St. John empty where Blackmore puts "Mouth of St. Croix River," a curious error, which seems to be pure carelessness. The lower part of the St. John shows the influence of Delisle in the double lake, but above that it is evidently taken not from Delisle, but from the same source as the New England map of 1685, which it so closely resembles



FIG. 28.—SOUTHACK, 1733.
From original; $\times \frac{3}{4}$.

(these Trans., IX., ii., 70). Thus Moll is a composite from at least four sources. There are several later maps by Moll, but none of them any improvement over this.

In 1733 appeared Popple's map (Fig. 30), which, on the North Shore is curiously different from any single map we know, but, in the main, seems to follow Delisle. It is the latest map I know of which retains Cartier's old C. Savage; the placing of I. Cocagne so far to the south is easily understood by reference to the ambiguous way in which that name stands on Delisle. The Bay of Fundy is from Blackmore, with a difference but hardly an improvement, in the Passamaquoddy region, while the interior seems to represent an attempt to harmonize Delisle and Moll, but with some new distortion introduced.



FIG. 23.—MOLL, 1715.

From original; x 9/10.

A map-maker of much independence and originality of orthography was Captain Cyprian Southack. Upon his map of 1746 he tells us he had cruised on the Atlantic Coast, from 1690 to 1712, in the service of the Crown. Green states in his "Explanation:" "Part of this last [i.e., St. John River] to the Fort of Naxoat, 28 leagues upwards from its mouth, was surveyed in the year 1697, when the English attacked the place.¹ The draught is ascribed to Captain Southack, and is laid down by a scale of one league to an inch one-eighth." Unhappily this is entirely lost, but it is fair to suppose that its chief features are shown on Green's map of 1755, presently to be referred to. Another map which, I think, is Southack's, already printed in these Transactions (IX., ii., 72) in an atlas dated 1707, but doubtless itself made as early as 1696, is very curious and of remarkable spelling, though most of the names are recognizable. On it occurs for the first time the name Wolves. Southack's chart of 1733 is of some importance²; it follows Blackmore in the Bay of Fundy, except about Passamaquoddy, where it introduces a new topography (Fig. 28), which was followed by Green, Mitchell and others. I think that on this map Passamaquoddy bay is not at all shown; that "Passamaquoddy River" represents the passage between Deer island and Maine, and the "St. Croix River" is Letite Passage. On this supposition the topography is intelligible, and far more accurate than on those which preceded it, or which followed it until the surveys of Mitchel in 1764. On the North Shore, however, it is very inaccurate, and, perhaps, put in from hearsay; he uses such curious names as *Barnabas Inlett*, *Naparont*, *Bastues Inlett*, etc., and uses *Red Sea* for Northumberland Strait, as do some other maps. A later map of his, of 1746, is again original, but contains little that is new, and produced no effect upon others.³

Another aberrant map of this period, but one of some local value, is that of La Hontan, of about 1740.

¹ Reference in Dexter's Church's Expeditions, II., 97, 124.

² Green states that this was published in 1731, but near a fort at St. Peter's, it has the inscription, "fortifying in 1733."

Green (in his "Explanation," p. 5) says of this chart: "A very coarse and erroneous Draught, yet not without its use. . . . It does not appear, however, that in making this chart he employed any Instruments excepting the Log and Compass. On which occasion I must observe, this is the first Time perhaps that ever a Person bred to the Sea undertook to make a Chart of so great an Extent of Coast, without ever taking a single Latitude; and for the Honour of Navigators, as well as the Safety of Navigation, I hope it may be the Last."

In "Dominion Archives," 1895, p. 11, is mentioned a "Memorandum of the Bounds of the Sea-Coast of Nova Scotia," by Southack.

³This map (the only copy that I know of is in possession of Mr. Jonas Howe, of St. John), in reference to a portage at the head of the St. John, has this legend: "Branch where Mr. Nelson, Coll. Tyng & Capt. Allden, when taken prisoners by the French in the year 1692, were carried prisoners to Quebec." This incident is explained in Murdoch, I., 199.

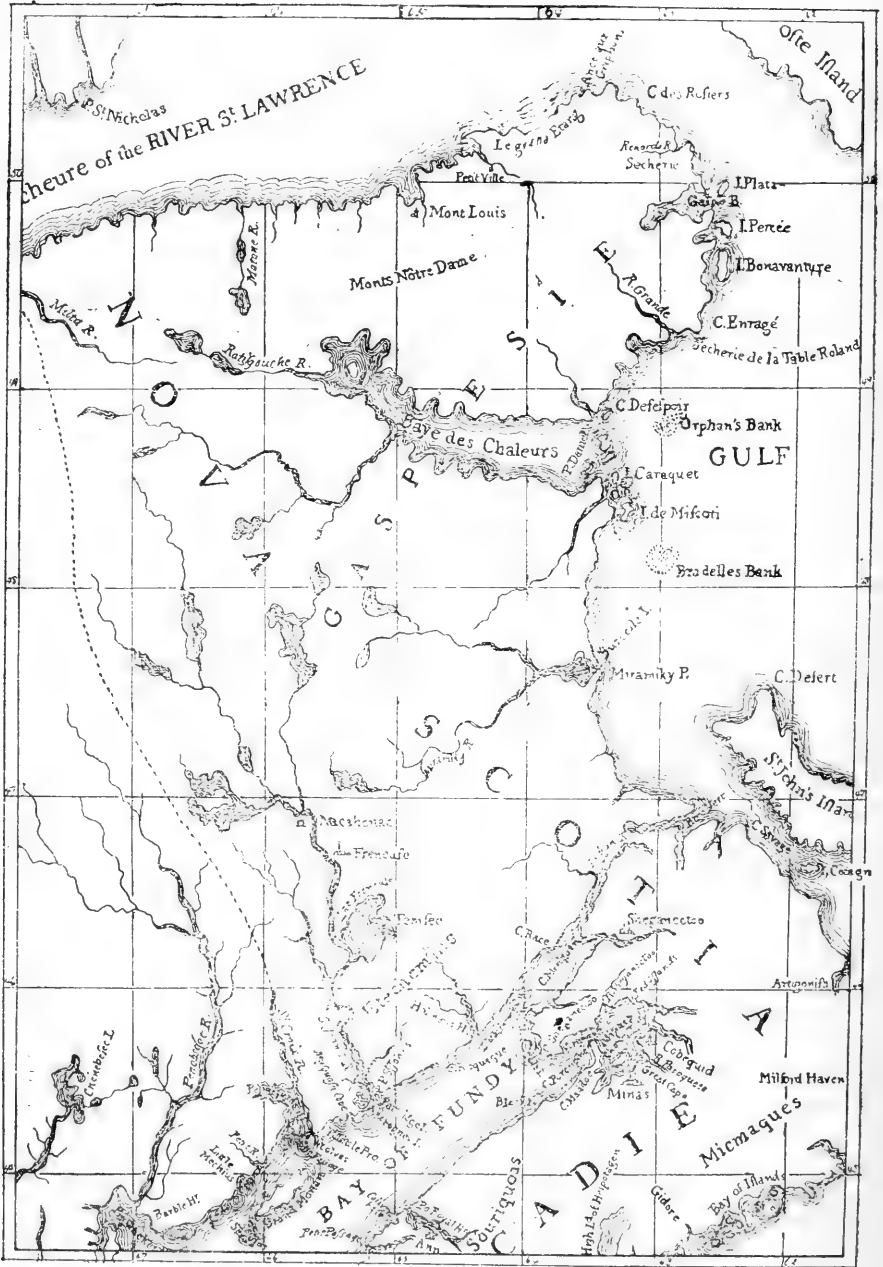


FIG. 30.—POPPLER, 1733.

From original; x 1/2.

This period, a short one, is thus characterized by a mixture of forms. Delisle gave a new type, but it suffered from its small scale, and did not impress itself so markedly upon the following maps as many other types have done. But it prepared the way for the great map by Bellin of 1744.

TYPE No. 5.—THE BELLIN TYPE.

BELLIN, 1744, TO CORRECT SURVEYS, ABOUT 1770.

The beginning of larger scale maps with more detail, especially in the interior; also, the dawning of the era of continuous, as distinct from discontinuous or saltatory improvement; the coasts little improved over the preceding period, but the interior much more fully shown, though with many errors, in part an inheritance from the preceding period; the St. Croix added to its source, and the head of the Bay of Fundy, at first poor, rapidly improves through knowledge gained from the events of 1750 to 1755. Began with the fine map of Bellin of 1744, and ended with the surveys of Morris, Wright, DesBarres and Holland.

The greatest French map-maker of the last century, with the possible exception of D'Anville, was Jean Nicolas Bellin (1703-1772). He was official cartographer of France, and under him was gathered the great collection in the *Dépôt des Cartes de la Marine*, which helped to make French maps in the last century of the foremost excellence and authority¹. Naturally he had access to all information then existent in France, and so well did he improve his opportunities that his maps are a great advance over all predecessors. His first map of importance to us is that of 1744, which he made for Charlevoix's "Histoire," (Fig. 31). Of this map Bellin himself says with perfect truth, in "Histoire generale des Voyages" (XII., p. xvii.): "I can say that I have been the first to lay down Canada and Louisiana with any kind of precision. The details to which I have had access have been hitherto unknown. To be convinced of this it is only necessary to glance at the charts which appear before 1744. But I have had the satisfaction since that time to find them in the works of our best geographers, who have adopted them with a confidence which greatly flatters me." This map is upon a larger scale than any printed map that had preceded it, and is a part of one of rather limited area; most of the preceding maps we have quoted have been either maps of the world or else of North America, and now, for the first time, is Eastern Canada of enough importance to have a map to itself. In addition to the large map, there is another of Acadia in the same volume of Charlevoix, which contains some information not on the larger.

¹ On Bellin, see Winsor, *America*, V., 420.

In considering Bellin's 1744 map, we must recall the fact that he had access to practically all existent materials, and these included many sketches now lost to us. On the North Shore it is easy to recognize his debt to both Jumeau and Franquelin, for while most of the names and the topography are from the former, *I. au pendu* and *Plauganic* (corrupted from *Pogomkik*) are from the latter. The head of the Bay of Fundy is extremely confused, suggesting that it was laid down from the reading of reports rather than from any sketch, for the inversion of the names *Memeramecou* and *Chidapouchi* (Shepody) can hardly otherwise be explained. The remainder of the Bay of Fundy is a degenerated copy from Blackmore, with some names from Franquelin, and is especially poor in the region of Passamaquoddy, where it shows no trace of Southack's improvement over Blackmore. All of this is true, also, of his map of Acadie, which, though it has some additional detail, is no more correct than the other. Neither of them has any new names in this entire region, all occurring either upon Franquelin or Blackmore. Passing to the interior, we find most prominent in the older parts the influence of Franquelin, though with an attempt at the correction of some of his errors, and, in addition, a few new features. Here, for the first time, the St. Croix is laid down and with some correctness, for it is made to head in a lake near a branch of the Penobscot on the one hand, and with the lakes emptied by the Medoctec on the other. The Medoctec, however, though heading with the St. Croix, empties here near the Grand Lake, an error which I have elsewhere explained¹, as probably due to a confusion of the river named *Meductic* (Eel river, below Woodstock), with the creek or point named *No-dec-tic* by the Maliseets, which is situated a short distance above the mouth of the Belleisle on the west bank. This error, however it arose, persisted long and was only rectified near the close of the century. Another error, for which I can think of no excuse, is the placing of the *Chacodi* so far to the westward and making it so large, for on Jumeau, from which it was no doubt taken, it is correctly given to Barnaby's river, a small stream not far from the mouth of the Miramichi. This error, also, soon became prevalent and was intensified, so that *Chacodi* became applied to the main south branch of the Miramichi, and so appears on many maps; while later, even in the present century, in both maps and documents, through a confusion of the Indian name of the Miramichi (*Restigouchiche*, or Little Restigouche), with the Restigouche itself, *Chacodi* became transferred to a south branch of the latter river; but, finally, after all these wanderings, it has become extinct. What an inertia some errors seem to have when once started, backed by authority! The Grand Lake is here very clearly shown for the first time on a printed map, no doubt from Franquelin, though his *Chimenpy* (Indian, *Che-min-pic*, now Salmon river) has become misprinted to *Chimanisti*, in which

¹ Monograph, 250.

form it long prevailed. The curious name, *Nid d'Aigle*, I have elsewhere explained¹, but I have no explanation to offer for the bilobed lake west of it, which is certainly not on Franquelin. On the upper

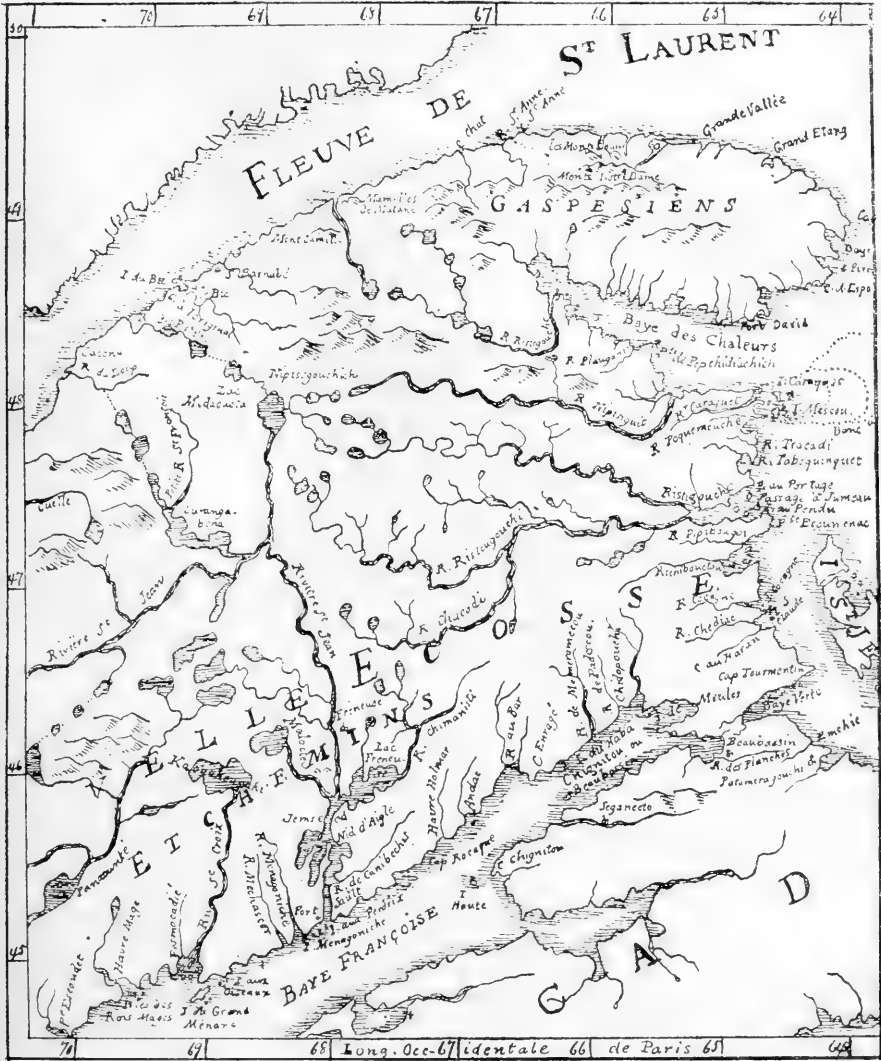


FIG. 31.—BELLIN, 1744. TYPE.

From original; x 1/2.

part of the St. John we find a most important advance over Franquelin and Delisle, for *Lac Médousta*, so far out of place on Franquelin, has been carried up to its proper position relatively to the St. Lawrence, but it

¹ Monograph, 257.

drags with it the *negooit* (Tobique) of Franquelin, which, in turn, takes along the Miramichi and Nepisiguit, with which it headed. Thus these rivers are carried both too far west and too far north, and hence have forced the Restigouche still farther north. What a distortion thereby is produced will become plain on comparing this map with the modern one. (Fig. 31 and Fig. 1.) This error in these three rivers persisted on printed maps until near or into the present century! Indeed, I do not know a printed map before that of Purdy of 1814, which has not the Restigouche thus out of position. On Bellin *Lac Medaousta* (of course, Temiscouata) heads properly with the Trois Pistoles; west of it comes the St. Francis heading with the R. du Loup, but here is a new error, for the St. Francis falls into a large lake called *Ourangabena*. The shape of this lake suggests at once that it was confounded with Temiscouata, which, I think, is the case, but the name Ourangabena I have been unable to trace except to a possible origin in an old Indian name for Baker brook, below St. Francis.¹ This Temiscouata-shape for the St. Francis likewise long persisted. Indeed, Bellin is honoured by his errors, for they show how closely all followed him, and he was not superseded in this region until the appearance of the modern maps based upon surveys.

The success of Bellin's new map was immediate. It was followed by D'Anville in his map of 1746 and by many others. In 1755 Le Sieur J. B. B. D'Anville (a great French cartographer, 1697-1782,²) published a fine map (Fig. 32), which, while in the main following Bellin, yet differs in some particulars, for he has tried to correct Bellin by the use of other authorities. Thus, upon the north shore, while in the main following Bellin, there are many new names, *Midicho*, *Pansaguet*, *Vieux Caichi*, *Minaqua*, *R. des 6. Bretons*, *Tenescou*.³ Happily, we can set these names back one stage, for in the French Archives there is a fine map undated and without author (Fig. 33) which, without any doubt, is the original of this part of D'Anville. Perhaps it, like that of Juneau, was the work of a missionary, but it is also possible that it was made by some officer, possibly by Pierre Boishébert, who was so active in this region from 1750-55. This map is the most accurate made of any part of New Brunswick up to that time. Chief reasons for considering it the original of D'Anville are, its greater accuracy and its much greater scale. It locates exactly the two curious names *R. demibreton* and *amion caichi*,⁴ which, more or less altered, occur on later maps. The names mentioned above as new on D'Anville, and several others, occur on it for the first

¹ See Monograph, 259.

² An important work upon his life, with a list of his works, is "Notice des Ouvrages de M. D'Anville," Paris, 1802, 120 pp. 8vo. This shows a list of 211 maps and 78 other publications.

³ All of these are explained in my Monograph.

⁴ On which see Monograph, 223. In that work this map is quoted as the Survey map of 1755.

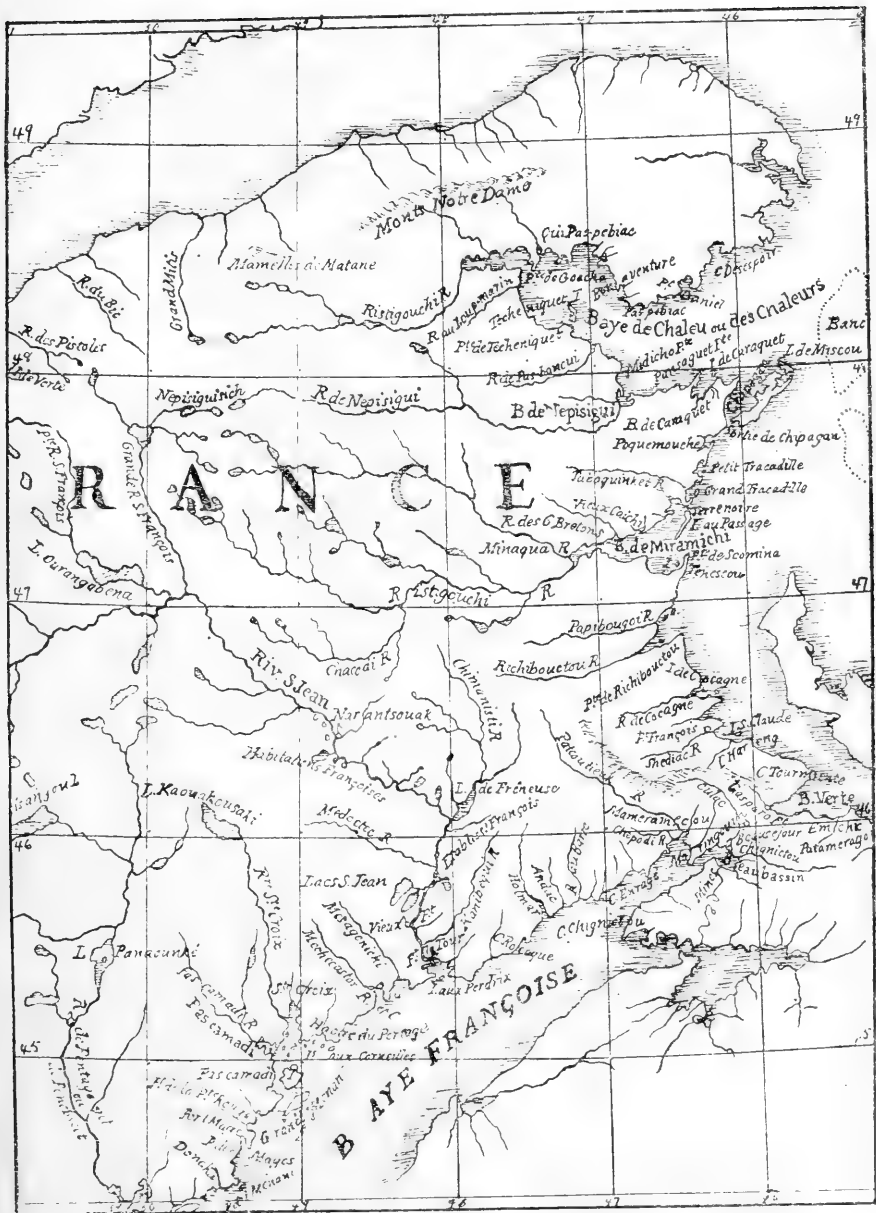


FIG. 32.—D'ANVILLE, 1755.

From original ; x 1/2.

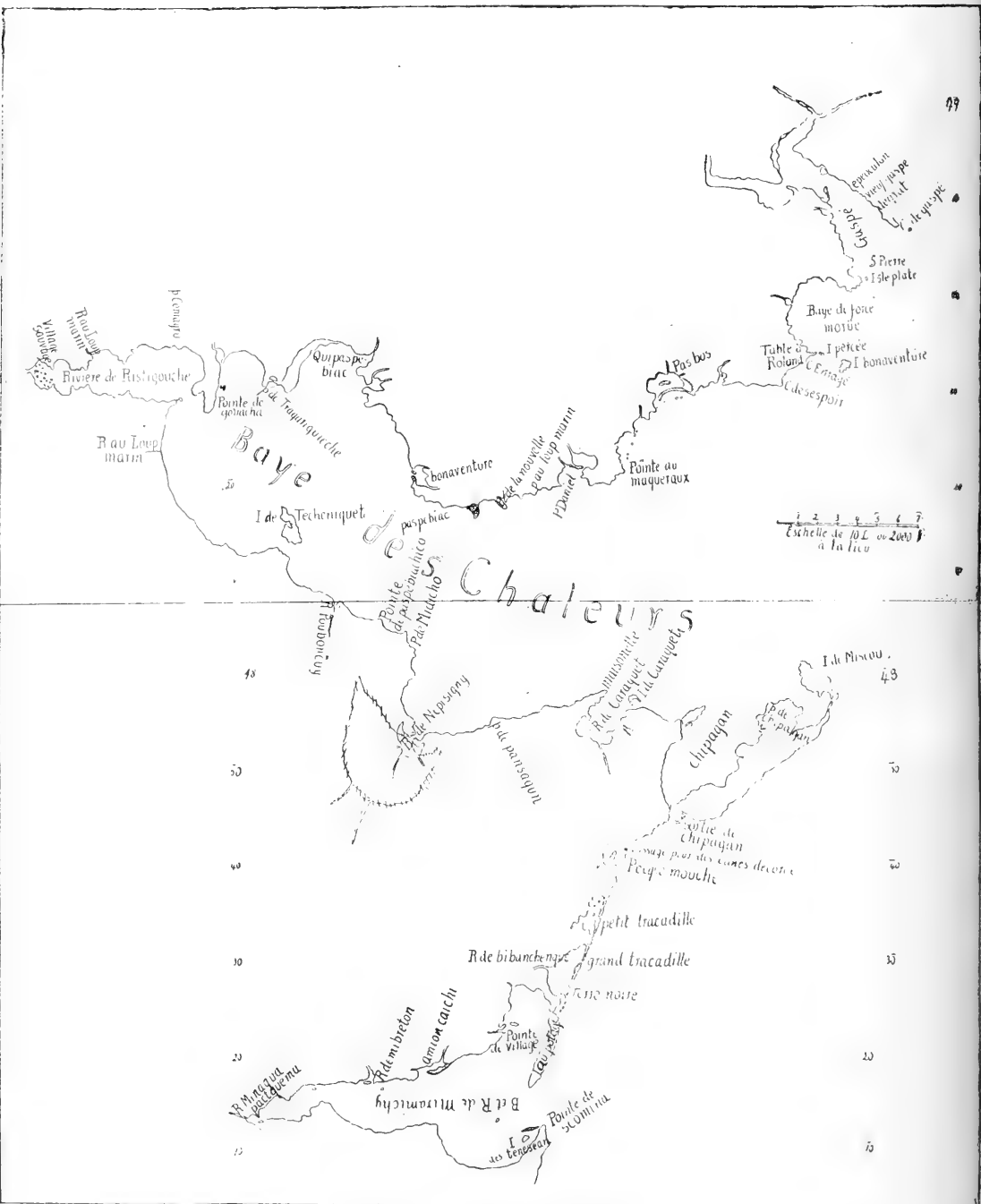


FIG. 33.—UNKNOWN, 1754 (?)
From copy of original; x 1/2.

time. It thus really becomes a sub-type. On D'Anville, the head of the Bay of Fundy is now laid down with some accuracy, and probably from plans sent home by Franquet, who in 1754 made a most careful survey of this region, of which the account is preserved, accompanied by a detailed map of the Missaguash, though no general map of his of that region is known to me¹. The Bay of Fundy is very like Bellin until Passamaquoddy is reached, which is much better than on Bellin, and seems to me to have been made up from the two maps of Champlain.² The Pas-camadi seems to be a branch of the Cobscook, and it is of interest to note that running off from it to the north is a stream ending in a lake near the St. Croix, precisely as Denys River and Meddybemps Lake do lie. Possibly for this there is some missionary map unknown to us. It is in the interior that this map is most like Bellin, and the differences are slight. The Madawaska River is here called *Grande R. S. François*; it had been called *S. François* by St. Valier when he descended it before 1688. Narantsouak (Nashwaak) is added, and *Vieux Fort*, which is known to have stood at the mouth of the Nerepis. The double lake below Medoctec is here intensified.

The year 1755 was prolific in good maps, for, in addition to smaller ones by Huske, Bellin (smaller) and others, which present to us nothing new, there are very important ones by Bellin himself, by Green and by Mitchell. Bellin's larger 1755 map in its upper part does not differ from that of 1744, but on the St. John, *Ste. Anne* (at Fredericton), *Ramatou* (Oromocto) and *Fort la Tour* are added, while there is much improvement at the head of the bay, though this part is not so well given as by D'Anville; and he adds a *Portage a beau Soleil* between what is clearly the Petitecodiac and Salmon River, though it should be to the Washademoak, which is here omitted.³ John Mitchell⁴ was an American of much learning, and his map (Fig. 34) is very famous in connection with the boundary controversies, for it was the one used in their deliberations by the negotiators of the Treaty of Paris in 1783. It is based almost entirely upon Bellin of 1744. The entire north shore follows that original very closely, there being upon it but a single name, *Minage*, not on Bellin, and that was obtained possibly from D'Anville. The head of the Bay of Fundy seems to be taken from Morris of 1749; the remainder of the bay is from Bellin, except the Passamaquoddy region, which is plainly taken

¹ On Franquet and his works see Catalogue of Library of Parliament (Ottawa), Vol. II.

² Or possibly from a sketch by Boishébert, who in 1754 was ordered by Duquesne to repair to Passamaquoddy and make an accurate draught of it. Broadhead, *New York Docs.*, x. 264.

³ Explained in my Monograph, p. 220.

⁴ Not the John Mitchel who surveyed Passamaquoddy in 1764, as Kilby has supposed, but Dr. Mitchell, F.R.S. See Huske, "Present State of North America," 1755, 2nd ed., 27; also Goode, "Beginnings of Natural History in America," 78.

from Southack (compare Fig. 28). In the interior Bellin is followed exactly and with rare fidelity.

The very imperfect representation of the Passamaquoddy region has led to great differences of opinion amongst people interested in the Eastern Boundary question, as to which river the St. Croix here shown really represents, whether that at present called St. Croix or some other.

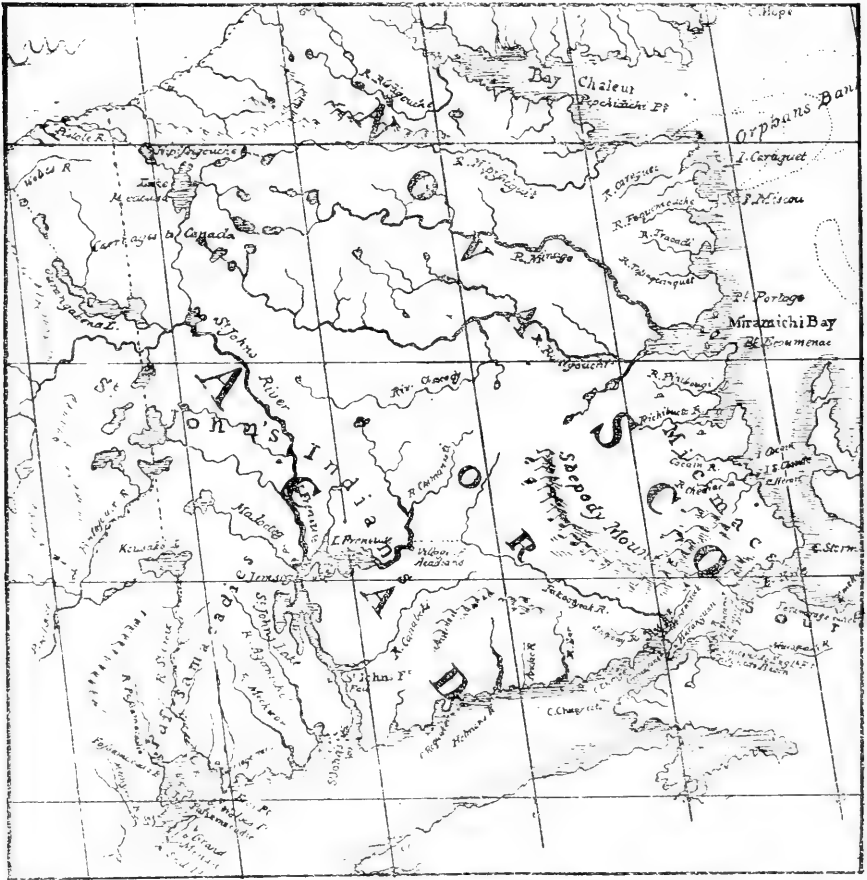


FIG. 34.—MITCHELL, 1755.

From original; $\times \frac{1}{2}$.

By some it has been considered to represent the Magaguadavic, and it has even been claimed by these writers that since this River St. Croix on Mitchell's map was the one chosen by the commissioners, and since the St. Croix of Mitchell's map really is the Magaguadavic, therefore the Magaguadavic should have been chosen as the boundary¹. Aside from the

¹ "America," VII., 173.

questionable validity of the latter claim, it has been proven beyond doubt that the St. Croix of Mitchell is really the river we now know by that name, for *Kousaki*, at its head, is the modern Grand Lake, called in Passamaquoddy to-day Kee-ok-qu-sak-ik, at the head of the St. Croix¹.

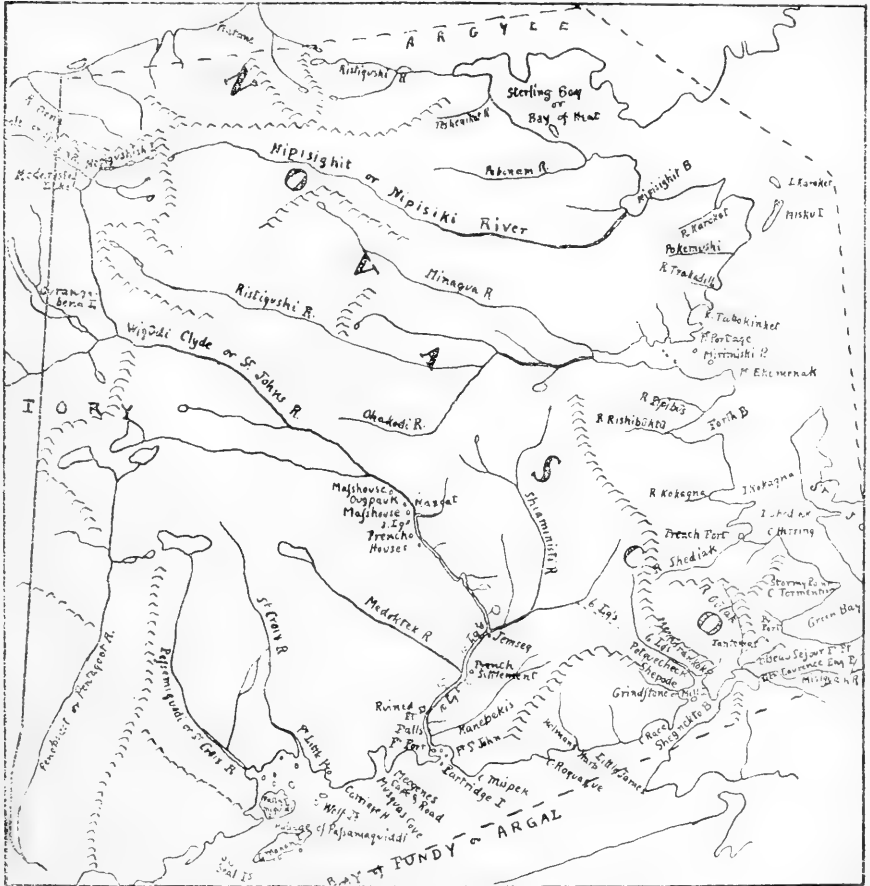


FIG. 35.—GREEN (JEFFERYS) 1755.
From original; x $\frac{1}{2}$.

Nothing can be told from its mouth, for, a fact which has been entirely overlooked, a comparison with Southack's map (Fig. 28) makes it extremely probable that it is shown emptying directly through Letite Passage.

Another map of 1755, of much importance, is that of John Green² (Fig. 35), which is chiefly remarkable for its effort to be as different as

¹ Discussed in *Magazine of American History*, XXVI., 261, and XXVII., 72.

² His real name was probably Braddock Mead, as shown by a letter mentioned in one of Stevens's Book Catalogues.

possible from the French maps of the time. Along the North Shore its topography differs considerably from any other known map, and while the names of Bellin are used as a basis, they are much altered and frequently translated, and, at least one old name, Forth, is readopted from Alexander, 1624, for whom the new name for Bay Chaleur, Sterling Bay, was, no doubt, given. There is no reason to suppose that Green had any new source of information in that region. The head of the Bay of Fundy is clearly taken from Morris, 1749, and the entire Bay of Fundy is of the Blackmore-Southack type. In the joining of the two St. Croix rivers, however, we find a feature resembling that we have spoken of in D'Anville, and, doubtless, it is from that map. On the lower St. John, however, this map is partially independent of the French maps of the time, though not entirely, as the Medoktek and Shiaministi show. Happily we know the source of this difference, for in his valuable "Explanation for the New Map of Nvaa Scotia, etc.," the author tells us that the river was surveyed in 1697 as far as Fort Nashwaak, and a plan made, it was supposed by Captain Southack, on a scale of one league to an inch-one-eighth. This plan, now lost, Green has, of course, used, and in most respects in this part he is much more accurate than any of the French maps. The *Ruined Fort* is, of course, that at Nerepis, the French settlement, is the *Nid d'Aigle* of Bellin, probably just above the mouth of the Belleisle. *Ougpauk* (called, also, Aukpaque, etc.), was the Indian name of the village at Springhill, above Fredericton. Above this point the map again follows Bellin, except that Alexander's name, *Clyde*, is restored, as is the name *Wigudi*, erroneously applied to the river by Champlain. The name *Spey* is probably, also, a relic of Alexander's nomenclature.

We may here notice a class of geographical documents of much value to our cartography in the last century, those pamphlets prepared to accompany the principal maps of the time, explaining the sources of information, etc., and containing remarks of great importance to an understanding of the relations of map-makers to one another, etc. Of these, four of much importance are known to me. Green's "Remarks in Support of The New Chart of North and South America," Green's "Explanation" for his map of 1755, "Bellin's "Mémoire" on his map of 1755, and D'Anville's "Mémoire" of 1756, the latter of which I have not seen. Green's "Explanation" not only gives a list of maps up to his time with much information about the makers, their sources of information, etc., but many other facts, to some of which I have referred in these pages.

The 1757 map by Bellin, "Carte du Cours du Fleuve de St. Laurent," while showing a part of New Brunswick, has nothing new, but his 1757 map of Acadie is remarkable for the large number of corrections in the Bay of Fundy region. Not only is the head of the Bay of Fundy shown with much greater accuracy than on his previous maps, but he adopts the Southack type for Passamaquoddy and the D'Anville type for the St.

Croix, and he removes Fort La Tour from the west side of the harbour, where he had placed it on his 1755 map, to the east side, and designates it *Ancien F. la Tour*, a point of very great importance in the determination of the exact site of that fort. In 1757 Jefferys published a "Chart of the River St. Lawrence," on which our North Shore is shown, in which he

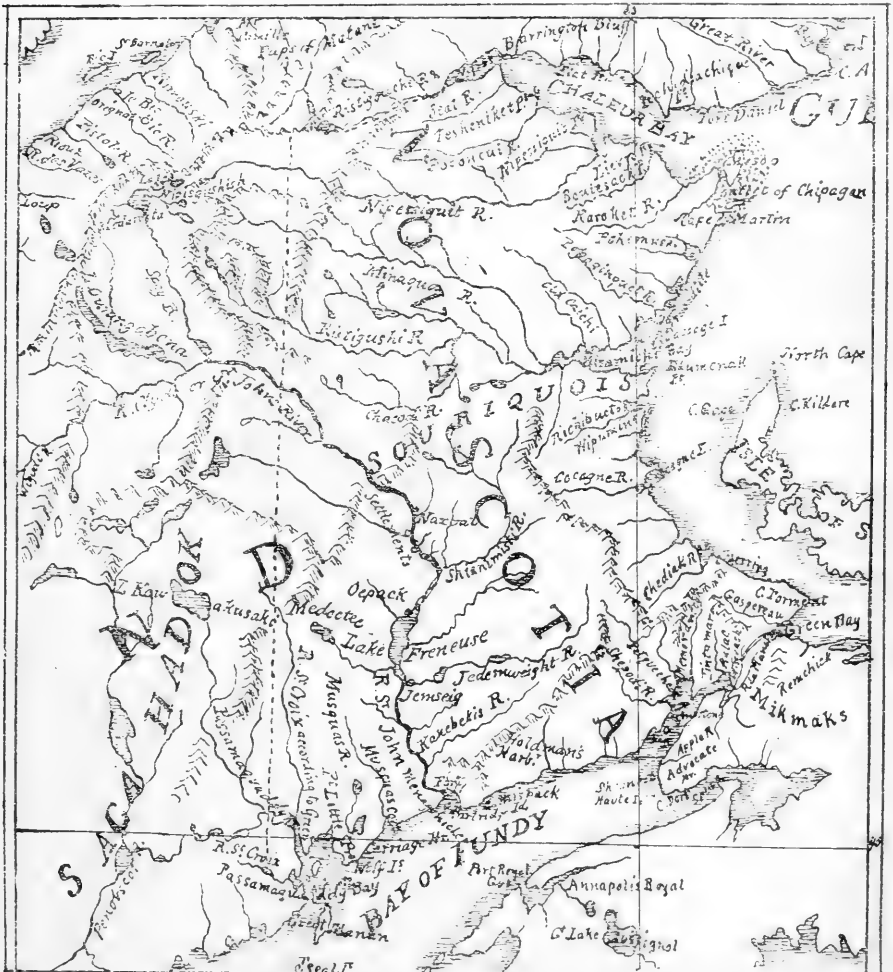


FIG. 36.—SAYER & BENNETT, 1776.

From original; full size.

closely follows D'Anville of 1755. The later "Chart of the Gulf of St. Lawrence," 1775, printed by Robt. Sayer, is probably based upon surveys made in 1760 by the ship *Norwich*, to which reference will be made later. In part it reverts clear back to Jumeau and Franquelin, for the names *Boutesack*, *Cape Martin*, *Hangman's Id.* (Translation of *I. Pendu*), re-

appear upon it. There is, perhaps, some other earlier printed map I have not met with which bears these names. Some of them, together with the old Bellin type of the interior, appear also on Capt. Carver's map of Quebec of 1776, also printed by Sayer. This type for the North Shore and interior are followed also on Sayer and Bennett's map of 1776 (Fig. 36), but in the Passamaquoddy region there is a great improvement, which is derived from Pownall's map, and that in turn was derived from the survey of John Mitchel of 1764, presently to be spoken of. We find, also, in this map the name *Spey*, from Green, transferred to the Madawaska. We may continue to trace the fate of the old Bellin type of interior topography. It persists upon a number of maps until the close of the century, when we find a struggle taking place between it and the newer and more correct ideas which were arising. Thus, in Solzmann's map of Maine, 1797, the *Ourangabena* is made identical with *Timisquata*, and the *Spey*, or river from Lake Medarosta, is identified with the present Green river, but there is no improvement in the other rivers. In the Laurie and Whittle map of 1794 (Fig. 40) an ingenious solution of the difficulty is found by identifying the old Lac Medaoasca with the chain emptying Lake Temiscouata by the Touladi, but the Nepisiguit and Miramichi still head with it. Finally, the maps of the United States, by Lapie, in 1806, and by Tardieu, in 1808, both revert back to the older type, but with them it disappears, for in the meantime far better maps were prepared, even if not published.

Of more special maps belonging to this period there are several worthy of mention. Morris, of 1749, belongs more properly to the next period, and will be considered there. Montresor's, of 1768, is of some value for the villages at the head of the Bay of Fundy, though of little account elsewhere. The important events of 1750 to 1755 in the region about the head of the Bay of Fundy naturally produced several maps, such as Franquet's of the Missaguash, that in the "Mémoires sur le Canada;" Jefferys's Plan of 1755, the map in Mante's "Late War," and another by Capt. Lewis showing a survey of the Bay Verte road, and the French map of 1779, all of great local interest. During the same period many Acadian maps appeared in the pages of "The London Magazine" and "The Gentlemen's Magazine" of London, made up from different sources. In addition to these there is a perfect host of maps, many of them brought out by the attention devoted to the troublous times in America from 1764 to 1783. They are mostly but copies one from another, and it is only occasionally, as in Pownall's and Evans's map that anything new appears upon them, and one may say that the Sayer and Bennett map of 1776 (Fig. 36) represents their very best development, and it may be considered as the closing map of this period, though in the Passamaquoddy region it belongs to the next. The good maps which appeared after it belonged more or less to the next period. It is not

profitable for us to attempt to work through all of these maps, of which a list has been published, first in Gallatin's "Right of the United States of America to the Northeastern Boundary claimed by them." (Boston, New York, 1840, p. 76,) and reprinted with many additions in "Statement on the part of the United States of the case referred to the King of the Netherlands." This list is not complete for the period it covers, and its length will show how prolific in maps was that time.¹

A very important phase of the cartography of this and the next period is its relation to the whole question of the boundary between New Brunswick and Maine. But this is a voluminous subject with a large literature of its own, and I do not here treat of it, partly because justice could not be done it in the space at my disposal, but especially because I hope to treat the whole question of the evolution of New Brunswick Boundaries in a future memoir of this series.² The subject is considered

¹ See, also, Winsor, *Maps of North America, 1763-1783*. America, VII, 182.

² As this subject of the boundary between Maine and New Brunswick is much misunderstood, and consequently misrepresented, by my fellow-countrymen in New Brunswick, I wish to express here the opinion to which I have been led by not a little study of this question extending over several years. The American claim, it will be remembered, was that the due north line from the source of the St. Croix should cross the St. John above Grand Falls (not stopping at the river), and continue north until it reached the highlands separating rivers falling into the St. Lawrence from those flowing south, which would bring it within a few miles of the St. Lawrence, and that all west of that line and south of the watershed, belonged to them. In my opinion the Americans were entirely correct in their claim that the treaty meant to award them this territory. Though the words of the treaty describe as the north-west angle of Nova Scotia a spot which actually does not exist, nevertheless it is plain enough that the old boundary between Nova Scotia and Massachusetts was intended by the treaty to be the International boundary. Now, excluding old French maps which do not bear on the question, upon dozens of maps, I believe upon all without exception, between 1763 and 1783, (See Figs. 36 and 38), whether made by Englishmen or anybody else, the boundary between Nova Scotia and Massachusetts ran north to those highlands near the St. Lawrence; and, moreover, that separation between the provinces was explicitly stated in a royal proclamation and commission of 1763. I know of maps made in England at the close of the Revolution, even as late as 1783, which make the boundary run north to those highlands. Moreover, at first the American claim was admitted without question by as great a jurist and typical Loyalist as the elder Ward Chipman, as shown by an original document in my possession, which I have acquired through the kindness of Rev. W. O. Raymond. It was only after 1783 that a different claim was set up by Great Britain. I am unable to doubt that it was entirely the intention of the commissioners who made the Treaty of Peace in 1783, that the old boundary running north to the highlands was to form here the International boundary. To suppose that the commissioners had any other intention in using the words they did, is to ask us to believe that these words conceal a cipher. Why the British Commissioners should have allowed this old boundary to stand, thus forever permitting a wedge of foreign territory to extend into British America, cutting off communication between its eastern and western parts, is an entirely separate question, the solution of which does not in the least degree affect the fact that they did that very thing. Perhaps they were too anxious to keep old boundaries as far as possible—possibly that wedge seemed too trifling an affair to be worth wrangling over, in comparison with the numerous immense interests they had to consider; perhaps they were outgeneralled. At all events it seems to me the blame

by Winsor in his chapter on the peace negotiations of 1782-1783 (America, VII.), and especially in his "Cartographical History of the Northeastern Boundary Controversy."

During this period a considerable advance in the maps, particularly of the Peninsula of Nova Scotia, was made through the more numerous observations for latitude and longitude. These were taken by officers of French ships of war on the coast. In 1750-51, as Green tells us, M. Chabert was sent out in a frigate by the French Government, and provided with the best instruments, to take numerous observations. This important expedition did not touch our present province of New Brunswick. In 1753, however, as Bellin tells us in his "Remarques sur la Carte du Golfe Saint Laurent," the "Thetis," King's frigate, made observations in Bay Verte. Morris, in 1749, determined the latitude and longitude of Mill Island, near Cape Enragé, $45^{\circ} 40'$, given on his Ms. map in the Public Record office, but these are the only such observations that I have noted in New Brunswick up to 1770.

This period does not end abruptly, but interlocks closely with the following, for many of its features persisted long after good surveys had improved other parts of the province.

for this great error belongs with them. This is, however, but one side of the question. On the other is the fact that the Americans, when it became plain that they had gained a great advantage, and that the value of the land in that wedge was but little to them in comparison with its value to Great Britain (for, while giving them a strategic advantage to which they were not in any other than an accidental way entitled, it cut off entirely direct communication between the two parts of an empire); then, backed by that lower standard of morals which prevails between nation and nation, as compared with that between man and man, they insisted upon the letter of the law, and upon its fulfilment to the uttermost. They could not rise to such a conception of international relations as would have yielded that wedge to a country that needed it more than did they, nor probably could they or any other nation even to-day, for Christian nations do not yet treat one another as Christian man is expected to treat a fellow-man. What would be applauded in the latter case would be viewed with wonder and disapprobation in the former. Great Britain would not yield the American claim, but set up a counter claim, and maintained that the north line was intended to stop at Mars Hill far south of the St. John, and to follow the highlands west from there. The actual present boundary splits the difference roughly between the two extreme claims. The statement is often made in New Brunswick, and is passed on without investigation and repeated from generation to generation, that New Brunswick was robbed of a great parcel of territory, including the Aroostook valley, by the sharpness of American diplomacy; and Lord Ashburton, the British commissioner in the final settlement of the boundary as it now runs, is viewed as having sacrificed British interests. As a matter of fact, it is extremely lucky for New Brunswick that the difference was split as it was, and she really possesses to-day far more territory than the treaty of 1783 allotted to her. Technically, the Americans were right in their extreme claim; New Brunswickers, when they feel aggrieved, should blame the British commissioners who negotiated the treaty of 1783. Lest it be considered that my judgment has been warped by long residence in the United States, and, as well, in justice to one of the foremost of Canadian historians, I wish to add, that this view is taken by Mr. Hannay, whom no one will accuse of too great partiality to the United States, and he has repeatedly affirmed it in newspaper articles, though I do not know that it appears in any of his more permanent writings.

TYPE No. 6.—THE MODERN TYPE.

FROM THE SURVEYS OF MORRIS, WRIGHT, DESBARRES, ABOUT 1770.
TO BONNOR, 1820.

A period with its beginning in the preceding, but in particular beginning with the accurate coast surveys of Morris, 1749, Wright, 1772, DesBarres, 1776-1781, and Wright, 1790, which together covered the entire coast; of the interior, the St. John, from its importance as the winter road to Quebec, was first laid down by Morris and others; the remainder of the interior east of it, found to be inaccurately mapped, was for a time abandoned altogether, and the maps left blank; the Restigouche later added from a special survey; the more accessible parts mapped by provincial surveyors in connection with surveys for settling the New England and Loyalist immigrants. These results brought together for the first time on a large-scale map showing New Brunswick alone, by Bonnor, 1820.

To understand this period, it is first necessary to define what is meant by the word surveys used in this connection. Surveys of one kind were made from the time of Cartier, but up until the last century the explorers made such hasty visits that they could do little more than use their ships' compasses for general directions, and the log and dead-reckoning for distances. More exact surveys, and those which define this period, could only begin with determinations for latitude and longitude, and with the use of proper compasses on shore for determining angles with exactness. Morris, in 1749, took at Mill (Grindstone) Island the first accurate determination for latitude and longitude in New Brunswick, and the second was by the "Thetis" in Bay Verte in 1753, and later there were others, and of course in this century they have been very numerous.¹ The taking of exact angles on shore seems to me to have begun with Morris, whose surveys of 1749 are in general so accurate that they could hardly otherwise have been made; and, without question, the surveys of Passamaquoddy, by Mitchel in 1764, were thus made, as his field-book shows. Of course, the surveys by Wright and DesBarres from 1768 onwards were thus made, though I do not know how they obtained distances so accurately. Triangulation is the only method of obtaining distances accurately by sea, but it could hardly have been used by them. Triangulation has of course been used in the Admiralty surveys in this century, and the results of some of the triangulations made by the United States Coast Survey about Passamaquoddy are accessible in their published reports. The only triangulation of the interior that I know of is that by Captain Owen, from St. John to Springhill, in 1841-43.

¹ The most complete list that I know of is in a table on Wilkinson's map of 1859. Sec. II., 1897. 22.

I shall note first some early surveys which seem to have produced little effect upon our cartography. Passing over the draft of the St. John made by Southack in 1697, and Blackmore's of the Bay of Fundy, we find that in 1734 George Mitchell, one of the Deputy Surveyors of the Woods in North America, was ordered to proceed to survey the river of Annapolis Royal and the entire coast around the head of the Bay of Fundy, the neck of land at Bay of Vert; "from thence you are to proceed to Chippody, the River St. Johns, and so forward around the Bay of Fundy to Passamaquady, Grand Menan." This survey was to be made with the greatest possible exactness,¹ but whether it was ever made I do not know, for I have not been able to find any trace either of maps made by George Mitchell or of any influence produced by such a survey upon other maps, with a possible exception to be mentioned later.²

Green speaks of a chart made by Captain Richard Hazzen, from the Merrimack to the St. Croix, of 1750, but I have seen no effects of this on any maps of that region.

But the first accurate survey of the modern type of any part of New Brunswick is that made by Lieutenant Bruce, of St. John harbour, in 1761. Many manuscript copies of this chart exist, and its principal portion has been published in these Transactions (IX., ii., p. 61); it is of very great importance to the local historian, since it shows so accurately the appearance of the harbour before the changes introduced by settlement. There is in the Public Record office a report by Bruce on cleared lands of the St. John, dated 1763, but I have not seen it.³ The next survey is that of John Mitchel, who, in 1764, was ordered by Governor Bernard, of Massachusetts, to survey Passamaquoddy bay,⁴ which he did with some thoroughness in that year, as we can learn from his field-book, which is now in existence.⁵ Mitchel's survey was made with compass on shore and with the distances estimated. His map, of which he made three manuscript copies, is now unknown, but its influence is shown in

¹ Murdoch, Nova Scotia, I., 497. A copy of Mitchell's full commission for this survey is in possession of Rev. W. O. Raymond, St. John.

² Possibly this was the survey referred to by Murdoch, I., 508, under date 1735:—"The Indians of the river St. John felt, or affected to feel, apprehensions on account of the proceedings of the government surveyors in that vicinity."

³ Archives, 1894, 239.

⁴ In Gov. Bernard's instructions to Mitchel, he is ordered to proceed to the head of the St. Croix, but he appears not to have done so. There is a reference to a survey in that region in 1764 in the Massachusetts journals.

⁵ This field-book is in possession of the Maine Historical Society. By the kindness of the secretary of that society and of the former owner of the MS., Mr. W. H. Kilby, of Boston, I have been allowed to make a copy of it, which later I shall publish with annotations. Much from this book has been published by Mr. Kilby in his "Eastport and Passamaquoddy."

There are important references to this and other early surveys in United States State Papers, I., 91. Also, see Kilby, 45.

at least one published map, that in Pownall's "Topographical Description" of 1776, where the bay is for the first time well laid down, and Lake Utopia, which Mitchel had visited, is also shown, though without name. His map is, perhaps, the original of this region in Solzman's Map of Maine, 1798. Morris's survey of the same bay the next year resulted in a map which I have not seen.

While considering Passamaquoddy we may as well trace it farther. We come next to the fine survey by Wright, represented by a splendid MS. map in the British Museum, dated 1772. This survey, as the title of the map tells us, was made "agreeably to the Orders and Instructions of the Right Honourable the Lords Commissioners for Trade and Plantations, to Samuel Holland, Esq., Surveyor-General of Lands for the Northern District of North America. By his Deputy, Mr. Thomas Wright." It shows the coast from Passamaquoddy to St. John, and is drawn so accurately and in such detail that the survey must have been made with far greater care than any which had preceded it anywhere in New Brunswick. Two careful determinations for latitude were made, the entrance of St. John harbour ($45^{\circ} 18' 28''$), and the North Wolf ($45^{\circ} 00' 19''$). Most of its many names persist, though some have disappeared, and altogether it is one of the most important maps in our cartography. A copy of this, probably, forms the map of Passamaquoddy, showing pre Loyalist grants preserved in the Crown Land office. This map undoubtedly formed the basis of the maps of DesBarres which immediately followed, and these, too, are of the greatest importance to our subject. Wright subsequently became Surveyor-General of the Island of St. John, and Holland Surveyor-General of Quebec. It is singular how fortunate Passamaquoddy has always been in the matter of surveys. It has been surveyed earlier, oftener and better than any other part of the province, excepting only St. John harbour, for which, no doubt, it has chiefly to thank its geographical position.

We come now to the great work of DesBarres. J. F. W. DesBarres is a not unimportant figure in the history of both New Brunswick and Nova Scotia. Born in 1722, he lived to the age of 102 years.¹ In the introduction to "The Atlantic Neptune" he tells us how his surveys began :

"In the year 1763 the Board of Admiralty, convinced of the many advantages that would accrue to the public from a thorough knowledge of the province [*i.e.*, Nova Scotia], engaged J. F. W. Des Barres to make exact surveys and charts of its coasts and harbours, and directed the several commanders-in-chief of the fleet in America to assist him with vessels and boats for taking soundings, tents for encamping on the shores, men, provisions, etc. In the survey the best instruments were employed, and work was always confirmed by celestial observations.

¹ For important matter on DesBarres see Bourinot, Cape Breton, 248-249; also, Morgan, Bibliotheca Canadensis.

"The climate not admitting the use of instruments more than six months of the year, added to the frequent interruptions from fogs and precarious weather, unavoidably made tedious a performance in which accuracy was the chief thing desired, and has rendered many years necessary to complete it for publication. But when the author reflects that the accuracy and truth of the work will stand the test of ages and preserve future navigators on the coast from the horrors of shipwreck and destruction, he does not repine at its having employed so large a portion of his life."

The beautiful charts containing the results of his surveys, together with the many views, were issued at intervals, those of New Brunswick from 1776 to 1781, some of them in more than one edition. They were later collected into three great volumes under the title, "*The Atlantic Neptune*." Omitting the views, some of which, such as that of *Campobello*, are of much historic importance, the New Brunswick maps are 14 in number, and they will be found listed in a later part of this paper.¹ They include the entire New Brunswick coast and the lower St. John, and one of them shows the interior in an altogether remarkable manner, but of this I shall speak later. The charts are fairly accurate. A chief peculiarity of them is their copious introduction of new names for places, seen especially in his 1776 chart of the entrance to the River St. John. These are mostly those of persons, but of these very few indeed have persisted, except Courtenay bay, Cape Spencer, Salisbury and, possibly, Fox Island, *Miramichi*.² These charts were, of course, the standard for the time, and have only been superseded by the more perfect ones of the Admiralty in this century. In 1790, however, appeared a "*New Chart of the Gulf of St. Lawrence*," by Wright, which, for our North Shore, is little or no improvement upon DesBarres, though upon a smaller scale, and probably is based upon DesBarres' without new surveys.

In following DesBarres' work to the end, I have omitted an interesting French series of charts, which, however, are far behind the dates of their appearance, and which exerted little or no influence upon our cartography. In Paris were published four charts of parts of New Brunswick—one of *Baye de Chaleur* ("*Levée par le Norwich en 1760, publiée à Londres en 1775*"), Paris, 1778; another, of *Port Ristigouche*, from the same source, probably in the same year. These charts are especially interesting from their connection with the attack by Byron upon the French fleet and settlement there in 1760; the names of Byron's ships are all given to places upon them. In 1779, also, was published by the French

¹ Different sets of the *Atlantic Neptune* differ considerably in their make-up. There is a collation of them in the Dominion Archives Volume for 1882, 92-93. See, also, Winsor, *America*, VII., 183.

² All of DesBarres names are given in my *Place-Nomenclature* under their modern equivalents.

Marine, "Plan du Port de la Riviere St. John," but it has little value. The "Plan de L'Isthme de L'Acadie," of the same year, already referred to, belongs to the same series.

So far, for the sake of considering all of Morris's work together, I have passed over his survey at the head of the Bay of Fundy. Charles Morris, an officer in the British service, was afterwards Surveyor-General of Nova Scotia. For both the intrinsic importance, as well as the merit of the work he did for our early cartography, he must stand as one of the foremost of our map-makers. He died in 1781 and was succeeded in office by his son of the same name. His first surveys were of the region about the head of the Bay of Fundy, and his maps are preserved in the British Museum. These maps excited the admiration of Green, who speaks of his "accurate surveys of 1748 and 1749," and of "another survey of Mr. Morris made in the years 1751 and 1752, with no less accuracy than the former." These surveys were probably used by Bellin to correct his later maps, as I have already mentioned. They were, of course, used by Morris in his remarkable map of the Northern English Colonies, of 1749, recently published in "Captain Pote's Journal," from the original MS. preserved in the Lenox library. This map is remarkable for its independence of most of those of the time, and one wonders whether George Mitchell's survey may not be the original for some parts, such as the St. John, which is unlike any map of that river known to me. The French influence, however, is evident in places, such as *L'Etang*; and *Misshapac* suggest Bellin's map of 1744. Probably Passamaquoddy is but a poor copy of the Blackmore-Southack type, and I do not know the original of the North Shore, but he has evidently used the same source as Green in his 1755 map. Without doubt, also, Morris is the maker of the map accompanying Monckton's journal, preserved in the British Museum, of his expedition on the St. John in 1758, one of the most valuable of all existent maps of any part of New Brunswick. (See Fig. 37.) A Major Morris, doubtless Charles Morris, was in command of the post at the mouth of the St. John in that year. This is not only the first map we possess which shows the lower St. John upon a fair scale and with fair accuracy, but it is the only one we possess which marks the French settlements in that region. It also gives us at least a part of the French place nomenclature, and shows that a number of our names, seemingly of English origin, are really translations from the French, as I have traced in my "Place-Nomenclature." In the beauty and accuracy of this map we have a distinct suggestion of Morris, and, as well, in some of its topographical features it is not unlike some of his later maps. In 1765 he had surveyed the whole river and the coast to Passamaquoddy, and his maps, upon a very large scale, exist in many copies with various later additions in the British Museum and the Public Record office, and in the Public Record office is a report by him on his surveys of the St. John and Passa-

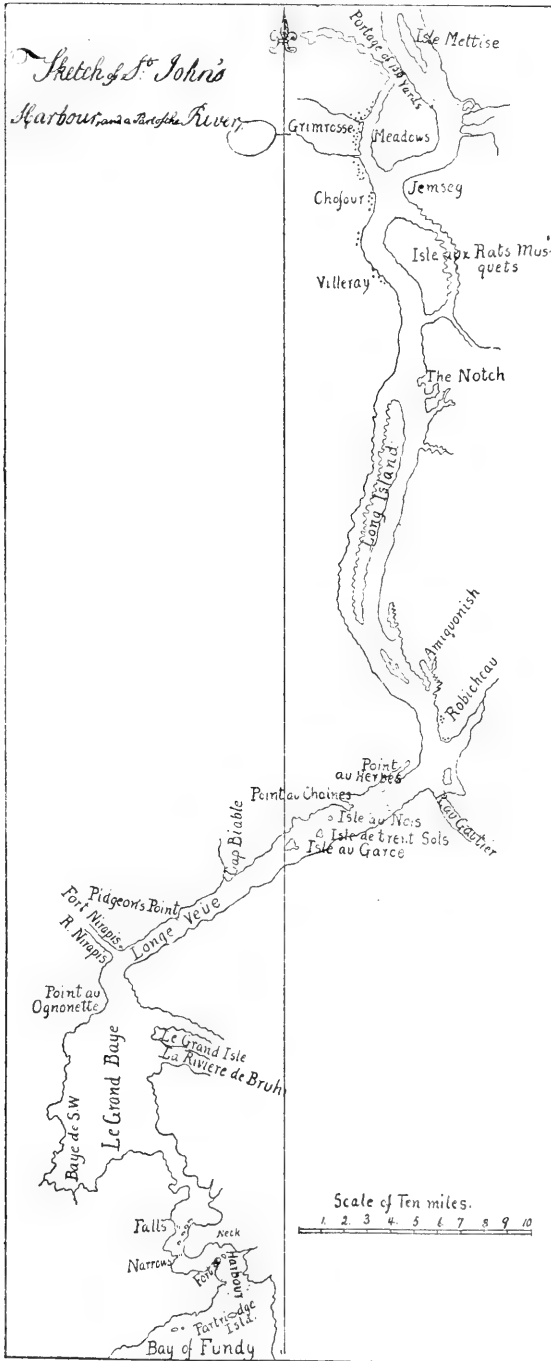


FIG. 37.—MORRIS (MONCKTON), 1758.
From copy of original ; x $\frac{5}{16}$.

maquoddy.¹ By 1781, as we learn upon good authority, the St. John had been surveyed for 95 miles, and probably by him. In the British Museum, and also in the Crown Land office at Fredericton, are copies of a map of 1784, seemingly based upon his, showing Loyalist and other land grants made up to that time, which shows the river as far as Grand Falls, and the entire nomenclature is that which has persisted to this day, and is now in use.

In an inscription upon one of his maps, Morris refers to the observations of Captain Peach upon the river as far as Lake Temiscouata. There was a Joseph Peach, a petitioner for lands on the St. John in 1764,² but I can find nothing about his voyage up the St. John. Possibly he was with George Mitchell in 1734 or 1735, or possibly his observations are but those of a traveller on the way to Quebec.

Upon DesBarres' chart of 1780 he shows the St. John river as far up as St. Ann Point, and marks a few of the Pre-loyalist townships, the only printed map known to me which does so. But on his chart of the coast from Newfoundland to Cape Cod, dated 1780, the interior of New Brunswick is represented with what is for that time a marvellous accuracy (Fig. 38). Up until long after 1780, all printed maps still had the distorted old Bellin topography, a heritage of the remarkable error of Franquelin. But here, not only is the general course of the St. John given with an accuracy much greater than appears in any other map prior to this century, but the Aroostook, Tobique and other branches are well laid down, and what is especially surprising is that the heading of the Tobique, Nepisiguit and Miramichi is given with fair accuracy, and better than upon any other map until that of Baillie in 1832. One at first is inclined to connect the St. John part with that of Peachey (to be referred to later), but a careful comparison shows nothing in common. It is plain enough that DesBarres had access to some plans or other source of information not accessible to other map-makers of that period, and totally unknown to us. This map is to me the greatest puzzle in all of our cartography. Its great differences as compared with others then current must have caused it to be viewed with suspicion, for, though published and widely circulated, it seems to have produced no influence whatever upon any other map. Perhaps the fact that it was a chart caused it to be overlooked by map-makers.

We come now to a map which, while hardly to be dignified as the result of a survey, nevertheless belongs to this period. In the British Museum is a map (Fig. 39) of the River St. John from Lake Madawaska to its mouth, on which is the inscription: "Drawn by James Peachey, Ensn. 60th Regt.," and Mr. Edward Scott, of the British Museum, writes me: "The map was executed between 1787 and 1793, as James

¹ Archives, 1894, 274, 275.

² Archives, 1894, 398.

Peachey, . . . by whom it was drawn, became lieutenant and changed his regiment in the latter year." The Portage road from the St. Lawrence was opened in 1783. The map shows the post houses established by the Government along the river for the accommodation of travellers ;

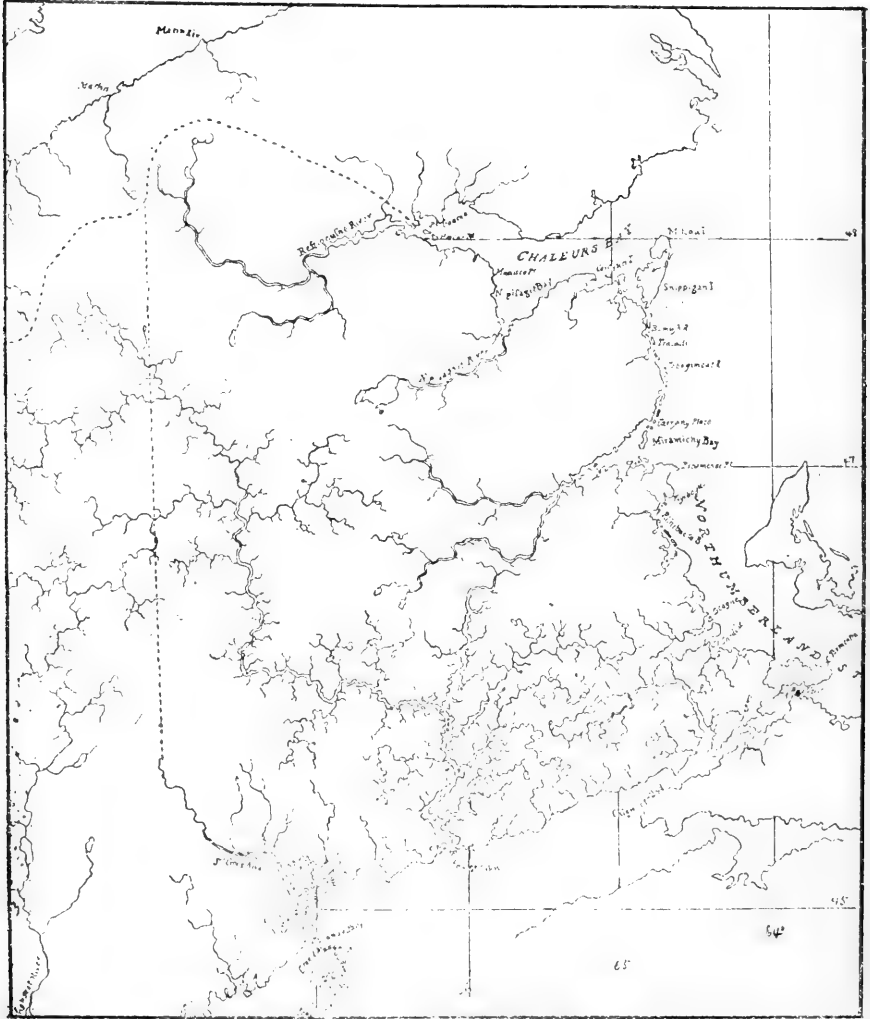


FIG. 38.—DES BARRES, 1780.

From original; $\times \frac{1}{2}$.

but what is most remarkable about it is its nomenclature, which differs greatly from that of Morris, and could only have been made from an actual visit, since the topography, though crude, is fairly correct, and the Indian names, though much corrupted are recognizable and correctly

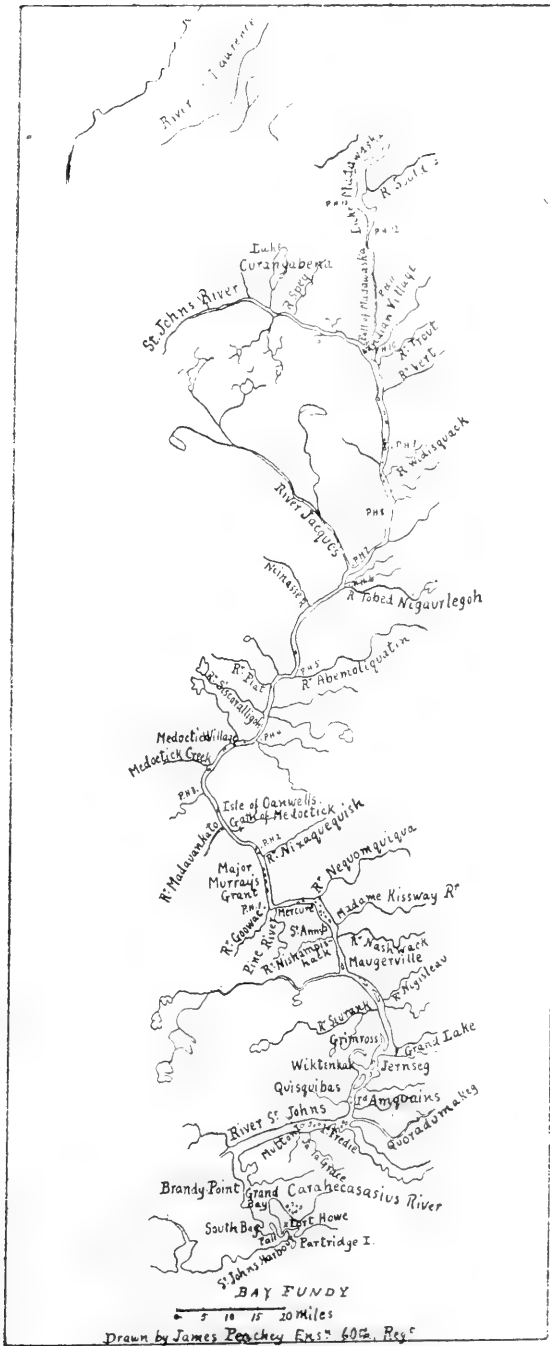


FIG. 39.—PEACHEY, 1783?
 From photograph of original; x 1/2.

applied, as may be found described in my "Place-nomenclature." Now, a curious fact is this, that while the names on the river below St. Anne's do not occur at all upon any other map or in any document known to me, those above St. Anne's are almost identical¹ with those used by Munro in his well-known Report of 1783. In describing the lower river, however, Munro does not use any of these names. It seems to me plain that all of the names on both the upper and the lower river are from the same original, for they are of much the same character and corrupt the Indian names in about the same way. This in itself would dispose of the supposition that the original of this map was made by Munro to accompany his report; even had he made it for the upper river, it is impossible that he could have made it for the lower, without using some of the names in his report. I think, therefore, that Munro used on his voyage an earlier map of the upper St. John made by some maker yet unknown to me, and this map of Peachey's is drawn from the same original, but with later additions. On the lower St. John, Munro probably had a map of Morris. Now, as to the original maker of this map, one at once recalls the reference by Morris to Captain Peach, and it is quite possible that the original of this entire map of the river is by him, or less probably, that it was made by George Mitchell in 1735. It may yet be found among the treasures of the British Museum, but for the present it remains one of those puzzles which will give zest to the pursuit of our cartography for some time to come.

Probably this map was published, for it was extensively copied. There is a manuscript copy of the part from St. Ann's to Grand Falls in the Crown Land office at Fredericton, with some differences from the Peachey copy. The earliest appearance of this type in print that I have seen is the map of 1794 in Kitchin's Atlas (Fig. 40), but it appears upon many others, as Arrowsmith's United States, 1796; Solzmann's map of Maine, 1798; a "Plan of the River St. John" on Holland's new chart of the coast of Nova Scotia, 1798, and even on Arrowsmith, 1794, and on Henderson's map of the St. John, 1827. But its nomenclature and topography later died out, and in the end the Morris type prevailed, and is

¹ Map and report agree in some curious mistakes, such as the presence of both *R. Nequomquiqua* and *Madame Kissway*, which are in fact the same, and in placing *Medoctick Village* at the south of the Madochenquiek (not named on the map), when it certainly should have been put below Medoctick Creek. On the other hand, the map has Gowac (Coac) wrongly placed and the report has it correctly. I sometimes have thought the map was made up to agree with the report. Perhaps, after all, the upper river is from a map by Munro. Several of the names are of totally unknown origin, such as *I. Oanwells*, *Gath of Medoctick*. On some of the maps which adopt the Peachey names, there are some seeming to belong to the same set which are on neither Peachey nor Munro, such as *Sigto hacto* (Shikatehawk) and *Sheers Quarter* (Grand River), seeming to show that all have drawn independently from a common source. Mr. I. Allen Jack, of St. John, writes me he once possessed a printed map, dated not later than 1770, which contained some of these names.

that which is the original of the maps we use to this day. In a printed map, the Morris type, appeared first, so far as I know, in Purdy's "Cabotia" of 1814, and again in the two maps by Bouchette, and from that time constantly down to the present.

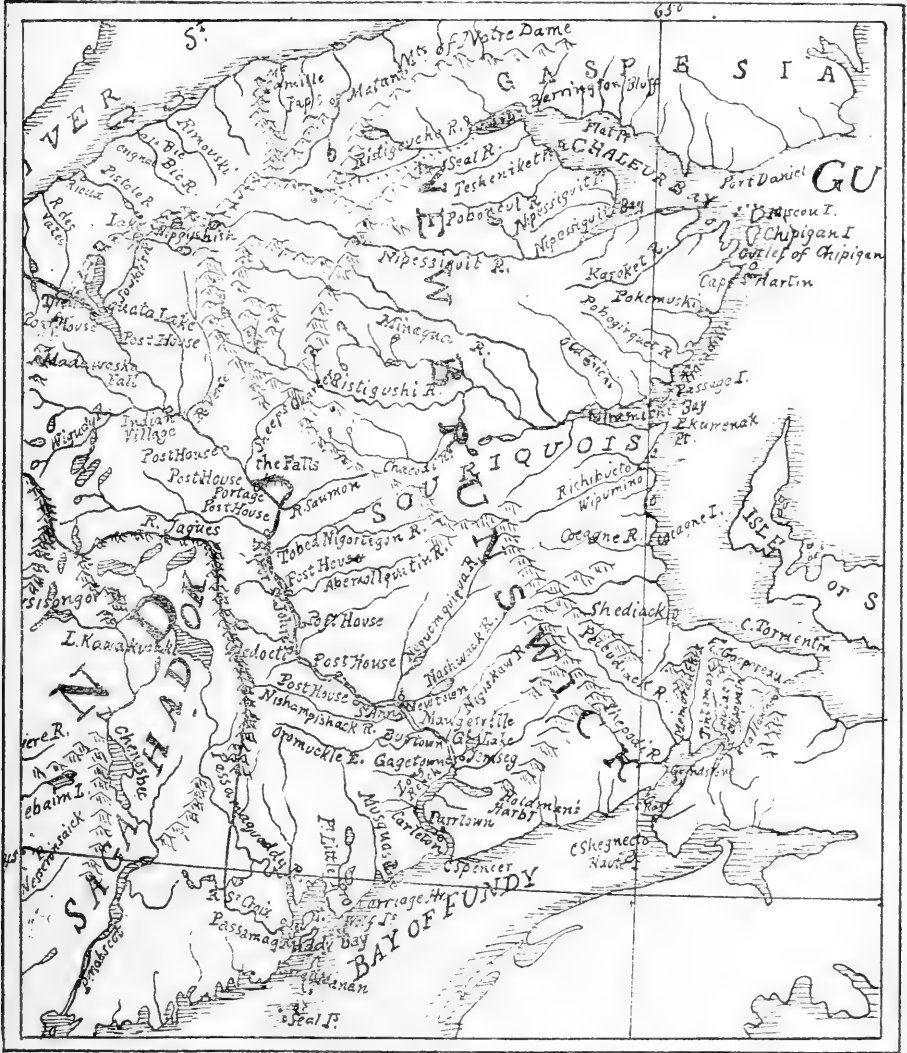


FIG. 40.—LAURIE & WHITTLE (KITCHIN), 1794.

From original ; full size.

While speaking of the St. John, we may here note a very interesting map of the river from its mouth to Grand Falls, made by Douglad Campbell in 1785, and preserved in manuscript in the Public Record office. It is followed on Major Holland's map of Lower Canada of 1802, but

in no other that I have seen. It is remarkable for the fidelity with which it records the Indian names of the river, to which the translation is often added. Another valuable map of the lower river is a published map of 1788, made by Robert Campbell, and nearly independently of other maps, and which contains information of considerable local historical value.

Passing now to other parts of the interior of the province, we find that the St. Croix, though somewhat roughly surveyed in 1785 by order of Governor Carleton, remains of the old Bellin type on printed maps

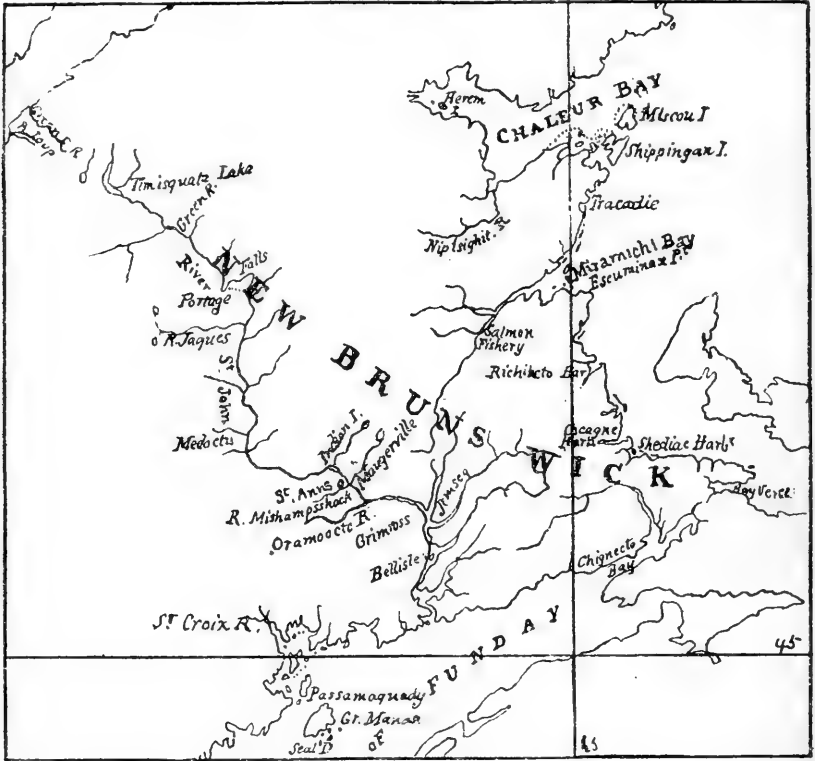


FIG. 41.—ARROWSMITH, 1795.

From original; full size.

until after the Boundary surveys of 1796–1798. Elsewhere in the province the old Bellin type is retained as late as the Kitchin map of 1794. The first to abandon it is Arrowsmith of 1794 (Fig. 41), who, however, omits the interior entirely; and, thereafter, it differentiates out again, slowly, but this time correctly, and the jump from the complicated but erroneous map of Kitchin to the simple but correct one of Arrowsmith, almost in itself marks another type in our cartography.

It is Purdy's "Cabotia" of 1814 which first gives the Restigouche with fair accuracy, and it appears again on Bouchette of 1815, and on

others to the present. Happily we know the source of Purdy's information. In 1786 this river was surveyed, the distances being measured on the ice, by W. Von Velden, under instructions from Surveyor-General Holland of Quebec, and a copy of his map is in the Crown Land office at Fredericton. It contains some errors, particularly in the placing of the Pata-pedia, which is made to empty where really Red Pine brook comes out, and this was copied on all maps down to Baillie, 1832, who was the first to correct it. The Miramichi, though with little detail, also appears on Purdy; and, no doubt, from surveys made in 1785 by Mischeau, a surveyor in that region, who mapped it as far as the present Boiestown. The remainder of its course was, no doubt, known in a general way from its use as an Indian route across the province. But from Arrowsmith on through this period, the region about the head of the Tobique and Nepisiguit is a blank, and it only appears gradually in the next period.

In 1784, New Brunswick was set off from Nova Scotia, and from that time on possessed a Crown Land office, Surveyor-General and surveyors of her own. An immense impetus was thereby given to the exploration of New Brunswick.

After 1783 the Maine-New Brunswick boundary was in dispute until 1842, and the surveys and commissions in connection with attempts to settle it produced a great abundance of maps of that region. There had been a rough survey of the St. Croix as early as 1785, and there are manuscript plans of parts of it dated 1786 and 1792 in the Massachusetts archives, but the first thorough survey, and the one which forms the basis for all subsequent maps, even to the present, is that made of the St. Croix and Magaguadavic rivers in 1796 to 1798, under authority of the Boundary Commissioners.¹ A copy of this map appears on Holland's map of Lower Canada of about 1800. Its effects appear also on Carleton's map of Maine of 1802, where also is clearly shown an interesting survey by the American Surveyor Titeomb, who, in 1794, being ordered to run a north line from the source of the St. Croix to the St. John, ascended Palfrey brook to Skiff lake, and ran from there a line which met the St. John near Old Fort Meductic. Happily an account of this survey has also been preserved.²

The first British printed map to use the boundary surveys was Purdy's "Cabotia," 1814, a beautifully engraved map, which is the very best of New Brunswick up to that time. Purdy was a rather celebrated English map-maker of high repute early in this century,³ and, of course,

¹ The field books and diaries of the surveyors of the Magaguadavic are in the possession of Rev. W. O. Raymond, St. John.

² In *Maine Historical Magazine*, VII., 154. Also, *Bangor Historical Magazine*, II., 91.

³ A full account of him may be found in the *Dictionary of National Biography*.

had access to the materials in the English Government offices. From this map, or from the same sources, Bouchette drew for his fine map of 1815, and likewise for that of the Post Route from Quebec to Halifax in the same year. And all subsequent maps have used the Boundary surveys. Another map of much interest made at that time is Wright's map of Bone or Dochet island, upon a very large scale, and of much value for its comparison with that of Champlain of 1613.

In 1817 the North Line from the source of the St. Croix was run to the St. John by Bouchette and Johnson ; and this was continued to the Highlands the next year by Johnson and Odell. The region about the Highlands was examined by Dr. Tiarks and Mr. Burnham in 1820, and the region west of the Touladi and the upper St. John was explored by several surveyors in 1819-1820. These surveys, along with many others later made in connection with the boundary disputes, made that region very well known. No maps showing the North Line appear to have been printed, but several in manuscript are referred to in the boundary literature, and their effects upon the subsequent printed maps are easy to trace.

Belonging to this period are a few other maps more or less aberrant in type, or of but minor importance. There are, of course, many general maps showing this region, but the new knowledge spread slowly and they are of little value. There are several MS. sketches made by Indians in 1792-1797 for the Boundary Commissioners in the library of the Maine Historical Society. A curious map, whose history I do not know, is Solzmann's map of Maine of 1797, which shows the St. John river of the Peachey type, and Passamaquoddy probably from Mitchel's survey, with the St. Croix somewhat, but not much, better than on Bellin. In the Green river and Temiscouata region it shows an ingenious attempt to reconcile the old Bellin topography with the newer knowledge of the Peachey map. Of MS. maps of this time there are naturally several of much importance. In the Massachusetts archives there are the maps of the St. Croix, already mentioned, of some interest for the detailed cartography of that region, and, also, a curious large "Sketch of Passamaquoddy, with the adjacent rivers, Boston, 1786," which, without doubt, as the notes imply, was made by Col. John Allen, well known in connection with the history of those parts ; the map is largely independent of others, but seems to me more curious than important. Another MS. map of Passamaquoddy is one by David Owen, made in 1797, showing the sites of old French settlements, and giving some curious forms for the geographical names of the vicinity, which, as his MS. preserved at Campobello show, are largely the result of curious theories of his as to the derivation of most Indian Place-names from the French. There are many MS. maps of this period preserved in the British Museum. In addition to those already mentioned by Morris, Peachey and others, I may note the following :

Map of Miramichi, by Micheau, 1785 ; a Plan of New Brunswick, 1785 ; Map of the Seudiac (St. Croix), 1785 ; Map of New Brunswick, 1786 ; Map of New Brunswick, 1788, all mentioned in the Canadian Archives for 1895, and listed more fully later in this paper. The plan and map of New Brunswick are, no doubt, of much interest, but I have not been able to see them. There are, also, in the British Museum, a map of a part of New Brunswick of 1786 on a large scale, and another of Fort Cumberland to Fredericton of 1799, neither of which I have seen. Some of the most important maps on New Brunswick are in the volume CXIX. in the King's library. Other maps of some importance are Jones's map of Passamaquoddy of 1805, and Lockwood's fine copper-plate map of the mouth of the River St. John of 1818.

After 1783 the more accessible parts of the province, particularly those fitted for settlement, were surveyed in connection with their assignment to the New England and Loyalist immigrants, and this gave the topography which appears in those parts in Purdy and the other earlier maps. The results of these surveys are carefully preserved in the Crown Land office at Fredericton, and naturally are of the utmost historical value.

It is surprising how few printed maps there are of this period which show the topography so rapidly developing. Arrowsmith's was the first, then the fragment on Osgood's Maine of 1802, then came Cary's small one of 1807, then that of Purdy, 1814 ; next came the two maps by Bouchette, but no others until that of Bonnor. Tardieu's map of 1808 is a complete return to the older type.

Such were the conditions at the close of this period, and such were the materials which Bonnor used in making his map of 1820. All through this period accurate data had been accumulating ; Bonnor was the first to collect them together upon a single map of large scale showing New Brunswick alone.

TYPE No. 7.—THE COMPLETE TYPE.

BONNOR, 1820, TO THE PRESENT.

The period of continuous improvement, through a series of large-scale maps of the entire province, each based upon a preceding complete map plus all information accumulated in the meantime. Numerous surveys in connection with the international boundary until after 1842, and the Quebec-New Brunswick boundary until after 1855, and others connected with formation of new settlements, county lines, timber licenses, running surveys of the principal rivers, roads, geological surveys, etc.; all these, pieced together, compose the successive maps. The coast entirely and minutely re-surveyed by the British Admiralty, and the lower St. John by Capt. Owen; thus, the coast on our maps

is far more detailed and accurate than the interior, of which no single comprehensive survey has yet been made. Began with the map of Bonnor of 1820, and, through a series of gradually improving forms, ended with that of Loggie of 1885.

It is not so much because of its intrinsic merit, even though it is a beautifully made map and contains more information than any of its predecessors, that Bonnor's map stands as a type in our cartography, but rather because it marks a new principle. It is the first published map devoted exclusively to New Brunswick, and it forms the first of the type which we have in use to-day. Our later ones do not differ from it in kind, but only in degree, in their greater detail and the correction of minor errors.

Thomas Bonnor was provincial agent for New Brunswick in London from 1816-1824. It is not likely that he made this map himself; it was probably prepared by some draughtsman in New Brunswick. It was published in London, is a lithograph with some colour, on a scale of eight miles to the inch. I know of the existence of but two copies, one in the Boston Athenæum library, and another, somewhat imperfect, which I possess, given to me some years ago by Mr. Arthur Hill, of St. Stephen. Probably there is a copy in the British Museum. It is very accurate as far as it goes, for it does not copy old errors but leaves blank those parts on which exact knowledge was wanting. The St. John is well shown, and of course the St. Croix and Magaguadavic from the boundary surveys, and the north line from the St. Croix, and the Green River-Madawaska region, from the same source. The Restigouche is fully drawn, but the Tobique and Nepisiguit only in their lower courses, while the region of their sources is a blank. The Miramichi is well shown to Boiestown and but poorly above, but its north branch is laid down fairly well. The upper courses of many of the smaller streams are shown only approximately. Roads are traced in red, many large reserves or other blocks are marked, and the counties are named, but no boundaries are assigned to them. The North Line from the source of the St. Croix, surveyed in 1817, is of course shown. Of highway roads, four principal ones are marked:—the Westmorland road, laid out late in the last century; that along the entire St. John river, from its mouth to Madawaska, likewise partly laid out in the last century and partly early in this; the St. John-St. Andrews road, surveyed in 1816; and the St. Andrews-Oromocto road, surveyed in 1813. In fine, the map seems to represent very well the knowledge of our geography at that time.

In one of the many works relating to the boundary disputes I have seen reference to a map of New Brunswick and Nova Scotia of 1825 by Wyld, but this is unknown to me.

The next complete map of New Brunswick alone is that by Lockwood of 1826, of which there is a copy, with numerous later manuscript

additions, in the Crown Land office. Anthony Lockwood was Assistant Surveyor-General of New Brunswick. Other maps of his have already been mentioned. His map is well engraved, on a larger scale than Bonnor's, six miles to the inch, and contains much more detail. The Nerepis road from Fredericton to St. John, surveyed in 1826, and the Shepody road are shown, and some others; but Cardigan appears to be the only new settlement, though a considerable immigration had begun in 1819. The county boundaries are all shown. The Tobique is added, though very roughly, but only a part of the Nepisiguit; and the old and poor representation of the Miramichi above Boiestown is omitted altogether. The entire courses of many streams are added correctly for the first time, such as Salmon River (Queen's) and those of Kent county. Moreover, the St. John is more accurately shown than hitherto, of course from the very careful survey by Captain Foulis in 1822. The map of this latter survey, on a large scale, and showing the levels from Springhill to Grand Falls, is preserved in the Crown Land office. It is the original for the representation of the river on all later and for our present maps.

Of much interest is the map by Bouchette of 1831, a map of all Canada, but showing New Brunswick well. This map, 14 miles to the inch, was made by Jos. Bouchette, son of the elder Jos. Bouchette, so well known as surveyor and author. Of this a new edition was issued, revised, in 1846, but I have not seen it. The elder Bouchette likewise issued a map of Canada and the Lower Provinces in 1831, on a scale of about three miles to one inch,¹ and this also I have not seen, but it can hardly differ much from the one we are considering. This map, for most of the province, appears to follow Lockwood, but with some differences; along the upper St. John it differs, and is an improvement, as is to be expected, since the elder Bouchette knew the region so well. It uses the boundary survey map of 1798 independently, for it retains some of its Indian names which no other printed maps have used. It has a good deal of additional information over Lockwood, particularly in the naming of the smaller rivers.² The Tobique-Nepisiguit region, however, is very erroneous, more so than on Lockwood.

The next maps of importance that we find are two of 1832—one by Thos. Baillie, in his "Account of the Province of New Brunswick," and the other, much larger, by Thos. Baillie and Lieut. Kendall. Baillie's smaller map is of great excellence. It shows the Nepisiguit to its head, no doubt from the survey made in 1832, and the Upsalquitch appears for the first time, but the Tobique is not improved over Lockwood. The upper Miramichi is shown, though not as well as on the larger map; it

¹ Under Bouchette in *Portraits of British Americans*, Notman & Taylor, 1865-68.

² Some of its names reappear upon a map of 1884 in Osgood's "Maritime Provinces," without appearing on others in the meantime.

had been surveyed to its head in 1831. New settlements are added, as Canaan, Galloway, Tay, Geary, Caverhill and some others, and a number of new roads. In the map of Baillie and Kendall we have a copper-plate map, ten miles to the inch, of great beauty of execution, in fact, artistically, the best map of New Brunswick which has yet appeared. It has all of the improvements of the smaller map, with some others. All of the streams from Restigouche to the Nepisiguit are shown with much detail, and the Tobique, though still incorrect, is better than on the small map, and the upper Miramichi is well drawn. The granted lands are all marked, which gives the map a special historic value, and there is an addition of much detail in different parts of the province. The grant to the New Brunswick and Nova Scotia Land Company is marked for the first time.

There is a map of 1834 by the New Brunswick and Nova Scotia Land Company, which I have not seen. This company, organized in 1832, incorporated in 1835, bought a large tract of land in York county, the bounds of which are still marked on the maps, and made settlements upon it, but the enterprise was unprofitable and was abandoned. This attempt forms an interesting chapter in our geographical history, and is one phase of a subject which I hope to discuss in a future memoir of this series, upon the physiographic and historic causes determining the geographical distribution of our settlements.

The next map of importance that I know of is one of New Brunswick and Nova Scotia by Wyld, undated, but of about 1841. In many respects it resembles Bouchette, which it follows, but it has some new information. Here, for the first time, the Tobique is given correctly, of course from the survey of it which had been made in 1838. New roads appear, but in general it does not contain as much new matter as was available. Thus the survey of the Lepreau lake system by Mahood, in 1837, is not noticed.¹

Next in our series is the map of 1842, bearing the name of John Simcoe Saunders, Surveyor-General. While far inferior in execution to Baillie and Kendall's, it nevertheless marks a distinct advance in the new information it contains, particularly as to the new settlements. On it appears, also, a range of hills running across the province from Mars Hill north-eastward. This feature is taken from the map of 1839, made by Featherstonhaugh and Mudge, two surveyors sent out in connection with the boundary question, and it was published in the British Bluebook on the Northeast Boundary. This map of Saunders, of course not made by

¹ In 1841 there appeared a map of Maine and New Brunswick by Greenleaf, which is of no value and far behind the times, but on it one notes three names which, so far as I have observed, are confined to Maine maps, i.e., Wolumkuas (Iroquois), Olumkuas (Little Presquile) and Menucook for a brook above Woodstock. These are, also, on Collin's map of the Public Lands of Maine, 1835, but I do not know their origin.

him but by one of the draughtsmen of the Crown Land office, is the last to leave the international boundary undefined, for it was settled in that year.

The next general map of the province that I have found, is an inferior map by G. H. Perley, of 1853. This shows the International boundary correctly, and also the Quebec–New Brunswick boundary, which had been fixed upon, but not surveyed, and its curious course in the vicinity of Long Lake, as compared with the direction it actually has on our later maps, shows that this line does not run exactly as expected.

During the interval between Wyld's and Perley's maps some important work had been done on New Brunswick topography. Not only had many county lines been run and new settlements laid out, but Captain Owen, in 1841-1843, had made his splendid traverse and triangulation of the St. John from the mouth to Springhill, and copies of his beautiful and most detailed maps are preserved in MS. in the Crown Land office, and form the basis of all subsequent maps of that region. In 1843-1844 the surveys for the military road from Quebec to Halifax, and later the Intercolonial Railroad surveys made known much of the topography of the province. In particular the surveys of 1843-1844 laid down the upper Restigouche in great detail, and the beautiful maps of that survey are in the Crown Land office. The Quebec–New Brunswick boundary was run in 1855.

In 1857 appeared a small but excellent map, probably prepared by M. H. Perley for his Handbook published in that year. It shows clearly the blocks of land laid out for settlement in 1856.

In 1859 we come to what is generally regarded as the greatest map which has yet been published of New Brunswick—that of John Wilkinson. This map is very well known, and many copies of it are still in use. Not only is it remarkable for the beauty of its workmanship, but also for the accuracy and completeness with which it brings together everything then known of New Brunswick geography. On it, for the first time on a New Brunswick map, a railroad, that from St. John to Shediac, appears. There has been but little to alter in this map since then, though much detail has, of course, been added. John Wilkinson came to this country, probably from England, as agent for the Campobello Company, and died at Fredericton in 1871, aged 67.¹

After Wilkinson's map there are many of varying scale and quality of execution, but none requiring special mention until Loggie's fine map of 1885, which brings together all material up to date, and is the standard map of the province to-day. Naturally, in the quarter of a century which had passed since Wilkinson's appeared, there had been great

¹ A full history of this famous map is contained in a pamphlet, "A Memorial of Claims on the Government of New Brunswick," by John Wilkinson, Fredericton, 1864.

development in the extension of roads, the building of railroads, formation of new settlements, and a general differentiation of the topography, all of which demonstrate New Brunswick's steady, even if not rapid, advance in settlement and communication, and her progress in wealth and civilization. I need not further describe a map so accessible and so well-known. Mr. Loggie is the present chief of the Crown Land office at Fredericton, and unites great skill as a draughtsman, an exhaustive knowledge of New Brunswick topography, and a care for the priceless records under his charge which keeps them in a state of order and accessibility highly gratifying to all who have occasion to consult them.

The only advance which has been made since Loggie's map, is shown upon some of the sheets of the Geological Survey of Canada, which, especially in the later ones, show more detail. This series consists of fifteen sheets on a scale of four miles to the inch, issued between 1878 and 1893, and they show with the most complete topography that existing materials allow, the colouring representative of the geology of the province as determined by the officers of the Survey. In 1887 the Government began to reissue, with some additions and corrections, these sheets with surface geology added, and so far ten of these have appeared. These geological sheets, collectively, form the most detailed map which has yet appeared of the province, but not one that is readily accessible or generally known.

In thus tracing the series of principal maps, I have passed over many of minor importance, which are but compilations and represent no use of original materials, as well as the many more or less crude maps made to illustrate special government and railroad reports, the many maps of special sections, and the postal and railroad maps. Of the former category, I may here refer to Macmillan's map with several issues in different years, Buck's map of 1874, and Mackinlay's map of the Maritime Provinces of 1885, the latter an excellent map with much detail, upon a scale of eight miles to the inch. Then there are, of course, many school maps, and others of all degrees of importance down to the most general maps of small areas, but it is not worth while to attempt to describe these in a work which, like the present, attempts not to exhaustively list all of our maps, but rather to trace the steps in the progress of their development. It will be necessary, however, to refer here to some important sectional maps, but I shall confine my enumeration entirely to those which are published, for any such enumeration of those in MS. in the Crown Land office would necessitate well nigh a volume in itself. Of some interest is a well engraved map of the St. John, by Henderson, 1827, which, in part, follows the old Peachey type. Of some value is a plan of the city and harbour of St. John, by John Cunningham, of 1835, which one may compare with the Admiralty chart of 1844. In 1832 a map was published showing the Bay Verte canal routes, by Lieutenant Kendall, which

I have not seen. There is a published plan of 1836 of the country from Salmon River to Richibucto. There is a valuable map of Campobello of 1839, and the Rapkin map of 1840 is of some interest. In 1862 was published a large map of St. John and King's counties, on a scale of 400 rods to an inch, by H. F. Walling, which will some day have great local historical value, since it locates and names the house of every settler in those counties outside of St. John in that year. Similar maps by the same firm have been published of Westmorland and Albert. A map by Mr. Loggie of the principal timber lands of New Brunswick, of 1874, has some value. Poe's Atlas of the Maritime Provinces of 1878, an inferior production, contains twenty-five New Brunswick maps, and there is an Atlas of York county, by Halfpenny, of the same year. A grotesque map of Charlotte County was issued by McAlpine, St. John, years ago. In connection with the boundary controversy, a perfect host of maps has appeared in the various special reports, but the enumeration of these and their critical estimate I leave to another occasion. In one of the Reports of 1840 is a lithographed series of reproductions of older maps of the French period, and accompanying them is a valuable map of the Madawaska region, showing the location of houses of most of the settlers. A valuable map of the Restigouche up to the Kedgwick, with a full local nomenclature, is given in Dean Sage's superb work, "The Ristigouche." The Bay Verte canal surveys of 1873-74 produced an accurate map of the Isthmus of Chignecto, which has been much copied. There is a very detailed map of Campobello of 1887. Bailey's "Canoeman's Map of the Upper St. John," 1890, is of some interest for New Brunswick. All of these special maps will be found listed on a later page.

The first geological map of New Brunswick is that in Lyell's Travels in North America, 1845. Abraham Gesner made the first geological map of the province, but it remained unpublished until recently, when a sketch of it has been printed by the New Brunswick Natural History Society. (Bulletin No. 15, 1897.) New Brunswick, also, figures in the more general maps by Hitchcock and by Marcou, and especially in the maps in the successive editions of Dawson's Acadian Geology. Of course there are many special maps of particular parts of New Brunswick in the geological and mining reports, where they are more or less accessible to those interested. The later maps of the Canadian Geological Survey have already been mentioned. A geological map of New Brunswick, based upon Gesner's, was published by James Robb, in Johnston's "Report on the Agricultural Capabilities of New Brunswick," 1850, and in the same volume is a map showing the relative qualities of its soils.

Of maps showing vertical topography, contours, etc., almost none exist. Except for the Admiralty maps, I know only of Owen's MS. map of the lower St. John. It is true there are some maps which make an attempt to represent the principal hill ranges by hachure lines, such

as Featherstonhaugh and Mudge's, already mentioned, but usually these are put in only by estimate, and are but approximate and very incomplete. Of published maps showing contour lines I know of none for any part of New Brunswick, except a very crude folder issued by a steam-boat company, based upon Owen's map of the lower St. John.

Upon our best maps of to-day there are large gaps where no topography at all is laid down, or where the streams are but dotted in approximately. Moreover, as every lumberman and every one of us who has been much in the wilderness areas of the province knows well, in many places the lakes and streams are wrongly laid down. If an absolutely perfect map of the province could be projected against Loggie's, for example, upon the same scale, I have no question that the differences would be considerable. It is simply impossible to make an exact map by piecing together surveys of different scale, different extent and different date; yet, in this way are our maps of the province constructed. An exact map can be made only by a complete unified trigonometrical survey of the entire province. But such a survey is extremely expensive, and we must wait long for it. When it comes it will initiate a new period in our cartography, and give a new type—the exact type.

This period of our Cartography I have traced far less fully, and I think much more imperfectly than the earlier periods. To do it justice would require as much space and labour as I have given to this entire subject. Moreover, I have not had the use of as good materials for this as for the previous periods, for the libraries and other collections to which I have had access are poor in modern maps, and in my visits to the Crown Land office I have worked rather upon other subjects. But I commend this study of the evolution of New Brunswick cartography from the foundation of the province down to the present, as a subject of the very greatest interest.

TYPE No. 8.—THE EXACT TYPE.

A complete and exact mapping of the Province, based upon a complete trigonometrical survey: the final possible type.

The Admiralty surveys of the coasts, and Owen's survey of the Lower St. John are of this type, but otherwise it does not yet exist.

CONCLUSION.

I shall here try briefly to state the relation of this study to the complete Cartography of New Brunswick. In this paper it has been my aim to make not so much a collective and exhaustive, as a selective and critical exposition of the subject, in order to illustrate the stages in its evolu-

tion, from the day when our province was but an unknown area of an undiscovered western sea down to our own times. In order to keep the work within manageable limits, and not to obscure the more important matters by an accumulation of those of lesser moment, I have had to treat each period far from fully, and to keep strictly to Cartography, resisting every temptation to add other geographical material. There is not one of the periods which would not under other circumstances repay nearly as full treatment as I have given to the whole. I have no doubt that in the future the subject will receive such treatment; but no matter how much more fully and how much better my successors may elaborate it, to me at least belongs the joy of having opened it up. In particular, the period of the sixth and seventh types will repay far more detailed study, and I am aware that in these my work is weaker than in the earlier ones. There must be many published maps of the last hundred years which I have missed, and, were these accessible, there exists in the Crown Land office at Fredericton the materials for working out in the minutest and surest fashion not only the evolution of our Cartography, but indeed of our entire geographical history for the past hundred and fifteen years. Moreover, there are other topics which I have left unsolved, not out of consideration for future students, but because I have been utterly unable to solve them. Thus, I may mention the many obscure points in the nomenclature of the maps which show Cartier's voyages, the source of the nomenclature of the English Pilot map of 1702, the source of DesBarres's information for his map of the interior of 1780, the true origin of the Munro-Peachey type; and there are many minor ones. Furthermore, there must be most valuable material in the British Museum and Public Record office which my short visits to those places did not disclose, and also in the Archives of Paris, which I have not myself seen. Probably, too, there is something in the Crown Land offices of Nova Scotia and Quebec, which I have not examined. Attempts to gain information about them from correspondence have not been satisfactory. In fine, I have but mapped out the broader outlines of this subject; the details still remain to be filled in.

PART III.

A CLASSIFIED LIST OF THE PRINCIPAL MAPS SHOWING NEW
BRUNSWICK OR PORTIONS OF IT.

In making up such a list as this, one has the greatest difficulty in deciding where to draw the line between those to be included and those to be left out. The important ones which certainly belong in it grade down imperceptibly into those which do not, through many whose eligibility is doubtful on account either of inferior workmanship, erroneous information, small scale, or lack of any valuable feature. While there are some maps which show only New Brunswick, in much detail and on a large scale, there are others which are mere sketches to accompany some special report, or small maps in school geographies or general atlases. Also on others, New Brunswick is but a part of Canada or North America, or the Western Hemisphere or the World, and hence may be of all degrees of smallness of scale. For the earlier periods New Brunswick is invariably a part of maps of very large range ; later it becomes a part of New France, later a part of Acadia, and it is only in the present century that it has maps devoted to it alone. How many of those showing New Brunswick are to be included is, therefore, a troublesome question, and I have solved it by selecting only those which seem to me to contain something really important. If one sought to make a complete list of maps showing New Brunswick, he would find them mounting upwards into the thousands,—if he tried to make it entirely complete—perhaps into the tens of thousands.

From a bibliographical standpoint my list is very faulty. A proper catalogue, of which there are models in Baker's List of Maps of Washington, D.C., in National Geographical Magazine, VI., 167, and in the recently published volumes of the United States Commission appointed to inquire into the Venezuelan boundary discussion, should include a full title, date, place of publication, author, publisher, size, scale, whether coloured or not, mode of engraving (copperplate, etc.), where a copy may be found, and should even give an idea of the amount of territory covered. But not only do my notes made at many places and different times during the past twelve years not afford such data, but to add them would swell too much the size of this work without a compensating value. Hence, in general, the titles are made but long enough to properly identify the map, excepting where they contain some information of value, though I have added the size and scale when I have these accessible. In cases where the maps are unique or rare, the place where they at present are to be found is added ; when no such note is given, it is to be understood that they are fairly common, and may be found in some of the principal

libraries of the United States, or in the British Museum. I have personally examined nearly every map here listed, and this is to be understood unless the contrary is stated. I also possess in my own collection either MS. or printed copies of the New Brunswick parts of nearly all of them.

In selecting the forty maps, of which reproductions are given in this paper, there has been somewhat the same difficulty as in making the list, but I have tried to choose the most important and those illustrative of the evolution of the subject. Without exception the copies for the engravings have been drawn by myself, and nearly always from the originals, and every possible precaution and care has been taken to make them perfectly true to the originals. Most of them have been made by direct tracing, but in a few very large maps (Figs. 26, 33, 37, 39) it has been necessary to trace the topography, and to print in the names much larger than in the original, for if kept the same size they would have been too small to be seen in the reproduction. A few (Figs. 9, 18, 20, 25, 26, 33, 37) were either made under circumstances which made exact accuracy impossible, or else are from manuscript copies, and there may be slight minor errors in them, but I think not. A few (Figs. 23, 25, 26, 33, 37, 38) are here published for the first time.

In this list and in the body of this work, plans of forts, views of geographical value, etc., are not mentioned, for they are to be treated in another memoir of this series.

I.—THE PRE-DIFFERENTIATION TYPE. 1500-1534.

1500. *La Cosa, Juan de* (Map of the World.) Fig. 3.

MS. in the Marine Museum at Madrid. Often reproduced; Jomard, XVI.; Kretschmer, VII.; Kohl, 151; Winsor, III., 9; HARRISSE, 90, etc.

1527. *Maggiolo, Vesconte di*. (Map of America.) Fig. 4.

MS. in the Ambrosiana at Milan. Copied in HARRISSE, X.; Kretschmer, XIV.; Winsor, IV., 39.

1529. *Ribero, Diego*. (Map of the World.) Fig. 5.

MS. in Weimar. Copied in Kohl, 299; Kretschmer, XV., etc.

1533 (?). *Gastaldi, Giacomo*. *Nuova Francia*. Fig. 6.

Woodcut in Ramusio's *Navigazioni* of 1556. Copied in Kohl, 227; Winsor, IV., 91.

Copies of the other maps mentioned may be found as follows:—

1502. *Canerio*. HARRISSE, XIV.; Kretschmer, VIII.

1505. *Reinel*. Kohl, 177; Kretschmer, IX; these *Transactions*, XII., ii., 74.

1508. *Ruysh*. Kretschmer, IX.; Winsor, III., 8; Kohl, 156; HARRISSE, XVI.

1511. *Ptolemy*. *Nordenskjold*, XXXIII.

1527. *Thorne*. Kretschmer, XIV.; Winsor, III., 17.

1529. *Verrazano*. See note on p. 331.

1534. *Viegas*. Kohl, 348; *Marcel*, *Reproductions*, No. 4; these *Transactions*, VIII., ii., 157; XII., ii., 77.

1538. *Mercator*. *Nordenskjold*, XLIII.

1542. *Ulpius*. Winsor, IV., 42.

1548. *Gastaldi*. Winsor, IV., 83.

1560. *Bertelli*. *Müller*. *Atlas*.

1561. *Ruscelli*. Winsor, IV., 92.

Important lost maps of this period which are known to have existed:—

(1) Those of the Cabots, showing their voyages of 1497-1498.

(2) That of Jean Denys of 1508.

(3) That of Chaves of 1536.

In no case is an original map made by any of the explorers of this period known to exist, but in most cases others, nearly contemporary, must be very like them.

II.—THE CARTIER TYPE. 1534-1604.

- 1541. Desliens, Nicolas.** (Map of the World.) Fig. 9.
MS. in Library in Dresden. Sketch in Harrisse, John and Sebastian Cabot.
- 1542. Rotz, Jean,** (Cape Breton to Florida.) Fig. 7.
MS. in his "Boke of Idrography" in British Museum. Copy in Winsor, IV., 83; Prowse, 34; these Transactions, VII, ii., 29.
- 1542. Harley.** (Map of the World.) Fig. 8.
MS. in British Museum. Copy in Prowse, 40.
The "Jomard" Map—Winsor, IV., 89; these Transactions, VII., ii., 44—is but a tracing of this.
- 1544. Cabot, Sebastian.** (Map of the World.)
Engraved. Bibliothèque Nationale, Paris. Often copied; Winsor, III., 22; Kohl, 358; Kretschmer, XVI.; these Transactions, IX., ii., 177; XII, ii., 86.
- 1545. Allefonse, Jean.** (Gulf of St. Lawrence.)
MS. sketches in his "Cosmographie." Copy in Winsor, IV., 74-77; Horsford, Defences of Norumbega, 44.
- 1546. Desceliers, Pierre.** (Map of the World.) Fig. 10.
MS. owned by the Earl of Crawford and Belcarres. Often copied; Jomard, XIX.; Kretschmer; Kohl, 351.
- 1546. Freire, Johannes.** (Canada and Labrador.)
MS. in Atlas in British Museum. Copy in Kunstmann.
- 1547. Vallard, Nicholas.** Terre de Bacalos (Northeastern Coast of North America.)
MS. in Atlas in Collection of Sir Thomas Philipps. Copy in Kohl, 354; Winsor, IV., 87.
- 1555. Testu, Guillaume le.**
MS. in Atlas in War Office, Paris. Copy in Horsford, Defences of Norumbega, 59. Atlantic Coast in Marcel, Atlas, 28.
- 1558. Homem, Diego.** (East Coast of North America.) Fig. 11.
MS. in Atlas in British Museum. Copied in Kohl, 377; these Transactions, VIII., ii., 151.
- 1560 (?). Agnese, Baptista.** (America.) Fig. 12.
MS. Copy in Kretschmer, XXIII. and XXIV.
- 1563. Luiz, Lazaro.** (America.)
MS. Copy in Bettencourt, Descubrimientos; Winsor, IV., 37; these Transactions, VII., ii., 149.
- 1566. Zaltieri.** (Map of North America.)
Engraved. Copy in Kretschmer, XIX.
- 1569. Mercator, Gerard.** (The World.)
Engraved. Copied in: Jomard; Kohl, 384; Winsor, IV., 373; these Transactions, VII., ii., 40.
- 1594. Linscot.** Orbis Terrarum.
Engraved in Histoire de la Navigation de Jean Hugues de Linscot, 1038.
- 1596. De Bry.** America sive Novus Orbis.
Engraved, in his Voyages.
- 1597. Wytfliet, Cornelius.**
Woodcut in the "Ptolemy" of 1597. Copy in Nordenskjöld, LI.; Winsor, IV., 100; these Transactions, VII., ii., 41.
- 1600. Molineaux, Emeric.**
Engraved. Copy in Hakluyt Soc. Ed. of Davis's Voyages; Winsor, III., 216; these Transactions, XII., ii., 91; Nordenskjöld, L.
- 1600.** (Map showing Eastern Canada.)
Engraved. In Germanic Museum, Nürnberg; Room, LXVII.
- Copies of the other maps mentioned may be found as follows:—
1570. Ortelius. Winsor, IV., 95.
1587. "Venezuela Commission Atlas, No. 20.
1593. Judeis. Winsor, IV., 97; Nordenskjöld, XLVIII.
1600. Quadus. Winsor, IV., 101; Nordenskjöld, XLIX.

1572. Porcacchi. Winsor, IV., 96.
 1592. Molineaux Globe. Winsor, III., 213.
 1592. Hood. Winsor, III., 197.
 1587. Pistolet. Prowse, 69.
 1580. Martinez. Prowse, 57.
 155-. Jomard. Winsor, IV., 89. (Same as the Harleyan, 1542.)

Of the following, no published copies are known to me; I have received photographs of them from Mr. Prowse :—

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|-------------------------------|----------------------|
| 1562. Gutierrez. | 1613. Oliva. |
| 1580. Dee. (Also Prowse, 58.) | 1623. Sanchez. |
| 1573. Dourado. | 1650. Oliva. |
| 1580. Simon. | 1550. B. M., 17938d. |

Important lost maps of this period :—
 Those by Cartier showing the results of his voyages.

III.—THE CHAMPLAIN TYPE. 1604-1703.

- 1607. Champlain, Samuel de.** Description des Costes, pts, radis, illes de la nouvell france.)
 MS., on parchment, in possession of M. HARRISSE. Marcel, Supplement, 1.
- 1609. Lescarbot, Marcus.** Figure de la Terre Neuve, Grand Riviere de Canada. et Côtes de Locean en la Nouvelle France. Fig. 13.
 Copperplate, 17 x 7½, in his "Histoire."
- 1610.** (Map of the Colonies in America, made for James I.)
 MS. reproduced in Brown, "Genesis of the U. S.," II.
- 1612. Champlain, Samuel de.** Carte géographique de la Nouvelle France.
 Fig. 14.
 Copperplate, 30 x 17½, in his "Voyages," 1613.
- 1613. Champlain, Samuel de.** Carte géographique de la Nouvelle France.
 Woodcut, 13½ x 10, in his "Voyages," 1613.
- 1613. Champlain, Samuel de.** Map of St. John Harbor.
 In his "Voyages."
- 1613. Champlain, Samuel de.** Map of Isle St. Croix.
 In his "Voyages."
- 1621. Jacobez, Anthony.** Americae Septentrionalis pars.
 Engraved map in "West-Indische Paskaret." Coloured *fac-simile* in Penn. Archives, ii. Ser., V., 1877.
- 1624. Alexander, Sir William.** Nova Scotia. Fig. 16.
 Eng. in his "Encouragement to Colonies." Reprinted in Purchas. Pilgrimes. III. Often copied: In Prince Society edition; these Transactions, X., ii., 127.
 9 x 13 in.; 110' in. = 1 in.
- 1630. De Laet, Joannes.** Nova Francia et Regiones adjacentes. Fig. 17.
 In his "Nieuwe Wereld," p. 1833.
 11 x 14 in.; 108 m. = 1 in.
- 1632. Champlain, Samuel de.** Carte de la Nouvelle France, augmentée depuis la dernière, etc. Fig. 15.
 In his "Voyages," ed. 1632.
 21 x 34 in.; 95 m. = 1 in.
- 1647. Dudley, Robert.** Carta particolare della terra nuova.
 Eng. in Del Arcano del Mare.
- 1656. Sanson, N.** Le Canada ou Nouvelle France. Fig. 18.
 Eng. Several others by Sanson, of later dates, show no improvement over this.
- 1660. Creuxius.** Tabula Novæ Franciæ. Fig. 19.
 Eng. in his "Historia Canadensis," 1664.
 13 x 17; 120 m. = 1 in.

- 1661. Van Loons.** Pas-cærtte van Terra Nova.
In "Pas-cærtte van Terra Nova."
- 1663. Tabula Novæ Franciæ.**
MS. in Poore MS., II., 147. Copy in Winsor, IV., 148.
- 1670 (?) Visscher, Nicolas.** Carte nouvelle contenant la partie d'Amerique la plus septentrionale. Fig. 21.
Eng. 18½ x 23 in.
- 1670 (?) Homann, J. B.** Nova Anglia, etc. Fig. 22.
- 1672. Denys, Nicolas.** (Carte de l'Acadie.)
In his "Description géographique," 1672.
15½ x 19½ in.; 35 m. = 1 in.
Copy in these Transactions, IX., ii.
- 1677. Du Val, P.** Le Canada fait par le Sr. de Champlain.
Engr. 21½ x 12.
Earlier editions; one of 1653 (Marcel, Catalogue, 73) and 1664.
- 1682 (?)** Carte de l'Amerique Septentrionale et partie de la meridionale, etc.
In Marcel's Atlas, No. 8. Harrisse, 219; Marcel, Catalogue, 131.
- 1684. Franquelin, J. B. L.** Carte de la Louisiane, ou des Voyages du Sr. de la Salle, etc.
MS. Paris. A reproduction is to appear in the "Jesuit Relations," ed. by R. G. Thwaites.
- 1685 (1680).** (Map of New England.)
MS. in Vol. III., 11, Poore MS. Copy in Winsor; these Transactions, IX., ii., 70.
12 x 7½ in.; 45 m. = 1 in.
- 1685. Jumeau, Emmanuel.** La grande baye de S. laurens en la nouvelle france, etc. Fig. 25.
Marcel, Supplement, 17. MS. in Paris; copy in Library of Parliament, Ottawa.
- 1686. Franquelin, J. B. L.** (Also cited as De Meulles.) Carte Gêrâlle du Voyage que Monsr. De Meulles, Intendant de la Justice, Police et Finances de la Nouvelle France, a fait par ordre du Roy et commencée le 9^e Novembre, et finy le 6^e Julliet 1686, en suivant, etc. Fig. 26.
Harrisse, No. 232. MS. in Paris; copy in Library of Parliament, Ottawa.
- 1686. De Meulles.** See Franquelin above.
- 1688 (?)** (Virginia to Gulf of St. Lawrence.) Fig. 23.
MS. Known to me only by a photo given me by Professor Horsford. Tracing of N. B. in this paper.
- 1689. Coronelli.** Partie orientale de Canada ou de la Nouvelle France.
Engr. Paris. 23½ x 17½ in.; 75 m. = 1 in.
Reproduced in these Transactions, IX., ii., 71.
- 1692. Le Clercq, Chr.** Carte generale de la Nouvelle France.
MS. mentioned by Harrisse, No. 367. Marcel, No. 90.
- 1699. De Rozier, Guillaume.** Carte de la riviere St. Jean, et des Missions parmy les Abenakis.
MS. in the Parkmann MS. (Abenakis, II.) in library of Massachusetts Historical Society.
- 1700. Delisle, G.** America Septentrionalis.
- 1702.** A Chart of the Sea Coast of Newfoundland, New Scotland, etc. Fig. 20.
In the English Pilot, 4th Pt.

Copies of others mentioned may be found as follows:—

1625. Briggs. America, IV., 383.

1626. Speed. America, IV., 384.

1640. Hœnius. Müller's Atlas.

1722. Wells. In his New Sett of Maps, London, 1722.

Important lost maps of this period:—

That of the St. John by Southack, 1697.

IV.—THE DELISLE TYPE. 1703-1744.

- 1703. Delisle, Guillaume.** Carte du Canada ou de la Nouvelle France, et les Decouvertes qui y ont été faites. Dressée sur plusieurs Observations et sur un grand nombre de Relations imprimées ou manuscrites. Fig. 24.
Paris, 1703.
26 x 20 in.; 160 m. = 1 in.
There are other later issues of this map, without dates.
- 1705. Fer, N. de.** Le Canada ou Nouvelle France, la Floride, la Virginie, etc.
Paris.
200 m. = 1 in.; 13 x 20 in.
- 1707. Seller, Jer., and Price, Cha.** A Chart of New France, Newfoundland, New Scotland and part of New England.
No doubt drawn by Southack, as his name often occurs on it.
17 x 23; 50 m. = 1 in.
In "Fourth Part of the General English Pilot . . . describing America." London, 1707.
See these Transactions IX., ii., 71.
- 1708. Franquelin, J. B. L.** Carte generale de la Nouvelle France dans l'Amerique Septentrionale.
MS. reproduced in Marcel's Atlas, 40; Catalogue, 279.
- 1710. Senex, John.** Map of North America.
26 x 38 in.
- 1713. Blackmore, Nat.** A Description of the Bay of Fundy, shewing ye Coast Islands, Harbours, Creeks, Coves, Rocks, Shoals, Soundings and Anchorings, &c., observed by Nat. Blackmore in ye years 1711 and 1712. By Her Majesty's special command. Fig. 27.
8 x 17 in.; 13 m. = 1 in.
In Mohl's Atlas Minor, 1732? No. 48.
- 1715. Moll, Herman.** A new and exact Map of the Dominions of the King of Great Britain on ye Continent of North America. Fig. 29.
24 x 40 in.
- 1719. Senex, John.** A new Map of the British Empire in America.
- 1720. Moll, Herman.** A new Map of the North Parts of America claimed by France.
40 x 24 in.
- 1731.** A correct Map of the Coast of New England.
In The English Pilot, Fourth Book, London, 1742.
- (1733.) Southack, Cyprian.** An actual survey of the Sea Coast from New York to the I. Cape Briton. Fig. 28.
London. No date, but an inscription at St. Peter's, in Cape Breton, says "Fortifying in 1733."
In The English Pilot, 1742. Also issued with somewhat different title.
24 x 31½ in.; 22½ m. = 1 in.
- 1733. Popple, Henry.** A Map of the British Empire in America, etc. Fig. 30.
In 21 sheets.
- 1740? La Hontan.** Carte Generale de Canada, etc.
21½ x 16½ in.

V.—THE BELLIN TYPE. 1744 to about 1770 (1783).

- 1744. Bellin, N.** Carte de la Partie Orientale de la Nouvelle France ou du Canada. Fig. 31.
15½ x 22 in.; 56 m. = 1 in.
In Charlevoix's "Histoire et Description Generale de la Nouvelle France." Paris, 1744.
There is an English edition of 1746 by Jefferys.
- 1744. Bellin, N.** Carte de l'Accadie, etc.
8 x 13 in.; 36 m. = 1 inch.
In Charlevoix, op. cit.

- 1745. Bellin, N.** Partie Orientale de la Nouvelle France, etc.
24 x 18½ in.
- 1746. Southack, Cyprian.** A New Chart of the British Empire in North America.
Boston. About 27 x 30 in.; 62 m. = 1 in.
- 1746. D'Anville, Sr.** Carte de l'Amerique Septentrionale.
Paris. Later issues. An English edition of 1752, "greatly improved by Mr. Bolton."
- 1748. Vaugondy, Robert de.** L'Acadie.
Not seen.
- 1749. Morris, Charles.** Draught of the Northern English Colonies, together with the French neighbouring settlements; taken partly from actual Surveys, and partly from the most approved Draughts and other accounts.
32 m. = 1 in.
MS. in Lenox Library; reproduced in *facsimile* in "Captain Pote's Journal."
- 1749. Morris, Chas.** Map of Head of the Bay of Fundy.
See under next Type.)
- 1753. Vaugondy, Robert de.** La Nouvelle France ou Canada.
This is the map referred to by Green and others as that of M. Robert. There are many other editions and maps by him.
- 1754.** Carte de la baie des Chaleurs. Fig. 33.
MS. in Paris. Marcel, 53. 19 pouces, 9 lignes = 1 degré.
- 1754. Franquet.** (Map of the Missaguash.)
MS. Copy in Library of Parliament, Ottawa.
- 1755. Bellin, N.** Partie orientale de la Nouvelle France ou du Canada.
Poore Coll., No. 12 in II. 21½ x 17 in.
- 1755. D'Anville, Le Sr.** Canada, Louisiane et Terres Anglaises. Fig. 32.
Three sheets, each 19 x 22½. Also ed. 1760.
35 m. = 1 in.
- 1755. Mitchell, John.** A Map of the British and French Dominions in North America. Fig. 34.
Amsterdam. Several sheets.
- 1755. Green, John, (Jefferys, J.)** A New Map of Nova Scotia, Cape Briton, etc. Fig. 35.
In Memorials of the English and French Commissaries. London. Reproduced in part in Winsor, America, V., 480. French edition of same year, "Nouvelle Ecosse ou Partie Orientale du Canada." Also several later editions; 1760, 1775, 1785.
- 1755. Green, John.** Chart of the Atlantic Ocean, including the British, French and Spanish Settlements in North America and the West Indies.
- 1755. Huske, John.** A New and Accurate Map of North America, etc.
- 1755. Seutter, Math. T.** Partie orientale de la Nouvelle France, etc. Pub. by Tob. Cour Lotter.
Distorted by a special form of projection.
19½ x 22½ in.
- 1755. Le Rouge, Le Sr.** Canada et Louisiane.
20 x 24½ in.
- 1755?** Map of Isthmus of Chignecto.
In Memoirs sur le Canada, 1749-1760, Quebec, 1873. Also in Winsor, America, V., 451.
- 1755.** A large and particular Plan of Shegnekto Bay and the Circumjacent Country, etc. Drawn on the spot by an officer. Pub. by Thos. Jefferys.
In his General Topography of North America and the West Indies, London, 1766.
22½ x 14½ in.
- 1755.** Map of the Bason of Chignectou and its Environs in Nova Scotia. From a French Draught, Capt. Lewis' Survey of the road to Bay Verte, and some other Surveys to the year 1755.
MS. 29 x 19 in.

- 1757. Bellin, N.** Carte de l'Acadie, Isle Royle et Païs Voisins.
8 x 11 in.; 35 m. = 1 in.
In "Histoire générale des Voyages," Vol. XIV. Paris, 1757.
- 1757. Bellin, N.** Carte du Cours du Fleuve de St. Laurent, etc.
Poore Coll., No. 59 in II.
- 1757. Jefferys, Thos.** An Exact Chart of the River St. Lawrence.
London. Also an ed. of 1775.
- (1758. Morris, Chas.** Sketch of St. John's Harbour, etc.
See under next Type.)
- 1759. Pelairet, I.** Carte des Possessions Anglaises et François du Continent de l'Amerique Septentrionale.
London. Also a 1755 ed. of this, without his name.
- (1761. Bruce, R. G.** Plan of the Harbour and a Part of the River St. John s.
See under next Type.)
- (1764. Mitchel, John.** Map of Passamaquoddy Bay.
See under next Type.)
- 1764. Bellin, N.** Acadie.
In "Le Petit Atlas Maritime," Paris, 1764.
- (1765. Morris, Chas.** Map showing the Coast from River St. John to Passamaquoddy.
See under next Type.)
- 1768. Montresor, Capt.** Map of Nova Scotia or Acadie.
- 1772. (1755.)** Fort Beauséjour and adjacent country, etc.
In Mante's "History of the Late War," London, 1772.
22½ x 13½; 1 3-5 m. = 1 in.
Copy of part in Winsor, America, V., 453.
- 1775. Sayer, Robt.** A Chart of the Gulf of St. Lawrence.
London.
- 1775. Jefferys, Thos.** The Map of North America, from the French of M. D'Anville.
In Douglass's "Summary, Historical and Political," I.
20 x 18 in.; 105 m. = 1 in.
- 1776. D'Anville, Sr.** Partie orientale du Canada avec la Nouvelle Angleterre, l'Acadie et la Terre-neuve.
Venice. 23 x 19½ in.; 45 m. = 1 in.
- 1776. D'Anville, Sr.** Carte generale du Canada, de la Louisiane, de la Floride, etc.
Venice, 1776. 26 x 19 in.
- 1776. Evans, Lewis, and Pownall, Thos.** General Map of the Middle British Colonies in America.
In Pownall's "Topographical Description." There are earlier editions of the map by Evans alone.
- 1776. Sayer and Bennett.** A General Map of the Northern British Colonies in America, etc. Corrected from Governor Pownall's late map, 1776. Fig. 36.
In American Military Pocket Atlas, London.
26 x 19; 60 m. = 1 inch.
- 1776. Holland, Samuel.** A General Map of the Northern British Colonies in America, which comprehends Quebec, Newfoundland, Nova Scotia, New England and New York, 1776.
Mentioned by Winsor, America, VII., 184. Not seen by me.
- 1777. Faden, William.** The British Colonies in North America.
London. 21 x 25 in.; 100 m. = 1 in.
- 1777. Andrews, John.** A New Map of the British Colonies, etc.
London.

- 1778 (?)** Port Ristigouche dans la Baye de Chaleur. Levé en 1760 par le Norwich.
Paris. 20 x 12 in.
- 1778.** Baye de Chaleur, dans le Golfe St. Laurent. Levée par le Norwich en 1760.
Publiée a Londres en 1775.
Paris. 18½ x 11½ in.
- 1779.** Plan du Port de la Riviere St. Jean, etc.
Paris. 15½ x 9½ in.
- 1779.** Plan de l'Isthme de l'Acadie, comprenant le Beau Bassin avec une Partie de la Baie Verte, etc.
Paris. 23 x 15½ in.
- 1780.** Bonne, M. L'Isle de Terre-neuve, l'Acadie, ou la Nouvelle Écosse, l'Isle St. Jean et la Partie orientale du Canada.
12½ by 8½ in.; 80 m. = 1 in.
In Raynal's Atlas, 1780; also a copy in his "Analyse Succincte," No. 44.
- 1783.** Kitchin, Thos. Map of the United States in North America, etc.
19½ by 16 in.; 95 m. = 1 in.
In English Translation Raynal's East and West Indies, London, 1788.

For a list of other Maps of this Period showing at least a part of New Brunswick, see Gallatin's "Right of the United States to the Northeastern Boundary claimed by them," 76, 77, 80, also "Statement on the Part of the United States of the Case referred to the King of the Netherlands;" 36 maps are mentioned in these lists, some of which are, however, given in this list.

VI.—THE MODERN TYPE. About 1770 (1749) to 1820.

- 1749.** Morris, Chas. (Map of Head of the Bay of Fundy.)
14 x 11 in.; 3½ leagues = 1 in.
MS. in Public Record Office, Archives, 1894, 135. See Green, p.
- 1758.** [Morris, Chas.] Sketch of St. John's Harbour and a Part of the River.
Fig. 37.
10 x 25 in.; 2½ m. = 1 in.
MS. with Monckton's "Report of the Proceedings of the Troops on the Expedition up St. John's River in the Bay of Fundy." Public Record Office.
- 1761.** Bruce, R. G. Plan of the Harbour and Part of the River St. John's in Nova Scotia.
40 x 28 in.; 300 yds. = 1 in.
MS. in Crown Land Office. Reproduced in part in these Transactions, IX., ii., 61.
- 1764.** Mitchell, John. Map of Passamaquoddy Bay.
Now lost, but the basis of this region in Evans' and Pownall's map and that of Sayer and Bennett. Fig. 36.
- 1765.** Morris, Chas. Map showing the Coast from River St. John to Passamaquoddy.
Not seen.
78 x 90 in.
MS. Public Record Office, Archives, 1894, 275. Probably the original map on which his others are based.
- 1772.** Wright, Thos. (Holland, Samuel.) Plan of the Coast from the West Passage of Passamiquoddy Bay to the River St. John in the Bay of Fundy.
4,000 feet to 1 inch.
MS. in British Museum.
- 1772.** Holland (Wright) Passamaquoddy Bay and Harbour.
28 x 34; 1 m. = 1 in.
MS. in Crown Land Office, Fredericton.
(Inscription can be seen only by holding map up to light.)

- 1774. Morris, Chas.** A Plan of the River St. John in the County of Sunbury and Province of Nova Scotia, etc.
62 x 29 in. . 1 m. = 1 in.
MS. in British Museum. Archives, 1894, 229.
Information on it to 1774; topography doubtless earlier.
- 1776. DesBarres, J. F. W.** (Chart of the Entrance to the River St. John.)
Later issues.
- 1777. Andrews, John.** A New Map of the British Colonies . . . showing the seat of war, etc.
London.
- 1779. DesBarres, J. F. W.** Northumberland Streights, Buctush to Bay Verte.
- 1780. DesBarres, J. F. W.** The Coast of Nova Scotia, New England, New York, Jersey, etc.
- 1780. DesBarres, J. F. W.** A Chart of Nova Scotia.
- 1780. DesBarres, J. F. W.** The Isthmus of Nova Scotia.
- 1781. DesBarres, J. F. W.** (Chart of Miramichi Bay.)
- 1781. DesBarres, J. F. W.** Shediack, Cocagne and Buctush.
- 1781. DesBarres, J. F. W.** (Bay Chaleur.)
- 1781. DesBarres, J. F. W.** (Bay Chaleur and Miramichi Bay.)
- 1781. DesBarres, J. F. W.** (Chignecto Bay and Isthmus and Bay Verte.)
- 1781. DesBarres, J. F. W.** (Grand Manan Island.)
- 1781. DesBarres, J. F. W.** (Wolf Island to Lepreau.)
- 1781. DesBarres, J. F. W.** (Passamaquoddy.)
- 1781. DesBarres, J. F. W.** The Harbours of Richibucto and Buctush on the West Shore of the Gulph of St. Lawrence.
- 1783? Peachey, Jas.** (Plan of the River St. John and the Post Route to the St. Lawrence.) Fig. 39.
MS. in British Museum.
- 1784. Morris, Chas.** Plan of the Bay and District of Passamaquoddy.
Not seen.
3 m. = 1 m.
MS. in British Museum.
Also special plans by him of the Towns of Belle View (Beaver Harbor) and St. George and St. Andrews, in same year.
- 1784. Morse, Robt.?** A Plan of the City and Harbour of Saint John, from an actual survey taken in the year 1784.
MS. in Crown Land Office. Probably same as that accompanying Morse's Report of 1784, Archives, 1881, 30.
- 1784. Morris, Chas.** (Plan of the River St. John, showing granted lands.)
28 x 50 in.; 3 m. = 1 in.
MS. in Crown Land Office, also in British Museum.
- 1785. Plan of New Brunswick.**
In Public Record Office. Not seen. Archives, 1895, N.B., 3.
- 1785. Campbell, Dugald.** Plan of the Ourasstook or Saint John's River, from an actual survey in the winters of 1784 and 1785.
About 60 in. long; 3 m. = 1 in.
MS. in Public Record Office. Archives, 1895, N.B., 5.
- 1785. Plan of the River Scoodick or Great Saint Croix, from an actual survey made by order of His Excellency Governor Carleton.**
1 m. = 1 in.
MS. in Public Record Office. Archives, 1895, N.B., 4.
Sec. II., 1897. 24.

- 1785.** (1765?) **Micheau, Daniel.** Map of Miramichi.
62 by 16 in.; $\frac{1}{2}$ m. = 1 in.
MS. in Public Record Office. Archives, 1895, N.B., 3.
- 1786.** Map of Southern Part of New Brunswick.
MS. in British Museum. Not seen.
(Catalogue of Additions, 122, 238.)
- 1786.** **Von Velden, W.** Plan of actual survey of Ristigouche, from Le Mission to Gagouchigouway, etc.
44 x 8 in.; 2 m. = 1 inch.
MS. in Crown Land Office.
- 1786.** (**Allen, John**?) Sketch of Passamaquoddy, with the adjacent Rivers.
MS. in Massachusetts Archives.
("Maps and Plans," XVI., No. 20.)
- 1788.** **Campbell, Robert.** Map of the Great River St. John & Waters, the first ever published, from the Bay of Fundy up to St. Ann's or Frederick's Town; being little known by White People until 1783, etc.
London. 16 $\frac{1}{2}$ x 30 $\frac{1}{4}$; 4 m. = 1 in.
Only copy known to me is in collection of the New Brunswick Historical Society.
- 1790.** **Wright, Thos.** A New Chart of the Gulf of St. Lawrence.
London.
- 1792.** **Titcomb, Samuel.** A Plan of the length of the River Schoodic; as well as Schoodic Lake on the East and Passamaquoddy Lakes on the West.
MS. in Massachusetts Archives ("Roller 997.")
- 1794.** **Laurie and Whittle.** A New and Correct Map of the British Colonies in North America. Fig. 40.
19 x 26 $\frac{1}{2}$ in.; 60 m. = 1 in.
In Kitchin's Atlas of 1799, London.
- 1795.** **Arrowsmith, A.** A Map exhibiting all the new discoveries in the Interior Parts of North America, etc. Fig. 41.
Large sheets, London. Also, with additions to, 1802; 1811 edition altered and improved.
- 1796.** **Arrowsmith, A.** A Map of the United States of North America. Drawn from a number of Critical Researches.
London.
- 1796.** **Owen, David.** Sketch of Passamaquoddy.
12 x 16 in.
MS. in possession of Rev. W. O. Raymond: two copies; differing somewhat.
- 1797.** **Solzmann, D. F.** Map of Maine.
Hamburg. Also 1798.
- 1797.** **Hedden, J., and Campbell, D.** Plan of the River Magaguadavic, with its principal branches. From the actual surveys of Isaac Hedden in the year 1796 and Dugald Campbell in 1797, etc.
28 x 78 in.; $\frac{2}{3}$ m. = 1 in.
MS. in Library of Massachusetts Historical Society. Field-book in possession of Rev. W. O. Raymond of St. John.
A map of the same scale for the St. Croix is not known to me.
- 1797.** Map of Bone [St. Croix or Dochet] Island.
MS. in Crown Land Office and Library of Massachusetts Historical Society.
4 $\frac{1}{2}$ chains = 1 inch.
- 1798.** Plan of the Rivers Scoudiac and Magaguadavic, survey whereof made in 1796, 1797, 1798.
20 x 21 in.; 160 chains = 1 in.
MS. in Crown Land Office, Fredericton.
- 1798.** **Holland, Capt.** Plan of the River St. John. From a New Chart of the Coast of Nova Scotia, with the South Coast of New Brunswick.
London. 19 m. = 1 in.

- 1798. Joseph, Francis** (an Indian.) (Headwaters of the St. Croix, and the Portages.)
MS. in Library of Maine Historical Society. Reproduced in *Mag. American History*, XXVI., 264.
(Cobscook Waters and Portages.)
MS. in Library of Maine Historical Society.
- 1799. Fort Cumberland to Fredericton.**
Not seen.
MS. in British Museum.
(Catalogue of Additions, 122, 238.)
- 1800? Holland, Samuel.** A new Map of the Province of Lower Canada, etc. To which is added a plan of the rivers Schouadiac and Magaguadavic, surveyed in 1796, '97 and '98, etc.
London. 38½ x 24.
Gagnon, Essai, 4423. Not seen.
- 1802. Carleton, Osgood.** Map of the District of Maine.
4¼ m. = 1 in. (about.)
The earlier editions of this contain nothing of any importance on New Brunswick.
- 1802. Holland, Major.** Lower Canada. (Shows River St. John.)
- 1807. Cary, John.** A New Map of Nova Scotia, Newfoundland, &c., from the latest authorities.
- 1808. Tardieu, P. F.** Carte des Etats-Unis, etc.
Paris, 1808.
- 1810. Jones, B. R.** A Map & Chart of the Bays, Harbours, Post Roads and Settlements in Passamaquoddy & Machias.
16 x 21 in.
Also ed. 1824.
Reproduced in Kilby's Eastport and Passamaquoddy as frontispiece
- 1814. Purdy, John.** A Map of Cabotia, comprehending the Provinces of Upper and Lower Canada, New Brunswick, etc.
London. 20 m. = 1 in.
With special enlargement of N. S. and Southern Part of N. B. on scale 15 m. = 1 in.
Also editions of 1821 and 1825.
- 1815. Bouchette, Jos.** Map of the Provinces of Upper and Lower Canada, etc.
London. 48 x 30 in.; 35 m. = 1 in. (about.)
- 1815. Bouchette, Jos.** A Plan of the Route from Halifax to the River du Loup, In his "Topographical Description of Lower Canada," London.
- 1818. Lockwood, A.** Mouth of the River St. John.
22½ x 17½. Fine copperplate. Only copy known to me is in Crown Land Office, Fredericton.
- Mentioned in Documents Relating to the North Eastern Boundary of the State of Maine, Boston, 1828.
- 1817. Bouchette, Jos.** Survey of the North Line from the source of the St. Croix, 1817. MS.
- 1817. Johnson.** Survey of the same line. MS.
- 1818. Odell.** Survey of Extension of the North Line. MS.
- 1818. Johnson.** Survey of the same line. MS.
- ? **Burnham.** Survey of Memkeswee, Green River and Beaver Stream. MS.
- ? **Tiarks.** Survey of Toladie and Green Rivers. MS.

THE COMPLETE TYPE. 1820 to the Present.

- 1820. Bonnor, Thos.** A New Map of the Province of New Brunswick.
London. 32 x 32 in.; 8 m. = 1 in.
- 1826. Lockwood, Anthony.** A Map of New Brunswick.
46 x 36 in.; 6 m. = 1 in.
- 1826. Foulis, R.** Map of the River St. John, Fredericton to the Great Falls.
MS. in Crown Land Office, Fredericton.
- 1827. Henderson, W.** Sketch of the Great Valley of the Rr. St. John, exhibiting the Situation and Extent of the Territory in Dispute between the British and American Governments, etc.
20½ x 18½ in.; 16 m. = 1 in.
In Quebec Legislative Report, 1827. Gagnon, Essai, 4451.
- 1831. Bouchette, Joseph.** Map of the Provinces of Upper and Lower Canada, with Adjacent Parts of the United States of America, etc.
London. 14 m. = 1 in.
Also an edition of 1846.
- 1832. Baillie, Thos., and Kendall, E.** Map of New Brunswick.
25½ x 24 in.; about 11 m. = 1 in.
- 1832. Baillie, Thos.** Sketch of the Province of New Brunswick.
In his "Account of the Province of New Brunswick," 1832.
12¾ x 12; 20 m. = 1 in. (about.)
- 1834. New Brunswick and Nova Scotia Land Company.** A Map of the Company's tract of land in the Province of New Brunswick.
London. 28 x 23½ in.
Gagnon, Essai, 4434. Not seen.
- 1835. Cunningham, John.** A Plan of the City and Harbour of St. John, N.B., etc.
Boston. 34½ x 25½; 500 ft. = 1 in.
- 1836. Layton, W. J.** Plan of a Projected Communication between the Settlements of Richibucto and Salmon Rivers.
Boston. 13 x 20 in.; 6 m. = 1 in.
- 1839.** Plan of Campobello and other Islands contiguous.
London. 21 x 16½ in.; 45 chains = 1 in.
- 1840. Rapkin, J.** East Canada and New Brunswick.
13 x 10 in.; 42 m. = 1 in.
In R. Montgomery Martin's British Possessions in North America.
- 1840.** Plate of reproductions of Old Maps, with a Map of the Madawaska District.
27½ x 17½.
- 1841 (?) Wyld, Jas.** A Map of the Provinces of New Brunswick and Nova Scotia, etc.
London. 12 m. = 1 in.
- 1841. Greenleaf, Moses.** Map of the State of Maine, with the Province of New Brunswick.
41½ x 50½.
3rd ed. Philadelphia. 1st ed., 1815; 2nd, 1832.
- 1842. Saunders, John Simcoe.** A Map of the Province of New Brunswick, including the Territory in Dispute between Her Majesty's Government and the United States.
10 m. = 1 in. Fredericton.
- 1846. Owen, W. F. W.** (Maps of the St. John, from the mouth to Springhill.)
MS. in Crown Land Office, Fredericton.
- 1853. Perley, George H.** Map of the Province of New Brunswick.
St. John, N.B. (Lithographed in Boston.)
20½ x 20½ in.; 14 m. = 1 in. (about.)

- 1857. Perley, M. H.?** New Brunswick.
 $15\frac{1}{2} \times 15\frac{1}{2}$; 18 m. = 1 in. (about.)
 (An excellent map, without name of author; probably made to accompany Perley's Handbook of 1857, for the named blocks of land recently surveyed for settlement, and so fully described in Perley's Handbook, are very plainly marked.)
- 1859. Wilkinson, John.** Map of the British Province of New Brunswick,
 with adjacent parts of Canada, Nova Scotia and Maine.
 50×48 in.; 8 m. = 1 in.
- 1862. Walling, H. F.** Topographical Map of the Counties of St. John and King's, New Brunswick.
 New York. $56 \times 57\frac{1}{2}$ in.; 1 m. = 4.5 in. (about.)
 There are similar maps by the same authors of Westmorland and Albert.
- 1867. Gregory, C. C.** McMillan's Map of New Brunswick.
- 1874? Buck, Wm.** Map of the Province of New Brunswick, with portions of Nova Scotia.
 New York.
- 1874. Steckel, R.** Map of the Isthmus between the Gulf of St. Lawrence and the Bay of Fundy, etc.
 Montreal. $8\frac{1}{2} \times 15\frac{1}{2}$ in.; 1.5-6 m. = 1 in. (about.)
 Reissued several times, with various additions.
- 1875. Loggie, Thos. G.** Map of the Principal Timber Lands of New Brunswick, Montreal and Toronto. 6 m. = 1 in.
- 1878 (?) Perley, H. F.** McMillan's Map of New Brunswick.
 St. John. 10 m. = 1 in.
- 1885. Loggie, Thos. G.** Map of the Province of New Brunswick, Canada.
 $69\frac{1}{2} \times 69\frac{1}{2}$ in.; 4 m. = 1 in.
- 1880-1896. Geological Survey of Canada.** (I.) The entire Province, in 15 sheets, each $19 \times 12\frac{1}{2}$ in. Scale, 4 m. = 1 inch. Coloured to show the geological formations. The most detailed maps of the Province which have yet appeared.
 (II.) Maps of the Surface Geology of the Province, by R. Chalmers. Of these, 10 sheets, of the same size and upon the same scale as the preceding, have appeared.
- 1887. Washburn, L. DeW.** Plan of Campobello Island.
 Boston. 10×16 in.; $\frac{1}{2}$ m. = 1 in.

ADMIRALTY CHARTS.

(The numbers preceding the titles are those officially applied to the charts.)

Chart of the Bay of Fundy.

Compiled from various manuscripts. Hydrographical Office of the Admiralty. 1824.
 Sheet 1st.

2020. Campobello Island.

Surv. Capt. W. F. W. Owen, 1847, with corrections U. S. Coast Survey, 1876. 1 sea m. = 1.9 in.

2539. Grand Manan Island, with the adjacent islands and dangers.

Surv. Commr. P. F. Shortland, 1855. 1 sea m. = 1 in.

1551. The Harbour of St. John.

1 sea m. = $3\frac{1}{2}$ in.; do. = 7 in. Surv. by Lieuts. Harding and Kortright, under orders of Capt. W. F. W. Owen, 1844.

1747. Northumberland Strait, Western Part.

Surv. Capt. H. W. Bayfield, 1839. 1 sea m. = $\frac{1}{2}$ in.

1712. Miramichi Bay and River.

Surv. Capt. H. W. Bayfield. 1 sea m. = 1 in.

- 1986. Buctouche River.**
Surv. Capt. H. W. Bayfield, 1839. 1 sea m. = 3 in.
- 2013. Quoddy Hd. to C. Lepreau.**
Surv. Capt. W. F. W. Owen, 1848. 1 sea m. = 66-100 in.
- 1715. Chaleur Bay.**
Surv. Capt. H. W. Bayfield, 1839. 1 sea m. = $\frac{1}{2}$ in.
- 352. Bay of Fundy. Sheet 1. Grand Manan to St. John.**
Surv. Lieut. P. F. Shortland (assisted by several others), 1862. 1 sea m. = 27-100 in.
- 353. Bay of Fundy. Sheet 2. Digby Gut to the Head of Navigation.**
Surv. Lieut. P. F. Shortland (assisted by several others), 1860. 1 m. = 3-10 in.
- 1743. Port St. Andrew.**
Lieut. Kortright, 1844. 1 sea m. = 6 in.
- 1857. L'Etang Harbour.**
1 sea m. = 3 in. Lieut. Kortright, 1847.
- 354. River Petitcoudiac and Cumberland Basin.**
1 sea m. = 1 1-10 in. Capt. Shortland, 1861.
- 2187. Miramichi Bay.**
Surv. Capt. H. W. Bayfield, 1837; additions by Commr. Orlebar, 1857. 1 sea m. = $1\frac{1}{2}$ in.
Also reissued by U. S. Hydrographic Office, 1179.
- 2686. Caraquette, Shippigan, and Miscou Harbours.**
1838. 1 sea m. = 1.5 in.
- 2199. Richibucto River.**
1839. 1 sea m. = 4 in.
- 1941. Cocagne Harbour.**
1843. 1 sea m. = 3 in.
- 1943. Shediac Bay and Harbour.**
1888. 1 sea m. = 3 in.

There is also a volume of Sailing Directions for the south-east coast of Nova Scotia and Bay of Fundy. Staff Com. McDougall, 3rd ed., 1885.

St. Lawrence Pilot, 2 vols., 5th ed., 1882, 1881.

Imray & Son have issued :—

Chart of Gulf of St. Lawrence. West sheet.

Compiled by James F. Imray, F.R.G.S. No. 105. Contains also Shediac Bay in detail, also Miramichi Bay in detail.

United States Coast Survey :—

- 101. Calais to Little River,** including Cobscook Bay, Maine.
1891. $1\frac{1}{2}$ m. = 1 in.
- 301. Eastport to Moose Cove,** including Cobscook Bay, Maine.
1893. $\frac{1}{4}$ m. = 1 in.

APPENDIX.

SOURCES OF INFORMATION.

In the preparation of this work I have received help at many points from several friends and correspondents, to whom I wish here to tender my grateful acknowledgment. For a series of very beautiful and valuable photographs of early maps I have to thank Mr. G. R. F. Prowse, of Bradford, Yorkshire, England, who has also sent me valuable notes, too special for use in this paper, but showing the wealth of cartographical material he possesses and the scholarly use he is making of it. Herr Dr. Sophus Ruge, of Dresden, has had the great kindness to send me a tracing of the Desliens map from the Royal Library, of which earlier M. HARRISSE had sent me a sketch. The late Mr. Justin Winsor, whose recent death is the greatest loss our cartography has ever sustained, has several times favoured me with advice. M. Henry Vignaud, of the United States Legation at Paris, has done me the greatest kindness in obtaining fine copies of several maps from the French archives, which I could not possibly have secured without his aid. At several points, also, I have had the great advantage of the assistance of Mr. Victor H. Paltsits, of the Lenox Library, New York, whose rare bibliographical instinct is combined with a sympathetic interest in his fellow-students' work and most cheerful willingness to aid them. Mr. Thos. G. Loggie, of the Crown Land office, Fredericton, has, as before, always been ready to make available to me the fulness of his knowledge of New Brunswick geography. Rev. W. O. Raymond, of St. John, has allowed me the use of several valuable records, of which he possesses a large collection. Mr. Arthur Hill, of St. Stephen, has loaned me several maps, and has given me the valuable and rare Bonnor map. My friend Mr. S. W. Kain, of St. John, has sent me many notes on maps, and rendered other valuable service. Mr. Harry Piers, of Halifax, has also given me assistance, as have several others whose names are mentioned in the preceding pages.

In making these studies I have had the great advantage of the use of Harvard College Library, which, as is well known, possesses the largest collection of American maps in existence, and also is very rich in map-literature, including atlases of reproductions. The entire collection, moreover, is in the very best condition of order and accessibility, as it is to be expected in any collection under the care of Mr. Winsor. There are very valuable maps, also, in the Massachusetts Archives in the State House at Boston, which includes the valuable Ben Perley Poore collection. The Boston Athenæum Library contains, also, some rare New Brunswick maps, which I have been allowed to examine freely. The collection in the Boston Public Library is also of use, though not so rich as the others

I have mentioned, though its collection of reproductions is very complete. The Library of the Massachusetts Historical Society also includes some valuable maps and other geographical records, including some among the Parkman manuscripts, and all of these the librarian, Dr. Green, has been ever ready to allow me to use freely. I have made some use of the Astor and Lenox libraries in New York, and of the Library of Congress at Washington, and think I have seen most that is valuable to this subject in them, but in my few visits to the British Museum and the Public Record office, I was able to examine but a small part of the treasures they possess for the student of our cartography.

Upon Cartography in the abstract, map construction, its relations to improvements in navigation, taking of latitudes and longitudes, etc., I have used but few works. There is valuable matter on this subject in Thacher's "Continent of America," and in Dawson's "Voyages of the Cabots."

Upon the History of Cartography, Judge Daly's "Early History of Cartography" is important, as are the articles "Map" and "Geography" in the *Encyclopædia Britannica*, and Kohl's Smithsonian Lecture, as well as parts of his "Discovery of the East Coast of Maine," for both of which works my admiration steadily grows; and there are references to other works in the books of Winsor and HARRISSE, by whose aid the subject may be fully traced. There is a "Histoire de la Cartographie et de l'arpentage sous le régime français," by J. E. Roy, which I have not seen. Some of the memoirs to accompany the great maps published in the last century, incidentally give much valuable information upon the different phases of cartography. A work, "America, its Geographical History," by D. W. B. Scaife, evidently relating to this subject, and the more recent "Dawn of Modern Geography," by Beazley, London, 1897, I have not seen.

Coming now to the works of authority upon our cartography in particular, there are first of all the books by Winsor, HARRISSE and Kohl, which are too well known to require description. Mr. Winsor's most important book is, of course, his great "America;" HARRISSE's is his "Discovery of America," though others are also important. Kohl's "Discovery of the East Coast of Maine" nearly exhausts the subject for that region. Winsor's account of the Kohl Collection of Maps at Washington is also of use. All of these works deal more especially with the earlier periods, those of Kohl and HARRISSE ending some time before the close of the sixteenth century; and Winsor, also, is fullest on the earlier periods, and for New Brunswick is of almost no aid for the three later periods.

On Canadian Cartography in particular, while there are few or no works relating to it as such, nevertheless many papers contain very scholarly cartographical descriptions and discussions, such as those by Patterson, Howley, Dawson and others. There are valuable notes upon

maps in Bourinot's Cape Breton, and Prowse's Newfoundland. Mr. G. R. F. Prowse is making for Newfoundland a microscopically minute study, though I do not know that he has yet published any work upon it. There is a paper on the Map-Literature of Canada, by H. Scaddin, of some importance for other parts of Canada, but not relating to our eastern region.

Under the general works should be mentioned the great atlases of reproductions of ancient maps, of which there are several of great excellence, by Jomard, Kretschmer, Kuntsmann, Marcel, Müller, Nordenskjold. These render accessible the materials for such studies as this, which, without them, would be hardly possible. Of great value for its account of the early maps of America, and as a compendium of our early cartography, is Ruge's "Entwicklung der Kartographie von Amerika." Much important matter is contained in Harrisse's "Notes sur la Nouvelle France," and Marcel's supplement to it, and also in Marcel's Catalogue of the Collection of Maps exhibited by the Bibliothèque Nationale in 1893.

For the cartography of New Brunswick this work has no predecessors. Winsor has, in his "America" (Vol. V., 472), given a brief outline of the cartography of Acadia for the earlier periods, but it is too brief to give a sufficient idea of the subject. The only other cartography of a limited district in America that I know of is "Virginia Cartography," by P. Lee Phillips, in the Smithsonian Miscellaneous Collections, No. 1039, 1896, but it is a mere list with no analysis. There must be others that I do not know of.

It is not necessary to trace further this subject of authorities and literature, for the various notes through the text amply explain the other sources of information, which are, with rare exceptions, very well known books.

I have not given as full an account of some geographical documents as may seem desirable, but it has been necessary to keep this work strictly to cartography.

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APPENDIX TO SECTION II

THE CABOT LEGENDS

(See *ante* p. 268)

THE LEGENDS OF THE CABOT MAP OF 1544

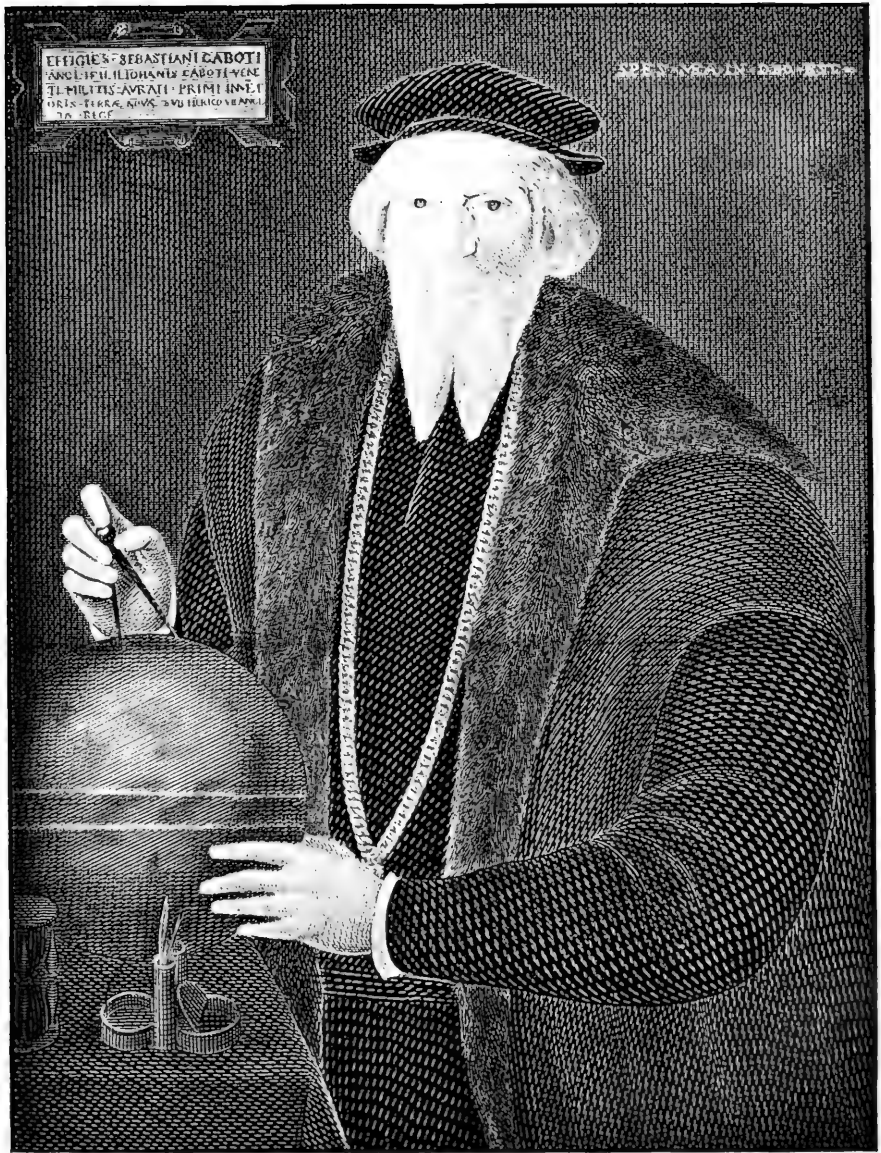
as transcribed and translated under the supervision of the late Dr. Charles Deane and published in Vol. VI., Second Series, Proceedings of the Massachusetts Historical Society (1890-91).

The references in the body of the map to the legends at the sides are placed as follows :—

- No. 1, between the Bermuda Islands and the West Indies.
- No. 2, north of the Island of Antigua.
- No. 3, opposite to the west coast of Mexico.
- No. 4, opposite to the Strait of Magellan.
- No. 5, at the Molucca Islands.
- No. 6, opposite to the coast of Peru.
- No. 7, at the mouth of the Rio de la Plata.
- No. 8, in Hudson Bay.
- No. 9, opposite to Iceland.
- No. 10, in the northern part of Russia.
- No. 11, in the northeastern part of Asia, where the reference is incorrectly given to Table 2, No. 2.
- No. 12, in the northern part of Asia.
- No. 13, in the middle of Africa.
- No. 14, in Hindostan, without a numerical reference, but it is indicated by the picture of a woman surrounded by flames.
- No. 15, north of Japan.
- No. 16, near Sumatra.
- No. 17, on the eastern side of the map, just south of the equator.
- No. 18, north of Europe and Asia.
- No. 19, in the Indian Ocean, nearly south of Hindostan.
- No. 20, directly below the preceding reference.
- No. 21, in the Indian Ocean, northwest from No. 19.
- No. 22, near Ceylon.

NOTE.

In the translation, words which are in the Spanish version but not in the Latin are printed in italics. The additions of the Latin version are given in the footnotes. Mr. Deane apparently employed two different persons to copy the inscriptions. The copyist of the Spanish version found his text put upon the map in such a bungling manner, in respect to the separation of syllables and the running together of words and in other ways, that he wrote out the abbreviations and corrected the spelling, in order to render the meaning intelligible. His copy has, therefore, been carefully followed. The Latin version was in a better state, but it contained a great number of abbreviations which could not be easily represented by modern type; and though these abbreviations were preserved by the Latin copyist, they have been spelled out in printing, to conform to the rule adopted with regard to the Spanish version.



SEBASTIAN CABOT.

From the original formerly in the possession of Charles Joseph Harford, Esq., of Stapleton, in the county of Gloucester. This painting afterwards became the property of Mr. Richard Biddle, of Pittsburg, Pennsylvania, and was destroyed by fire at his residence.

LEGENDS IN LATIN AND SPANISH AS ON THE MAP.

TABULA PRIMA.

Del almirante.

Nº 1. El almirante Don Christoval Colon, de nacion ginovez, se ofrecio á los Catholicos Reyes, de gloriosa memoria, que descubriera las islas y tierra firme de las Indias, por el occidente, si para ello le diesen suficiente armada y favor, y aviendole, armado tres caravelas, el anno de 1492 passó á descubrirlas; y dende en adelante otras muchas personas an proseguido el dicho descubrimiento, segun que por la presente discrecion [descripcion] se manifiesta.

Nº 2. En la isla Española ay mucho oro de nascimiento, y azul muy fino, y mucho azucar y cañafistola, e infinito ganado de toda suerte. Los puerocos desta isla dan á los dolientes, como acá en nuestras partes carnero. Tiene esta dicha isla muchos puertos y muy buenos, y el principal dellos es la cibdad de Sant Domingo, que es una cibdad muy buena y de mucho tracto; y todos los otros son lugares edificados y poblados por los Españoles. Y en la isla de Cuba, y de Sant Joan, y en todas las otras islas & tierra firme, se halla mucho oro de nascimiento: Y en la cibdad de Sant Domingo tiene su magestad su chancelleria Real, y en todos los otros pueblos y provincias gobernadores y regidores que los gobiernan y rigen con mucha justicia. Y cada dia se van descubriendo nuevas tierras y provincias muy ricas, por donde nuestra saneta fe catholica es, y será, muy aumentada; y estos Reynos de Castilla han grandescidos de muy gloriosa fama y riquezas.

Nº 3. Esta tierra firme, que los Españoles llamaro la nueva España, conquistóla el muy illustre cavallero don Fernando Cortes, Marques del Valle de Guaxacon. Ay en esta tierra provincias y cibdades innumerables; la principal dellas es la cibdad de Mexico, la qual tiene mas de cinquenta mil vezinos; está en una laguna salada que coge quarenta leguas. Ay en dicha cibdad, y en todas las otras provincias mucho oro, plata de nascimiento y de todo genero de piedras preciosas: y criase en la dicha tierra y provincias mucha seda y muy buena, y algodón y alumbre, orchilla, y pastel, grana, y azafran, y azucar, y de todo lo suso dicho mucha cantidad, de lo qual muchas naos vienen cargadas á estos Reynos de España. Los naturales desta tierra son muy avisados en todo

Nº 1. Architalassus Dominus Christophorus Colon, natione Ligur, aperiturum se occidentales Indorum Insulas & continentem Regibus Catholicis felicis memoriae pollicitus est, si ad hanc provinciam capesendam, necessaria sibi abunde impenderint; quippe qui trium navium, regio apparatu, & copiis omnibus, suffultum emiserunt, anno ab orbe redempto 1492; post eum plurimi succedentes has provincias nobis clausas aperuerunt, pro ut in presentí descriptione patet.

Nº 2. Hispania hæc Insula innumeri prædives pecoris & armentorum est. Plurimo inde extracto abundat auro, Saccaro & Cassia fistula; permulte navium stationes, ac tutissimi insunt portus. Præcipuus autem omnium est sancti Dominici, quæ civitas insignis esse perhibetur, multique commercii, reliquæ siquidem Coloniae ductæ ab Hispanis & conditæ sunt. Cubæ ac divi Joannis cæterisque omnibus Insulis, necnon continenti, auri fodinæ innumeræ passim effodiuntur. Hæc loca omnia frequentibus incolis habitantur. Celebri divi Dominici urbe, regium forum præest, Imperatoris edicte, in aliis vero oppidis, villis & insulis, ejus gubernatores & populos regunt, ratione & legum sinceritate potius quam animi affectibus. Incognitæ seu ignotæ nobis Indorum regiones indies aperiantur, expugnanturque, quo fides catholica felix ac faustum capit incrementum. Hispania vero congestis undique opibus ditior evadit.

Nº 3. Hanc continentem Hispani à suo nomine novam Hispaniam denominaverunt, quam illustris dominus Fernandus Cortesius, Vallis & Guaxace Marchio expugnavit; ejus plurimæ insunt provincia, urbesque innumeræ habitantur, quarum insignior Mexicum nuncupatur, Indorum nomine. Hæc siquidem numero quingenta incolarum millia excedit, eamque Lacus quidam salsus circuit, quadraginta parasangis; inde extracta maxima auri & argenti copia, ac preciosis lapillis, cum reliquæ aliæ hujus provincie urbes, tum ipsa Mexicum præcipuè abundat, plurimus hic bombix & gossipium, alumen, crocum, glastum, aliique ad inficiendum colores producantur. Præsertim saccarum, seu arundineus succus, adeo passim-prodit, ut omnes Hispanorum naves annuatim ad

tracto de mercaderías ; usan en lugar de moneda unas almendras partidas por medio que ellos llaman cacao, o cacanghate, barbara dicion. Tienen mucho trigo, y cevada, y otras muchas semillas, y viñas y muchas fructas de diversas suertes. Es tierra de muchos animales ; ciervos, puercos monteses, leones, pardos, tygres y otra mucha caza, así de aves como de animales terrestres. Es gente muy abil en contrahazer al natural qualquiera figura de bulto y en debuxar pinturas. Las mugeres comunemente se adornan con piedras preciosas y perlas de valor. Usan esto Indios cierta especie de papel en el qual debuxan con figuras todo lo que quieren dezir, en lugar de letras. Nunca tuvieron paz entre ellos, antes los unos perseguían á los otros con batallas continuas, en las quales, los que eran presos de una parte y de otra los enemigos los sacrificavan á sus dioses, cuyos cuerpos muertos eran mantenimientos publicos á la hueste. Erán ydolatras y adoravan lo que se les antojava, eran muy amigos de comer carne humana ; puesto que al presente se despojaron de aquellas fieras y crueles costumbres, y se vistieron de Jesu Christo, creyendo de buen corazon nuestra sancta ley Evangelica, y obediendo á la sancta madre yglesia y á sus mandamientos sanctissimos.

Nº 4. Este estrecho de todos sanctos descubrió Hernando de Magallanes, Capitan de una armada que mandó hazer la S. e. c. m. del Imperator Don Carlos y Rey, nuestro senor para el descubrimiento de las islas Maluco. Ay en este estrecho hombres de tan grande estatura que parecen Gigantes. Es tierra muy desierta ; y vistense de pelos de animales.

Nº 5. Estas islas de Maluco fueron descubiertas por Fernando de Magallanes, Capitan de una armada que su magestad mandó hazer para el descubrimiento de las dichas islas, y por Joan Sebastian del Canno : es á saber, que el dicho Fernando de Magallanes descubrió el estrecho de todos sanctos, el qual está en LII grados y medio hazia el polo Antartico ; y despues de aver passado el dicho yio estrecho syn [estrecho, y no sin] grandissimo trabajo y peligro, prosiguió su viaje hazia las dichas yslas por espacio de muchos dias, [y] llegó á unas yslas de las quales le meridional dellas está en XII grados ; y por ser la gente della tan bulciosa, y porque les hurtaron el batel de una nao, la pusieron

Bethicam Hispalim onerentur, indeque ad omnes provincias, hujus incolae ad commutandas omnimodas merces callidissimi sunt. Pro numis enucleatis mediis amidalis utuntur, quod numerum genus Cacao, seu Cacagnato barbaro Indorum nomine appellant ; tritico, ordeo, aliisque seminibus, uvis & cæteris fructibus plurimum abundat ; innumera terrestrium animalium genera, precipuè Cervorum, Aprorum, Leonum, Pardorum, Tigridum passim vagantur, aviumque volatiliu in exhausta propemodum multitudine, quæ quidem loca omnia venationis plena. Ea gens doctissima & apprimè studiosa est, tam ad formas qualescunque res sculpendi arte, quam ad effigendas quasvis exacte figuras graphice. Foru mulieres gemmis unionibus & preciosis lapillis adornantur. Papyri quodam genere Indi utuntur, in quo figuris quibusdam deliniant quæcunque voluerint pro literis. Nunquam mutuo pacem ineunt concordi federe, quinimo se invicem insequantur bellis assiduis ac detestandis. Qui vero ex utraque acie victi capiuntur, hi ceu victima diis patriis pro victoria litabantur, quorum cadavera pro publicis dapibus exercitui apparabantur. Ea gens Idolorum cultris erat, carnis hominum avidissima, adorabatque omnia quibus animus ejus quotidie afficiebatur. Etsi tempestate nostra ferinis illis antiquis moribus exuta & Christum Dominum nostrum se induens, cum fido corde profiteatur, veneretur, & colat : Evangelicæ fidei, Christicolæque religioni firmiter credens, sacre sanctæque Catholice orthodoxorum Ecclesie synceris monitis divinisque præceptis obtemperans.

Nº 4. Fretum hoc Omnium Sanctorum Fernandus Magallianus aperuit, quem classis regie Hispanorum ad aperendum expugnandumque Malucarum Insulas S. e. c. Majestas Caroli Imperatoris invictissimique Regis Domini nostri, hujus nominis quinti, duces præferebat. Qui hoc fretum degunt, Gigantes potius terrigenesque homines esse traduntur, horum regio amplissima, vasta solitudine, ac raro habitatore colitur, hi hominum solis animalium pellibus induuntur.

Nº 5. Has Malucarum Insulas Fernandus Magallianus diu nostratibus clausas aperuit, necnon Joannes Sebastianus del Canno ejus successor, quem inquam Fernandum ad opulentissimas has Indorum Insulas aperiendas S. e. c. Majestas Caroli Imperatoris domini nostri hujus nomine quinti, suæ regie Hispanorum classi duces & gubernatores præferebat, quæ quidem classis è portu Hispalis insignis civitatis Beticæ provinciæ nauticum solvit. Is itaque primo fretum Omnium Sanctorum aperuit, quod ab equinoctiali ad Antarticum vergens 52. gradibus cum dimidio distat ; cumque supradictas Insulas petens haud sine maximo sui periculo suorumque labore intolerabili, ulterius navigare per-

nombre, la isla de los ladrones; y de ay prosiguiendo su viaje, como dicho es, descubrió una isla, que le pusieron nombre la Aguada, porque ay tomaron agua; y de ay adelante descubrieron otra, que se dize Bunham, y Aceilani, y otra, que se dize Cubu, en la qual ysla murió el dicho Capitan, Hernando de Magallanes, en una escaramuza que uvo con los naturales della; y la gente que quedó de la dicha armada eligieron Joan Sebastian del Canno por Capitan della: el qual despues descubrió la ysla de Bendanao, en la qual ay mucho oro de nacimiento y canela muy fina; y asy mismo descubrió á la ysla de Poloan, y á la de Brunay, y á la de Gilolo, y á la ysla de Tridori, y á la de Terenati, y Motil, y otras muchas, en las quales ay mucho oro, y clavo, y nuez moscada, y otro genero de especeria y drogueria. Cargó el dicho Sebastian del Canno dos naos, que les avia quedado de cinco que llevaron, de clavo en la dicha ysla de Tidorí, porque en ella, y en la dicha ysla de Terenati, dizen naser el dicho clavo, y no en otra alguna; y assi mismo truxo mucha canela y nuez moscada. Y viniendo la buelta del cabo de buena esperanza por el mar Indico adelante, para venir á España, una nao le fue forzado de arribar y tornar á la ysla de Tidorí, de donde se partió, por la mucha agua que hazia; y el dicho Capitan Joan Sebastian del Canno, con su nao, nombrada Sancta Maria de la victoria, vino á estos Reynos de Castilla, á la cibdad de Sevilla, Anno de M. D. XXII, por el cabo de buena esperanza. De manera que claramente parece aver dado el dicho Joan Sebastian del Canno una buelta á todo lo universo; por quanto fue tanto por occidente, aunque no por un paralelo, que bolvió por el oriente al lugar occidental de donde se partió.

Nº 6. Estas provincias fueron descubiertas por el honrado y muy efforzado cavallero, Francisco Pizarro, el qual fue governador dellas durante su vida; en las quales ay infinito oro y plata de nacimiento, y minas de esmeraldas muy finas. El pan que tienen hazenlo de maiz, y el vino semejantemente; tienen mucho trigo y otras semillas. Es gente bellicosa; usan en sus guerras arcos, y hondas, y lanzas; sus armaduras son de oro y plata. Ay en las dichas provincias unas ovejas de hechura de pequennos camelos; tienen la lana muy fina. Son gentes idolatras y de muy sutil ingenio; y en toda la ribera de la mar, con mas de veinte leguas dentro de la tierra, no llueve. Es tierra muy sana.

geret. Tandem longo post tempore quibusdam appulit Insulis, è quibus à Polo Arctico, quæ magis ad meridiem expectat duodecim ab æquatore gradibus semota est, cuius homines agilitate apprime callidi sunt, quorum latrocinii, quia cymbula quedam classis, è conspectu nautarum Hispanorum evanuit, ea loca, latronum Insulas denominaverunt. Hinc deinceps ulteriori navigatione aperuit quandam Insulam, cui Laguada nomen indidit quoniam eodem aquatum ire illi contigit: Aperuit & alias Bunham scilicet, Aceliani & Acubu, quarum ultima dictus Fernandus Magellianus congressu quodam Indorum hostium vita functus est, cui Joannes Sebastianus del Caño totius classis suffragiis, votisque omnium electus feliciter successit, qui postea sequentes Insulas Bedenao, Apoloam, Brunai, Gilolo, Atidori, Terrenati, Motil, aliasque quàm plurimas Insulas prosperè aperuit quibus maxima auri copia exoritur, Gariophilorum, Cinamomi, nucisque miristice, ac omnium aromatum & mercium, adeo ut ipse classarius Joannes Sebastianus del Caño duas naves ex quinque, quas è naufragio cøperat incolumes, Tidorí Insula Gariophillis oneravit. In illa siquidem ac Terenati tantum, in aliis vero Insulis nusquam produci aiunt: Abundat itidem Cinamomum, ac nucs miristice Bendenao legantur, quarum etiam maximam copiam inde abstulit. Dumque is ad Hispaniam per mare Indicum rediret, ac bonæ spei promontorium insinuare properat, altera navium sentinam exantlare haud facillè valens, ne fluctibus obrueretur, Tidorí Insulam iterum petere coactus fuit, unde mare metiri cøperat: Joannes vero Sebastianus del Canno bonæ spei promontorium pertransiens, navi, quæ vehebatur cui nomen diva victrix Maria, Hispalim civitatem Beticæ regionis tuto adire potuit est, unde primum navigare inchoaverat, Anno à nativitate redemptoris 1522. Ex quo satis constat Joannem Sebastianum del Canno totum orbem circulariter navigasse, utpote qui adeo occidentale plagam usque permeavit, ut eam transiens ad occidentem iterum rediret, unde primum iter cøperat.

Nº 6. Has provincias nobis aperuerunt expugnaueruntque magnanimi equites Franciscus Pizarro & Almagro, qui inquam Franciscus Pizarro has dum vixerit gubernavit; copiosè inde extractis divitiis. Abundant enim aurifodinis & preciosis Smaragdís. Panis eorum quo vescuntur, & vinum quod bibunt, ex quadam spica prægrandi fit, quæ Indorum idiomate Maiz appellatur. Ea gens belligera est, acri ingenio, idolorumque cultrix, utiturque in bello fundis, arcu & iaculis. Armaturæ eorum aureæ sunt & argenteæ. Genus quoddam ovium illic nascitur parvorum Camelorum simile, quarum lana mollis ac subtilissima est; ad viginti parasangas & amplius, tota litoralis ora nunquam pluvia

Los Christianos tienen hecho en ella muchos pueblos, y cada dia van aumentando.

Nº 7. Llamen los Indios á este gran Rio, el Rio huruai, en castellano, el Rio de la plata. Toman este nombre del Rio huruai, el qual es un Rio muy caudaloso, que entra en el gran Rio de Parana. Descubriólo Joan Diaz de Solis, piloto mayor de los catholicas reyes de gloriosa memoria; y descubrió hasta una isla, que el dicho Joan Diaz puso nombre la isla de Martin Garcia, porque en ella enterró un marinero, que se decia Martin Garcia; la qual dicha isla está obra de treynta leguas arriba de la boca deste Rio; y costéle bien caro el dicho descubrimiento, porque los Yndios de la dicha tierra lo mataron y lo comieron. Y despues passados muchos annos lo bolvió á hallar Sebastian Caboto, Capitan y Piloto mayor de S. c. e. m. del Imperador don Carlos, quinto deste nombre y Rey, nuestro sennor, el qual yva por Capitan general de una armada que su majestad mandó hazer para el descubrimiento de Tarsis, y Ofir y Catayo oriental; el qual dicho capitan Sebastian Caboto vino á este Rio por caso fortuito, porque la nao capitana, en que yva, se le perdió, y visto que no podia seguir el dicho su viaje, acordó de descubrir con la gente que llevaba el dicho Rio, vista la grandisima relacion que los Indios de la tierra le dieron de la grandisima riqueza de oro y plata, que en la dicha tierra avia; y no sin grandisimo trabajo y hambre y peligros, así de su persona como de los que con el iban. Y procuró el dicho capitan de hazer cerca del dicho rio algunas poblaciones de la gente que llevó de España. Este Rio es mayor que nynguno de quantos acá se conocen; tiene de ancho en la entrada, que entra en la mar, veinte y cinco leguas, y trezientas leguas arriba de la dicha entrada tiene dos leguas en ancho. La causa de ser tan grande y poderoso es que entran en el otros muchos rios, grandes y caudalosos. Es rio de infinitisimo pescado y el mejor que ay en el mundo. La gente en llegando á aquella tierra quiso conocer si era fertil, y aparejada para labrar y llevar pan; y senbraron en el mes de setiembre LII granos de trigo, que no se halló mas en las naos, y cogieron luego en el mes de diezembre cinquenta y dos mill granos de trigo, que esta misma fertilidad se halló en todas las otras semillas. Los que en aquella tierra biven dizen, que no lexos de ay en la tierra adentro, que ay unas grandes sierras de donde sacan infinitisimo oro, y que mas adelante en las mismas sierras sacan infinita plata. Ay en esta tierra unas ovejas grandes como asnos comunes, de figura de camelos, salvo que tienen la lana tan fina como seda; y otras muy diversas animales. La gente de la dicha

madescet. Christicolæ plurimas illuc ducunt colonias, indiesque eas augere student.

Nº 7. Vastum flumen hoc Indorum lingua Vruai, Hispano vero idionate Rio de la plata nuncupatur, cui affluit & alius fluvius Parana nomine; hoc autem Joannes Dias de Solis invictissimorum catholicorumque regum Ferdinandi & Elizabeth archigubernius primus aperuit, Insule tenus, quam à nomine cujusdam nautæ suæ classis ibi sepulti, Insulam Martini Gartie denominavit, quæ memoratum intra flumen ab ejus hostiis quadraginta parasangis distat. Hanc siquidem per varios casus per tot discrimina rerum, dum clausum suis aperit, expugnatque, ab Indis oppressus occisusque levoratur. Elapsis autem postea multis annis Sebastianus Cabotus navigandi arte astrorumque peritissimus, dux & archigubernius Caroli Imperatoris, hujus nominis quinti regisque potentissimi, denuo nobis aperuit classe regia, cui ipse Imperator ducem præfecerat ad aperiendum insulas Tarsis, Ofir, Ciapangu & Eocitai, qui inquam archigubernius obiter flumen hoc intravit, in causa fuit, quia navium eius ductrix naufragium fecerat, procellosis obruta fluctibus, quo cursum sibi destinatum cum sociis minimè continuare potuit, cumque his nautis, qui mari recepti aderant, flumen aperire aggressus est laud sine magno sui periculo suorumque labore intolerabili, fame ac rerum omnium penuria, à nonnullis Indorum antea certior factus, regionem istam auro & argento omnium opulentissimam esse, quo solertissimus dux & archigubernius motus ducere colonias cœpit; prope flumen nonnullos arces ac propugnacula condere diligenter curavit, quibus Hispani incolæ facile tuerentur, & vim hostium Indorum inde propellerent. Hoc flumen majus est omnibus nobis cognitis, cujus ostia mare adfluentia latitudine viginti quinque parasangis protenduntur. Reliquum hujus supra trecentas ab ostiis latitudine duobus parasangis dimetitur, cujus vasta profunditas causatur ex multorum confluxu ingentium fluviorum; multis abundat & optimis piscibus omnium quas mare nutrit. Gens nostra cum primum his appulit oris, an culta tellus illa fertilis esset & aptissima lætas ferre segetes periculum fecit, collectis quinquaginta duobus tritici granis, quæ in tota eorum classe invenerant mense Septembri terræ mandavit. Decembri vero duo millia supra quinquaginta mensuit, aliorum seminum ac leguminum eadem est fertilitas. Hujus regionis incolæ non procul inde celsos quosdam montes inesse aiunt, è quibus ingentem auri copiam extrahere solent, nec multo longiori intervallo alios asserunt innumero abundare argento, & alia cum visum dictu innumerabilia enarrantur, quæ

1 Should be "messuit."

tierra es muy diferente entre si, porque los que biven en las aldas de las sierras son blancos como nosotros, y los que estan hazia la ribera del rio son morenos. Algunos dellos dizen que en las dichas sierras ay hombres que tienen el rostro como de perro, y otros de la rodilla abaxo como de Abestruz, y que estos son grandes trabajadores y que cogen mucho mays, de que hazen pan, y vino del. Otras muchas cosas dizen de aquella tierra que no se pone aquy por no ser prolixas.

Nº 8. Esta tierra fue descubierta por Joan Caboto Veneciano y Sebastian Caboto su hijo, anno del nascimiento de nuestro Salvador Jesu Christo de m. cccc. xciiii, á veinte y quatro de Junio por la manna; á la qual pusieron nombre prima tierra vista, y á una isla grande, que está par de la dicha tierra, le pusieron nombre sant Joan, por aver sido descubierta el mismo dia. La gente della andan vestidos de pieles de animales; usan en sus guerras arcos y flechas, lanzas, y dardos, y unas porras de palo, y hondas. Es tierra muy steril; ay en ella muchos orsos blancos, y ciervos muy grandes como cavallos, y otras muchas animales; y semejantemente ay pescado infinito, sollos, salmones, lenguados muy grandes de vara en largo, y otras muchas diversidades de pescados, y la mayor multitud dellos se dizen baccallaos; y así mismo ay en la dicha tierra halcones, prietos como cuervos, aguillas, perlices, pardillas, y otras muchas aves de diversas maneras.

Nº 9. En esta yslandia ay grandissima multitud de pescado; tomanlo en el yvierno, y secanlo con el grande frio que haze allá porque esta dicha isla está dentro del círculo Artico; y en el verano van allá de muchas partes, y mercan del dicho pescado así seco á trueque de harina y cervesa; y este dicho pescado es tan seco y duro, que para comerlo lo baten con unos martillos de hierro encima de unas piedras duras como marmol, y despues le ponen á remojar un dia o dos, y asy lo comen despues, cozido con manteca de vacas. Y en toda esta mar setentrional ay grandissima multitud de pescado, y muchos dellos grandes y de monstruosa forma; an visto los que en esta mar navegan morenas grandissimas, que parecen grandes sierpes, y acometer á los navios para comerse los navegantes. Los naturales de la dicha isla la mayor parte dellos hazen sus casas debaxo de tierra, y las paredes de huesos de pescados; no tienen leña salvo unos

pro eorum prolixitate ne fastidiant animos silentio traduntur. Hi homines proni sunt ad laborem, ac terræ cultus studiosissimi, unde multum vini & panis conficiunt ex ea spica, quam Indi Maiz appellant. Quoddam genus ovium hic magno corpore adest parvorum camelorum instar, quarum vellera permolli ac tenuissima lana, ceu bombice exornantur suntque alia quam plurima diversorum animalium genera. Hujus regionis homines, forma & colore inter se longe differunt siquidem qui in montibus degunt, albi colore & nobis similes sunt: qui vero fluminis ripas incolunt, hi fusco & tetro colore nigrent. Nonnulli eorum caninam faciem habere perhibentur, quidam autem pedes & tibias ad strutho-camelorum similitudinem habent.

Nº 8. Terram hanc olim nobis clausam aperuit Joannes Cabotus Venetus, necnon Sebastianus Cabotus ejus filius, anno ab orbe redempto 1494. die vero 24. Julii, ¹ hora 5. sub diluculo, quam terram primum visam appellarunt, & Insulam quamdam magnam ei oppositam, Insulam divi Joannis nominarunt, quippe qua solenni die festo divi Joannis aperta fuit. Hujus terræ incolæ pellibus animalium induuntur, arcu in bello, sagittis, hastis, spiculis, clavis ligneis, & fundis utuntur: sterilis incultaque tellus fuit, leonibus, ursis albis, procerisque cervis, piscibus innumeris, lupis scilicet, salmonibus & ingentibus soleis unius ulnæ longitudine, aliisque diversis piscium generibus abundat, horum autem maxima copia est, quos vulgus Bacallios appellat; ad hæc insunt accipitres nigri corvorum similes, aquilæ, perdicesque fusco colore, aliæque diversæ volucres.

Nº 9. Hæc Insula innumera piscium multitudine abundat, quos ejus incolæ hyeme capiunt & Boreali horriferoque frigore desiccant, utpote inque sub Arcti sita circulo, penetrabile frigus constringit desiccando. Ineunte autem vere Angli, Germani, aliarumque diversarum regionum incolæ huc adnavigant, pisces hos frigore desiccatos empturi, cervisiæ & farinæ commutatione. Estque hoc piscium genus adeo durum, ut malleis ferreis superlapidem pertunderi necesse sit, postea vero aqua biduo molire, quo tandem butyro condientes comedant. Nec solum hæc Insula ingentem piscium copiam alit, sed etiam totum mare Scythicum, quorum nonnulli adeo vasto corpore emergunt, ut monstra potius marina quam pisces videantur. Fertur à quibusdam hoc mare navigantibus adeo hic ingentes murenas prospici, serpentibus similes ut naves ipsas invadere audeant, quo nautas & vectores arripientes devorent. Insulæ hujus incolæ

¹ In Chytræus it reads "1494 die vero 24 Junii."

pequenos arbolezitos y destos muy pocos, y en pocos lugares. Mas el Proveedor de todas las cosas lo provee cada anno, que le viene por la mar, de hazia las partes setentrionales de la dicha isla, muy grandisima multitud de arboles de diversas suertes y grandezas, como cosa de naufragio, transportados de furiosos vientos septentrionales á la costa de la dicha isla; de los quales los naturales se proveen, y gastan para todo lo á ellos necesario. Y dizen que muchas vezes oyen hablar spiritus, y llamarse por sus nombres, y parecer á personas vivas, y dezirles quien son, y en ciertas partes de la dicha isla salen unos fuegos muy horribles, y otras muchas maravillas dizen los naturales desta dicha isla que ay en ella.

Nº 10. Los hombres que habitan en esta region son salvajes; carecen de pan y de vino; amansan ciervos y cavalgan en ellos; y pelean con otra gente, que está mas adelante hazia el setentrion, que ellos llaman nocturnos, porque van de noche y hazen sus haziendas como acá de dia; y esto porque los dias allá, desde XIII. de setiembre hasta X de marzo, son tan pequenos que non ay una hora de claridad. Son muy mala gentes, alteadores; roban á todos los que passan por ay cerca; navio ninguna no osa estar surto á la costa por miedo destos hombres nocturnos, porque matan y roban á todos quantos pueden aver á las manos. Y un poco adelante destos nocturnos, hazia el sueste, dizen aver unos monstruos que tienen todo el cuerpo como de persona humana, salvo la cabeza, que tienen como de puerco, y que gruñendo se entienden como puercos.

subterranea domicilia sibi construunt, quorum parietes piscium ossibus erigunt, lignorum autem penuria laborant, perexigua siquidem arbuscula raraque hic pullulant, sed summus ille gubernator his necessaria annuatim satis copiosè largitur ex Septentrionali plaga, quàm plurimè variæque ac proceræ arbores, turbine ventorum eradicate immanique agilitate procella his littoribus, naufragii instar impelluntur, quibus incolæ abunde utuntur. Aiunt præterea persæpe hic audire spiritus se mutuo alloquentes, propriisque nominibus se invicem appellantes, & vivis hominibus nonnunquam apparentes, quibus se ac sua nomina, quæ sint indicare perhibentur, & quibusdam ejusdem Insulæ locis, ignis, visu horribilis per se excutitur & procul jactatur, rotaturque. Et plura alia cum visu tum auditu mirabilia hujus Insulæ inesse asserunt quæ brevitatis causa omituntur.

Nº 10. Hujus regionis incolæ ferinis moribus imbuti, solitudinem incolunt sylvestresque omnino sunt, panè & vino penitus carent, cervos cicutæ ac mites reddentes, horum dorsis invehuntur. Cumque his hominibus magis ad Septentrionem vergentibus bella semper ineunt Nocturnis nomine appellatis, quia suas ipsorum res tam publicas quam privatas noctu, quemadmodum apud nos diu nostrates peragunt, eis quoque hoc evenit, quia è decimo quarto Septembris die, usque ad decimum Martii, adeo brevis dies eorum semper evolat, ut vix unius horæ spatium contineat; ea gens pessima est, cassatrixque & omnimodo latrocinii deditissima, adeo ut nullus viator ea loca adeat, quin ab eisdem Nocturnis occidatur spoliaturque. Paulò ante ulterius à Nocturnis Aphricum versus monstra quædam inesse aiunt, quæ quidem toto corpore hominibus, capite vero porcis similia sunt, & grunnientes porcorum instar se mutuo intelligunt.

TABULA SECUNDA.

Nº 11. Los que habitan en esta Region, algunos adoran el Sol, otros la primera cosa que veen por la mañana quando se levantan, otros adoran un pedaço de paño colorado que ponen encima de una lança, y asy cada uno adora lo que se le antoja; estan debaxo del poder del gran Can, Imperador de los Tartaros.

Nº 12. Aquí ay monstruos semejantes á hombres, que tienen las orejas tan grandes que les cubre todo el cuerpo; y mas adelante, hazia oriente, dizen que ay unos hombres que no tienen coyuntura ninguna hazia las Rodillas ny en los pies: Estan debaxo del poder del gran Can. En la provincia de Balor, la qual tiene cinquenta dias de andadura, son hombres silvestres; habitan en los montes y florestas.

Nº 11. Eorum qui hac regione degunt, quidam Solem adorant: Alii vero exurgentes late quicquid primum viderint: Alii item frustum panni rubri hasta affigentes venerantur numinis instar.

Nº 12. Sunt hic monstra hominibus similia, quæ adeo demissas prægrandesque habent aures, ut his totum corpus operiant. Ulteriusque orientem versus quosdam homines inesse perhibentur, quorum genua & pedes junctura carent, deguntque sub ditione magni Canis, in illa provincia, quem Balor eorum nomine dicitur, hæc quinquaginta dierum iter continet. Hi homines sylvestres omnino sunt, montium nemorumque cultores.

Nº 13. Aquí habita aquel poderoso Rey de Aziumba y Auxama, que algunos llaman Preste Joan, al qual sesenta Reyes le dan obediencia ; es abundantísimo de toda riqueza, y nunca se halla que fuese vencido en batalla alguna, mas muchas vezes bolvió del medio dia, de los pueblos Throgloditas, gente nuda y negra, con gloriosa victoria ; la qual gente llega hasta el cabo de buena esperanza. Entre la qual gente ay una nacion que no hablan, mas sifflando se entienden. Y este no es el Preste Joan, porque el Preste Joan tenia su señoria en la Yndia oriental y meridional, fasta que Chençhis, primero Rey de los Tartaros, lo venció y superó en una muy cruel batalla, en la qual murió ; y el dicho Chençhis le tomó todos sus Reynos y señorias, y dexó bivar los Christianos en su ley, y les dió Rey Christiano que los regiese y gobernase ; el qual Rey se llamava Jorge, y despues aca todos los reyes que suceden se llaman Jorge, como lo dize Marco Polo mas largamente á los xlii y á los xlviij capitulos de su libro.

Nº 14. El Rey desta provincia y Reyno de Bengala es muy poderoso señor y tiene debaxo de su señoria muchas cibdades, y muy grandes y de mucho tracto. Ay en este provincia y Reyno mucha canela, clavo, gengibre, pimienta, sandalos, lacar y seda en mucha cantidad. Tienen por costumbre en este Reyno y provincia, despues que mueren, de quemar los cuerpos ; y quando el marido muere primero que la muger, quemase la muger biva con el marido, diziendo que va á gozar con el en el otro mundo ; y es desta manera ; que muriendo el marido la muger haze un gran combite y se viste de los mas ricos vestidos que tiene ; al qual combite vienen todos sus parientes y del marido, y despues de aver comido, va ella con toda la gente á un lugar donde está hecho un grandísimo fuego, cantando y baylando fasta llegar al dicho fuego ; y despues hechan el cuerpo muerto del marido dentro, y luego ella se despide de sus parientes y amigos, y se lança en el fuego ; y aquella que mas liberalmente se hecha en el fuego, aquella da honra á su linage. Mas ya esta costumbre no se usa como solia, despues que los portugueses tractaron con ellos, y le dieron á entender que Dios nuestro señor no era servido de tal cosa.

Nº 13. Hic potentissimus ille regum degit, Aziumba Auxamaque civitatibus Imperans, quem vulgus Preste Joannem appellant, cujus ministerio astrincti sexaginta Reges versantur, quorumvis potentissimorum Regum felicissimam sortem divitiis suis exuparans, quippe qui nunquam bello ut ullis pro illis ¹ victus recessit, sed sæpe Throgloditis nudo nigroque corpore populis meridie maxima cum victoria triumphans rediit, qui cum promontorio bonæ spei (ut fertur) conterminat, inter quos genus quoddam horum hominum non loquitur, sed sibilis tantum se invicem percipere solent. Hunc itaque haud Preste Joannem illum esse, facile constat, cum is Eois, ac meridionalibus Indis imperaret, donec Chenchis primus Tartarorum rex, crudelis bellico congressu quodam eum superans feliciter prostravit ejusque imperium armata manu usurpavit. Christicolis que (quoscumque ibi invenerat) impune religione sua uti clemens concessit, ipsis Regem statuit ejusdem fidei, qui mitissimè eos regeret, ac benignè eos tractans gubernaret, Georgius nomine, cujus deinceps successores idem nomen sibi vendicabant, quemadmodum Marcus Polus libri sui quadragesimi, secundo & tertio capite copiosius refert.

Nº 14. Hujus provincie regni que Bengolæ potentissimus rex est, pluribus ingentibus ac insignibus & maximi commercii civitatibus dominatur, estque incredibili propemodum conjunctus necessitudine cum invictissimo Lusitanie Rege, quocum perpetuo federe pacem inivit unde ingens ei copia provenit Cinamomi, Gariophilorum, Zinziberis, Piperisque, Sandalorum & Bombicis. Horum moris fuisse aiunt cadavera cremare, & si uxoratus aliquis ex vivis decessisset, cum eo vivam ejus conjugem in rogo mariti comburere, credentes illam ad alium orbem migrantem eo ipso usque frui, cum quo hic vitam egerat. Cujus res hujusmodi erat, conjugem mortuo uxor ejus convivium vivis solenne parabat, defunctoque parentalia, induebaturque auro & peplo preciocissimo, omnium quæ possidebat, & ad lautas epulas illar omnes confestim tam sui quam mariti affines & amici properantes convivabantur, quibus postquam exempta fames epulis, mensæque remotæ, tunc illa convivis omnibus & funerali pompa stipata ad pyram accedebat, exultansque canebat & tripudiabat, quo ubi pervenerat, mariti cadavera in ignem dejecta, ipsa deinceps in rogam desiliebat, extremum vale omnibus dicens, & quæ hilariori vultu in flammis se projiciebat, majori se suosque omnes honore afficiebat. Enimvero vanus ille ritus & detestanda religio evanuit, ex quo gens Lusitania eorum commercio utitur, quippe quæ diu eos adronens pessimum facinus illud

¹ So on the map; but in Chytraus it is "aut ullis præliis."

Nº 15. El gran Can, Imperador de los Tartaros es muy grandísimo señor y muy poderoso ; intitulase Rey de los Reyes y Sennor de los sennores ; tiene por costumbre de dar á sus Varones vestidos treze vezes en el anno, en treze grandisimas fiestas que haze en cada un anno, y estas vestiduras son de mayor ó menor valor, segun la calidad de las personas á quien se da ; y á cada uno dan una cinta, y calzas, sombrero guarnescido de oro y perlas y piedras preciosas, segun la grandeza de las personas ; y estas vestiduras que da el dicho gran Can en cada un anno son CLVI. m ; y este haze por egrandescer y magnificar sus fiestas. Y quando muere llevanlo á enterrar á un monte que se dize Alcaý, donde se entierran los gran Canes, Imperadores de los Tartaros ; y los que lo llevan á enterrar matan á todos los que hallan, diziendoles ; id á servir á nuestro sennor en el otro mundo ; y assi mismo matan todos sus cavallos, camelo y azemilas que tienen, creyendo que van á servir á su sennor. Quando murió Mongui Can, Imperador de los Tartaros, fueron muertos trezientos mill hombres, que encontraron en el camino aquellos que lo llevavan á enterrar, segun dize Marco Polo en su libro, capitulo XLII. Poggio Florentino, Secretario del Papa Eugenio quarto, acerca del fin de su segundo libro, que escribió de la variacion y mudanza de la fortuna, hace mucho para la confirmacion de lo que el dicho Marco Polo escribió en su libro.

Nº 16. Diversas opiniones ay qual sea la Trapovana, despues que los Españoles y Portugueses navegaron el mar Indico : de la manera que el Ptolemeo la tiene situada, por grados de longitud y latitud, creo que á todos sea notorio. Algunos de los modernos descubreadores tienen que la isla de Ceislan es la Trapovana ; otros tienen que es la isla de Çamatra. Plinio escribe de la Trapovana en su sexto libro, capitulo xxij, y dize que fue un tiempo que tuvieron opinion que la Trapovana fuese otro mundo, y que se llamava Antichtono ; y que Alexandro fue el primero que nos dió noticia aquella ser isla ; y que Oneschrito, almirante de su armada [dijo] que en la dicha isla de Trapovana ay mayores elephantes y mas bellicosos que en la India ; y que Magasaene pone su longura siete mill estados, y de anchura cinco mill ; que no ay en ella ciudad cercada, salvo sete cientos villages ; y que en el principio de Claudio vinieron embaxadores de la dicha isla á Roma. Desta manera : el li-

dedocuit, quæ omnia Deo displicere facillè nunc persuaderentur.

Nº 15. Princeps ille Tartarorum, quem vulgo magnum Can nominant, locupletissimus potentissimusque esse perhibetur, jubetque superbissima nomenclatura se regem regum ac potentium omnium principem appellari. Huic morem esse aiunt, iis viris omnibus, qui in ejus aula suo ministerio astricti versantur, tredecim diebus festis, quos summo honore peculiari ritu quotannis celebrat, recentes preciosasque vestes pro cujusque meritis dare, donatque his omnibus festis etiam singulas zonas singulis singulaque tibialia, caligulas, galeros vel umbellas, auro, margaritis, ac preciosis gemmis circumseptas, ut cujusvis merita sunt. Vestium autem numerus quas singulis annis largitur, sex millium supra centum quinquaginta proditur, quæ omnia & sua festa colendi, ac extollendi, & proprii nominis celebrandi gratia diligentissimi fieri curat. Qui mortuus in montem, cui Alcai nomen inditum, tumulandus effertur, porro efferentes quotquot inter eundum obvios habent pro victimis occidunt. Aiunt siquidem, par esse, eos principem suum comitari, aut alio orbe debita servitutis obsequia sint præstanda : mactant etiam equos omnes, camelos ac mulos, quibus vivens utebatur, persuasum habentes, ea omnia suo Principi post mortem servitura. Mortuo Mongui horum Tartarorum Principe, quem magnum Can appellari diximus, trecenta hominum milia in itinere, cum in montem (ut diximus) deferretur ab efferentibus reperta, auctore Marco Pollo libro quarto capite 24. cesa sunt assertit hoc idem Florentinus Poggio, qui à secretis fuit Eugenii Papæ quarti libro secundo de fortunæ mutatione, qui non dubia quæ à Pollo scripta sunt, apertissimè demonstrant.

Nº 16. Tarpovana quænam sit, ac ubi terrarum sita, varie auctores sentiunt, ex quo ab incolis Beticæ regionis, necnon Lusitanæ mare Indicum navigari ceptum est. Utque à Ptolemeo secundum latitudinem graduum ac longitudinem ejus describitur, neminem latere censeo. Nonnulli vero neotericorum, qui incognita loca nobis nota tradidere, Ceilam insulam Taprobanam esse uno ore asserunt : Alii eam Camatram esse contendunt. Plinius libro 6. capite 22. hujus meminuit, dicens : Taprobana alter orbis esse, sententiâ omnium habebatur, unde Antichton ab eis nuncupabatur. Alexandrum autem tradunt primum exitisse, qui eam insulam esse, non orbem indicaverit, utque Onosecritus classis ejus Architalassus refert. Hæc insula majores pugnatiosesque habet elephantes omnibus, quos tota India enutrit, cujus insulæ Magastes longitudinem septem milibus stadiorum, quinque vero milibus latitudinem metitur, nullaque civitas mœnibus vallatur, septingenta tamen

berto Danio Plocamio, el qual avia mercado de la republica la renta del mar vermejo, y navegando al rededor de Arabia, fue dal viento setentrional transportado de manera, que al quintodecimo dia entró en un puerto de la dicha isla, el qual se dezia Hipno; y que fue del Rey liberalissimamente rescebido y tractado. Y que, despues de aver estado en la dicha isla seis meses, aprendió la lengua, y que un dia, hablando con el Rey, le dixo, que los Romanos y su Imperador eran de inaudita justicia, y que el Rey mirando la moneda, que el dicho liberto tenia, eran de ygal peso aunque las ymagnes demonstravan ser de diversos Imperadores, movido desto, embió embaxadores á Roma; el primero fue Rachia, á conciliar amicitia con Claudio. De los quales embaxadores entendió que en la dicha isla avia cecce ciudades, y que estos dichos embaxadores se maravillaron de ver en este nuestro cielo Setentrion y las Vergilias, como cosa nueva y á ellos incognita; y que dezian que en la dicha isla no veian la luna sobre la tierra, si no del octavo dia fasta el quintodecimo; y maximamente se maravillavan que las sombras yvan hazia el nuestro cielo y no hazia el suyo, y que el sol saliese á la diestra y se pudiese á la siniestra; por las quales susodichas razones paresee, que en la dicha isla, donde el dicho liberto aportó, no parece la estrella de Norte, la qual parece en la Trapovana isla. Por donde se podria dezir, atento de donde se partió el dicho liberto Danio Proclamio, y al camino que podria hazer con furioso viento setentrional, que la isla, donde el aportó, fue la isla de Sant Lorenzo y no la Trapubana. Y que el Rey de la dicha isla es elegido, por el comun, hombre viejo y clemente y sin hijos; y si despues de elegido engendrase alguno, luego lo descomponen; y quando lo eligen, le dan treynta consejeros; y que el dicho Rey no pueda condenar á nadie, si la mayor parte de los dichos sus treynta consejeros no sean de consentimiento con el; y que despues, el dicho condenado puede apelar para el pueblo, el qual luego eligen setenta Juezes, los quales miran su causa; y si hallan que fue mal sentenciado, danlo por libre, y aquellos consejeros, que fueron en condenarlo, quedan privados de sus oficios y por infames para siempre jamas.

villæ ejus provincie annumerantur. At hæc sub ditione Claudii circa primam sui Imperii gubernationem hujus Insulæ oratores Romam petiere hæc de causa & ratione, Libertus Damius Plocamius à Romanis vectigalia & proventum maris rubri redemit, dumque Arabiam obnavigat, Septentrionalis ventus eum adeo procul disjecerat, ut quindecim elapsis diebus cuidam hujus Insulæ portui appulerit, cui nomen Hippurus, à cujus rege benigno hospitio susceptus est. Postquam sex menses, cum ejus idioma satis apprime addicisset, ac longo sermone regem alloqueretur, maximam Romanorum justitiam, summamque eorum Imperatoris rectitudinem enarrabat, cumque Rex diversum monetae genus Romanorum diu circumspiceret, quod Libertus secum attulerat, varia Imperatorum imaginem¹ impressos nummos, pondus vero æque omnium idem animadvertens, maxime admiratus est, unde confestim ad Romanorum Imperatorem Oratores legavit, qui perpetuo cum eo pacis fœdus inirent; cui cum sociis Rachias oratorum ejus celeberrimus Claudium conciliavit, ex quibus Imperator quingentas huic insulæ civitates inesse facile percepit. Inque sua cœli plaga Septentrionalem arcum & vergiliarum ortum minime videri, quibus conspectis admirabantur, siquidem hæc sidera sua regione incognita esse & nunquam apparere asserebant. Præterea Lunam ab octavo ad quintumdecimum usque diem tantum prospici aiebant. Illud omnium maxime eos admiratione afficiebat, quod umbra dextrorsum ad nostrum polum vergerent, cum sua ipsorum regione sinistras ire semper intuerentur, solemque dextra exoriri, leva vero occidi, quibus de causis & rationibus constat, arcum hæc insula, cui Libertus appulit, nunquam videri, quodque Libertus insulam sancti Laurentii, non autem Taprobanam adiit. Siquidem ex Liberti cursu & navigatione, enarrationeque oratorum ad Tiberium, ut dictum est, insula, cui ipse Libertus Damius Plocamius appulit, haud Taprobana fuit, sed potius insula divi Laurentii. Huic insulæ moris esse aiunt regem è senioribus eligere communis omnium suffragiis, qui clementia, comitate, ac ingenti animi benignitate longe omnes superaret, quique sine liberis ac prole sit. Hic itaque sceptro jam potitus, si interim liberis adeptus fuerit, confestim regia potestate privari solet. Tempore autem quo is eligitur, triginta consiliiarii, qui regi assistant decernuntur. Hic autem neminem morti adjudicare potestatem habet, nisi prius major eorum numerus ipsi suffragetur, ad hæc jure reo permittitur, qui à rege & ejus consiliiariis morti adjudicatus est, populum in sui defensionem provocare, hic protinus septuaginta legum peritissimos ac justissimos judices deligit, qui ejus causam diligenter

¹ I Should be "imagine."

Retulo del auctor con ciertas razones de la variacion que haze el aguja del marear con la estrella del Norte.

Nº 17. Sebastian Caboto, capitan y piloto mayor de la S. c. c. m. del Imperador don Carlos, quinto deste nombre, y Rey, nuestro sennor, hizo esta figura, extensa en plano, anno del nascimiento de nuestro salvador Jesu Christo de MDXLIII annos, tirada por grados de latitud y longitud, con sus vientos, como carta de marear; imitando en parte al Ptolomeo y en parte á los modernos descubridores, asi Espanoles como Portugueses, y parte por su padre y por el descubierto, por donde podras navegar como por carta de marear teniendo respecto á la variacion que haze el aguja del marear con la estrella del Norte; verbi gratia, tu te quieres partir del cabo de Sant Vincente para ir á tomar el cabo de Finisterra; mandarás gobernar tu navio al Norte por tu aguja de marear y yrás á dar dentro del dicho cabo, mas tu verdadero camino, que tu navio hizo, fue al Norte quarta del Nordeste, porque tu aguja de marear te Nordestea una quarta en el dicho cabo de Sant Vincente, de manera que, mandando gobernar tu navio al Norte por tu aguja de marear, tu camino será al Norte, quarta del Nordeste; y asi mismo, partiendote de Salmédina, que es una baxa á la salida de San Lucar de Barrameda, para yr á la punta de Naga de la isla de Tenerife, mandarás gobernar al Sudueste por tu aguja y yrás á tomar la dicha punta de Naga por lo que está situada en la carta de marear, mas tu camino no será al Sudueste, por quanto tu aguja de marear te Nordestea en Salmédina una quarta larga, mas será tu camino al Sudueste, quarta del Sur largo; y así que podras dezir que, partiendote del cabo de San Vincente al Norte, tu camino será Norte, quarta de Nordeste, y partiendote de Salmédina al Sudueste, tu camino sera al Sudueste, quarta del Sur; y así por consiguiente harás en toda otra parte deste universo, mirando la variacion que te haze la dicha aguja de marear con la estrella del Norte. Porque la dicha aguja no se buelve ny está en todo lugar al Norte, como el comun vulgo piensa; porque la piedra yman, segun parece, no tiene virtud para hazerla buelver al Norte en todo lugar, mas, segun por experiencia se vee y acaña, tiene solamente virtud de hazerla estar stabil y fixa en un lugar, por donde se de mostrar forçado por linea recta por

examinant, hi si reum mortis inique condemnatum communi consensu compererint, eum ilicò vinculis solvunt, ac pristinae libertati restitunt, consiliarios vero qui reum moriturum censuerunt injustissimè regio privant munere, ac perpetua ignominia afficiuntur.

Epilogus, in quo Auctor hujus Chartæ reddit certas rationes, variationis acus nauticæ ad stellam Polarem.

Nº 17. Sebastianus Cabotus Dux & archigubernius S. c. c. m. domini Caroli Imperatoris, hujus nominis quinti, & Regis Hispaniæ domini nostri, summam mihi manum imposuit, & ad formam hanc protrahens, plana figura me deliniavit, anno ab orbe redempto, nativitate Domini nostri Jesu Christi 1544. qui me juxtà graduum longitudinem ac latitudinem, ventorumque situm, cum docte tum fideliter, navigatoriæ Chartæ instar descripsit, Geographi Ptolemæi auctoritatem, peritiorumque omnium neotericorum loca clausa nobis aperientium tam Hispanorum quàm Lusitanorum fidem sequutus, necnon ex usu ac industria longæ navigationis integerrimi viri Joannis Caboti natione Veneti, atque Sebastiani astrorum peritia navigandique arte omnium doctissimi, ejus filii auctorisque mei, qui aliquantam orbis partem diu nostratibus clausam aperuerunt, qua propter me fida doctissimaque magistra, ceu Hydrographica charta utens, quocunque est animus mare metiri poteris, acus nauticæ variationem observans, qua ad Arcum vertitur. Cujus rei argumentum est: Sic ex sacro promontorio nauticum solvearis, Celticum promontorium petiturus, navem licet protinus ad Arcum dirigere jubeas, Hydrographica acu, quo cursu recto tramite Finis terræ appuleris promontorio, iter tamen quod vere navis tua peregerat, non recta ad Arcum, sed Arcum versus ad quartam Cæciæ fuit. Navigatoria siquidem acus & si recta linea è Sacro promontorio ad oram Finis terræ cursum demonstrat, ad Arcum nihilominus tamen quarta parte ab Arcto ad Cæciam distare certum est, Quapropter cum navem acu nautica ad Arcum regere juseris, erit navigatio tua per quartam Septentrionis Cæciam versus. Eandem navigationis considerationem observabis, cum è Salmédina brevi scopulosoque mari, in exitu portus sancti Lucae ad Nage oram Teneritiæ Insulæ navigare decreveris, tunc siquidem licet ad Liben seu Aphricum navem regere studeas Hydrographicae chartæ observatione, rectus tamen itineris cursus nauticæ acus probabiliore fide per Aphricum quarta & eo amplius Austrum versus procul dubio erit, Salmédina nempe ad Nagam navigatio quarta longe minus quàm Hydrographica charta indicat, nautica acus demonstrat. Unde pro comperto

qualquier viento que fueres, y no por circular, y aessa causa haze la dicha variacion.⁴ Que si le dicha aguja se buelviere al Norte, cada y quando y en todo lugar, no haria variacion ninguna porque yria por linea circular, porque siempre estarias en un paralelo, qual no puede ser yendo por linea recta en un redondo. Y as de notar que quanto mas te apartares del meridiano que la aguja te está derechamente al Norte, hazia el Occidente o hazia el Oriente, tanto mas se apartará tu aguja de Norte, es á saber la flor de lis della, la qual está semalandá por el Norte; por donde parece claramente que la dicha aguja muestra por linea recta y no por circular; y as de saber que el meridiano donde la flor de lis del aguja está derechamente al Norte es obra de treynta y cinco leguas de la isla de Flores, la ultima isla de los Acores hazia el occidente, segun la opinion de algunos expertos, por la mucha experiencia que dello tienen, á causa de la quotidiana navegacion que hazen al Occidente á las Indias del mar Oceano. El dicho Sebastian Caboto navegando hazia el occidente se halló en parte donde el Nordeste quarta del Norte le estava derechamente al Norte; por las quales susodichas experiencias, parece claramente ser verdad los defectos y variacion que la dicha aguja de marear haze con la estrella del Norte.

habebis, cum è Sacro promontorio oram solveris Septentriones petiturus, quod iter tuum erit per quartam Arcti Cæciam versus. Eodem modo si è Salmédina ad Nagan Tenerifiæ Insule adnavigaveris ad Aphricum, navis tuæ cursus erit per quartam Austri. Eadem ratione sigillatim uti poteris in quavis hujus discretionis parte acus magnetæ fricate variationem observans, qua cum Arcti sidere variè operatur, quippè quæ non assidue neque ex omnibus locis Septentrionem expetat (uti plebs indocta censet) cum Magnes lapis ille (ut patet) nullam habet vim dirigendi navigatoriam acum ex omni parte ad Arctum, qui potius (ut experientia constat) calibem volubilem immotum reddere recta linea, non autem circulari ad quemvis ventorum Arcto proximum, & hac de causa acus nauticæ usque variatur, nam si eadem acus assidue ex omnibus locis verteretur ad Arctum, nulla fieret ejus variatio, utpote quæ per circularem lineam semper viam demonstraret, ex quo sequeretur, eundem æquedistantem seu parallelum frequentare, quod nullo modo continget recta linea circularem formam adempti. Porrò unum hoc adnotabis, candide lector, quo magis ab Arcto te distare pro comperto habebis, unde satis liquet, acum nauticam rectè linea non autem circulari viam demonstrare. At notandum igitur est, quod linea meridionalis, quam nauticæ acus liliæ rectissime Septentriones ostendit, distat à Florum Insula triginta parasangis, quæ quidem ultima accipitrum Insula est occidentem versus, juxta peritissimorum omnium navium gubernatorum consensum, opinionemque, necnon ex eorum solerti experientia, quam diutina assiduaque navigatione suo jure profitentur, siquidem Atlanticum mare & Indicum indies remetiri assuescunt. Ad hæc Sebastianus Cabotus meus auctor, occidentalem Oceanum adnavigans, ad æquor quoddam devenit & plagam, ubi quarta parte Septentrionum juxta Cæciam ventus acus navigatoriæ Liliæ illi rectissime Arctum ostenderet, quibus de causis & rationibus & tutissima navigandi experientia apertissime constat defectus & variationes acus nauticæ crebro fieri cum Arcti observatione.

*Plinio en el segundo libro, Capitulo lxxix
escribe.*

Nº 18. Que de la ciudad de Gadiz y de las columnas de Hercules, con el circuito de la Espanna y de la Galia, se navegó todo poniente. El Oceano Setentrional se navegó la mayor parte en el tiempo de Augusto, passando todo la Germania hasta el cabo de Cimabri, y desde ay fasta Scithia. Y de Oriente navegó por el mar Indico

hazia Setentrion, fasta tener el mar Caspio al Sur, la armada de Macedonia, en el tiempo que Seleucio y Antiocho reynavan; y mandaron que aquella region se llamase Seleuchida y Antiochida. Y al Septentrion del mar Caspio muchas partes se an navegado; de manera que poco queda que todo el mar Septentrional no le ayan navegado. Y asi mismo dize en el mismo capitulo, que Cornelio Nipote escribe que á Quinto Metello Celero, el qual fue consul con Afranio y entonces era Proconsul en la Galia, le fueron imbiados ciertos Indios del Rey de Suevi, los quales eran partidos del mar Indico, con fortuna transportados en Germania.

Nº 19. En estas islas Rocos ay aves de tal grandeza (segun dizen) y fuerça, que toman un boy [buey] y lo traen volando para comer; y mas dizen, que toman un batel por grande que sea, y lo levantan en grande altura, y despues lo dexan caer y comense los hombres. Y el Petrarcha semejantemente lo dize en su libro de prospera y adversa fortuna.

Nº 20. Ay en la yslla de los de Calenguan leones, tigres, honças, ciervos y otras muchas diversidades de animales; asi mismo ay aguilas y papagayos blancos, que hablan tan claro como personas lo que á ellos les es ensennado, y otras muchas aves syn numero de diversas faciones. La gente de la dicha isla son ydolatras; comen carne humana.

Nº 21. Halló esta isla de Mamorare una nao de Cambayo, y dizen aver tanto oro en ella que no cargaron otra cosa, segun dizen los portugueses.

Nº 22. En esta isla de Ceilan ay canela de nascimiento y rubies, y iacintos, y ojos de gato y otros generos de piedras preciosas.

[N. W. Quadrant of Map. 18 of Chytræus.]

Ciapangu es una isla grande situada en alto mar, la qual esta en 1500 milla apartada de la tierra firma del gran Can hazia oriente. Son ydolatras y gente de buena manera y hermosa; tiene rey proprio, libre, que á ninguno es tributario; tiene mucho oro de nascimiento, lo qual nunca se saca fuera de la dicha isla a causa que no aportan navios á ella por estar tan apartada [y] fuera de camino. El rey desta

[S. E. Quadrant of map.]

His Rocorum insulis insunt quedam venatoriæ aves ac rapinæ delitæ adeo pro-cero et ingenti corpore ut humi petentes bovem sursum abstrahentes prædam suis nidis afferant devoraturæ; eoque unguibus præpollent ut scapham seu cymbam quantumvis maximam arripientes ac in sublimem tollentes inde rursum deturbere soleant deorsum; gaudent præterea vesci carne hominum quemadmodum Petrarca refert libro qui de prospera et adversa fortuna inscribitur.

En Romance ve á tabla 2ª Nº 19.

Hac insula innumeri leones, tigrides, pantheræ, corvi¹ aliorumque diversorum animalium species, armentorum instar, depascunt; præterea aquilæ, psitaci albi, multaque variarum avium genera turmatim convolant. Hæc gens idola colit et carne hominum avidè vescit.

En Romance ve á tabla 2ª Nº 20.

Hanc Hemorare insulam aperuit quedam (ut fertur) Cabierum navis, quam tot aurifodinis abundare perhibet ut navem ipsam solo auro oneraverint.

En Romance ve á tabla 2ª Nº 21.

[N. E. Quadrant of map.]

Hac Ceilani insula ingens cinnami inde extracta provenit copia. Pluribus lapidibus, lunaribus, piropis, hiacintis, aliisque preciosis lapillis abundat.

En Romance ve á tabla 2ª Nº 22.

1 Should be "cervi."

isla tiene un palatio muy grande y muy maravilloso, todo cubierto de oro hecho de pasta, de grosura de dos reales ; y las ventanas y columnas deste palatio son todas de oro. Tienen piedras preciosas y perlas en mucha cantidad. El gran Can, oyda la fama de la riqueza desta dicha isla, quisola conquistar y embió á ella una grande armada y nunca la pudo soyuzoar [sojuzgar], segun Marco Polo mas largamente lo cuenta y dize en su libro, capitulo ciento y seis.

[The Latin of this is not on the map.]

[S. W. Quadrant of Map. Not in Chytræus.]

En esta figura estense en plano se contienen todas las tierras, islas, puertos, rios, anglas, baxos, que hasta oy día se han descubierta ; y con sus nombres y quien fueron los descubridores dellas, como por las tablas desta dicha figura mas claramente consta ; con todo lo demas que antes fue conocido, y todo lo que por Ptholomeo ha zido escripto, como son : provincias, regiones, ciudades, montes, rios, climas y paralelos, por sus grados de longitud y latitud, assi de Europa como de Assia y Aphrica.

Y as de notar que la tierra está situada conforme á la variacion que haze el aguja del marear con la estrella del norte ; la razon de lo qual podras ver en la tabla segunda del número diez y siete.

[The Latin of this is immediately above it on the map.]

[S. E. Quadrant of Map. S. of Africa. Not in Chytræus.]

Del pescado que detiene una nao.

Plinio escribe en el su noveno libro, capitulo veinte y cinco, de un pescado que se dize Nichio, el qual dise ser como redondo y que pegandose á una nao la tiene aunque baya á la vela. Et Petrarca, en el prohemio del segundo libro de prospera y adversa fortuna, dize que el echenis o remora, pez de grandeza de medio pie detiene una nao aunque sea muy grande y que los bientos y ondas y remos y velas le ayden á yr ; el solo fuerza la fuerza de los elementos y hombres, no con otra obra ninguna, sino pegandose á las tablas del navio, ni con otra fuerza alguna, si no con sola su naturaleza ; el qual pece es como limo¹ o cieno placandolo [y sacandolo] del agua pierde la fuerza. Hallase lo suso dicho en muy claras escripturas, las quales aquí no se ponen por no ser prolixo.

[No Latin on the map.]

In hac protrahens in planum figura continetur totus terræ globus, insulæ, portus, flumina, sinus, syrtes, et brevia quæ hactenus aneotericis adaptata sunt, eorumque nomina et qui ea loca aperire ut eisdem hujus figuræ tabulis liquidius patet ; ad hæc omnium quæ a majoribus cognita sunt, necnon quæ à Ptholomeo referuntur ; regionum, scilicet provinciarum, urbium, montium, fluviorum, climatum, parallelorumque, tam Europæ quam Asiæ, et Aphricæ exacta descriptio. Annotabis tamen, candide lector, situm hunc orbis terrarum depictum esse juxta variationem qua acus navatica utitur ad arcum septentrionalis, observationis cujus rationem perlegere poteris, tabula secunda decimi septimi numeri.

1 Limazon, a snail ?

ENGLISH TRANSLATION OF THE LEGENDS.

FIRST TABLE.

Of the Admiral

N^o 1. The admiral Don Cristoval Colon, a Genoese by birth, offered to their Catholic Majesties of glorious memory to discover the islands and mainland of the Indies,¹ by the west, provided they gave him for this purpose a sufficient *fleet* and favor; ² and having it, and having fitted out three caravels in the year 1492, he proceeded to discover them, and from that time on many other persons have continued the said discovery, as is shown by the present description.

N^o 2. In the island Española there is much virgin gold and *very fine lapis-lazuli* [*blue copper ore* ?] and much sugar and cassia fistula, and an infinite number of cattle³ of all kinds.⁴ *The swine of this island they give to the sick, as here in our parts they give mutton.* This said island contains many harbors,⁵ and *very good ones*, and the chief one of them is the city of Santo Domingo, which is a very good city and of much trade, and all the others are places built and settled by the Spaniards; and in the island of Cuba and of San Juan, and in all the other islands, and on the mainland virgin gold is found;⁶ and in the city of Santo Domingo his Majesty has his royal chancery, and in all the other towns⁷ and provinces governors and rulers who govern and rule them⁸ with much justice; and every day are discovered⁹ new lands and provinces, very rich, by means of which our Holy Catholic Faith is, and will be, much increased, and these kingdoms of Castile have become great with much *glorious fame and riches*.

N^o 3. This mainland which the Spaniards named New Spain, the most illustrious gentleman, Don Fernando Cortez, marquis del Valle de Guaxacon, conquered. There are, in this land provinces and cities innumerable: the chief of them is the city of Mexico,¹⁰ which contains more than fifty thousand inhabitants; it is in a salt lake which extends over forty leagues. There is in the said city, and in all the other provinces, much gold, virgin silver, and all kinds of precious stones; and there is produced in the said land and provinces much very good silk, and cotton, alum, orchil, dyewood, cochineal, and saffron, and sugar,¹¹ of all the aforesaid great quantities, with which many ships come loaded to these kingdoms of Spain.¹² The natives of this land are very expert in all that relates to trade; instead of coins, they make use of certain kernels, split in halves, which they call cacao, or cacaghnate, a barbarous expression.¹³ They have much wheat and barley, and many other grains, and vines, and many fruits of different kinds. It is a land of many animals, deer, mountain boars, lions, leopards, tigers, and much other game, both birds and land animals. It is a people¹⁴ very skilful in moulding any object after nature, and in painting pictures. The women usually adorn themselves with precious stones and valuable pearls. These Indians use a certain kind of paper, on which they draw what they wish to express with figures [pictures] instead of letters. They never had peace among themselves; on the contrary, some persecuted others in continuous fights in which the prisoners on either side were sacrificed by their enemies to their gods, and their dead bodies were given to the army, as public banquets. They were idolaters, and adored whatever took their fancy; they were very fond of eating human flesh, whereas now they have laid aside these fierce and cruel customs, and have clad themselves in Jesus Christ, believing heartily in our holy evangelical faith,¹⁵ and obeying our most holy mother¹⁶ church and its most holy precepts.

1 the western islands and mainland of the Indies.

2 if they provided him sufficiently with the things needful to him.

3 and flocks.

4 [In the Latin version the last clause of this sentence comes first.]

5 and ports.

6 all these places are filled with many inhabitants.

7 cities and islands.

8 rather by the reason and integrity of the laws than by arbitrary will.

9 and conquered.

10 is called Mexico by the name of the Indians.

11 or juice of the cane.

14 very learned and.

12 to Seville of Andalusia.

15 and the religion of the Christians.

13 by the barbarous Indian name.

16 orthodox Catholic.

N° 4. This strait of All Saints was discovered by Hernando de Magallanes, captain of an expedition which his Sacred Cæsarean Catholic Majesty,¹ the emperor and king Don Carlos, our lord, ordered to be made to discover the Maluco islands. There are in this strait men of such great stature that they seem giants; it is a very desolate land,² and they dress themselves in the skins of animals.³

N° 5. These islands of Maluco⁴ were discovered by Fernando de Magallanes, commander of⁵ an expedition which his⁶ Majesty ordered to be made to discover the⁷ said islands, and by Juan Sebastian del Canno;⁸ that is to say, the said Fernando de Magallanes discovered the strait of All Saints, which⁹ is in 52½ degrees towards the Antarctic pole; and¹⁰ *after having passed the said strait*, [and not] without very great labor and danger, he continued his journey towards the said islands; after many days he arrived at certain islands of which the southern one is situated in 12 degrees,¹¹ and because the people were so turbulent, and because they stole from him the boat of one of his ships, they gave it the name of the isle of thieves (de los Ladrones); and thence continuing his journey, as has been said, they discovered an island, which they called la Aguada, because they took in water there; and from thence on they discovered another, which is called Bunham, and Aceilani, and another, which is called Cubu, in which island died the said Captain Hernando de Magallanes, in a skirmish which took place with the natives thereof, and the survivors of the said expedition chose Juan Sebastian del Canno as commander of it, who afterwards discovered the island of Bendanao, *in which there is much virgin gold, and very fine cinnamon; and in the same way he discovered the island of Poloan, and that of Brunay, and that of Gilolo, and the island of Tridore, and that of Terenati, and Motil, and many others in which there is much gold, and cloves, and nutmeg, and other kinds of spices and drugs.* The said Sebastian del Canno loaded two ships which¹² remained to him out of five which they took with them, with cloves in the said island of Tidori, for in it, and in the said island of Terenati, the said cloves are said to grow, and not in any other, and in the same way he took much cinnamon and nutmeg;¹³ and coming on through the Indian Ocean,¹⁴ in the direction of the Cape of Good Hope, one ship was forced to put back and return to the said island of Tidori, from which it had set out, on account of the great amount of water which it was making, and the said Captain Juan Sebastian del Canno with his ship, called St. Mary of Victory (Sancta Maria de la Victoria), came to these kingdoms of Castile, to the city of Seville, in the year 1522, by the Cape of Good Hope; so that it clearly appears that the said Juan Sebastian del Canno sailed round the whole universe,¹⁵ because he proceeded only towards the West, *although not on one parallel*, through the East to the place in the West whence he set out.

N° 6. These provinces were discovered¹⁶ by the honored and valiant gentleman,¹⁷ Francisco Pizarro, who¹⁸ was governor of them during his life; in which there is infinite gold and virgin silver and mines of very fine emeralds. The bread which they have they make of¹⁹ maize, and the wine likewise; they have much wheat and other grain. It is a warlike race; they use in their wars bows and slings and lances; their arms are of gold and silver. There are in the said provinces certain sheep of the form of small camels; they have very fine wool. They are an idolatrous people, and of very subtle mind;²⁰ and on all the sea-coast, and for more than twenty miles inland it never rains. *It is a very healthy land.* The Christians have made many settlements in it, and continually keep increasing them.

N° 7. The Indians call this great river the river Huruai, in Spanish the river of silver (Río de la Plata). They take this name from the river Huruai, which is a very

1 fifth of the name.

2 and with few inhabitants.

3 only.

4 long closed to us.

5 his royal Spanish fleet.

6 His Sacred Cæsarean Catholic Majesty the Emperor Charles, fifth of the name.

7 these very rich islands of the Indies.

8 which said expedition set sail from the port of Seville, a famed city of the province of Andalusia.

9 measuring from the Equator to the Antarctic.

10 seeking the aforesaid islands.

11 north latitude.

12 which he had saved from shipwreck.

13 much cinnamon and nutmeg is collected in Bendanao, of which likewise, he took thence great quantities.

14 to Spain, and hastening to double the Cape.

15 in a circle.

16 and conquered.

17 knights Francisco Pizarro and Almagro.

18 that is, Francisco Pizarro.

19 very large corn, which, in the language of the Indians, is called maize.

20 [In the Latin version the statement that "They are an idolatrous people, and of very subtle mind," follows immediately after "It is a warlike race."]]

mighty river¹ which runs into the great river Parana. Juan Diaz de Solis, pilot-major of their² Catholic Majesties³ of *glorious memory*, discovered it, and he explored it as far as an island, to which the said Juan Diaz gave the name of the island, of Martin Garcia, because in it he buried a sailor who was called Martin Garcia, which said island is about thirty leagues above the mouth of this river *and the said discovery cost him very dear*, for the Indians of the said land slew him and ate him; and after many years had gone by it was again discovered by Sebastian Cabot, Captain and Pilot-major⁴ of his Sacred Cesarean Catholic Majesty the Emperor Don Carlos Fifth of the name, and king, our lord, who was commander of an expedition which his Majesty ordered should be made to discover Tarsis and Ophir⁵ and *Oriental Cathay*; which said Captain Sebastian Cabot came to this river by chance, for the commander's ship, in which he was, was lost,⁶ and seeing that he could not continue his said voyage, he determined to explore with the people he had with him the said river, by reason of the very great account which the Indians of the land gave him of the very great wealth in gold and silver which there was in the land, and not without very great labor and hunger, and dangers both of his own person and of those who were with him.⁷ And⁸ the said⁹ Captain endeavored to make near the said river certain settlements of the people whom he brought from Spain.¹⁰ This river is larger than any that is known up to the present time Its breadth at the mouth where it enters the sea is thirty-five¹¹ leagues, and three hundred leagues above the said mouth it is two leagues in breadth. The cause of its being so great and mighty is that there run into it many other and mighty rivers. It is a river infinitely full of fish and of the best there is in the world. The people, on arriving in that land, wished to learn if it were fertile and fit to plough and raise bread; and they planted in the month of September fifty-two grains of wheat,—for there was no more in the ships,—and they gathered soon in the month of December fifty-two thousand grains of wheat; and this same fertility was found in all the other seeds.¹² Those who live in that land say that not far from there, in the country inland, there are certain great mountain-ranges from which they take infinite gold, and further on in the same mountains they take infinite silver. There are in this land certain sheep large as ordinary asses, of the shape of camels, except that the wool they bear is fine as silk, and other animals of different kinds. The people of the country differ very much; for those who live on the slopes of the mountains are white like us, and those who are near the banks of the river are dark. *Some say that in the said mountains* there are men who have faces like dogs, and others are from the knee down like ostriches, and that these are great workers, and that they raise much maize, of which they make bread and wine. Many other things they say of that land, which are not put down here lest they be tedious.¹³

N^o 8. This land was discovered by Jurn Cabot, a Venetian, and by Sebastian Cabot, his son, in the year of the birth of our Saviour Jesus Christ 1494, on the 24th of June,¹⁴ in the morning, to which they gave the name of "first land seen" (*prima tierra vista*); and to a large island which is situated along the said land they gave the name San Juan, because it had been discovered the same day.¹⁵ The people of it are dressed in the skins of animals. They use in their wars bows and arrows, lances and darts, and certain clubs of wood, and slings. It is a very sterile land. There are in it many¹⁶ white bears, and very large stags *like horses*, and many other animals; and likewise there is infinite fish,—sturgeons, salmon, very large soles a yard in length, and many other kinds of fish,—and the greatest quantity of them is called (*bacallaos*) rodfish;¹⁷ and likewise there are in the same land hawks black as crows, eagles, partridges,¹⁸ *linnets*, and many other kinds of birds of different species.

1 into which runs.

2 conquering and.

3 Ferdinand and Isabel.

4 most skilful in the art of navigation and of astronomy.

5 Ciapangu and Eoicatai.

6 being buried in the stormy waves.

7 [In the Latin version the last clause, beginning "and not without very great labor," precedes the clause beginning "by reason of."]

8 Wherefore.

9 most energetic.

10 and to build certain citadels and forts by which the Spanish inhabitants could easily be protected and could thence repel the attacks of their Indian enemies.

11 twenty-five.

12 This extraordinary statement as to the productiveness of a grain of wheat in the country of the La Plata is repeated in the Latin version of this section. It is probably an inadvertence. Eden, who copied this section from Cabot's map, in the free English version, into his "Decades of the New World," London, 1555, pp. 317-319, corrects the error, but on what authority, except his own knowledge of natural history, we do not know. He makes the text read thus: "Taking, therefore, fifty grains of wheat and committing the same to the earth in the month of September they gathered thereof two thousand and fifty at December next following." Eden then proceeds: "Wherein some being deceived and mistaking the thing, have written in the stead of two thousand and fifty, fifty thousand and two."—*Note by Mr. Deane.*

13 [In the Latin version the last sentence follows immediately after "infinite silver," and is itself followed by the clause beginning "and that these are great workers,"]

14 24 July, at the fifth hour, about daybreak.

15 on the solemn festival of St. John.

17 by the common people.

16 lions.

18 dark.

N° 9 In this same island of Iceland (Islanda) there is a great quantity of fish. They take it in winter, and dry it by means of the very great cold which there is there, because this said island is within the Arctic circle, and in summer men¹ go there from many parts and barter for this fish, thus dried, in exchange for meal and beer; and this said fish is so dry and hard, that to eat it they beat it with certain hammers of iron on certain stones hard as marble, and then they put it to soak a day or two, and thus they eat it, stewed with butter. And in all this Northern sea there is a very great quantity of fish, and many of them large and of monstrous shape; those who sail in these seas have seen very large lampreys, which resemble great serpents and [have seen them] attack ships, in order to eat the sailors. The natives of the said island most of them build their houses underground, and the walls of fish-bones. They have no wood, except some extremely small trees, and of these very few and in few places; but the Provider of all things provides every year that there comes to them by sea, on the northern parts of the said island, a very great quantity of trees of different kinds and sizes, as driftwood, borne by furious north winds to the coast of the said island, with which the natives provide themselves, and make use of it for all that is needful to them. And they say that often they hear spirits speak and call each other by name, and take the form of living persons, and tell them who they are; and in certain parts of the said island there rise up² certain very dreadful fires, and other wonders³ the natives of the said island say there are in it.⁴

N° 10. The men who dwell in this region are savages,⁵ they are destitute of bread and wine, they tame deer and ride upon them, and they fight with another people which is situated farther to the north, and which they call the Nocturnal people, for they go about in the night and perform their business as here [we do] in the day, and this because the days there from the 14th of September to the 10th of March are so short that there is not an hour of light. They are a very wicked people, quarrelsome, they rob all those who pass [through their country] so that no ship dares to ride at anchor near the coast for fear of these night people, because they slay and rob all who fall into their hands; and a little beyond these night people toward the southeast they say there are certain monsters which have bodies like those of human beings except the head, which is like that of a pig, and that they understand one another, grunting like pigs.

N° 11. Those who inhabit this region, some adore the sun, others the first thing they see in the morning, others adore a piece of colored cloth which they place on a lance, and thus each worships what he prefers: they are under the sway of the great Khan, emperor of the Tartars.

N° 12. Here there are monsters like unto men who have ears so large that they cover the whole body, and they say that farther on towards the East there are certain men who have no joints whatever at the knees nor in the feet: they are under the sway of the grand Khan. In the province of Balor, which is fifty days' journey in extent, there are wild men; they live in the mountains and forests.

N° 13. Here dwells that mighty king of Aziumba and Auxama whom some call Prester John, to whom sixty kings yield obedience; he is very wealthy in all riches,⁶ and there is no record that he was ever defeated in any battle, but often as he come back with glorious victory from the south from the Throglodyte people, a race naked and black, which people extends as far as the Cape of Good Hope. Among which people there is a race which does not speak but they understand each other by whistling; and this is not Prester John,⁷ because Prester John had his empire in eastern and southern India until Genghis Khan, first king of the Tartars, defeated and overcame him in a very cruel battle, in which he died and the said Genghis took from him all his kingdoms and lordships, and allowed the Christians to live in their own faith, and gave them a Christian king to rule and govern them, which king was called George, and from that time till now all the kings who succeed him are called George, as Marco Polo relates more at large in the 42nd and 48th chapters of his book.⁸

N° 14. The king of this province and Kingdom of Bengal is a very mighty lord, and has under his rule many cities, very large and of great trade.⁹ There is in this kingdom and province much cinnamon, cloves, ginger, pepper, sandalwood, lacquer, and silk in great quantities. They are wont¹⁰ in this province and kingdom to burn

1 Englishmen, Germans, and the inhabitants of various other regions.

2 fire, dreadful to be seen, rises of itself, and is thrown up and whirled away to a distance.

3 both to be seen and heard. 4 which for the sake of brevity are omitted.

5 live in the desert and are entirely wild.

6 surpassing by his wealth the most fortunate lot of these most powerful kings.

7 It is easy to prove that this one is hardly the real Prester John.

8 in the second and third chapters of his fortieth book.

9 and he is bound with extremely close bonds with the ever victorious king of Portugal, with whom he has made a perpetual treaty of peace, by means of which he receives immense quantities of.

10 Were wont, they say.

bodies after death, and when the husband dies before the wife, the wife burns herself alive with her husband, saying that she is going to be happy with him in the other world, and it is done in this way, that, the husband dying, the wife gives a great entertainment and dresses herself in the richest garments she has, to which entertainment come all her relatives and those of her husband, and after having eaten, she goes with all the people to a place where a very great fire has been built, singing and dancing until she reaches the said fire, and then they throw in the dead body of the husband, and at once she bids farewell to her relatives and friends and leaps into the fire, and she who most nobly throws herself into the fire brings most honor upon her family. but even now this custom is not observed as it used to be, since the Portuguese have traded with them and given them to understand that Our Lord God is not served by such a practice.

N^o 15. The grand Khan of the Tartars is a very great lord and very mighty, he is called King of Kings and Lord of Lords: he is wont to give to his liegemen garments thirteen times a year, at thirteen very great feasts which he holds each year; and these garments are of greater or less value according to the quality of the person to whom they are given, and to each one is given a¹ belt and leggings, a hat adorned with gold and pearls and precious stones according to the greatness of the personage, and these garments which the said grand Khan gives each year are 156,000; and this he does to give greatness and magnificence to his feasts, and when he dies they bear him to be buried to a mountain which is called Alcaÿ, were are buried the grand Khans, Emperors of the Tartars, and those who bear him to burial slay all those they find, saying to them go and serve our master in the other world; and in the same way they slay all his horses, camels, and baggagemules which they have, thinking that they will go to serve their lord. When *Mongui* Khan, Emperor of the Tartars, died, there were slain three hundred thousand men, whom those who bore him to burial met on the way as Marco Polo says in his book, chapter 42.² Poggio the Florentine, secretary of Pope Eugenius IV, *towards the end of* his second book, which he wrote on the variation and changes of Fortune, does much to confirm what the said Marco Polo wrote in his book.

N^o 16. There are various opinions as to what is Trapovana,³ since the Spaniards and Portuguese have navigated the Indian Ocean. How Ptolemy places it in degrees of latitude and longitude I think is well known to all. Some modern explorers hold that the island of Ceylon is Trapovana; others hold that it is the island of Sumatra.⁴ Pliny writes of Trapovana in his sixth book, chapter 22, and says there was a time when the opinion was held that Trapovana was another world, and that it was called Antichton, and that Alexander was the first to inform us that it was an island, and that Onesechritus, admiral of his fleet, [says] that in the said island of Trapovana there are larger and more warlike elephants than in India, and that Magasaene gives as its length seven thousand stadia, and as its width five thousand; that there is no walled city in it, but seven hundred villages, and that in Claudius' reign⁵ ambassadors came from the said island to Rome. In this way: the freedman Damius Plocamius, who had bought of the republic⁶ the taxes of the Red Sea and sailing around Arabia was carried by the north wind in such a way that on the fifteenth day he entered a port of the said island called Hipnus,⁷ and was very generously received and treated by the king, and that after having remained in the said island six months he learned the language, and that one day talking with the king he told him that the Romans and their Emperor were incredibly just, and that the king, seeing that the coins which the said freedman had were of equal weight although the stamp showed that they were of different emperors, moved by this, sent ambassadors to Rome, the chief of whom was Rachia, to make friendship with Claudius, from which ambassadors he heard that in the said island there were five hundred cities, and that the said ambassadors were astonished to see in these heavens of ours the north star and the Pleiades as something new and to them unknown, and that they said that in the said island they only saw the moon above the earth from the eighth day to the fifteenth, and they were especially astonished that shadows turned⁸ towards our sky and not⁹ towards theirs, and that the sun rose on the right and set on the left, from which aforesaid reasons it seems that in the said island where the said freedman made harbor the north star is not seen, which is seen in the island Trapovana, whence it might be said, considering whence the said freedman Damius Proclamius started and the course he might have made with a raging north wind,¹⁰ that the island where he made harbor was the island of San Lorenzo and not Trapubana. And that as king of the said island an old and mild man

1 belts, leggings, shoes, helmets or shade hats [cf. Marco Polo.]

2 in the twenty-fourth chapter of his fourth book. 3 and where it is situated.

4 [What follows is not taken from the text of Pliny, but is translated directly from the Spanish.]

5 about the beginning of his government.

6 the Romans.

7 Hippurus [cf. Pliny].

8 to the right towards our pole.

9 when in their country they saw them always go the left.

10 and the narration of the envoys to Tiberius.

without children is usually elected, and if after being elected he should beget any, at once they depose him; and when they elect him they give him thirty counsellors; and that the said king can condemn no one if the majority of his said thirty counsellors are not agreed with him, and that afterwards the said condemned man can appeal to the people, which thereupon selects seventy judges, who examine his case, and if they find that he was wrongly sentenced they set him free, and those counsellors who agreed in condemning him are deprived of their offices and are held infamous forever after.

Inscription of the author with certain reasons for the variation which the needle of the compass makes with the north star.

N^o 17. Sebastian Cabot, captain and pilot-major of his Sacred Cæsarean Catholic Majesty, the Emperor Don Carlos, fifth of the name, and King,¹ our lord, made² this figure projected on a plane in the year of the birth of our Saviour Jesus Christ 1544, drawn by degrees of latitude and longitude, with its winds,³ as a navigating chart, imitating in part Ptolemy⁴ and in part the modern discoverers both Spanish and Portuguese, and⁵ partly discovered by his father and partly by himself, by which you may navigate as by a navigating chart, bearing in mind the variation which the needle of the compass makes with the north star. For example, you wish to set out from Cape St. Vincent in order to make Cape Finisterre; you will give orders to steer your ship to the north according to the needle of the compass, and you will strike within the said cape, but your real course, which your ship made, was to the north, quarter northeast because your compass-needle northeasts you a quarter at the said Cape of St. Vincent, so that commanding your ship to be steered north by the compass-needle, your course will be north, quarter northeast; and in the same way sailing from Salmedina, which is a shoal as you go out of San Lucar de Barrameda, to go to the point of Naga on the island of Teneriffe you will give orders to steer southwest by the needle and you will make the said point of Naga because it is situated on the navigating chart, but your course will not be to the southwest inasmuch as your compass-needle northeasts you a wide quarter point at Salmedina, but your course will be southwest, a wide quarter south; so that you may say that sailing from St. Vincent to the north your course will be north, quarter northeast, and sailing from Salmedina to the southwest your course will be southwest, quarter south, and so consequently you will do in every other part of this universe, watching the variation which the said needle of the compass makes with the north star, for the said needle does not turn or stay fixed to the north in every place, as the vulgar think, since the magnet-stone, as it appears, has not the power to make it turn to the north in every place, but, as is seen and acquired by experience, it has only the power to make it remain stable and fixed in one place, wherefore it must point necessarily in a straight line whatever wind you may have, and not in a curved line, and this cause brings about the said variation; for if the needle were to turn to the north always and in every place, there would be no variation, for then it would follow a curved line, because you would always be on one parallel, which cannot be when you go in a straight line on a sphere; and you must notice that the further you move from the meridian on which the needle points directly north, towards the west or east, so much the more will your compass move from the north, that is, from the flower-de-luce in it which marks the north: wherefore it clearly appears that the said needle points along a straight line and not a curved line; and you must know that the meridian where the flower-de-luce of the needle points directly north is about thirty-five⁶ leagues from Flores, the last island of the Azores towards the west, according to the opinion of certain experts, because of the great experience which they have of this, on account of the daily navigation which is made toward the West, to the Indies of the Ocean. The said Sebastian Cabot,⁷ sailing towards the west, found himself in a place⁸ where northeast quarter north [of the compass] stood directly north, on account of which observations aforesaid it appears clearly that defects and variations which the said needle of the compass makes with the north star really exist.

Pliny in the second book, chapter 79,⁷ writes:—

N^o 18. That from Cadiz and the columns of Hercules, sailing around Spain and Gaul, the whole west was sailed over. The greater part of the northern ocean was

1 of Spain.

3 so wisely, so exactly.

5 and likewise the experience and labors of the long nautical life of the most honest man John Cabot, a Venetian by birth; and the knowledge of the stars and of the art of navigation of Sebastian his most learned son and my author, who discovered some part of the world which had long been unknown to us.

6 thirty.

7 my author.

8 came to a sea and shore.

7 [Pliny, lib. 2, cap. 67. There is no Latin for this on the map. In Chytraeus, where it is numbered 19, the Latin is copied directly from Pliny, l. c., and not translated from the Spanish.]

sailed over in the time of Augustus, passing by all Germany as far as the Cimbrian Cape, and thence as far as Scythia. And from the East the fleet of Macedonia sailed along the Indian Ocean towards the north until the Caspian Sea was to the south of them, in the time that Seleucus and Antiochus reigned, and they ordered that that region should be called Seleuchida and Antiochida. And to the north of the Caspian many parts have been sailed over, so that the northern sea has been nearly all sailed over : and he likewise says, in the same chapter, that Cornelius Nepos writes that to Quintus Metellus Celer, who had been consul with Afranius, and who was then pro-consul in Gaul, there were sent certain Indians by the king of the Suevi, who, starting from the Indian Ocean, had without mischance been carried to Germany.

N° 19.¹ In these Rocos islands there are birds of such size (as they say) and strength that they take up an ox and bear it in their flight² in order to eat it, and *still more they say*³ that they take a vessel, no matter how great it may be, and raise it to a great height and then let it drop, and they eat the men. Petrarch likewise says so in his book of Prosperous and Adverse Fortune.

N° 20. There are in the island of *the people of Calenguan* lions, tigers, panthers, deer, and many other different kinds of animals ; likewise there are eagles, and white parrots *who speak as clearly as human beings what is taught them*, and many other countless birds of various kinds. The people of the island are idolaters ; they eat human flesh.

N° 21. A ship from Cambaya discovered this island of Mamorare, and it is said there was so much gold in it that they loaded it with nothing else *according to what the Portuguese say*.

N° 22.⁴ There are in this island of Ceylon native cinnamon, and rubies and hyacinths and cats' eyes and other kinds of precious stones.

Ciapangu is a large island lying in the high seas, which island is one thousand five hundred miles distant from the mainland of the Grand Khan towards the east. They are idolaters, and a gentle and handsome race. It has an independent king of its own, who is tributary to no one. It contains much virgin gold, which is never taken away from the said island, because ships never touch there, as it is so distant and out of the way. The king of this island has a very great and very wonderful palace, all made of gold in ingots of the thickness of two reals, and the windows and columns of the palace are all of gold. It [the island] contains precious stones and pearls in great quantities. The Grand Khan, having heard the fame of the riches of this said island, desired to conquer it, and sent to it a great fleet, and could never conquer it, as Marco Polo more amply relates and tells in his book, chapter 106.

[S. W. Quadrant of Map.]

In this figure, projected on a plane, are contained all the lands, islands, ports, rivers, waters, bays, which have been discovered to the present day, and their names, and who were the discoverers of them, as is made more manifest by the inscriptions [tables] of this said figure,—with all the rest that was known before, and all that has been written by Ptolemy, such as provinces, regions, cities, mountains, rivers, climates, and parallels, according to their degrees of longitude and latitude, both of Europe and of Asia and Africa.

And you must note that the land is situated according to the variation which the needle of the compass makes with the north star, for the reason of which you may look in the second table of No. 17.

[S. E. Quadrant of Map.]

Of the fish which stops a ship.

Pliny writes in his ninth book, chapter twenty-five, of a fish which is called Nichio, which he describes as being round, and that attaching itself to a ship it holds it even though it be under sail. And Petrarch, in the preface to the second book of Prosperous and Adverse Fortune, says that the echenis or remora, a fish of half a foot in length, stops a ship, though it be very large, and winds and waves and oars and sails aid its course ; it alone overpowers the power of the elements and of man, with no other agency save attaching itself to the planks of the ship, and with no other force than its own nature ; which fish is like mud or mire, and taking it out of the water it loses its power. The aforesaid is found in very distinguished writings, which are not quoted here lest it take too much space.

1 [The Latin of Nos. 19, 20, and 21 is in the S. E. quadrant of the map. It ends in each case with a reference in Spanish to the Spanish of the tables.]

2 to their nests.

3 their talons are so strong.

4 Latin in N. E. quadrant of map.

ROYAL SOCIETY OF CANADA

TRANSACTIONS

SECTION III.

MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES

PAPERS FOR 1897

I.—*Presidential Address: On the Transcendental Geometry.*

By Prof. N. F. DUPUIS, A.M.

(Read June 23rd, 1897.)

Gentlemen,—As you have done me the honour of electing me to the presidency of this section of the Royal Society, the duty has devolved upon me, in accordance with custom, to prepare a presidential address.

I confess that it is with some degree of misgiving that I have done so, for I cannot forget that we have been pretty plainly told by some of the members of this section that, at least, it is not pleasant to be treated to a lot of hieroglyphics in the way of mathematical formulæ, in which, from not being able to understand them, they could take no real interest.

Such a sentiment is hard upon the mathematicians of the section, for if they are not to use mathematical formulæ, who are to use them? or what are they to use? Every subject has its own symbology and its special technicalities, and although mathematics may have more of them than the majority of subjects, yet chemistry and physics are not without them.

The real difficulty is that pure mathematics has little or no affinity with experimental subjects, and we, who are thrown together into a sort of uncognate agglomeration in order to form a section, must try and exercise as much forbearance as possible.

Whether my subject is one in which many of you are interested or not I do not know, but I will promise you one thing, that I will not treat you to hieroglyphics. I purpose to consider and to criticise, as far as time allows, that system of geometrical speculation known under the names of the new geometry, transcendental geometry, hyperspace, spherical space, pseudo-spherical space, etc.

Prof. Clifford, who, during his life, was an active advocate of the new geometry, says: "Just as in any branch of physical inquiry we start by making experiments, and basing on our experiments a set of axioms which form the foundations of an exact science, so in geometry our axioms are really, although less obviously, the result of experience. On this ground geometry has been properly termed a *physical science*."

I do not agree with Prof. Clifford that geometry is a physical science in anything like the same sense as sciences such as chemistry, and experimental physics, and others which we usually call physical sciences. But more of this hereafter. He goes on to say that "the danger of asserting dogmatically that an axiom based on the experience of a limited region holds universally will be apparent." Even admitting the truth of all this, it does not affect the geometry, which for the sake of distinction we

may call the old geometry. The old geometer, by submitting his experience to reason and judgment, forms the idea which he formulates in the straight line, and upon this idea he builds up his geometry.

The system of geometry thus constructed is now called Euclidean, to distinguish it from varieties belonging to the new geometry, and the space which admits of Euclidean geometry is called Euclidean space. As this geometry assumes the existence of the defined straight line, and as such a line cannot return into itself or have a necessary and absolute termination, Euclidean space may be, and possibly is, infinite.

Down to about the year 1830 it was generally held by all geometers that Euclidean geometry represented the actual of the universe, and that it was the only possible system of geometry. About this time, however, Lobatchewsky questioned the generally received dictum of previous geometers, and expressed the opinion that the geometry of the universe need not perforce be Euclidean, but that some other geometry not founded upon Euclid's definitions and axioms, and to which these were not applicable, might be the real geometry of the universe.

About 1850 Riemann and Gauss gave a great impetus to the new geometry, and in more recent years Beltrami, and Dedekind, and Helmholtz, and Klein, and Clifford, and Hinton, and Ball, and many others have each added their quota to help it along and perfect it into a system. And just about as generally as it is supported by mathematicians it is condemned and repudiated by philosophers.

It might be here explained that the principal arguments in support of the new geometry are drawn from apparent analogies between relations connected with geometry of one and of two dimensions, and that it is by analogy alone that extensions of these new ideas can be made to geometry of higher dimensions. Also, that to postulate the possibility of the new geometry is to postulate the existence of four-dimensional space, and the possible finitude of the universe. So that all these things are, of necessity, connected with the subject of transcendental geometry.

Considering the Euclidean definition of a plane, it is well-known that a triangle in this plane has the sum of its internal angles constant and equal to two right angles. Or to put it in another way, the sum of the internal angles of a triangle formed by three straight lines which intersect two and two, but are not concurrent, is invariably two right angles.

Now the new geometry tells us that since we get our idea of a plane from experience, as also our idea of a line, we cannot be sure that our experimental plane is the Euclidean plane, or that our experimental straight line is the straight line of Euclidean geometry; so that we have no right to assume that because Euclidean relations seem to hold experimentally for any extent of the apparent plane that comes within our observation, therefore they must hold through any extent whatever.

It tells us that, for all we can know to the contrary, if a triangle could be taken sufficiently large, the sum of its internal angles might be

either greater or less than two right angles, and that if either possibility is true for any triangle, however large, it is presumably true to some kind of a proportionate extent, for any triangle however small.

This hypothesis, in its application to plane geometry, has given rise to the following notation, which may be convenient for reference: The two-dimensional space in which the triangle is supposed to be constructed is called elliptic, parabolic, or hyperbolic, according as the sum of the internal angles of the triangle is greater than, equal to, or less than two right angles. I say apparently plane geometry, because if the word *plane* be employed in the Euclidean sense, the space is necessarily parabolic.

We see then that both the elliptic and the hyperbolic space are founded upon the assumption or hypothesis, that the Euclidean plane is an impossibility in the constitution of the universe, and that the Euclidean straight line is either an impossibility, or is restricted to certain relational directions.

If you ask for the reason you are told that the possibilities of geometry are fixed and determined by the nature and properties of space; and that space-properties may be such as not to admit of the Euclidean axioms and definitions, and therefore not to admit of such a universe as will answer to every extent, and in all respects to the conclusions of Euclidean geometry.

Of course, there are no means of proving this. But the new geometer holds that neither are there any means of proving the principles of Euclidean geometry. That all the different species of geometry, for I suppose that that is what we must call them, are equally possible and probable, and are founded upon assumptions which are equally reasonable and plausible, and that although Euclidean geometry *may* be that of the universe, so also may any of the others, and that it is a mistake to place geometry upon so limited a basis as is involved in merely one species of geometry.

The following illustrations will possibly make this clearer:

If we suppose some very minute intellectual lilliputian confined to live and carry on his experiments and observations upon the smooth surface of some frozen lake like Superior, and to be limited in his migrations to a few yards or rods from a given point, he would naturally infer that he lived upon a plane, inasmuch as no experiments which he could institute, and no observations that he could make would detect any deviation from the absolute plane. He might draw lines on this plane such as he would call parallel and which, he would be fully convinced, would never meet however far they might be produced. His triangles lying in his habitable plane would, as far as he could see, have the sum of their internal angles equal to two right angles, and the whole geometry of his assumed plane would be Euclidean.

But we who view the matter from a higher point, in a larger field, know that the plane of the lilliputian, is a minute portion of a great spherical surface. That his supposed straight lines, although the shortest from point to point upon his supposed plane, are only geodetic lines on the sphere, and therefore not straight in the Euclidean sense ; that his parallels will meet in no less than two points if produced far enough ; and consequently that two of his straight lines can include a space ; and that the sum of the internal angles of a triangle drawn on his plane would be greater than two right angles.

On the other hand if we suppose our lilliputian to be living upon the surface of a hyperboloid of one sheet, or a hyperbolic paraboloid whose radius of curvature at any point is exceedingly great as compared with the limits of his migrations, then, although he would draw the same conclusions in regard to his plane geometry as before, we know that under his conditions of existence he could have two straight lines, and no more, passing through any one point in his plane, and that all other lines through this point, although appearing to be straight, would be slightly curved, being geodetic lines upon the surface, that his parallels would never meet, but would gradually separate when continued sufficiently outwards, and that his supposed plane triangle might have the sum of its internal angles less than two right angles.

Now the new geometry holds that the properties and relations of space may be such as to compel a state of things something such as here illustrated. That although we, on account of our limitations, might be never able to detect any deviation from the strictest Euclidean conclusions, yet our so-called parallels might either approximate when very greatly extended, when our space would be called elliptical ; or they might separate under like conditions, in which case our space would be hyperbolic, and thus, of course, all the other consequences would follow.

Prof. Clifford, whose versatility and ingenuity made him somewhat of a vandal amongst mathematical usages, gave great attention to illustrating these transcendental speculations, and I shall make use of some of his illustrations.

Clifford begins by assuming an intellectual worm of infinitesimal thickness, part of a geometrical line, in fact, moving in a tube of infinitesimal bore. Such a worm, he claims, could have knowledge of space of one dimension only. If his tube were straight it might be infinite in length, and thus the one dimensional space of the worm would be infinite in extent, and same ; *i.e.*, identically the same in every part. But if the tube were bent into a circle, so that the bore would form a continuous circumference, the space would be equally endless, and as the worm could still pass along the tube without any knowledge of change or limitation to motion, it would naturally infer, as before, that the one dimensional space which it occupied was infinite and same. If, however, the tube

were changed from a circle to some elliptic or irregular form of closed curve, the vermal inhabitant would have still an infinite space, as far as its intelligence could determine ; but as the curvature would be different at different points, the worm, in accommodating itself to these curvatures would experience different sensations at the various points, which, although really due to the character of the space in which it moved, would by it be referred to some physical change in its own nature or in the universe of which it was cognizant.

Carrying his illustration one stage farther, Clifford supposes a fish, intelligent, but of infinitesimal thickness, that is a portion of a geometrical surface, moving in a sea of infinitesimal depth. Such a being could have knowledge of two dimensions only. If its sea were a plane, the fish's space would be infinite, of two dimensions and same. Also, if the sea were a portion of the surface of a sphere, the two-dimensional space, as far as the determination of its form or limits by the intelligence of the fish could go, would be still infinite and same ; since a surface figure which would coincide with the surface of a sphere at one point will coincide at every point.

But if the sphere were transformed into an ellipsoid, or into any other surface closed or open, with varying curvature from point to point, the space of the fish would be still apparently infinite, as far as its knowledge could go, but as it would have to undergo change of form at different points, in order to accommodate itself to changes in curvature of its sea, it would become cognizant of different sensations at these points ; but instead of referring these changes of sensation to the proper source, the curvature of the space in which it was constrained to move, it would naturally refer them to some change in its own physical constitution, or in that of the universe of which it had any knowledge.

Here illustration must cease, and the argument must be founded upon analogy alone, for it is not possible to illustrate that which in itself is inconceivable.

Reasoning from analogy, then, the new geometer says that it is possible, just as in the case of the worm in its circular tube, and of the fish upon its spherical surface sea, that our three dimensional space may have some property which we might call a *bend* in it, so that although it seems to us to be infinite in extent, it may, in reality, be finite. In which case, of course, it could not possibly admit of the Euclidean straight line, for that is necessarily infinite in length. Looking at such a possibility, then, the new geometer argues that it is not wise to state dogmatically that Euclidean geometry is the absolute geometry, or that Euclidean space is the only possible space, or that the universe is infinite in extent, although, of course, it is unlimited, just in the same way, all necessary changes being made, as the power to keep on moving without coming to a necessary termination, is, for the imaginary worm and fish, unlimited.

But this is not all. If our space has a bend in it, the bending may be uniform in all directions, or uniform in only some directions, or it may completely vary in one or more directions from point to point, so that we have an endless number of possibilities.

If the bending is uniform at all points and in all directions, no change could be experienced in our passing from one part of space to another, so that the space so endowed would be same but not Euclidean.

But if the bending is not uniform, then different parts of space may have different properties, and for all we can know to the contrary, the bending of space may be some sort of a function of time, so that certain parts of space, or the whole of it, may be undergoing slow, but continuous changes in curvature.

And Clifford says that "the hypothesis that space is not homaloid, *i. e.*, Euclidean, and again that its geometrical character may change with the time, may, or may not be destined to play a great part in the physics of the future." And one of Clifford's commentators goes even further, for he says: "The most notable physical quantities which vary with position and time, are heat, light and electro-magnetism. It is these that we ought peculiarly to consider when seeking for any physical changes, which may be due to changes in the curvature of space. If we suppose the boundary of an arbitrary figure in space to be distorted by the variation of space curvature, there would, by analogy from one and two dimensions, be no change in the volume of the figure arising from such distortion.

"Further, if we *assume* as an axiom that space resists curvature with a resistance proportioned to the change, we find that waves of 'space-displacement' are precisely similar to those of the elastic medium which we suppose to propagate light and heat. We also find that 'space-twist' is a quantity exactly corresponding to magnetic induction, and satisfying relations similar to those which hold for the magnetic field. It is a question whether physicists might not find it simpler to assume that space is capable of a varying curvature, and of resistance to that variation, than to suppose the existence of a subtle medium pervading an invariable homaloidal space."

After this long quotation I think that it is not necessary to say anything further with regard to the theoretical possibilities of a changeable curved and twisted space.

Going back to Clifford's illustrations and reasoning on the basis of Euclidean geometry, it will be noticed that while the tube inhabited by the worm remained straight, only one dimension was involved. But as soon as any flexure occurred in the tube, at least a second dimension of space was introduced, and the worm lived in space of, at least, two dimensions, although supposed to be cognizant of only one, and we see that the second dimension is necessary in order that bending may be pos-

sible. Similarly, if his sea of infinitesimal depth were a plane it would occupy space of two dimensions only, but as soon as flexure of any kind takes place, the two dimensions rise to three, and the third dimension is necessary in order that flexure may be possible. And the fish in this latter case, although supposed to have knowledge of only two dimensions, is really living and moving in space of three dimensions.

Then reasoning from analogy, again, we see that if our three-dimensional space is curved, there must be a four-dimensional space in order to make such curvature possible, and in which the curvature takes place. And hence, in the new geometry, the postulate that gives to tri-dimensional space what has been called a curve or twist, makes the existence of four-dimensional space a necessity. And if there is no space of four dimensions, then the transcendental geometry is an impossible one, and must take rank with the mathematical imaginaries. Also, if there be space of four dimensions, why not of five, or six, or n dimensions, for it is just as difficult to conceive the first of these as to conceive the last.

It is quite impossible to describe four-dimensional space, or to say what existence in such a space would be like; for it is absolutely inconceivable to minds like ours. Nevertheless, it appears to be very plastic in the hands of the new geometers, for in it they find the potency and explanation of many difficulties in physics and chemistry.

It has been called into use to explain the mysterious wonder-working sometimes effected by spiritual mediums, for it has been shown that by the aid of space of four dimensions it is possible to tie a knot or to undo one in an endless piece of rope; that it is possible to pass into or out of a closed room, without going through any opening in floor or ceiling or walls; that it would be possible, in fact, to turn the room inside out without particularly disturbing any of its arrangements.

It is said that a person living in four dimensions could see completely through us, and inspect the working of every internal organ, and of every part of it, as clearly as if we were made of some perfectly transparent liquid or jelly, thus clearly outdoing the best feats of the Roentgen rays. The value of a four-dimensional physician to the public cannot be overestimated.

Hinton has shown that by supposing a properly disposed four-dimensional object to pass through our three-dimensional space, the whole phenomena of the birth, growth, life, and death of an organic being can be readily and scientifically explained.

Four-dimensional space, also, can be made to furnish a reasonable cause for the impenetrability and the inertia of matter, and under certain conditions for the conservation of energy.

Ball gets rid altogether of the luminiferous ether, and even gets a possible explanation of the cause of gravitation, by supposing our three-dimensional space to rest on a plate or lamina of four-dimensional space,

which is capable of vibrating, and of carrying its vibration onwards in a sort of wave motion after the manner of a material body. By means of this wonderful space the chemist could work out explanations of many of his difficulties, and particularly why there is a certain definite number of kinds of atoms. But by the same means he would lose one of his powerful aids in analysis. Dextrose and Levulose could no longer be distinguished with any certainty by their twisting effect upon a polarized ray of light, for a left-hand twist would become a right-hand one, merely by being turned over in four-dimensional space.

Examples of this kind might easily be increased; but to give more is unnecessary, while to enter into an outline of the reasoning by means of which the results have been obtained would take me too far beyond the limits set for this address.

I have now given what I consider to be a fair statement of the leading results of the transcendental geometry, of that geometry which is being studied and taught in some of the best institutions, and by some of the best mathematicians in the world, not in the descriptive form in which I have presented it for your consideration, but analytically, and by means of the methods and machinery of co-ordinates.

From the gravity of the situation introduced by the speculations of the new geometer in regard not only to geometrical knowledge, but indirectly to all knowledge, it seems to me that the foundations of this new geometry should be most critically examined both mathematically and philosophically before a general assent is given to it, or before it is held to be altogether untrustworthy.

The founders have proceeded upon the principal that geometry is a physical subject, derived quite directly from experience, and that in establishing any system of geometry we are not justified in claiming for it any more than we can draw from experience.

Because we have never experienced a straight line in the Euclidean sense, we have no right to assume that there is such a line; and because we have never experienced a Euclidean plane it is quite possible that there is and can be no such thing as a plane; and that our conceptions of such things are merely idle dreams which can have no existence in the real universe, not because they contain any inconsistencies or self-contradictions, but because the universe, from the very nature of its space properties, will not admit of them.

If this principle is to be followed, it is doubtful if we can have any geometry at all in the accurate sense of the word, if, indeed, we can have any knowledge.

For if we are to adopt the lines and planes and the figures of our experience, instead of the concepts drawn from these by reason and judgment, our lines must be irregular and variable, and our planes curved and uneven. But the determination of a point by two such lines

has no meaning, in exact geometry; and the distance between two points is equally meaningless if the points are to be anything else than those laid down by Euclid's definition, and certainly such points are not those of our experience. And thus the whole doctrine of the triangle, which lies at the foundation of all geometrical measurement, is faulty and uncertain; and what is worse, we have no means of knowing wherein the faultiness lies, or in which direction it tends. And if we cannot trust our mental conceptions in building up a knowledge of geometry, how can we trust them as a basis of any other knowledge.

The straight line is the simplest of all geometrical concepts, since it involves the most elementary idea of continuity without variation. And it is doubtful if any being, endowed with human intelligence, could be placed under circumstances of existence in which it could not form the concept of the straight line.

Even Clifford's worm in its crooked tube,—of which we shall say more hereafter—if it were to turn on its axis—quite a legitimate operation—would very readily draw an inference as to a tube, or condition of existence, which was bent in every direction alike, and this would be the straight line.

But the new geometer holds that the universe may be such that Euclidean space may not be its space, but that the latter is so constituted as to have a bend in it, so that its simplest geometrical element may be a curved line.

The space of the new geometer is then more complex than that of Euclid. And when we consider that Euclidean space is absolute in its simplicity, and that it is thinkable and admits, not only of the straight line, but of every form that can be imagined or conceived, while spherical and pseudo-spherical spaces are hampered by restriction, and are totally and absolutely inconceivable, it seems to me, apart from all other considerations, that the probability is overwhelmingly in favour of the space of Euclidean geometry being that of the universe.

Moreover, if space is curved, the character and direction of its curvature must be purely arbitrary, and the radius of curvature for any section must be arbitrary. But just as we can give a strong and valid non-experimental reason why a point acted upon by two forces in different directions should move along the diagonal of the parallelogram whose sides represent the forces; so for every reason why space should have curvature in one direction, an equally potent reason can be given why its curvature should lie in the opposite direction. And the only space in which these arguments may be said to fail, or be said to hold equally well, is the space of Euclidean geometry, which is another strong presumption in favour of Euclidean space as that of the universe.

Again, the new geometer, in drawing his conclusions in regard to hyperspace, is compelled to found his arguments very largely upon

analogies which he believes to hold good between the conditions of existence in spaces of lower dimensions.

But arguments in mathematics, drawn from analogy, even where the analogy is unquestionable, are not always trustworthy. Of this I shall adduce one single example out of many :

It is well known that a quadratic equation has a reducing linear, or can by a substitution be reduced to a linear. So also a cubic equation has a reducing quadratic, and a quartic equation has a reducing cubic. Analogy would tell us then that the quintic equation should have a reducing quartic. But all attempts at finding such a quartic have failed, and Abel has shown that no such quartic exists. Here then analogy fails us, and in a case where we would particularly expect it to hold.

What then can we say of arguments resting upon doubtful analogies between the abstract and the concrete, and between the real and the inconceivable, and where there is, and can be, nothing in our conceptions to support such arguments.

In Clifford's worm we are asked to conceive an intelligent being reduced to a segment of a line, and in his fish, a similar being reduced to a portion of a surface, and from imaginary experiences of these hypothetical beings we are to rise, by a very doubtful analogy, to space of four dimensions, to the properties of such a space, and to the experiences of creatures or intelligences inhabiting it.

Let us see what all this means.

It is very convenient to speak of a plane as being space of two dimensions, and of the straight line as space of one dimension. But, considering the matter a little more in detail, we see that a surface is the boundary or limit belonging to an object of three dimensions, and separating this object from adjacent ones, or from the space which lies without it. A surface considered in these relations, and as the limits or bounds of a material object is real enough ; but separate it from these relations and it becomes a mere abstraction. And similar remarks might be made in regard to the line. How then can we imagine an intelligent being as inhabiting an abstraction ? For so long as we fail to consider the surface in relation to the third dimension, that is what it comes to. And the fish, which has no relation to the third dimension, is an abstraction also. And yet we are asked to find an analogy between the life and experiences of an abstraction and those of real creatures who lead a real life in space of three dimensions. And from this analogy we are to draw conclusions with respect to relations existing between the real space which we inhabit and the inconceivable unknown called space of four dimensions. For my own part I must confess that I cannot see any analogy upon which an argument can be built.

Again, it is argued that a four-dimensional figure may possibly be projective into a figure of three dimensions, just as one of three dimen-

sions is projective into one of two, etc. Or, in other terms, just as the whole of plane geometry may be looked upon as a projection of solid geometry, or geometry of three dimensions upon a plane of projection, so geometry of three dimensions might be considered to be the projection of four-dimensional geometry upon what we would have to call a tri-dimensional space of projection, whatever such a phrase may mean.

Of course there is more analogy in this argument than in the preceding one, and yet, whatever it may render possible, it proves nothing whatever.

A line, which is of one dimension, can be projected into a point, which is of no dimensions, and thus into a geometrical figure one dimension lower, *only* when the line to be projected is normal to the plane of projection. And a plane, which is of two dimensions, can be projected into a line, which is of one dimension, and therefore one dimension lower than the original, *only* when the plane to be projected is normal to the plane of projection.

But in these very cases it is impossible to know, from anything in the nature of the projection itself, whether the original was of higher, or of the same dimensions as the projection. So also a figure of three dimensions gives rise, when projected, to a figure of two dimensions. But nothing in the nature of the figure thus produced can indicate whether the original was of three dimensions or of only two. And were it not that we know beforehand the character of the original, it would not be legitimate to infer, from anything presented to us in the projection, that the original must be of three dimensions.

Reasoning then from analogy, all that we are justified in saying is, that if there be such a thing as a four-dimensional space, our solid figures may possibly be projections from figures in that space, although we fail to conceive how such a projection could be effected. But we are certainly not justified in assuming that there *is* a four-dimensional space, unless we can first know something about the nature of a figure in such space.

And then again, if we can reason by analogy from a three-dimensional space to a four-dimensional space, we can rise by the same means from a four to a five-dimensional space, and so on by induction to a space of infinite dimensions. For if we admit the legitimacy of the method there can be no stopping point, except a merely arbitrary one. But it has been shown that even in cases where we have the strictest analogy, this method of argument may fail. Then in the present case where the analogy is certainly not very close, it is highly probable that at some point it will fail, and it is just as reasonable, and more so, to suppose that it fails in rising from three to four dimensions, as to suppose that it will fail at some higher point.

It is said, again, that the mathematician frequently works upon the assumption of a four-dimensional space, as when he employs four co-ordin-

ates for the sake of homogeneity, and in many similar operations. And that his results, as far as any tests can be applied to them, are consistent and presumably correct.

Now, in the operations here referred to, the mathematician is employing the symbolic language of algebra, in which the symbols stand for and denote quantities or magnitudes, and operations, which by a circumlocution can always be expressed in words. And there is no more virtue, beyond that of convenience, in writing x^4 where x stands for a line segment, than there is in speaking of a four-dimensional figure, every dimension of which is the same. And however consistent with the principles of algebraic operation the result may be, it will be capable of being tested, and therefore will be presumably correct, only when it admits of a real interpretation.

To say that because x^2 denotes the square on the line-segment x , and x^3 denotes the cube on the same, therefore x^4 must denote a four-dimensional figure of equal dimensions on the line-segment, is no proof of anything, unless we assume, to begin with, that every homogeneous algebraic expression must have an interpretation in real geometry; which is a glaring example of the *petitio principii*.

That such usages and formal interpretations have their advantages no mathematician will deny. But in cases where the interpretation cannot be made in real terms, it is difficult to see how such expressions can be looked upon outside of mere matters of formulization.

Thus we speak of two circles as intersecting in the two circular points at infinity, and we give this as a reason why the two circles cannot intersect in more than two real points. But surely no person will maintain that two circles, every part of each of which is visible, can extend to infinity, and the very fact that the circular points at infinity are imaginary, shows that they do not. But the nomenclature and the determining formula are decidedly advantageous, serving, as they do, to generalize the properties of the circle and to connect it with that group of curves to which it naturally belongs.

Finally, we must consider the new geometer's idea of space itself. To him space is something which is capable of exercising restriction, of exerting a compelling influence which may prevent the existence of a straight line and of a plane; it is something which has at least a potential form, which may be curved or bent, and of any or all degrees of curvature; which is capable of exercising force and thus of resisting curvature; something which can suffer displacement, and which can propagate waves of displacement; which can be twisted or have vortex motion, and which may have its law of change a function of elapsed time.

I do not know that any one of the new geometers would endorse all these statements, but they certainly can be drawn from all their writings.

Now all these assumed properties of space are physical properties which are the attributes of matter, and all matter must possess some of

these. So that if space possesses all or any of these, it is difficult to see how we are to distinguish between space and matter. For we are compelled to call that matter which possesses the attributes of matter, and just to the extent to which space possesses these attributes, to that extent it is akin to matter. It appears then that this new space, being to some extent, at least, akin to matter is best described as some new form of ether. For although very little is known of the luminiferous ether which the physicist has been compelled to create for the purpose of explaining phenomena, yet it is assumed to have some properties which are more or less physical, and which are not very different from those attributed to the new space.

But it is hard to see what we are to gain by substituting for the luminiferous ether something very like it, but which we agree to call space.

Of course the new geometer may say that his space has reference to the possibility of describing geometrical figures, while the luminiferous ether has no such reference. This is quite correct. But, after all, the power of restricting the forms of geometrical figures is only a new property added to the ether, and does not therefore transform the ether into space. And the only way out of the dilemma is for the new geometer to deprive his space of all physical properties whatever.

But this would destroy the new geometry, because a space without physical properties cannot have a bend in it, or have curvature ; it cannot exert an influence, or offer a resistance ; it cannot suffer displacement, or propagate wave motion, or be thrown in vortex whirls.

The fact is that space is the antithesis of matter, and instead of being endowed with physical properties, is the negation of all such properties. When we, in thought, extract from any material thing every property except that of extension, we arrive, as nearly as we can get, to the idea of space. And even the extension does not belong to space or form any part of it, but to the material thing which exists in space. So that space is merely the possibility of the existence of material or of conceptual entities. As such it is not subject to any tests or any hypotheses, and instead of geometry being determined by the conditions of space, space is determined by the conditions of geometry.

To say that we can imagine elliptic space on the surface of a great sphere, or hyperbolic space on the surface of an extended hyperboloid, is of no account whatever ; for space in the absolute is unimaginable and unthinkable, and all that we imagine is something which can exist in space. When we try to imagine a point in space what we really imagine is that point in its relation to ourselves, through some geometrical figure, usually the straight line, which in this case resolves itself into the idea of distance, and possibly of direction.

Then, that geometry which is thinkable and consistent carries within itself the idea of a thinkable and consistent space ; and a geometry which

is inconceivable exists only in an inconceivable space, and thus takes rank with the mathematical imaginaries.

But the Euclidean geometry is thinkable and consistent, and is in fact the only one which for us is so. Therefore the Euclidean geometry *must* be a geometry of the universe, and it must be the only one, unless we are prepared to make the inconceivable assumption that the universe may admit of different and contradictory geometries at the same time.

As for four-dimensional space, even if it were a possibility, it does not necessarily follow from analogy, or from any other reason, that it must falsify our Euclidean geometry of three-dimensions, any more than our geometry of three dimensions falsifies our geometry of two.

But from the point of view which I have laid down, four-dimensional space need not give us any difficulty. For when any intelligent being can imagine or conceive a four-dimensional figure, he has in this very conception a four-dimensional space.

To say that there may be superior intelligences which possess this power, is to state the existence of a possibility for which we have not the shadow of a proof.

II.—*On some Measurements of the Temperature of the Lachine Rapids made during the Winter of 1896-97 with a Differential Platinum Thermometer.*

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(Communicated by Professor H. L. Callendar, M.A., F.R.S., F.R.S.C.,
and read June 23rd, 1897.)

In the paper¹ which the writer had the honour to read before this section of the Royal Society a year ago, will be found recorded a series of observations made with new and very delicate apparatus, to determine the extent to which the temperature of the river water opposite Montreal, under the surface ice, varied from the freezing point during the winter of 1895-96.

From these experiments it was shown that the temperature of the river remained exceedingly steady, although the air temperature ranged from -28° F to $+40^{\circ}$ F. Small variations are recorded of a few thousandths of a degree, and these were found to accompany atmospheric changes. In no case, however, has a difference greater than one hundredth of a degree from the freezing point been found.

The writer further pointed out that an electrical resistance thermometer is really the only form of temperature measuring instrument suitable for work of this kind, not only because it is capable of greater refinement than can be obtained with any other form of thermometer, but because readings may be taken of the temperature of the river without withdrawing the stem from the water.

The discrepancies in the observations of previous observers have shown that very little reliance can be placed on a mercury thermometer taken out of the water and read in a cold atmosphere.

Where a large difference below freezing has been obtained by this means, it is important for the observer to state clearly how the measurements were taken, and what precautions were used in making the readings.

In this respect the instrument used in the experiments carried out by Mr. Sproule, the assistant engineer of the harbour commissioners' works, Montreal, on the temperature of the river water, is the most suitable where an accuracy of not more than 1/10th of a degree is required. It consists of a mercurial thermometer protected by an outer case, in which a quantity of the water to be measured is entrapped. This serves the purpose of preventing sudden changes in the air. The result of Mr. Sproule's work is found to be in good agreement with that of the writer's,

¹ Transactions of the Royal Society of Canada, Vol. II., Sec. III., p. 37, 1896.
Sec. III., 1897. 2.

in so far as it shows, within the limits of accuracy of his readings, that the temperature of the river water never varied from the freezing point throughout the winter, either under the surface ice or in open water.

In the charts of air and river temperatures now in the possession of Mr. John Kennedy, made by the late Mr. T. D. King for the Grand Trunk Railway at Victoria Bridge, will be found recorded variations in the temperature of the river water, under the surface ice, amounting to several degrees either way from the freezing point. Unfortunately, it is not known definitely to the writer how the observations were made, or what precautions were taken against sudden changes in the air. As the variations do not correspond, however, with changes in the temperature of the air, they suggest possible errors of observation.

The purpose of the present paper is to record a number of observations made by the writer during the past winter of the temperature of the Lachine rapids, in continuation of the measurements, already described, made under the surface ice at the guard pier opposite Montreal.

It was considered almost certain *à priori* that the temperature of the open water in the Lachine rapids could not differ to any large extent from the freezing-point. But, as a matter of further interest, it was deemed important to establish this by direct experiment, and to determine, as far as possible, the relationship between the formation of frazil ice and the temperature of the water.

Place of Observation.

It was difficult to choose a place for making the measurements which would present a sufficient variety of conditions in the state of agitation of the water, to enable the readings to be of value in determining any inequality in temperature throughout the mass of the river.

The first locality selected was at the foot of the rapids, between the north shore of the river and Ile Héron, at the spot where the main current runs under the barrier ice. It was soon seen, however, that this would prove to be a most dangerous place in which to leave the observation shanty and instruments, on account of the continually shifting surface ice. A shove of considerable size might at any moment take place here during extreme cold weather, owing to the complete blockage of the channels under the ice by frazil. A place was finally selected higher up, which from the solidity of its foundation, and the character of the water in the immediate vicinity, made it as suitable as could well be desired.

The Lachine Hydraulic Co., their works being then under construction, had built out from the north shore, for a considerable distance, a coffer-dam of earth and stone, which, with the outer dam of the same material, extending down to the power-house, served to turn aside an immense volume of water, otherwise to be employed for power purposes. Just at

the corner where this coffer-dam joins the outer dam, the water attained a considerable velocity, with a great deal of surface agitation in parts. It was decided to locate the observation shanty at this point in preference to any other, for the following reasons: The shanty would be on the solid earth of the pier, and hence remain steadier for the measurements; the water was in nearly every state of agitation within easy reach of the thermometer stem; and the depth of water varied so in the immediate vicinity, that while in some parts it was sufficiently shallow to permit of observations being made of the growth of anchor ice, in others it attained a depth of nearly 20 feet. Moreover, the current sweeping around the point caused a large sheet of comparatively quiet back water to work up from a considerable distance below. This remained open, except in the severest weather, when frazil, swept in from the currents, aided by surface-formed ice, became compacted into a thin moving heterogeneous surface sheet soon dispersed in milder weather. The especial advantage of having this quiet water and the swift current in juxtaposition, was to enable the measurements to be made at close intervals, of the temperature of the water in such different conditions, coming together from opposite directions.

The river in winter above the place where the shanty was located, is open for a distance of six or eight miles, and flows so swiftly that it is being continually stirred to the bottom by surface currents carried down and lower layers brought to the surface. All along the bottom there are formed immense quantities of anchor ice, and, owing to the surface agitation, large quantities of fine floating ice as well. The conditions are as favourable, therefore, at this point for producing an extreme temperature in the water as they might ever be expected to be.

Instruments used in the Investigation.

The instruments used in the present series are the same as those described in the writer's previous paper, and consisted of the differential thermometer, compensated wire resistance box, low resistance galvanometer, reversing key and battery.

The observation shanty was provided by the harbour commissioners of Montreal, through the kindness of Mr. Kennedy, the chief engineer, and although smaller than the one provided the previous winter, served the purpose sufficiently well. It was necessary to provide a smaller cabin than that of the previous winter, owing to the difficulty of transportation to and from the city, a distance of five miles, and placing it in a suitable position on the end of the pier. The services of a watchman were also procured to protect the instruments and to prevent them from freezing.

Method of making the Measurements and accuracy of the Readings.

The method of making the measurements consisted, as in the previous experiments, of immersing the two stems of the thermometer in a carefully prepared mixture of snow and water contained in the shanty, and

obtaining by this means a zero reading, or reading on the bridge wire when both ends were at 0° C. Leaving the shorter end in the mixture, the longer end was passed out of the shanty into the river, and any difference in temperature, from the mixture of snow and water was indicated by a change in reading on the bridge wire. The thermometer had a scale of 20 cm. to the degree centigrade, with vernier reading by means of lens to $1/100$ of a millimetre. One millimetre then corresponded to $\cdot 005^{\circ}$ C. It was possible, under suitable laboratory conditions, to measure to the ten-thousandth part of a degree. In the present case, however, it was exceedingly difficult to be accurate to more than one-thousandth. The peculiar want of proper laboratory conditions in the observation shanty, together with the care that had to be exercised in making the mixtures of snow and water for the steady end of the thermometer, rendered the work much longer and more tedious than would have been the case under a more favourable environment. The mixtures had to be prepared of sufficient magnitude to avoid errors of conduction, and of sufficient uniformity to avoid errors of temperature throughout their mass. It was possible, however, by taking proper precautions, to prepare mixtures of snow and water that would be, within the limits of these measurements, sufficiently uniform. The same procedure was carefully followed in every case, and was essentially as follows: To a large cask, provided for the purpose, was added two or three buckets of snow. This was pounded down by means of a flat ended club, and enough river water added to moisten the whole mass. The "slush" thus produced was then further worked down, excess of water poured off and continually beaten until the mass became firm and solid throughout. This was repeated with every successive batch of snow until the cask was nearly full of a firm mass of moist snow. River water was then added in sufficient quantity to permeate the whole mass. This mixture would remain good for several hours, and a much longer time, of course, if the temperature of the shanty was so regulated as to be only a little above 0° C. Where sets of readings were separated by several hours, a fresh mixture had to be prepared in order to secure absolute uniformity of temperature throughout the mass. The snow remaining in a mixture that had already been prepared, served as a beginning for a fresh supply, by pouring off all excess of water and working down until thoroughly firm and compact. The time required to make one of these mixtures of sufficient uniformity to be relied upon to $1/1000$ of a degree, was from one-half to three-quarters of an hour.

The following table will show the probable error to be found in carefully prepared freezing-point mixtures, as determined by a number of zero readings at different times :

Same Mixture.	Different Mixtures.
$\pm \cdot 00045^{\circ}$ C.	$\pm \cdot 00090^{\circ}$ C.
$\pm \cdot 00070^{\circ}$ C.	$\pm \cdot 00020^{\circ}$ C.
$\pm \cdot 00020^{\circ}$ C.	$\pm \cdot 00065^{\circ}$ C.
$\pm \cdot 00025^{\circ}$ C.	$\pm \cdot 00085^{\circ}$ C.

These differences may be regarded as satisfactory, when it is considered under what unfavourable circumstances they were taken.

In determining differences in temperature of the various parts of the water at short intervals of time, of course all errors due to the freezing-point mixture and cabin end of the thermometer were eliminated. Errors of $\pm .005^{\circ}$ C., and even greater, have been obtained in cases where the freezing-point mixtures were carelessly made and not sufficiently compact, or when attempts were made to use old mixtures. These either contained an excess of water through melting, or were being converted into solid ice on the bottom, from the fact that the floor of the shanty was of a temperature much below freezing.

To avoid errors of conduction along the thick lead tube containing the connecting leads, a length of about 18 inches was buried in the snow with the thermometer stem, and about a foot more was protected by building up snow around it. When both stems were immersed at the same time they were, as far as possible, buried together. From time to time, while readings were being obtained, the immersed end, or in the case of a zero-reading, each end was stirred, and snow repacked around it.

To ensure more perfect uniformity, it would have been better to arrange some form of helical pump, by which water could have been set in circulation through the snow around the thermometer stems, by drawing it from the bottom to the surface. A greater degree of accuracy could have been thus attained, but owing to the want of space in the shanty, it was thought that serious difficulties might have arisen, which would outweigh the advantages to be gained. Then, again, unless the other conditions in the shanty, such as its being unprotected from the wind, and the proximity of magnetic bodies to the galvanometer, could have been rectified, it was useless aiming at greater refinement in the freezing-point mixture.

On account of the refinement of the temperature measurements great care had to be taken with the thermometer to avoid sharply bending the stems or otherwise straining the fine platinum coils. When this took place during a set of readings, it was necessary to redetermine the zero point.

Time of the Observations.

The shanty was put in place on the first day of February, 1897, and on the third the instruments were taken out and observations commenced, lasting over an interval of nearly six weeks. It was impossible to obtain readings every day, on account of the length of time required to reach the cabin from the city. Delays occurred through the occasional giving out of the apparatus, owing to the want of laboratory conditions. College duties also prevented the writer from being away long at a time during the day. Nevertheless, a great many observations have been ob-

tained, including night readings, which will, it is hoped, throw considerable light on river ice formation.

It is to be regretted that the extreme weather which was experienced the winter before, could not have been repeated, as owing to the mildness of the winter, the air did not fall more than 10° below zero F. during the entire time of the experiments. A great many readings have been obtained on what may be termed "zero" days, when the temperature was a few degrees either way from 0° F. Observations have also been taken in stormy, cloudy and bright weather, showing that all these conditions have an important influence in determining the temperature of the open water.

Details of the Observations.

The amount which the open river may become cooled below the freezing point appears to be of the same order as under the surface ice, but the extent to which it may be warmed by sun and rain is much larger than could be expected under a surface sheet.

Many observations were destroyed during the taking owing to want of proper laboratory conditions, and were never recorded, while others had to be discarded from the same cause, even after the work had been completed. The following table will, however, give a few of the observed differences on various dates, worked out to the ten-thousandth place. The writer feels confident that they were measured under as steady and uniform conditions as was possible to produce in the observation shanty, and necessary to maintain for an accuracy of one-thousandth of a degree :

Date.	Air Temp. Fahrenheit.		Sunshine in percent of possible.	Sky.	Wind in Miles per Hour.	Diff. from Freezing Point in Degree Centigrade.	
	Max.	Min.				Current.	Quiet Water.
Feb. 3rd.	+ 20°	+ 10°	89	Clear.	28·6	0·0000	.....
" 5th.	+ 32°	— 3°	88	"	9·7	.....	+ 0·0215°
" 7th.	+ 38°	+ 27°	00	Raining.	13·1	+ 0·0197°	+ 0·0182°
" 8th.	+ 34°	+ 28°	00	"	16·3	+ 0·0547°	+ 0·0415°
" 11th.	+ 18°	— 3°	94	Clear.	6·5	+ 0·0137°	+ 0·0151
" 12th.	+ 11°	— 2°	00	Stormy.	21·1	— 0·0065°	— 0·0068°
" 13th.	+ 17°	0°	100	Clear.	15·1	.....	+ 0·0186°
" 15th.	+ 33°	+ 24°	67	Clear to Cloudy.	17·6	+ 0·0280°	+ 0·0423°
March 1st.	+ 22°	— 10°	25	Clear to Cloudy.	16·8	.....	0·0000

The records of sunshine and velocity of wind are taken from the monthly reports of the McGill College meteorological observatory. Most

of the maximum and minimum air temperatures were measured at the rapids with a suitable registering thermometer. The column of differences contains temperatures for both the swift current and quiet back water.

It will be seen that during the warm, rainy weather, the current was a little warmer than the quiet water, while during the clear weather, with a large percentage of sunshine, the current was colder. These readings were all taken during the day and show what an enormous influence the sun has in warming the water, although the air temperature remained cold. The wind has a marked influence in cooling the water, especially if it is blowing against the current, as on Feb. 12th. On this date the largest difference below freezing was recorded. It is interesting, from purely theoretical considerations, to see that the water, being vigorously churned and mixed with air, showed an indication of being warmer than the quiet water. Immense quantities of ice were manufactured on this date throughout the mass of the river, giving a general brown, sandy colour to the water, more especially in the swifter currents.

A shallow portion of the current near the shanty gave excellent opportunity for studying the growth of ground ice. When the temperature observations were commenced on February 3rd, large masses of anchor ice were located there. These were disintegrated and otherwise completely cleared away during the warm, rainy weather from February 6th to 9th. On the nights of February 10th and 11th anchor ice appeared again growing *in situ* and in greater abundance on the darker rocks. On February 12th, owing to the slight undercooled state of the water, floating ice carried down by the currents stuck in quantities to the ground ice, causing it to grow to a great thickness. Large islands of ice appeared also scattered through the rapids in the shallower parts. On February 13th, although the air temperature still remained cold, the bright sun served to warm the water and to bring up a great deal of ice. The river was of an entirely different colour, and there was apparently no ice forming in the water beyond a small amount of fine ice in the currents produced by extreme agitation. Early in the morning there were also no blocks of anchor ice visible, but as the sun became stronger, immense quantities of this ground ice were brought up and floated down. During the remaining time of the experiments there was a continual formation of ice on the bottom near the shanty, on the cold, clear nights, and a corresponding melting, by the heat of the sun's rays penetrating the water during the days following.

In order to test the effect of radiation in the water, both during the day and night, some readings were taken on February 13th, 15th, and 26th. On February 13th and 15th the readings were taken at noon, with the sun at its brightest, in the quiet water just over the edge of some bordage ice formed out from the pier. By this means the stem of the

thermometer could be placed at any distance in the water down to a depth of about five feet. It could also be bent so as to pass under the bor-
dage ice, and thus somewhat protected from the direct rays of the sun. On February 26th the readings were made at night under similar conditions.

The following readings on February 13th and 15th were obtained :

Date.	Sunshine in %	LOCALITY.	Diff. from 0° C.	Air Temp.
Feb. 13th.	100	5 ft. from surface (bottom).	+ ·0186° C.	+ 16° F.
“	“	2 “ “ “	+ ·0474°	“
“	“	8 ins. “ “	+ ·0741°	“
“	“	Shallow current.	+ ·0461°	“
Feb. 15th.	67	3 ft. from surface.	+ ·0423°	30° Sky Clear.
“	“	8 ins. “ “	+ ·0819°	“ “
“	“	Just under edge ice.	+ ·0292°	“ “
“	“	Deep current.	+ ·0280°	“ “
“	“	Bottom of back water, sun cloud- ed.	+ ·0112°	“ Cloudy.

Had the stem of the thermometer been painted black, no doubt it would have indicated a higher temperature. On the bottom, in the quiet water, the lower temperature suggests the presence of a layer of ground ice, made very probably by the clear nights previous. The rapidity with which the temperature approached the freezing point on February 15th, when the sky became clouded over, also indicates this. The observation given of the temperature of the back water, with the sun clouded over, was made about one hour after the previous set of readings.

On February 26th a successful set of night readings was obtained, which will illustrate to a moderate extent the effect of a clear, cold atmosphere. The maximum and minimum temperatures for that date are recorded as + 9° F. — 4° F., with a temperature during the night of about 0° F., and towards morning of a little above. The sky was not so clear as could be desired during the earlier part of the night, but towards midnight it became very clear and remained so for the greater part of the night. Readings were started at 4.30 in the afternoon of February 26th and were continued at intervals of every two hours until 7 o'clock the following morning.

The freezing-point mixture had to be repaired and renewed at intervals all night, to ensure sufficient uniformity. The measurements commenced by showing the water to be slightly above freezing, owing to the influence of a bright sun all day. Towards evening it became colder and

remained practically at the freezing point until after midnight, when it became cooled slightly below the freezing-point. The currents and quiet water showed very little difference in temperature.

About 6.40 p.m. the following readings were obtained, which will serve to show how uniformly the temperature of the river was falling to the freezing-point :

Quiet water down 3 feet.	+ ·0037° C.
“ “ “ 8 inches.	+ ·0034° C.
Current	+ ·0037° C.

This tends to show that the cooling by the surface abstraction of heat, which would cause the upper layers of water to be cooler than the lower layers, was also probably aided by radiation, which would cause the mass to sink more uniformly.

Later readings between 7 p.m. and 11 p.m. showed the temperature remaining practically at 0° C. At midnight, when the sky was about at its clearest, experiments were tried with the thermometer stem at different depths in the quiet water. The temperature at the bottom was, as near as could be measured, at the freezing-point. Differing the other readings from the reading of the thermometer on the bottom, we have :

Within 1 foot of surface.....	—·0016° C.
Same reading 15 minutes after; stem not disturbed.....	—·0023° C.
At 3 feet.....	—·0018° C.

These observations apparently show that the thermometer, when left undisturbed, was being actually cooled by radiation below the temperature of the surrounding water, a condition further borne out by the formation of ice actually on the stem itself. At about 3 a.m. measurements were made of the difference in temperature of the back-water and current. The quiet water was apparently colder than the current by ·0058° C. The only difference in the temperature of the two bodies of water seems to be explained best in admitting again the possibility of radiation influencing the readings of the thermometer. This is a condition not so easily attained in the swift current. It may be of interest to state that the writer had actually to remove ice from the stem of the thermometer which, from its nature, was apparently formed *in situ*.

During this night the radiation did not continue so strong as it sometimes does, as was shown by the small amount of ice made on the bottom. The radiation, although small in amount, became strong at times when the sky was clearest, and had an important influence in determining the temperature of the water, as already shown.

Towards morning the current became cooled slightly below the freezing point. Observations at 5.50 a.m. give —·0058° C., and at 6.30 a.m. give —·0046° C. This was no doubt due to the continued action of the cold atmosphere, as well as to the effect of many hours of radiation. Curiously

enough, about this time the quiet water became warmer than the current by $\cdot0033^{\circ}$ C., showing a difference itself from the freezing-point of -0022° C. The question suggests itself, whether there was any natural cause for this change, and the only answer seems to be, that there was some possible check to radiation occurring in the atmospheric conditions towards morning. As a matter of fact, as the light grew stronger, the conditions were such as to suggest a dull day, although during the night the sky had been perfectly clear. Heavy banks of clouds were noticed, which cleared away, however, as the day advanced.

A great deal of fine ice was noticed coming down in the currents all night, especially noticeable during the early morning when the water was slightly undercooled.

Attempts were made to obtain similar readings on a number of other occasions, but owing to practical and experimental details occurring to prevent, no other all-night readings could be obtained.

The coldest day on which readings were obtained was on March 1st, in the morning, when the air temperature went down to -10° F. after a few days of mild, rainy weather. Many of these readings were rendered valueless by the fact that a block of ice coming down in the current so bent the stem of the thermometer as to sever a wire in the fine platinum coil. Enough has been recorded, however, to show that the temperature of the river did not vary to any extent from the freezing-point, certainly not more than has already been found.

Later readings during March are not given on account of experimental difficulties. It may be said that up to the middle of that month, when the readings were discontinued, the temperature of the river water showed no larger variations from the freezing-point. It was always possible, by noting the conditions of the weather, to foretell, with considerable exactness, the temperature of the water.

General Considerations.

The extreme steadiness of the temperature of the river, both in open water and under the surface ice, is a matter of great interest.

From theoretical reasoning it is impossible to imagine water cooled much below the freezing-point. Under favourable laboratory conditions, water, free from ice and dissolved air, has been brought to several degrees below. On the introduction of the smallest crystal of ice, however, the whole mass comes to the freezing-point with the formation of ice. The solution can no longer be cooled below the freezing-point while any water remains.

That the apparent isothermal change of ice into water, or water into ice, is dependent on minute temperature differences in its mass has already been claimed by some authorities; and that the temperature of a mixture

of ice and water depends on the relative amounts of ice or water present, has also been stated. The experiments conducted by the writer, although not undertaken to show any such supposition, yet indirectly support this. The fact that in the measurements of the temperature of the water under the surface ice, the water commenced, after a sudden cold dip, by being in a slightly undercooled state, and that after the proportion of ice increased, the temperature gradually came to the freezing-point, would tend to show this. In the open water, where the quantity of water is very great, compared to the ice, a slightly larger difference has been observed than was possible under the ice. Although the more the water is being churned up and mixed with air and ice, the less can its temperature be cooled below the freezing-point. It has been shown in the writer's experiments that radiation must be an important factor in the manufacture of river ice. This has been often disputed, and for that reason it was satisfactory to have been able to actually demonstrate it by the effect on the stem of the thermometer itself. Another important indication of radiation is that the ground ice apparently grows on dark rocks easier than on light ones.

On the Formation and Agglomeration of Frazil and Anchor Ice.

The terms "frazil" and "anchor ice" appear to be often understood as the French and English for the same thing, both referring to the ice formed on the bottom of a river. Frazil has also come to be applied to the fine surface crystals to be found throughout the mass of a river, on account of the widely held opinion, which is undoubtedly correct in part, that ground ice is formed by the sticking on the bottom of these fine needle crystals. Accepting the obvious action of radiation in causing ice to grow *in situ* on the bed of a river, it appears to the writer that some distinguishing terminology should be applied. Already, in the report of the Montreal Flood Commission, published in 1890, which is the highest authority on river ice formation we have, will be found the following: "Frazil, as distinguished from anchor ice, is formed over the whole unfrozen surface above and below Lachine Rapids, between Prescott and tide water, and wherever there is sufficient current or wind agitation to prevent the formation of bordage ice . . ." This distinction appears to the writer to be a fair and natural one, accepting, of course, the already obvious and exclusive meaning of anchor ice.

The connection between the two forms of river ice lies in the fact that during extreme cold weather, when the water becomes slightly undercooled, there is a large excess of frazil being formed. Lower layers of these crystals and quantities carried to the bottom by the surface currents become attached to the anchor ice, and help to build it up. Whether or not the frazil could become attached to the bottom previous to the formation *in situ* of a layer of ground ice, seems doubtful.

Mr. Keefer, in the discussion following Mr. G. H. Henshaw's paper on frazil, published in the Transactions of the Canadian Society of Civil Engineers, for March, 1887, after describing an observation made by himself on the condition of the river opposite Montreal, before there was any floating ice, during a very cold day, says: "In this condition of the river the water, no doubt, at the deepest point, is loaded with ice spicules to the bottom, densely and uniformly distributed throughout the whole mass, and would supply the raw material for the formation of anchor ice at the bottom, whenever the latter was prepared to receive it." He goes on to state that "ice will attach itself to ice or to other frozen bodies, but not to the unfrozen bed of a river." The "frozen bed of a river" must be taken to mean that there is a layer of ice already formed. It becomes, then, a matter to investigate how this first layer appears.

With the water at the freezing-point, the bottom cannot possibly become cooled below 0°C ., except by radiation. There is indeed always a tendency for it to become warmed above the freezing-point, on account of the slow conduction of heat from beneath. How, then, can the bottom become cooled sufficiently to cause an abstraction of the latent heat in the water in immediate contact, necessary to cause ice to form? The bottom at 0°C . cannot radiate heat into the water at 0° .

From the experiments by Prof. Tyndall on radiant heat, it was shown that heat rays may be passed to a moderate extent directly through water or clear ice. In this case there is no reason why the bottom of a river should not radiate heat straight through the water and atmosphere into space. From the cooling of the bottom by this means the first layers of ground ice would grow with considerable rapidity. The growth would, of course, be continued by radiation from the surface of the ice itself, as well as, during the extreme weather, by the sticking of fine surface formed ice carried down by currents. Radiation from the bottom would be somewhat retarded as the ice increased in thickness. When the ice became so thick as to practically check radiation, on account of its granular texture, heat conducted through from beneath would serve to slowly bring up the anchor ice, as well as to prevent any further formation of ice.

From the results of the observations on soil temperatures,¹ carried out by Professor Callendar in conjunction with Professor McLeod, in the McDonald Physics Building, with delicate electrical resistance thermometers placed at different depths in the ground, it has been shown that the conduction of heat is exceedingly small. It may be easily calculated, from their work, that in one hour there would be enough heat transmitted to the bed of a river sufficient only to melt a layer of ice not more than .05 mm. in thickness. It will take very little radiation, then, on a clear night, to overcome this minute source of heat.

¹ Transactions of the Royal Society of Canada. Vol. I., Sec. III., p. 63, 1895, and Vol. II., Sec. III., p. 109, 1896.

The rays of the sun, which have already been shown to have such an important influence in determining the temperature of the river water, also have a powerful effect on the growth of ground ice. Under a bright sun, anchor ice cannot form. The solar heat is radiated through the atmosphere and water, and by passing directly through the anchor ice itself to the bottom, melts off its hold.

The writer has frequently noticed, during the progress of these experiments, that in the early morning, after a cold, clear night, there was little floating ice visible beyond the usual amount of fine ice in the currents. As soon, however, as the sun rose higher and became more powerful, the surface of the river was dotted over with the characteristic white patches of anchor ice. Immense quantities were thus brought up from the bottom and floated down.

In regard to the specific gravity of subaqueous ice, the best proof of the fallacy that ice, on account of its density, is prevented from rising, as stated by some observers, is in the way in which anchor ice forms. It is well known how it grows in long needles as far as possible in a vertical direction, taking beautiful arborescent forms. This shows a tendency, on the part of the ice, to be buoyed up even as it is made. The branching condition of ground ice would also help to entangle and collect the fine floating ice crystals. The force tending to raise the mass is often sufficient to tear it away from its foundation, and, as is well known, lift stones of considerable size.

There is very little doubt that the greatest amount of the fine floating ice found in our rivers is due to surface agitation caused by current or wind. The more water is being churned up and mixed with air, whereby its exposed surface is increased, the faster will be the abstraction of heat, and the greater the quantity of frazil formed. During extreme cold weather, especially with a high wind or with a great deal of radiation at night, the mass of the river is thrown into a very slightly undercooled state. The adhesiveness of the ice was noticed by the writer only when the water was in this state, and could in general be easily anticipated from atmospheric conditions. In this state the worst effects from frazil are to be met with due to its agglomerating. While measurements were being made of the temperature of the water on February 12th, when it was slightly undercooled, the thermometer stem was placed in the current just resting on the surface of some ground ice. It soon became frozen down, and could only be removed with great difficulty without injury.

Under surface ice, of course, frazil cannot form, but wherever an open stretch of water occurs, immense quantities are swept under the barrier ice and carried into quiet waters, there to rise and become attached to the under side of the surface sheet. This goes on during the entire winter, until, for miles below the Lachine Rapids, the surface ice is solid in many places to the very bottom. Cross sections made of the river, published by

the Montreal Flood Commission, illustrate this, and show how the area of ice gradually diminishes and the area of free waterways gradually increases as the sections recede from the rapids.

The formation of anchor ice obviously cannot take place under any surface which would act as a check to radiation, such as an opaque layer of surface ice. There is another important reason why, in very deep water, anchor ice is not readily formed. Below 4° C. warmer layers of water sink to the bottom, and colder layers rise. The bottom of a deep river, not flowing with sufficient rapidity to cause a thorough stirring, may well be above freezing. Whenever, also, water is flowing so slowly as to prevent agitation, a surface layer of ice generally forms, and further prevents the growth of ground ice. A thick mass of water also acts as a resistance to radiation, especially if the water is not perfectly clear.

A great deal more might be said in regard to the formation of river ice, but as the writer has already written fully on this subject in an article published in the *Canadian Engineer* for May, 1897, it becomes the less necessary here. Again, the present paper is intended more as a sequel to the writer's first paper, in which will be found a full discussion of the principal points brought out by previous observers.

In conclusion, the writer desires to call attention to the report of the Montreal Flood Commission, which has recently come under his notice, as deserving of the highest praise. The untiring efforts of the engineers on the Commission, during so many years of tedious and necessarily severe work, in collecting data for the charts and diagrams accompanying the report, make it of inestimable value.

The writer also desires here to acknowledge the kind encouragement and generous aid in carrying out the present series of experiments so willingly given by Professor Callendar and Mr. John Kennedy, as well as to express his thanks to the Lachine Hydraulic Co. and the many prominent engineers who have taken an interest in the work.

III.—*Observations of Soil Temperatures with Electrical Resistance
Thermometers.*

By H. L. CALLENDAR, M.A., F.R.S., F.R.S.C.,

AND

C. H. McLEOD, MA. E., F.R.S.C.

(Read June 23rd, 1897.)

In continuation of the results previously presented of the Observations of Soil Temperatures, taken at the McDonald Physics Building, we have now the records of another year to submit to the society, containing several observations of interest, together with an account of some further improvements which we have been able to make in the apparatus.

ANNUAL CURVES OF TEMPERATURE. (FIG. I.)

The annual curves of temperature for the seven buried thermometers, are exhibited on a uniform scale of two centimetres to ten degrees Fahrenheit. A study of these curves reveals the same peculiarities as those of last year, but modified by the different conditions of the winter. Owing to the absence of a protective covering of snow, during the early part of the winter, the frost penetrated very much deeper into the soil than in the two previous years. The thawing through of the ground, after the disappearance of the snow, was also a correspondingly lengthy process. The time occupied was more than twenty days from the disappearance of the snow, and the temperature at a depth of 20" did not rise above the freezing point until the first of May. It is probable that this circumstance may partly account for the lateness of the spring.

A very striking and peculiar break is shown in the curves of the 20", 40" and 66" thermometers, about the date November 27th and 28th, 1896. This was due to the very rapid percolation of a large quantity of water at 32° F., which had accumulated in consequence of a sudden thaw over a thin surface layer of ice. A similar case was recorded on December 12th, 1894, but the present instance is a much more striking example of the great influence of percolating water in causing the diffusion of heat through the soil.

ANNUAL MEAN TEMPERATURE AT VARIOUS DEPTHS.

The annual means for the different thermometers are as follows:—

DEPTH.	1896-1897.	1895-1896.	DIFFERENCES.
1"	51·60°	51·48°	0·12
4"	44·97°	47·12°	-2·15
10"	45·25°	46·65°	-1·40
20"	45·30°	47·17°	-1·87°
40"	45·72°	47·00°	-1·28°
66"	45·91°	47·00°	-1·09°
108"	45·53°	46·82°	-1·27°
Air Temperature.	42·53°	42·65°	.. ....

The means are taken from May 8th to May 8th in each case. The differences between the thermometers, so far as we have been able to analyse them, appear to be due, partly to the time of reading in the case of the upper thermometers, and partly to the peculiar conditions of the winter. The mean in the case of the 20" thermometer appears to be unduly depressed, owing to the continuance of the frost at that depth till May the first.

If we take the average of the six lower thermometers, which, making allowance for time of reading, should agree fairly with the annual mean temperature of the soil, we find the value 45·45° F., which is 2·92° F. higher than that of the air. If we adopt the suggestion made last year, and take this excess as being a measure of the protective influence of the snow covering during the winter, we find that the protection during 1895-1896 was more efficient than that of 1896-1897 in the ratio of 4·33° to 2·92°.

VALUES OF THE THERMAL DIFFUSIVITY OF THE SOIL.

The average value of the thermal diffusivity of the soil at various depths, as deduced from the annual range of temperature and retardation in the case of the different thermometers below the 20" level, is found by analysis of the curves to be 0·00361 in C. G. S. units Centigrade. This value is in exact agreement with that obtained last year with the same thermometers.

In our communication last year, we were able to show, by the application of the graphic method previously explained, that there appeared

to be very marked seasonal variations of the diffusivity, due to the condition of the soil, and to the amount of percolation. The curve of the variation of the diffusivity at different seasons of the year exhibited in Fig. I., for the period 1896-1897, will be seen to bear a remarkably close resemblance to that obtained last year, and to confirm our previous conclusions in the most complete manner. The following table gives the dates for which the diffusivity has been calculated.

VARIATION OF THE THERMAL DIFFUSIVITY AT DIFFERENT SEASONS OF THE YEAR.

PERIOD.	NO. OF DAYS.	DIFFUSIVITY.	RAIN PER DAY.
May 9—June 1.....	..	·00561	·115
June 1-6.....	5	·00461	·002
“ 6-13.....	7	·00544	·381
“ 13-20.....	7	·00716	·000
“ 20—July 1.....	10	·00514	·125
July 1-15.....	14	·00606	·223
Aug. 1—Sept. 1.....	31	·00351	·173
Sept. 1-29.....	28	·00504	·096
Sept. 29—Oct. 31.....	32	·00774	·091
Oct. 31—Nov. 19.....	19	·00566	·126
Nov. 19—Dec. 25.....	36	·01488	·030
Nov. 27-28 } 18 hours }	$\frac{3}{4}$	·323	{ ·021 per hour Ratio 0·504
Dec. 25—Feb. 1.....	38	·00272	·013
Feb. 1—March 1.....	28	·00156	·017
March 1—April 1.....	31	·00241	·060
April 1—May 2.....	31	·00426	·101
May 2-7.....	5	·01050	·044
May 7-12.....	5	·00834	·114

On examining these results, it will be observed that the diffusivity during the month of February, when the ground was so frozen that there was practically no percolation, namely, ·00156, is practically identical with the value observed during the last two winters under the same conditions. We may, with justice, conclude that this is the value of the

diffusivity due to pure thermal conduction *per se*, and that more than half of the average annual value is, therefore, due to the effect of percolation.

The remarkably sudden fall of temperature which occurred between November 27th and November 28th, in a period of eighteen hours, if worked out on the same method as the longer periods, gives a value of the diffusivity 0.323, which is about 200 times greater than the value, .0015, due to thermal conduction, apart from percolation. Such cases are, of course, exceptional. It is rarely that so large a quantity of cold water can accumulate, and then be absorbed in so short a space of time.

Results derived from similar observations with respect to the conductivity of the soil have often been applied to estimate the possible age of the earth. Geologists have, as a rule, complained that these estimates did not allow then as much time as was required by other evidence for the evolution of the earth. Since, however, these estimates of conductivity have generally neglected the effect of percolation, which must be very great in the surface soils and in rocks which are permeable to water, it is plain from the evidence which we have adduced that such estimates of the age of the earth may require to be largely increased.

The method of comparing the conductivity at different depths, which was mentioned last year, by supplying a known quantity of heat through one of the thermometers, and observing the resultant rise of temperature, has been applied in a few instances during the past year. The results are not as yet sufficiently exact and extensive to warrant any important conclusions, but so far as they go they are in agreement with those previously obtained. The conductivity of the lowest stratum, at a depth of 108" in the blue clay, was found to be greater than that of the sand in the ratio of 41 to 36. The conductivity of the sand was found to be very uniform, as had been previously inferred.

AUTOMATIC RECORDING APPARATUS.

After spending a considerable amount of time in experiments, a satisfactory method has at length been evolved of making the apparatus self-recording. This is accomplished by means of an electro-magnetic mechanism of a complicated nature, which writes the record with pen and ink on a revolving cylinder. It has been found possible to make the apparatus work satisfactorily on a scale as large as one inch to the degree Fahrenheit, and it is hoped that in special cases the records may be made accurate to the hundredth of a degree. The same electrical thermometers which have been in use for the last three years have been arranged in such a way that any one of them can be connected at pleasure in a few seconds, either to the automatic recording apparatus, or to the galvanometer with telescope and scale, which has been in use hitherto. It is thus possible to check the readings of the recorder with very considerable accuracy.

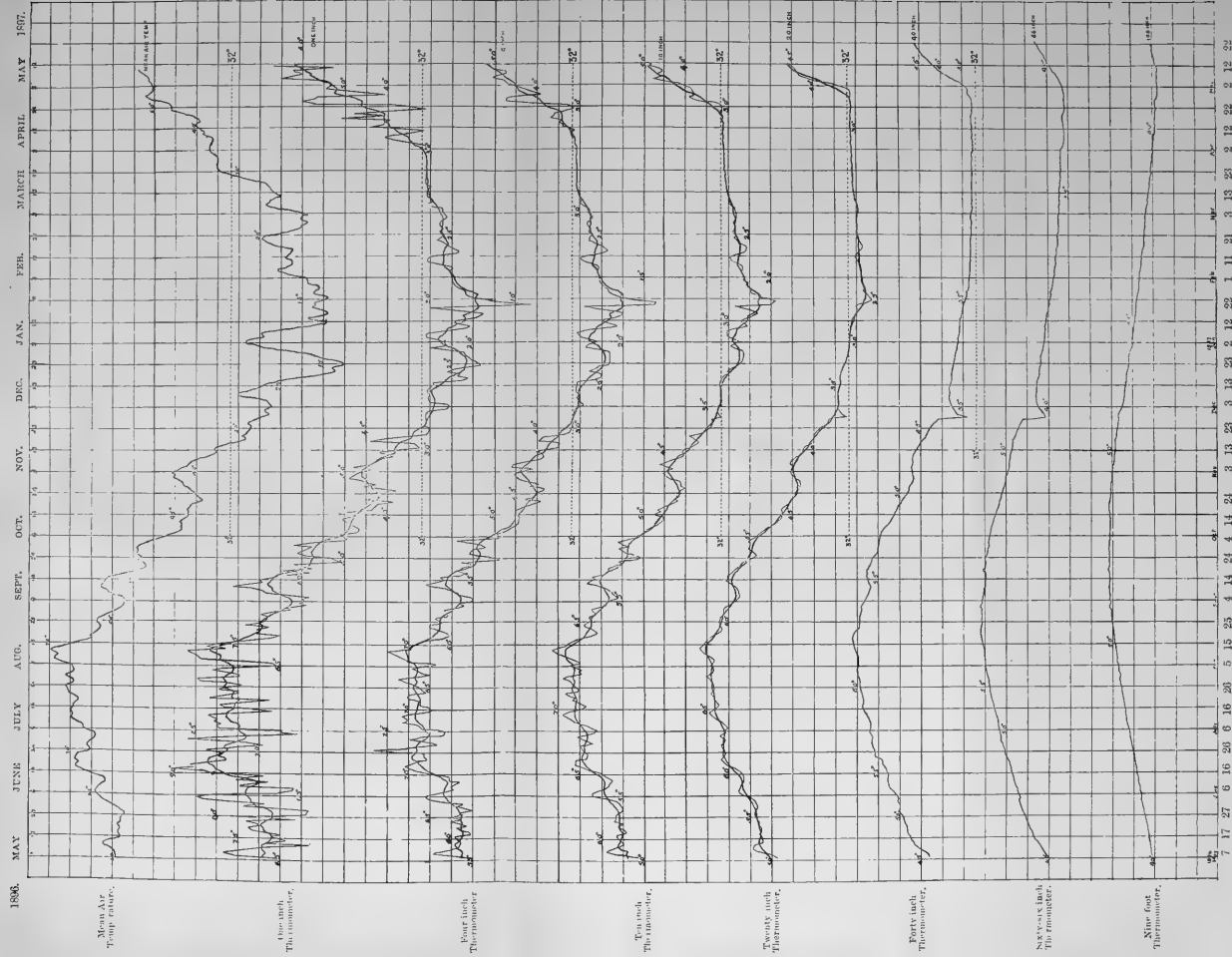
A few samples of the records obtained have been reproduced. The scale of the record may readily be made much more open than in the case of ordinary recording instruments without loss of accuracy or sensitiveness. We have observed curious differences in the minute detail of several of the curves, which could not have been detected with less sensitive and accurate instruments, which appear to be connected in some way with the type of weather prevalent at the time in each case. We hope to be able to find some meaning in these minute characteristics, as it appears that they may be of use in forecasting.

With regard to these records, it will be observed that the co-ordinates on the chart are rectangular, a point of great convenience in many ways. The scale of the record may also be very readily changed at any moment. For instance, we prefer to use a scale of 5 mm. to the degree Fahr. for the atmospheric temperature. This can be changed in a minute to one of two or three centimetres to a degree if it is required to obtain a record of one of the buried thermometers, which are otherwise exactly similar to the air thermometer except that their temperature changes are much slower and of smaller range.

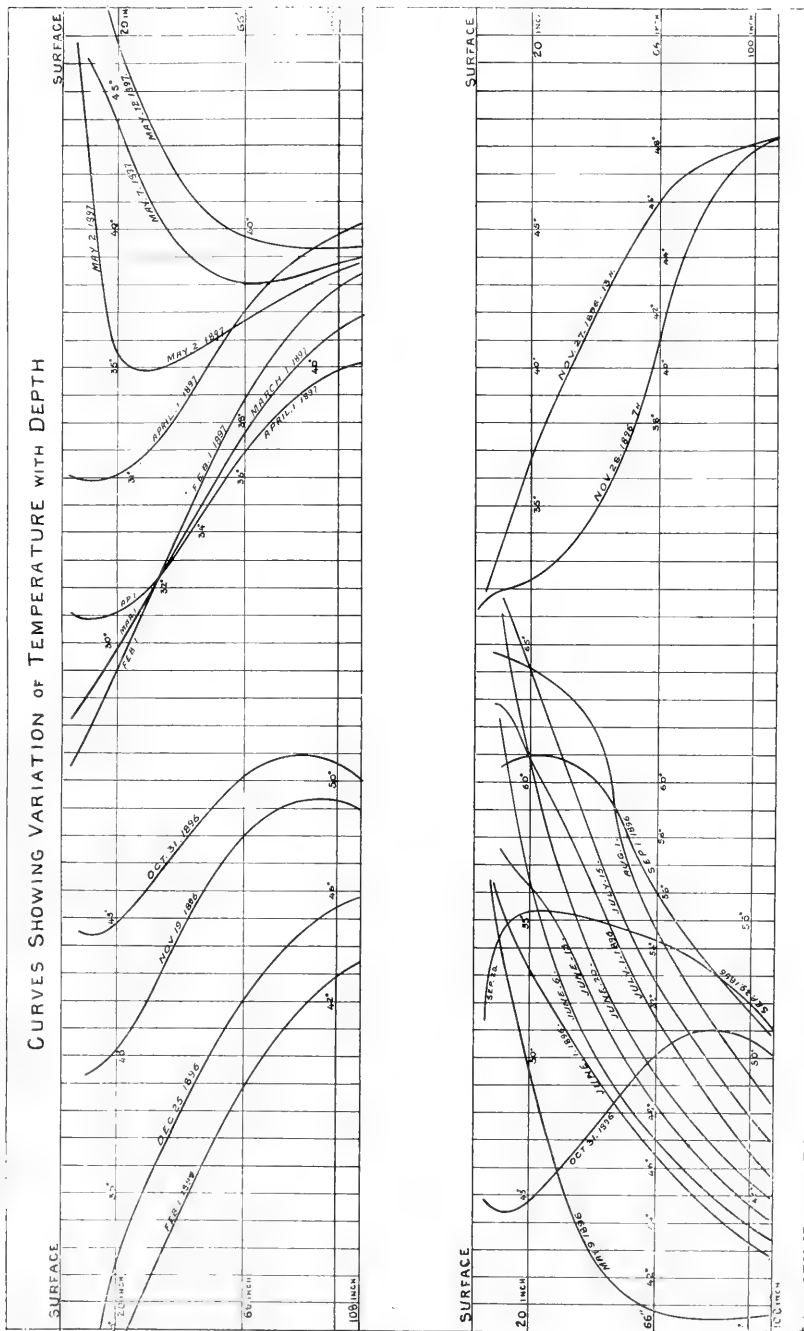
SOIL TEMPERATURES AT MCGILL COLLEGE

May 8th, 1886, to May 11th, 1897.

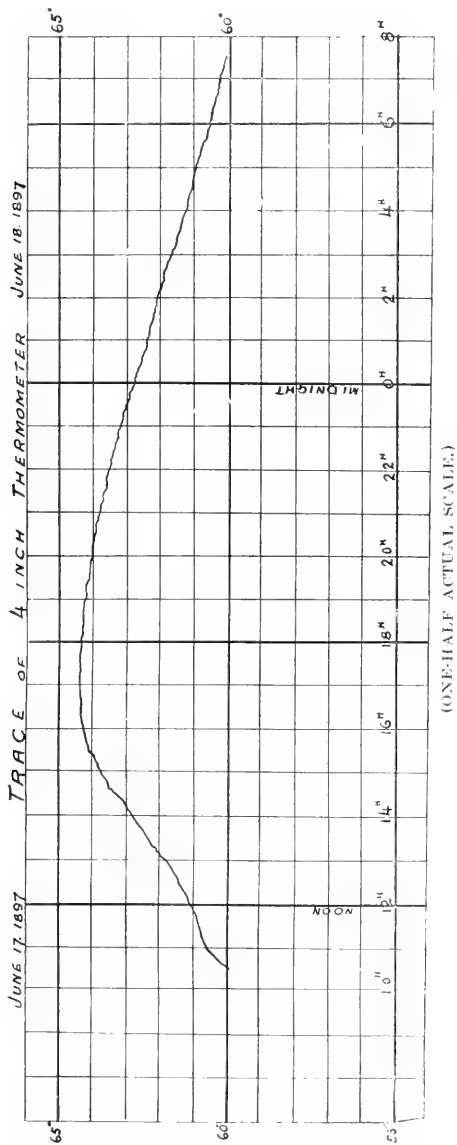
NOTE.—The heavy lines on the 1 in., 4 in., 10 in. and 20 in. curves are 10 day means.



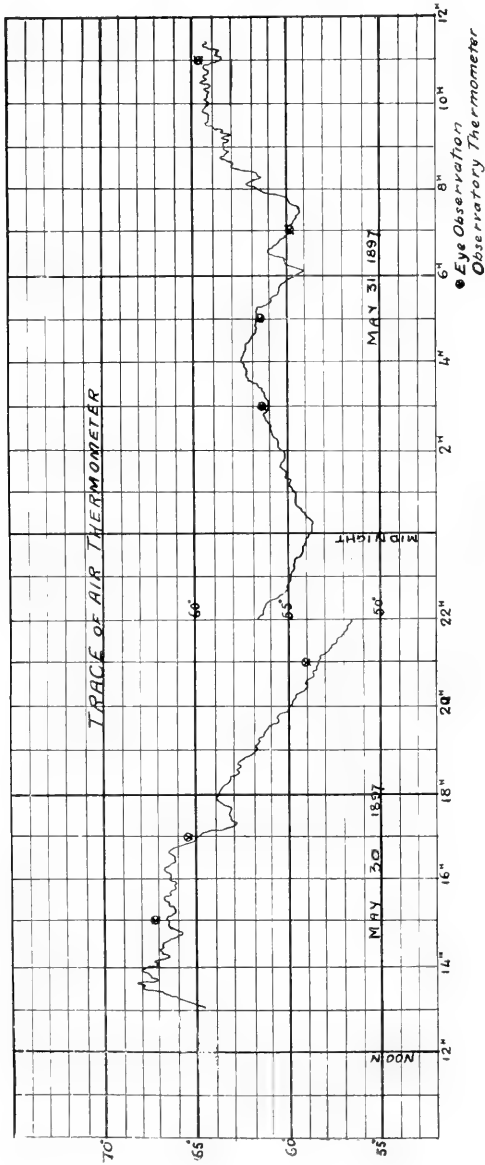
OBSERVATIONS OF SOIL TEMPERATURES



OBSERVATIONS OF SOIL TEMPERATURES

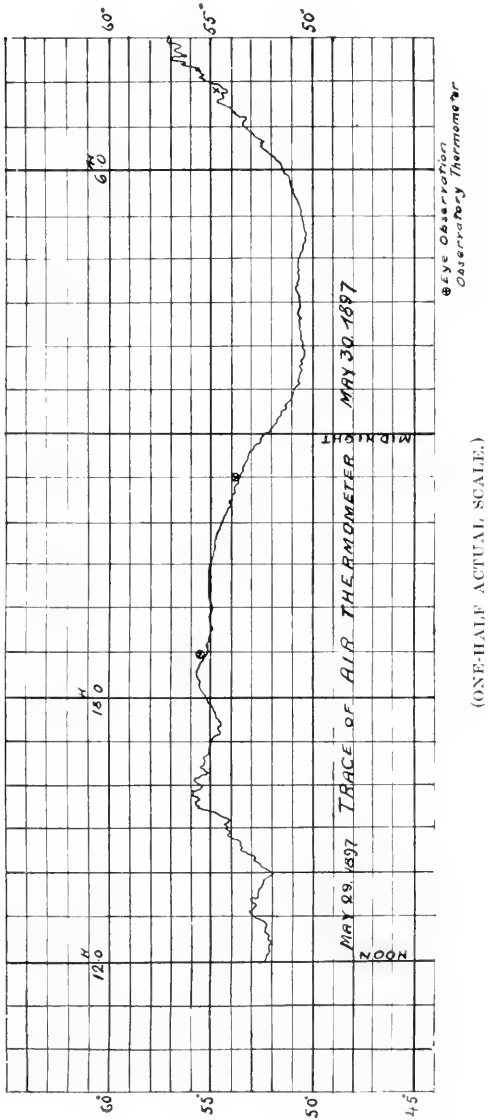


OBSERVATIONS OF SOIL TEMPERATURES

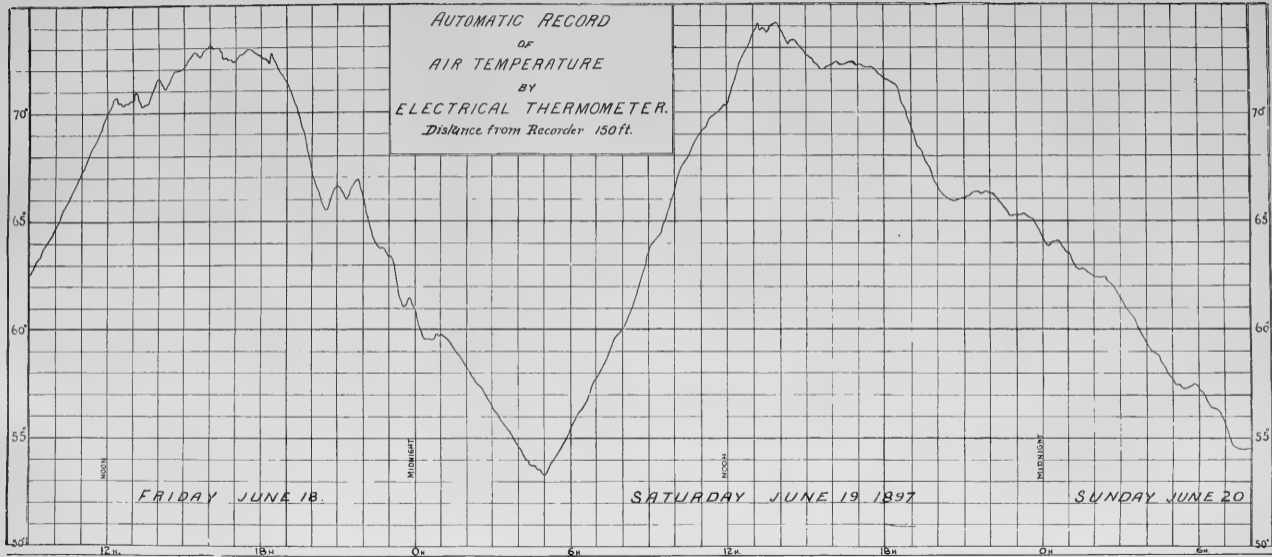


(ONE-HALF ACTUAL SCALE.)

OBSERVATIONS OF SOIL TEMPERATURES

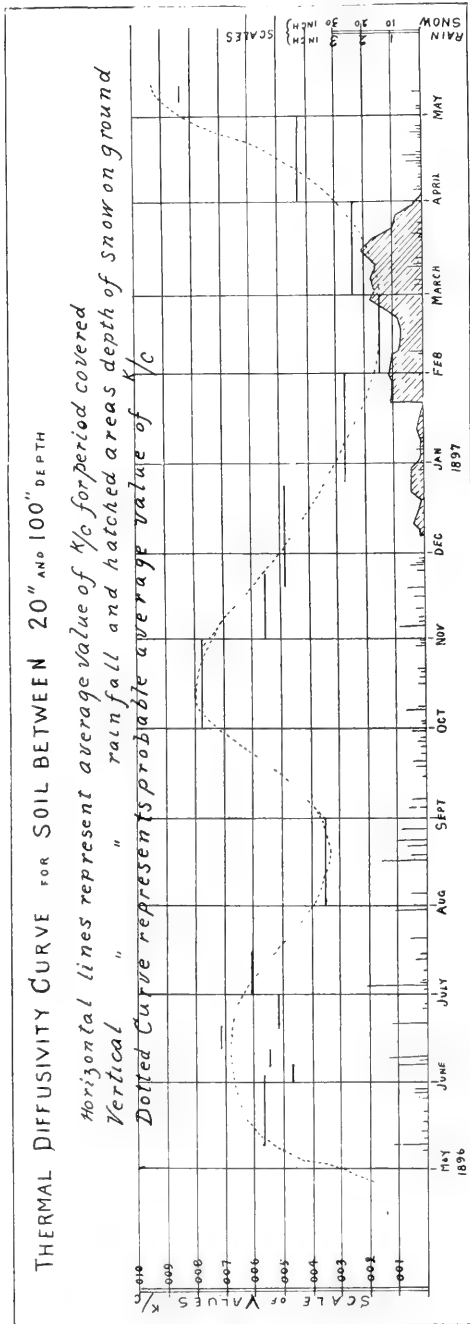


*AUTOMATIC RECORD
OF
AIR TEMPERATURE
BY
ELECTRICAL THERMOMETER.
Distance from Recorder 150 ft.*



(ONE-HALF ACTUAL SCALE.)

OBSERVATIONS OF SOIL TEMPERATURES



IV.—*Character and Progress of the Tides in the Gulf and River St. Lawrence ; as ascertained by simultaneous observations with self-registering Tide Gauges.*

By W. BELL DAWSON, M.A., MA. E., ASSOC. M. INST. C.E., M. CAN. SOC. C.E., F.R.S.C.

(Read June 23, 1897.)

The Gulf of St. Lawrence is a land-locked area or inland sea, inclosed on the northern and southwestern sides by Canadian territory, and on the eastern side by Newfoundland. Including the estuary of the St. Lawrence River, its extent from tide-water at Three Rivers to the Strait of Belle Isle is 940 miles ; and its width north and south is 350 miles. The Strait of Belle Isle, by which it communicates with the Atlantic at its northeastern angle, has a width of 11 miles and a depth of 35 fathoms ; but its main communication with the ocean is through Cabot Strait, between Cape Breton Island and Newfoundland, which has a width of 75 miles and a depth of 250 fathoms. A deep channel, from 60 to 40 miles in width, and with a continuous depth of over 200 fathoms, runs in from the Atlantic through Cabot Strait, and continues completely across the Gulf, passing north of the Magdalen Islands ; it enters the mouth of the St. Lawrence between the Gaspé coast and Anticosti, and continues up the Lower St. Lawrence with a depth which only decreases to 100 fathoms near the mouth of the Saguenay. (See outline Map, Plate I.) This deep channel forms the main avenue which the tides follow. On its southwestern side, the water is comparatively shallow ; and ranges only from 30 to 50 fathoms in the broad bay formed by the sweep of the coast from Gaspé along New Brunswick and Nova Scotia to Cape Breton Island. This broad bay, in which Prince Edward Island lies, forms a region in which the tides are relatively much retarded.

In order to obtain tidal data throughout these regions, seven principal tidal stations have been established by the Tidal Survey, which is being carried on by the Department of Marine and Fisheries, and is in charge of the writer. These stations afford the tidal data required in the investigation of the currents ; and serve also as reference stations to which the tides at intermediate places can be referred, by difference in the time of the tide from the principal stations. They have accordingly been placed at positions carefully chosen, so as to be free from disturbance due to local conditions. They are furnished with self-recording tidal instruments, working day and night ; and they are provided with heating in winter to secure a continuous record throughout the year ; means are provided to obtain a constant datum level and correct time

for the observations ; and barographs are used where required. The greater number of these stations are on open coasts where no wharfs or other facilities exist ; three of them are inaccessible during the winter months ; but with nearly all there is telegraphic communication. Their positions are as follows : (See Map, Plate I.)

St. John, N.B., as a reference station for the Bay of Fundy.

Halifax, N.S., to obtain the Atlantic tide.

Strait of Belle Isle, at Forteau Bay, in the narrowest part of the strait, near its inner end.

St. Paul Island, in Cabot Strait ; to command the main entrance by which the tides enter the Gulf of St. Lawrence.

Southwest Point of Anticosti, at the entrance to the St. Lawrence.

Father Point, the Pilot station on the St. Lawrence, 195 miles below Quebec.

Quebec ; the gauge being situated at the dry dock on the Lévis side.

The only station of the seven which is open to any technical objection is Quebec ; because the true head of the estuary of the St. Lawrence is at the lower end of the Island of Orleans, where the tide has its maximum range ; whereas Quebec is so far up, as to show some of the features of a river tide.

This number of principal stations is required on account of the great variation in the range of the tide, and the irregularities it presents. The range varies from 4 or 5 feet at the more open stations, to 26 and 32 feet at Quebec and St. John. To avoid a further increase in the number of principal stations, it is therefore important to obtain tidal results for intermediate ports by means of constant differences in the time of high and low water, and ratios in the range. Tidal data for this purpose can be obtained by short series of observations, taken during the summer months only, and compared with the record obtained simultaneously at the principal stations. For two of these stations, Halifax and Quebec, tide tables have already been prepared and issued for the last two years ; and tide tables for St. John also, are in preparation for 1898.

The last four stations as above given, form a series extending from the main Gulf entrance to Quebec. In Cabot strait, and at Anticosti and Father Point, the stations are close to the deep water of the channel already referred to ; as they are within seven miles of the 100-fathom line. The character of the tide in its progress from Cabot strait to Quebec is shown in Plate II. When once it enters the mouth of the St. Lawrence at Anticosti, it proceeds to Quebec with a regularity which is in marked contrast with its character while in the open Gulf. This will be seen from a comparison of the following figures, which give the period of time occupied by the tidal undulation in its progress from one station to another ; and the range or variation in this period. All the differences

given are in absolute time ; as the time of the tide throughout is reduced to Standard time for the 60th meridian, four hours slower than Greenwich Mean Time. In the differences between Anticosti, Father Point, and Quebec, the ten highest and ten lowest values in each year are omitted, and the values given are the averages of the next three highest and lowest. These extreme values are omitted to allow for irregularity due to wind disturbance, which is considerable in so long an estuary, especially when the winter months are included in the observations. The omissions thus amount to about two per month on the average.

St. Paul island, Cabot strait ; to S. W. Point, Anticosti.—Distance, 240 miles.

From simultaneous observations of November and December, 1894, and July to October, 1896.

Difference in the time of H. W. ranges from 4h. 19m. to 6h. 56m.
Range in the difference, 2h. 37m. Average difference=5h. 35m.

S. W. Point, Anticosti to Quebec.—Distance, 450 miles.

From one year's observations ; November, 1894, to October, 1895.
Difference in time of H. W. ranges from 4h. 50m. to 6h. 01m.
Range in the difference, 1h. 11m. Average difference=5h. 26m.

From one year's observations ; November, 1895, to October, 1896.
Difference in time of H. W. ranges from 4h. 37m. to 6h. 00m.
Range in the difference, 1h. 23m. Average difference=5h. 21m.

Father Point to Quebec.—Distance, 195 miles.

From one year's observations ; December, 1894, to January, 1896.
Difference in time of H. W. ranges from 3h. 46m. to 4h. 42m.
Range in the difference, 0h. 56m. Average difference=4h. 21m.

From one year's observations ; January, 1896, to February, 1897.
Difference in time of H. W. ranges from 3h. 45m. to 4h. 41m.
Range in the difference, 0h. 56m. Average difference=4h. 19m.

We thus find that the variation in the period of time which the tidal undulation occupies in crossing the open Gulf, is twice as great as the variation in its period between Anticosti and Quebec, where the distance is double as far. The reason of this irregularity in the Gulf we will refer to again.

It is to be expected in the long estuary of the Lower St. Lawrence that the spring tides, because of their greater amplitude, would travel faster than the neaps. The tides at Quebec accord with this principle ; as the high waters follow each other at closer intervals, while the amplitude of the tide is increasing, and fall off again through longer intervals towards the neap tides. To test the effect of this upon the differences in the time of high water between Anticosti and Quebec, these differences were tabulated according to the synodical lunar month, or the period of the moon's phases ; but they failed to show any regular variation

throughout its course. The proportion of the variation in the difference which is due to this cause, appears therefore to be relatively small ; and the greater part of the variation is probably occasioned by wind disturbance, which in so long an estuary is much felt.

If, therefore, the outstanding error in the time of high water as found by the method of constant difference from Quebec, is due to meteorological causes, the average difference from simultaneous observations as above, is the best result that can be arrived at ; and it is only necessary to determine further differences for intermediate places with reference to these principal stations. In the actual result, the maximum error will rarely exceed the semi-range in the difference as above given. Although this may amount to as much as 42^m at Anticosti, it decreases towards Quebec ; and thus as the tides become higher and more definite the error is less. It is, therefore, the more allowable to use constant differences for the determination of the time of the tide throughout the whole estuary from Quebec to Anticosti and Gaspé. Also, as the difference does not vary in accordance with the synodical month, it is allowable to assume that throughout the course of the month it will differ little from the difference in Establishment. For intermediate places in this region, the differences in Establishment from the Admiralty list, compared and checked by the differences at Father Point and Anticosti, have therefore been made use of in the mean time as tidal differences from Quebec.

This regularity of the tides in the Lower St. Lawrence is the more remarkable when compared with their character at the Gulf entrance and throughout the Gulf. The tides in this region are specially important in relation to the strong tidal currents of the Lower St. Lawrence ; but systematic observations to ascertain this relation have not yet been made.

In the Strait of Belle Isle, the tide and the tidal currents are fairly regular when undisturbed by the wind ; but during heavy winds the tide is liable to be from 1½ to 2 hours early or late ; and this is also accompanied by an appreciable difference in the elevation of mean sea level during several successive tides. The tide is chiefly important in its relation to the tidal currents in the strait ; as it appears to have relatively little effect on the Gulf tides in general, compared with the main tide which enters by Cabot strait.

It was expected that a constant difference could be obtained between the time of high water in the Strait of Belle Isle, and the Atlantic tide at Halifax. But in making the comparison it was found that the range in the difference of the time of high water was very nearly as great as the variation in the luni-tidal interval itself. The following comparisons are based upon one year's observations, from September 1st, 1895, to September 26th, 1896 ; and in both cases the figures given are found by omitting the ten highest and the ten lowest values, and taking the average

of the next three highest and lowest. This is to eliminate exceptional values due to wind disturbance, as was done on the Lower St. Lawrence, in the case of observations extending over a whole year. The result is as follows :—

Strait of Belle Isle, at Forteau Bay. (Tide later than at Halifax.)

Difference in the time of H. W. between this strait and Halifax, ranges from 0h. 45m. to 4h. 01m.

Range in the difference, 3h. 16m. Average difference=1h. 54m.

Luni-tidal interval ranges from 8h. 18m. to 11h. 49m.

Range in the interval, 3h. 31m. Average interval=9h. 57m.

The range in both cases is too great to make the comparisons of practical value. By further comparisons, from which the wind disturbance is more carefully eliminated, and the variation in diurnal inequality is allowed for, it may be possible to obtain a better result.

The same difficulty is met with in the case of the tidal current in the strait. In 1894, while the surveying steamer was anchored in the strait, good observations of the turn of the current were obtained during periods when the currents were undisturbed by the wind; in all 16 at high water, and 12 at low water. On these, two series of comparisons were based; first, between the turn of the current and the time of the tide at Forteau bay; and second, between the turn of the current and the moon's transit. The range in the difference of time amounted, however, to 2^h 35^m in each case. (See details of comparisons given in Annual Report, Department of Marine, 1895; pages 97 and 98.) It would thus appear that the time at which the current turns when undisturbed by the wind, can be found without greater error by direct comparison with the time of the moon's transit, than by comparison with the time of high and low water at Forteau bay in the strait itself. (See note p. 66.)

It is evident that Cabot strait, which forms the main entrance by which the tides enter the Gulf of St. Lawrence from the Atlantic, is of the first importance from a tidal point of view. The best position that could be found for a tide gauge was on St. Paul island; and the gauge was built into a break in the cliffs, which affords a certain amount of shelter. It has been difficult to maintain, and has been twice destroyed by winter storms in three years. It was expected that the tide would have the same character as at Halifax, and that a constant difference in the time of the tide between the two places could be obtained. Careful comparisons were also made with Brest, France; Sandy Hook at New York; and St. John, N.B., in the hope of obtaining a constant tidal difference with some well established station; but these endeavours were without result, as the variation in such tidal differences is so great that no reasonable approach to constancy can be obtained.

The reason of this is that the tide in Cabot strait is affected by a large diurnal inequality. The two tides of the same day have thus a long interval and a short interval of time between them; and their ranges are also very different in amount. These inequalities attain a maximum value when the moon's declination is greatest north or south of the equator; and they disappear at the nodes. Hence the period of the variation is the draconitic month, which is reckoned from the ascending node of the moon to its next ascending node. Its mean length is $27^{\text{d}} 5^{\text{h}} 5^{\text{m}} 36^{\text{s}}$, or 2.32 days shorter than the synodic month. Its commencing point thus retrogrades through the synodic month in a period of less than thirteen lunar months.

This inequality, which is so marked in Cabot strait, appears to be occasioned by the over-running of the tide by a tidal undulation from some other direction. It disappears almost entirely from the tide after it enters the mouth of the St. Lawrence; and at Father Point and Quebec it is seldom appreciable. It was known, however, that the tides at Pictou and Charlottetown in Northumberland strait, were affected by diurnal inequality; but the reason of this was not understood. It has been customary in the past to refer the tide at ports within the Gulf, to some port of reference on the Atlantic coast; but this occasions an error of nearly $1\frac{1}{2}$ hours, early or late, in the time of high water; which is chiefly due to the inequality referred to.

These conditions made it necessary to obtain simultaneous tidal comparisons at a series of points extending from Cabot strait to Gaspé, in order to trace out the progress of the tide, and to ascertain how far these irregularities are felt. The results obtained at these points could also be compared with any of the principal tidal stations; and the extent of the region which can be referred to each of them as to a port of reference, could thus be decided, which is the important question from a practical point of view.

A series of secondary tidal stations was accordingly established in the season of 1896, extending from Chaleurs bay along the southwestern side of the Gulf, through Northumberland strait, and around Prince Edward Island. In this region the principal harbours had the first claim, and consideration had also to be given to the relative importance of places from a tidal point of view, so as best to obtain tidal differences for intermediate points. The choice of the following stations was accordingly made:—Carleton, which is as near the head of Chaleurs bay as possible, while avoiding the local influence of the Restigouche river; Lower Neguac, near the mouth of Miramichi bay, where the Gulf shore is furthest distant from the entrance at Cabot strait; Charlottetown, where the tide in Northumberland strait is latest in time, and has also the greatest range; Pictou, in line with the open channel between Prince Edward Island and Cape Breton Island, up which the tides pass; and

Souris, P.E.I., at the mouth of Northumberland strait, nearest to Cabot strait. These five stations were provided with self-recording instruments of a smaller type than those used at the principal stations; and the observations were continued throughout the season from June to November. Arrangements were also made for obtaining time, and for referring the observations to a suitable datum.

The results obtained at these stations were supplemented by observations at places which stood next in importance. On the coast between Miramichi bay and Pictou, short series of staff readings were taken at Richibucto, Buctouche and Pointe du Chêne; and a gauge record during two months was obtained at Cape Tormentine, where the strait is narrowest. Also on the north coast of Prince Edward Island, short gauge records were obtained at St. Peter's bay and at Alberton, and staff readings at Rustico, in order to trace the progress of the tide along the shore of the open Gulf.

The observations thus obtained are specially valuable because they were simultaneous, and were taken while the principal stations also afforded a continuous record. The whole of the results were reduced to standard time for the 60th meridian; and all the differences in the time of high water are, therefore, in absolute time. The range of the tide throughout the greater part of this region is usually from three to five feet. On the north coast of Prince Edward Island, and sometimes at Neguac also, the tide is almost effaced at the neaps. Its greatest range is at Charlottetown and Carleton, where it reaches a maximum of nearly nine feet.

From a careful digest of these observations and an exhaustive series of comparisons with the principal stations, the following description of the general course of the tide in the Gulf can now be given:—

When the tide enters Cabot strait, a branch passes to the southwest between Cape Breton and Prince Edward Island, into Northumberland strait. The large diurnal inequality at St. Paul island affects this region, and is very marked at Pictou and Charlottetown, though somewhat altered in amount. The latest tide in this region is at Charlottetown, where high water is, on the average, 2^h 21^m later than at St. Paul island. The main tidal undulation from Cabot strait undoubtedly follows the line of the deep channel which runs directly across the Gulf towards the entrance of the St. Lawrence, as already described. The time which the tide takes in crossing from St. Paul island to Southwest Point, Anticosti, is 5^h 35^m on the average; although this varies through a wide range. A part of the tidal undulation, no doubt, turns into the northeastern arm of the Gulf, and runs between Newfoundland and the north shore of the Gulf towards the Strait of Belle Isle; but the tides in this region have not yet been examined. On reaching the Anticosti side of the Gulf, a portion of the main tidal undulation turns off towards Chaleurs bay and

Miramichi, and returns along the north coast of Prince Edward Island to its extreme eastern end. In passing the western end of Northumberland strait, there is interference between this tide and the direct tide which enters the strait by its eastern end. The result of this is, that in the western end of Northumberland strait, from Shediac to Richibucto, the tide is almost effaced; and the time of the tide is difficult, if not impossible, to determine with any certainty.

There appears to be an extensive interference in the open Gulf also, between this undulation, which returns from the region of Miramichi bay along the north coast of Prince Edward Island eastwards, and the following tide which enters through Cabot strait. Thus we find the tide to be nearly simultaneous along the north shore of Prince Edward Island, which points to the meeting of two undulations from opposite directions, rather than to interference from the Belle Isle tide; as this would run across the main tide at right angles and would affect its *range*, but would not alter appreciably the *time* of the tide. It may possibly be this return undulation which gives rise to the inequalities observed at St. Paul island itself. This would also show why the tide in the St. Lawrence estuary is free from these irregularities; because the tide from the Atlantic, although overrun by this return undulation while passing through the Gulf, is again free from it on entering the mouth of the St. Lawrence; as this is beyond the point at which the return undulation begins. This would be in accordance with the usual laws of the interference of undulatory movements.

This explanation of the nature of the tidal interference in the Gulf is further corroborated by the investigation of the difference in the time of the tide at points along the open shore of the Gulf, to which we are now referring. These differences, if taken for the same tide followed on its course from Cabot strait, are so irregular as to be entirely valueless. This, therefore, shows the interference to be of the nature of a return undulation; as it reverses the diurnal inequality in the tide at the two sides of the Gulf with respect to each other. (Compare the tides at St. Paul island and Carleton, as given in Plates III. and IV., and in Plate V.)

We find accordingly, that on these coasts the only tidal differences which approach to constancy, are those between high water at any point, and the *next following* high water at St. Paul island. A number of comparisons were made in the endeavour to refer these tides by constant difference to some other Gulf station, such as Pictou, or Southwest Point, Anticosti; but St. Paul island itself was found to be the only station to which they could be referred with any reasonable degree of accuracy.

The nature of these complications in the Gulf is further shown by the following comparisons of the times of the tide, based upon the differences of time as now determined :—

PROGRESS OF H. W. AT SPRING TIDES.		PROGRESS OF THE FOLLOWING L. W.	
<i>Locality.</i>	<i>Time of H. W.</i>	<i>Time of L. W.</i>	<i>Locality.</i>
St. Paul Island...	8h. 41m.		
Anticosti.....	14h. 16m.	14h. 54m	St. Paul Island.
Neguac in Miramichi Bay...	17h. 47m.	17h. 41m. {	L. W. at the middle of the open Gulf.
St. Paul Island.....	21h. 08m.	20h. 29m.	Anticosti.

Thus by the time the tidal undulation reaches Miramichi bay, along the course described, and causes high water there, the next following low-water has entered Cabot strait and is already half way across the Gulf on its way to the entrance to the St. Lawrence. We thus have high water on the southwestern side of the Gulf at the same moment that a low-water depression is in the middle of the Gulf in the offing. This accounts for the effacement of the tide at the Magdalen islands in the middle of the Gulf. A tidal station was originally established there; but it proved useless, as often for days together the variation in level was so slight that the time of the tide could not be made out. It was only at the springs that the tide was at all distinct.

In Northumberland strait the tide progresses regularly; although on the Nova Scotia side it is nearly simultaneous in time for the greater part of the distance. The differences in the time of high water with St. Paul island are not constant, however; although the greatest difference is on the average only 2^h 21^m later. This appears to result from a variation in the amount of the diurnal inequality, with the progress of the tide. Thus, in the difference between Pictou or Charlottetown and St. Paul island, there is still an inequality or outstanding variation which follows the moon's declination. At Charlottetown the case is further complicated either by the effect of the wind, or by some form of tidal interference; but this we will refer to again.

The southwestern half of the Gulf of St. Lawrence, in which all the more important Canadian harbours of the Gulf are found, may thus be divided into three regions, with respect to the tidal stations to which the tides can be referred. The region of the Lower St. Lawrence, already referred to Quebec, can be extended to include Chaleurs bay. The open

shore of the Gulf, from Miramichi bay along the north coast of Prince Edward Island, can be referred to St. Paul island, by giving the time of the tide as *earlier* than at that station. Northumberland strait forms the third region, in which the tides must be referred also, directly or indirectly, to St. Paul island.

The reason of this division will become clearer in examining the tidal differences derived from the observations. In obtaining the results, a large number of trial comparisons were made ; but only the more important of these will now be referred to.

The tides in Chaleurs bay show a fairly constant difference in time with Southwest Point, Anticosti ; which thus enables them to be included with the Quebec system. The latest tides in that bay are at Carleton, with the exception of Dalhousie and Campbellton in the Restigouche river, where complications with river influence would be found. The difference, based upon simultaneous observations from July 1st to October 25th, is as follows :—

Carleton, Chaleurs Bay ; and Southwest Point, Anticosti.

Difference in time of H. W. ranges from 0h. 55m. to 2h. 27m.

Range in the difference, 1h. 32m. Average difference=1h. 30m. later.

The differences for intermediate places in the bay and around the Gaspé peninsula, may be interpolated from their difference of Establishment, as on the Lower St. Lawrence.

The wide range in the difference in the time of high water which occurs in the Gulf, may be illustrated from a comparison between Neguac, in Miramichi bay, and Pictou. The difference between these stations was found to range from 3^h 04^m to 6^h 16^m, showing a range of 3^h 12^m.

On the shore of the open Gulf from Miramichi bay towards Cabot strait, the time of high water must be taken as earlier than at St. Paul island, for the reasons explained. As the tide at Neguac in Miramichi bay, is the earliest in time of the tidal stations in this region, the value for its difference with St. Paul island was first worked out ; and in doing so, one of the features which here characterize the tide was taken advantage of. In this region the Establishment is closely the same as the mean luni-tidal interval throughout the course of the month. As the interval thus varies little with the moon's age, a larger number of individual tides become available in determining the Establishment, and irregularities from other causes can be better eliminated ; and also differences of Establishment are closely the same as direct differences in the time of high water taken throughout the month.

The Establishments at Neguac and St. Paul island were accordingly determined from sets of four consecutive tides, namely the 2nd, 3rd, 4th and 5th, following full and change of the moon ; an even number of tides being taken to eliminate the diurnal inequality in the luni-tidal interval. At Neguac there were only four semi-lunations at which good observ-

ations were available ; but at St. Paul island the determination is based upon sets of four tides at 23 semi-lunations throughout the year 1896. The results are as follows ; the corrected establishments being in 60th meridian standard time :—

Neguac. Establishment=5h. 01m. Corrected establishment=5h. 20m.
St. Paul island. Establishment=8h. 40m. Corrected establishment=8h. 41m.

The latter result is within one minute of the value found for the Establishment from the earlier observations of 1894, by the method given in the "Annuaire du Bureau des Longitudes," and based upon eight semi-lunations.

The difference in the time of high water between Neguac and St. Paul island, was then found from 102 tides as observed from July to November, 1896 ; the values given being the average of the three highest and three lowest of the individual differences. The result is as follows :—

Neguac and St. Paul island. Distance 250 miles.
Difference in time of H. W. ranges from 2h. 10m. to 4h. 28m.
Range in the difference, 2h. 18m. Average=3h. 21m. earlier.

The average is thus the same as the difference in the corrected establishment ; and this result must be accepted as the best that can be obtained ; as the differences, if taken in the opposite sense (i. e. later than at St. Paul island), are extremely irregular.

Along the north shore of Prince Edward Island, the bays are much shut in by sand bars ; and as the object was to obtain comparisons for the tide on the open coast, the tide gauges were placed as near as possible to the mouth of the bays, where the tide would not be retarded locally. The positions at which the gauges were placed were as follows :—Alber-ton, at the Government wharf, beside the range-light mast, $1\frac{1}{2}$ mile from the mouth of the bay ; Rustico, at the breakwater at East Rustico beach ; St. Peter's, at the lighthouse breakwater, at the entrance of the bay. The observations at these stations were for so short a time, and the tides are so flat, that a special method was employed to obtain the best result :—

Direct differences in the time of high water were taken in both direc-tions, to Neguac on the one hand and to St. Paul island on the other ; and by means of these differences, values for the Establishment were found. The mean luni-tidal interval from all the observations obtained, was taken as another value for the Establishment. The two values, as thus found, differed only by 3^m to 13^m from each other ; and the average of the two was adopted as the true value of the Establishment. The differences in Establishment between these stations and St. Paul island as thus found, were then taken as the correct difference in the time of high water. By this method, all good observations could be utilized ; which is important where the tides have so small a range that the time

of high water is often uncertain, and where the variation in the luni-tidal interval with the course of the month is certainly less than other irregularities which can thus be better eliminated. The resulting differences are as follows :—

Alberton and St. Paul I. October 16th to 24th ; 13 tides.
Difference in time of H. W. (by above method) 2h. 33m. earlier.

Rustico and St. Paul I. October 20th to 24th ; 7 tides.
Difference in time of H. W. by above method,
corrected also (by 5m.) by interpolation ; 2h. 31m. earlier.

St. Peter's and St. Paul I. October 27th to November 23rd ; 31 tides.
Difference in time of H. W. (by above method) 2h. 10m. earlier.

This shows the tide to be nearly simultaneous along the north shore of Prince Edward Island, whereas the Establishments given in the Admiralty list range from 6^h 10^m to 8^h 30^m, and therefore require a large correction. This error may have resulted from the difficulty of obtaining good results where the range of the tide is often so small, or from the observation of the day tides only, where the diurnal inequality is large.

In Northumberland strait, a number of comparisons were made to ascertain to which of the principal stations the tides in that region could best be referred. It was here found that the difference in the time of high water with other stations, especially those on the Atlantic coast, was itself subject to an alternation in value with successive tides, of the same character as diurnal inequality in the luni-tidal interval. There was thus a large second difference when the moon's declination was high ; whereas near the nodes, the consecutive differences were nearly or quite equal. This will be illustrated by the following example :—

DATE. 1896.	TIME OF HIGH WATER.		DIFFERENCE.	REMARKS.
	PICTOU.	HALIFAX.		
July 8.....	7h. 10m.	6h. 15m.	0h. 55m.	Moon's declination maximum north.
“	21h. 11m.	18h. 02m.	3h. 09m.	
July 9.....	8h. 02m.	6h. 50m.	1h. 12m.	New moon.
“	22h. 07m.	18h. 55m.	3h. 12m.	
July 10.....	9h. 00m.	7h. 50m.	1h. 10m.	
“	23h. 15m.	19h. 30m.	3h. 45m.	
July 11.....	9h. 45m.	8h. 35m.	1h. 10m.	
“	23h. 57m.	20h. 22m.	3h. 35m.	
July 12.....	10h. 35m.	9h. 15m.	1h. 20m.	

In Northumberland strait, this alternation appears to result from a variation in the amount of the diurnal inequality itself, with the progress of the tide. In the following comparisons, the amount given for this diurnal inequality in the difference, is the highest value of the average of two consecutive second differences. The amounts given for the differences themselves, are as before the average of the three highest and three lowest values, in order to avoid too great reliance upon individual observations. The differences are all in absolute time.

As the tide at Charlottetown is the latest in time and has also the greatest range, comparisons were first made between that port and the simultaneous observations at Halifax, St. Paul island, and Pictou; and with the tide tables for Quebec, calculated from the Quebec records. The tide reaches Charlottetown and Quebec by channels and estuaries in a somewhat similar way; and it was therefore hoped that the difference in time might be fairly constant; but it proved to be quite the contrary. The observations at Charlottetown extended from June 20th to 26th; July 18th to September 7th; and October 7th to November 25th; comprising in all 157 tides. The differences are as follows:—

Charlottetown and Quebec. (Charlottetown earlier.)

Difference in the time of H. W. ranges from 6h. 06m. to 10h. 59m.

Range in the difference, 4h. 53m. Average difference=8h. 17m.

Diurnal inequality in the difference=3h. 25m.

Charlottetown and Halifax. (Charlottetown later.)

Difference in the time of H. W. ranges from 1h. 01m. to 5h. 49m.

Range in the difference, 4h. 48m. Average difference=3h. 02m.

Diurnal inequality in the difference=2h. 57m.

Charlottetown and St. Paul island. Distance 230 miles.

Difference in the time of H. W. ranges from 0h. 44m. to 4h. 05m.

Range in the difference, 3h. 21m. Average difference=2h. 21m.

Diurnal inequality in the difference=1h. 16m.

Charlottetown and Pictou. Distance 50 miles.

Difference in time of H. W., from 0h. 19m. earlier, to 2h. 48m. later.

Range in the difference, 3h. 07m. Average difference=1h. 02m.

Diurnal inequality in the difference=1h. 24m.

although this inequality seldom exceeds 0h. 48m.

The results for Pictou are less irregular. The observations there extended continuously from June 4th to November 1st; giving in all, comparisons for 285 tides. The differences, obtained in the same way, are as follows:—

Pictou and Halifax. (Pictou later than Halifax.)

Difference in the time of H. W. ranges from 0h. 14m. to 4h. 14m.

Range in the difference, 4h. 00m. Average difference=2h. 09m.

Diurnal inequality in the difference=3h. 12m.

Pictou and St. Paul island. Distance 180 miles.

Difference in the time of H. W. ranges from 0h. 34m. to 2h. 46m.

Range in the difference, 2h. 12m. Average difference=1h. 35m.

Diurnal inequality in the difference=1h. 26m.

The above method of obtaining the range in these differences is the fairest that can be used. It would not have given as fair a comparison, if several of the highest and lowest values were omitted, as was done for the Lower St. Lawrence and the Strait of Belle Isle, where the observations extend over a whole year, and thus include the winter season; and where the wind influence is so great. It is also to be noted that the average of a larger number of high and low differences, or any other reasonable method of determining the limiting values, would only change the result by a few minutes; as the differences range fairly between the above limits.

It is evident from these comparisons that Pictou is the best port of reference for Northumberland strait. The range in the difference with both Halifax and St. Paul island is there much less; and a much greater proportion of the range is due to diurnal inequality than in the case of Charlottetown; and as this can be reduced to law, the outstanding errors will be less. Pictou is also more centrally situated, and the variation in the diurnal inequality along the strait will therefore be better divided, and leave less residual error, if the differences are taken in the two directions from there. It will probably be found also to stand in better relation to the tidal currents in the strait, when these come to be examined systematically.

The tidal stations selected, enable comparisons to be made with Pictou for the two ends of the strait, at Souris and Cape Tormentine, or as far as the tides have a marked range. The differences given are the averages of the three highest and three lowest values, and are in absolute time as before. The observations at Souris extend from July 8th to September 2nd, and from September 16th to November 15th, comprising in all 192 tides. At Cape Tormentine the comparisons extend from July 26th to 31st, August 4th to 9th, and September 5th to 30th; giving in all comparisons for 70 tides. The results are as follows, Charlottetown being repeated for convenience in the comparison:—

Souris to Pictou. Distance 65 miles.

Difference in the time of H. W. ranges from 0h. 16m. to 2h. 08m.

Range in the difference, 1h. 52m. Average difference=1h. 14m.

Pictou to Cape Tormentine. Distance 70 miles.

Difference in time of H. W. from 25m. earlier, to 57m. later.

Range in the difference, 1h. 22m. Average difference=0h. 24m.

Pictou to Charlottetown. Distance 50 miles.

Difference in time of H. W. from 0h. 19m. earlier, to 2h. 48m. later.

Range in the difference, 3h. 07m. Average difference=1h. 02m.

The maximum outstanding error along the strait will not exceed the semi-range in the above differences which may occur at certain times during the month. In the case of Charlottetown, this error is the greatest; and the irregularity in so short a distance may be due to some

form of tidal interference ; and probably also, in part at least, to wind disturbance, which appears to be considerable in the inlets leading to Charlottetown, and in the tidal portion of the Hillsborough river which runs beyond it.

In order to ascertain the best method of obtaining the tide at Pictou itself with reference to the principal stations, further comparisons were made with Halifax and St. Paul island. As the greater part of the range in the difference is evidently due to diurnal inequality, the differences in the time of high water from Halifax to Pictou, during the five months of the observations, were tabulated in draconitic months, or in sets beginning and ending at the corresponding lunar nodes ; and taking care to keep the differences for upper and lower transit tides respectively, in alternate columns. The mean values of the differences throughout the draconitic month were then plotted as successive ordinates, and a pair of undulating curves was obtained, corresponding with the upper and lower transits of the moon respectively. These curves are symmetrical, and intersect each other on their horizontal axis at about three tides after the nodes, as they should. The ordinate of the axis, measured from the zero line, corresponds with the average difference in the time of high water. The semi-amplitude of the curves, at the maximum declination of the moon, is $1^h 14^m$, which is half the diurnal inequality in the difference. The variable difference between Pictou and Halifax thus obtained (varying with the moon's declination) enabled the diurnal inequality to be allowed for. To test the accuracy of the result, a tide table for Pictou for one of the months of the observations themselves, was calculated by means of this variable difference with Halifax. The range of error in this table, as compared with the observed tides, was then found by omitting the greatest and least error, and taking the averages of the 2nd and 3rd greatest and least, to allow for any exceptional values, in the same way as in the case of the tidal differences themselves. The error was thus found to range from 45^m early to 22^m late ; and the average error during the month, without reference to sign, was 15^m . The tide at Pictou for the same month, as found by the constant difference given in local almanacs now published, showed an average error of 45^m during the month.

The difference between Pictou and St. Paul island is less than with Halifax ; and the corresponding declination curves obtained by the method above described, were found to be unsymmetrical ; but had a semi-amplitude of only 37^m . As the tidal data for St. Paul island have not yet been deduced from the observations, the variable difference from Halifax was made use of, in the preparation of provisional tide tables for Pictou for the season of navigation of 1897. The observations of the previous season are thus made immediately available ; and these tables will be sufficiently accurate to be of practical service in the meantime.

We thus find that the tides throughout the greater part of the southwestern half of the Gulf of St. Lawrence, can be referred directly or indirectly to the tidal station at St. Paul island, which is an important result; and the leading tidal differences for the purpose have also been obtained.

The tidal data for St. Paul Island are accordingly being worked out, by the harmonic analysis of the tidal record during one complete year; which form the best continuous observations that it has yet been possible to obtain. When these data are computed, closer results for Pictou and the dependent ports in Northumberland strait, can be obtained. The tidal differences throughout this portion of the Gulf will also become available.

As the range in the difference between Charlottetown and Pictou is so great, a further endeavour was made to arrive at a more satisfactory result. Declination curves, obtained by the method above described, were prepared from the differences with both Halifax and Quebec; but the outstanding errors in the time of the tide were found to be quite as great as when the average difference with Pictou was used as a constant quantity. It appears, therefore, to be impracticable to obtain better results than by following up the lines already suggested. It would no doubt be possible to obtain good results from long continued observations, by the establishment of thoroughly equipped stations at individual harbours, if their importance would warrant the expenditure required in doing so. But the endeavour of the Tidal Survey is to make it possible to refer the tides to the existing principal stations.

NOTE.

(Tide and current in the Strait of Belle Isle).—As the wide range in the difference in the time of the tide between this strait and Halifax appears to be largely due to diurnal inequality, the differences were tried a second time in the opposite sense; that is, the difference between the time of high water in the strait and the *next following* high water at Halifax. This amounts to a reversal of the diurnal inequality at the two places with respect to each other; and although the difference itself is greater, the inequalities, and consequently the range in the difference, are much reduced, which is more satisfactory. The result for a period of four months, namely, May 1 to August 31, 1896, is as follows:

Difference in time of H.W. ranges from 9h. 16m. to 11h. 21m.
 Range in the difference, 2h. 05m. Average difference; tide at
 Forteau bay, 10h. 16m. *earlier* than next following tide at Halifax.

A careful elimination of wind disturbance would further reduce this range and bring the average difference to a reliable value for purposes of computation.

With regard to the relation of the current to the tide in this strait; the variation appears less irregular than above stated in the part of the comparison for which the better-observed tides of September, in 1894, are used, when the tides were obtained on the recording gauge. Further observations of the turn of the current in the strait are, however, desirable.

EXPLANATION OF THE PLATES.

The accompanying plates will serve to illustrate the character and progress of the tides throughout the Gulf and Lower St. Lawrence. The tide curves given in these plates are reductions from the actual traces obtained from the self-recording tide gauges. The vertical scale of the gauge at each station is adapted to the local range of the tide. The time used throughout is Standard time for the 60th meridian, or four hours slower than Greenwich Mean Time. Each series of tides is thus a simultaneous set, in absolute time.

The positions of the principal tidal stations themselves, and the secondary stations of 1896, are shown on the outline map, Plate I.

The four principal stations at St. Paul island, Anticosti, Father Point, and Quebec, form a series extending from the main Gulf entrance to the head of the St. Lawrence estuary, a distance of 690 miles; and the character of the tide in its progress on this main route is shown in Plate II.; and in the first half of Plate III. the simultaneous Atlantic tides at Halifax and in the Strait of Belle Isle, are given for comparison. These are spring tides in October, 1896, which have an unusually great range, as the moon was in perigee at the time.

In the latter half of Plate III. and in Plate IV., a set of spring tides in July is followed from the Atlantic through Cabot strait, and along Northumberland strait, to show the character of the tides in that region. The tide curves are taken from the simultaneous records obtained at Halifax, St. Paul island, Souris, Pictou, and Charlottetown. The tides at Carleton are also given for comparison. At Pictou and Charlottetown, the diurnal inequality is strongly marked in these tides, as the moon's declination was then near its maximum.

The character of the tides on the open shore of the Gulf is given in Plate V., which shows a set of spring tides in November, extending from Cabot strait along the north coast of Prince Edward Island to Miramichi and Chaleurs bay. These are from the stations at St. Paul island, St. Peter's, P. E. I., Neguac, N. B., and Carleton, Que. In parts of this region the tides are very flat at the neaps; but these tides are unusually high even for spring tides, because of the nearness of the perigee to the new moon. The reversal of the diurnal inequality on the two sides of the Gulf is also very noticeable; the moon's declination being near its maximum.

The astronomical conditions at the time of these tidal observations are as follows, in Standard time for the 60th meridian, Civil reckoning :

For July 24, 25, 26 ; 1896.....Plates III and IV.

Full Moon, July 24*d.* 13*h.* 45*m.* Apogee, July 30*d.* 18*h.*

Moon at maximum declination south, July 21*d.* 17*h.*

Declination of sun and moon at beginning and end of period of the tides as shown in the Plates :

July 24d. 0hSun=19° 48' NMoon=23° 45' S.
“ 27d. 0hSun=19° 08' NMoon=9° 46' S.

For October 6, 7, 8, 9 ; 1896.....Plates II and III.

New Moon, October 6d. 18h. 18m. Perigee, October 7d. 1h.
Moon's descending node, October 5d. 10h.

Declination of sun and moon, for the above period :

October 6d. 0hSun=5° 18' SMoon=3° 58' S.
“ 10d. 0hSun=6° 49' SMoon=25° 42' S.

For November 4, 5, 6, 7 ; 1896Plate V.

New Moon, November 5d 3h. 27m. Perigee, November 4d. 13h.
Moon at maximum declination south, November 7d. 20h.

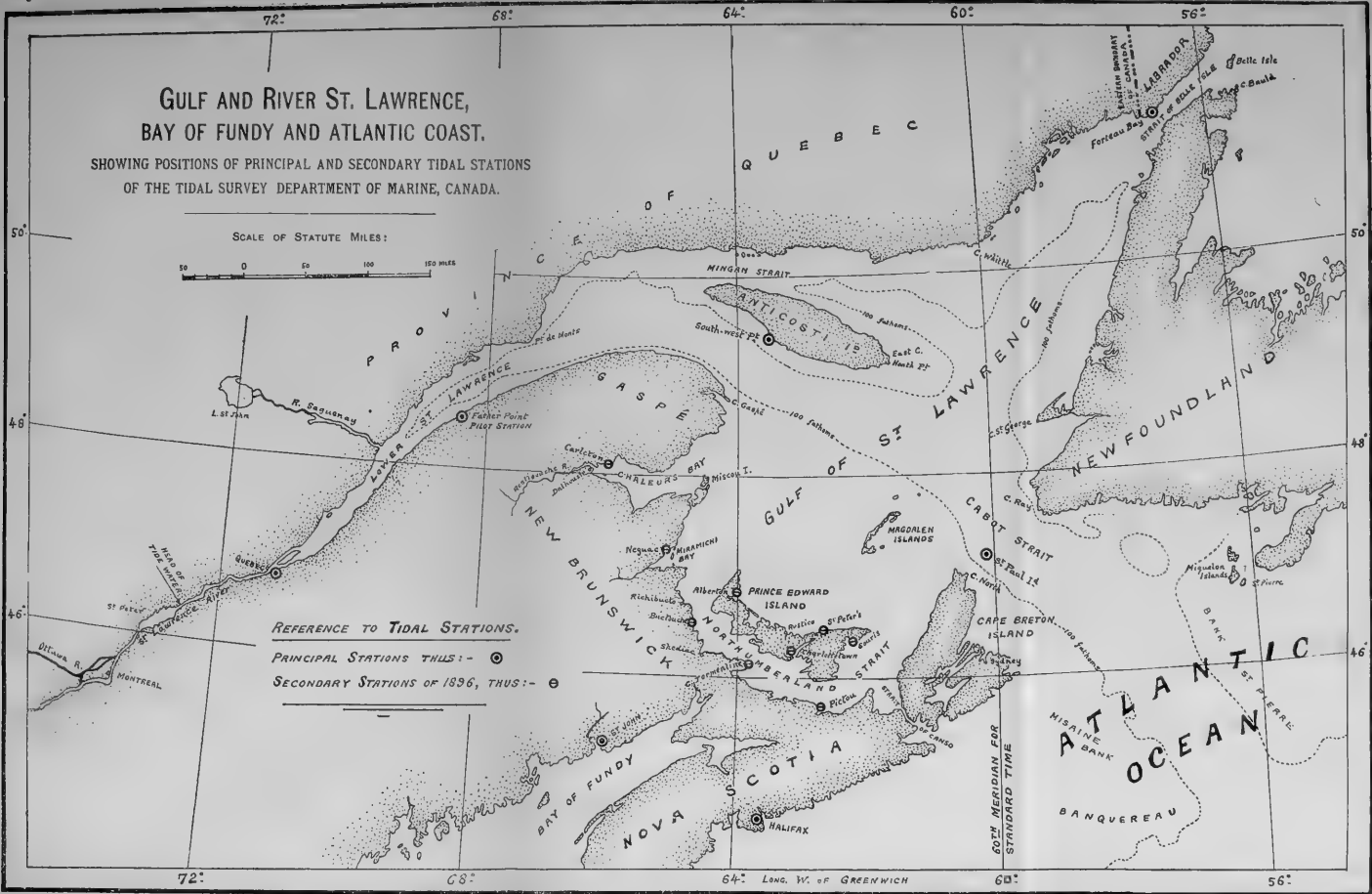
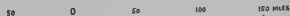
Declination of sun and moon, for the above period :

November 4d. 0hSun=15° 32' SMoon=14° 15' S.
“ 8d. 0hSun=16° 43' SMoon=27° 28' S.

GULF AND RIVER ST. LAWRENCE, BAY OF FUNDY AND ATLANTIC COAST.

SHOWING POSITIONS OF PRINCIPAL AND SECONDARY TIDAL STATIONS
OF THE TIDAL SURVEY DEPARTMENT OF MARINE, CANADA.

SCALE OF STATUTE MILES:

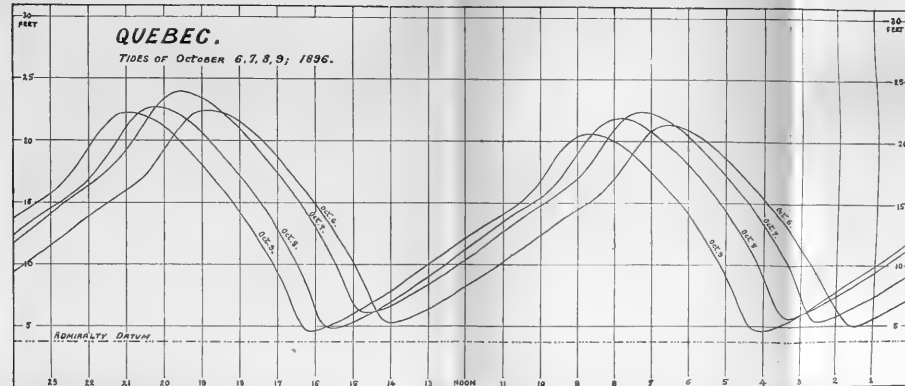
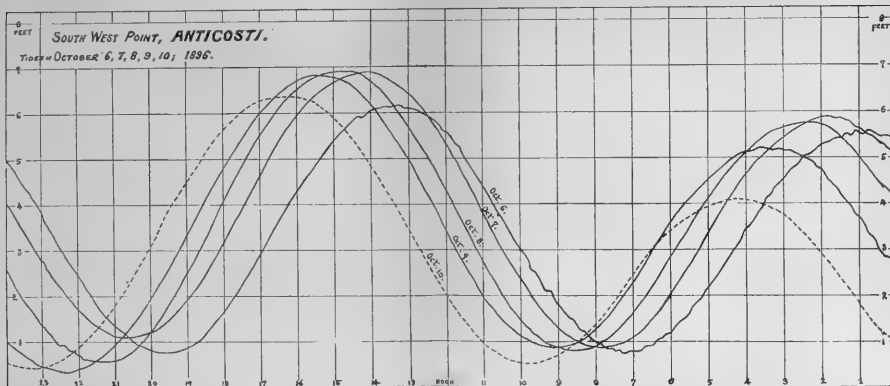
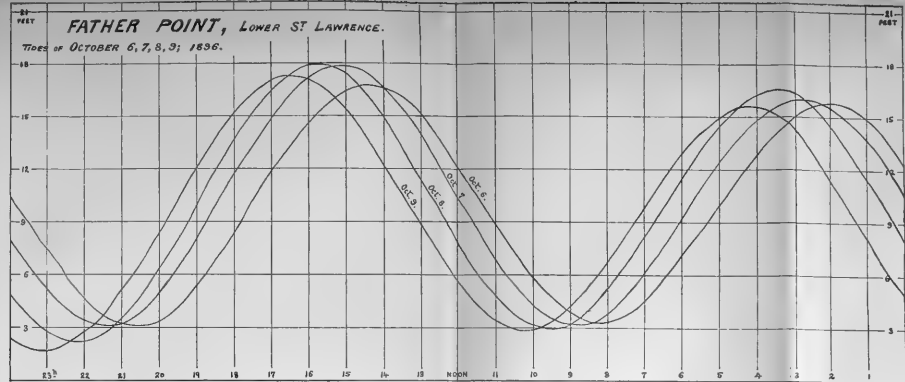
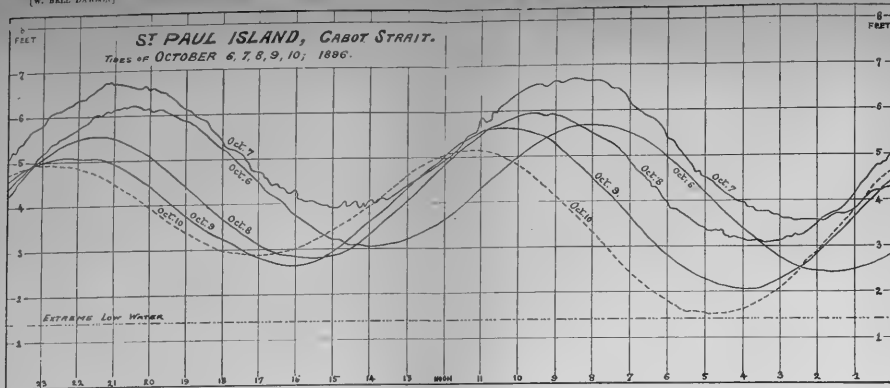


REFERENCE TO TIDAL STATIONS.

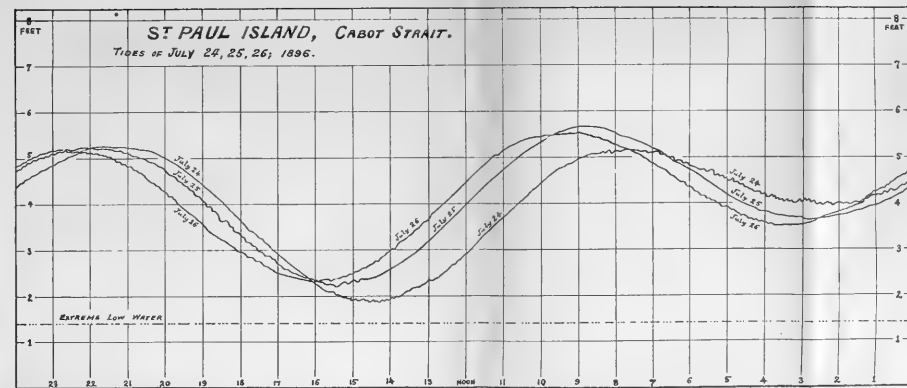
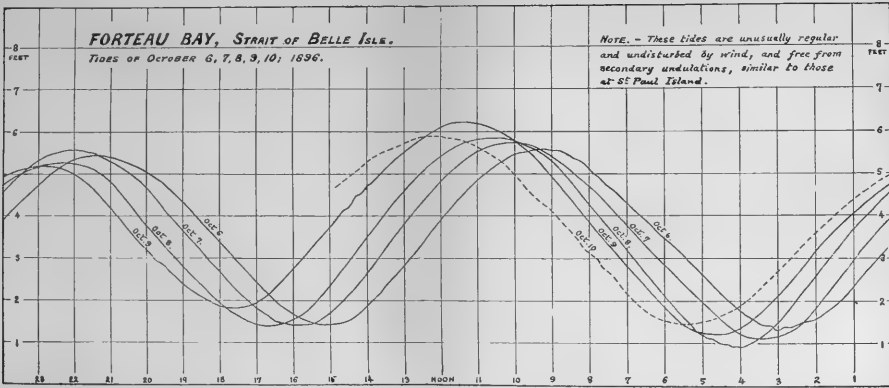
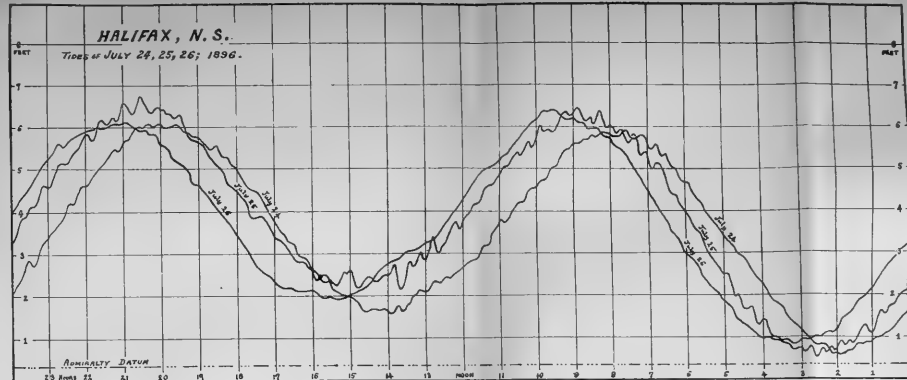
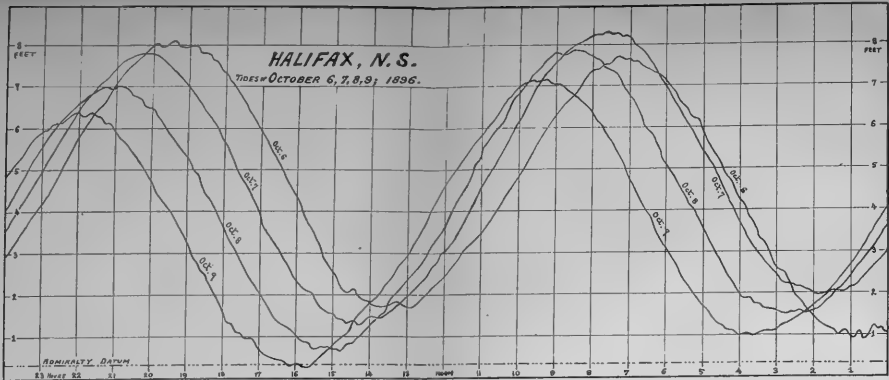
PRINCIPAL STATIONS THUS: - ●

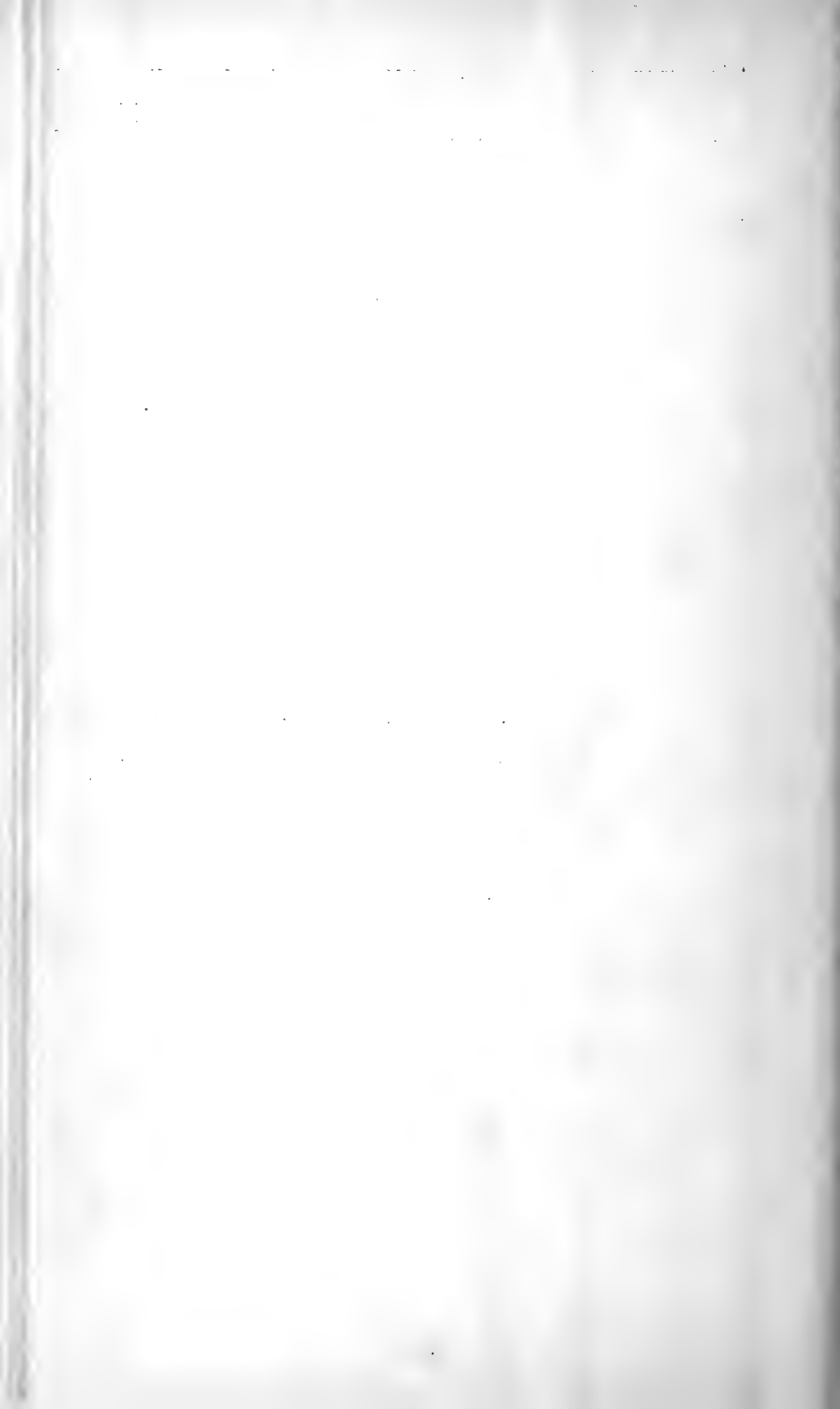
SECONDARY STATIONS OF 1896, THUS: - ○

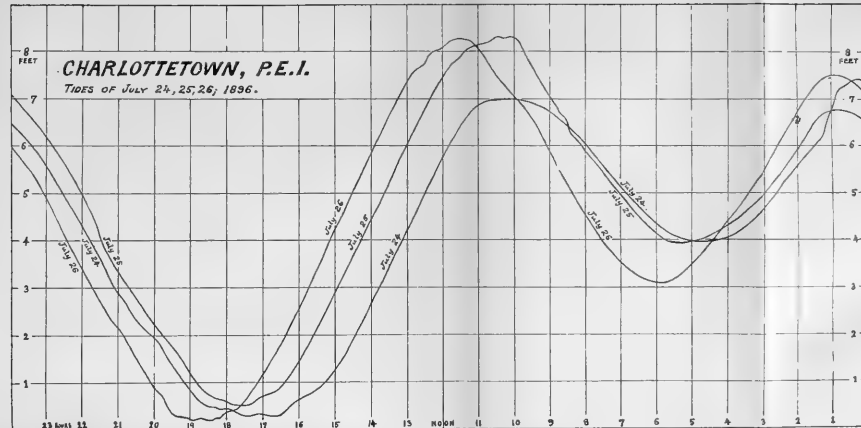
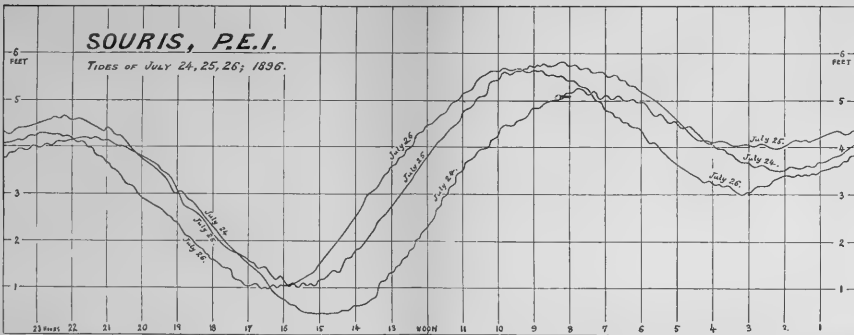
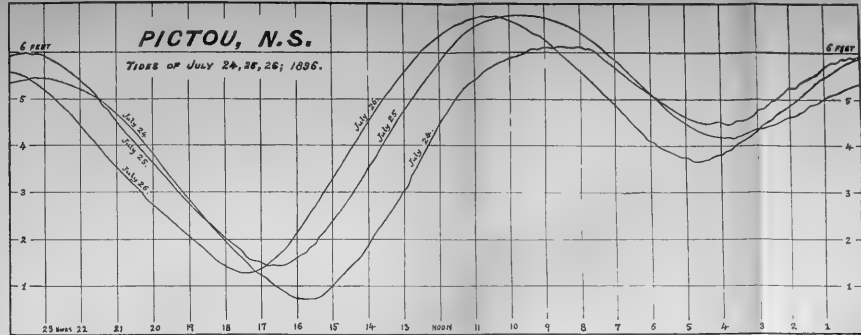
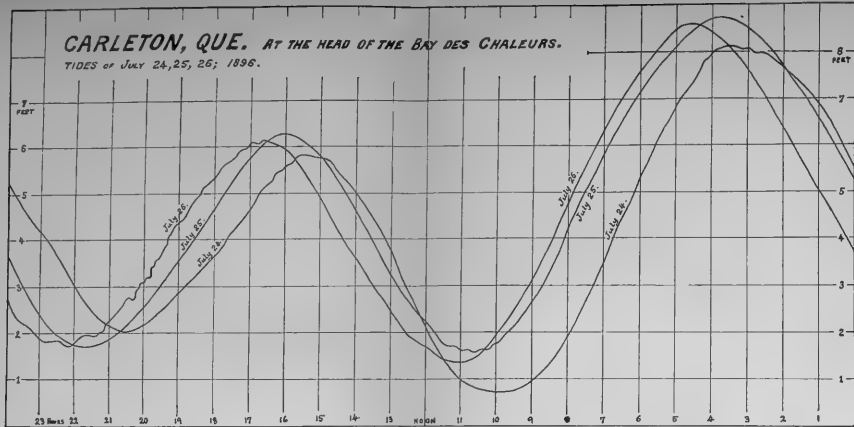




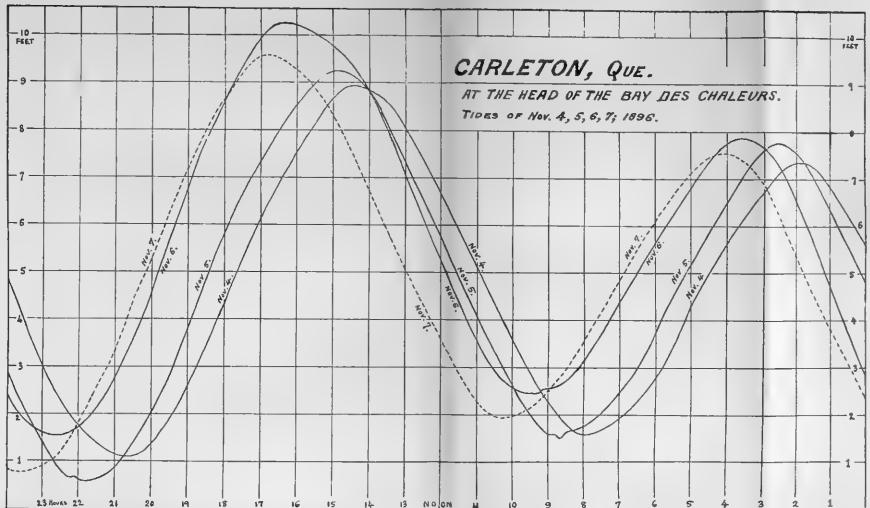
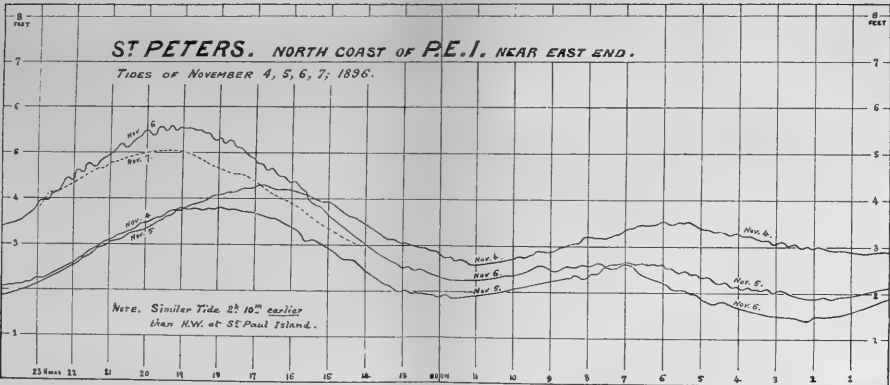
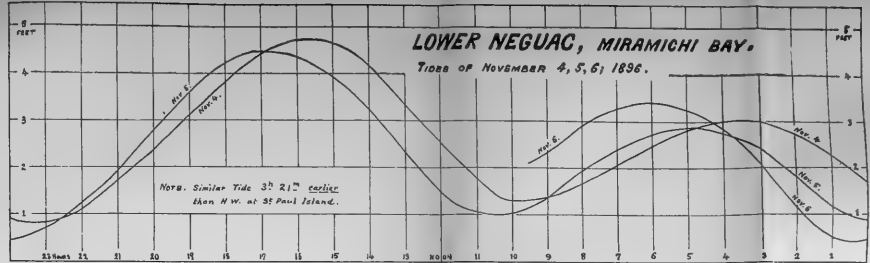
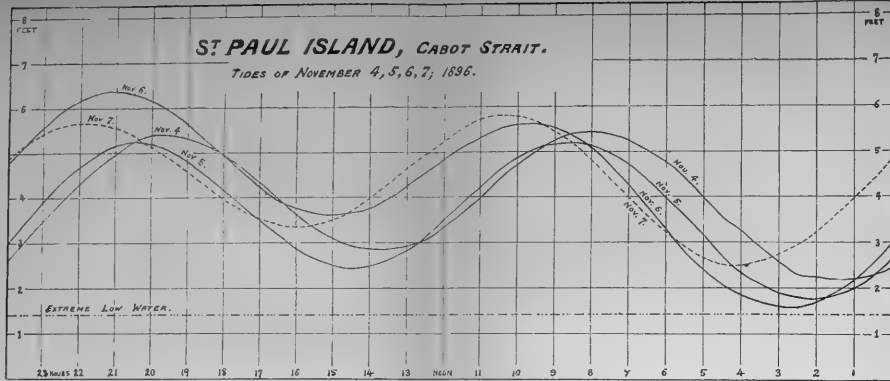














V.—*On the Calculation of the Conductivity of Aqueous Solutions containing Sodium Chloride and Potassium Sulphate.*

By E. H. ARCHIBALD, B.Sc., Dalhousie College, Halifax, N.S.

(Communicated by Prof. J. G. MacGregor, and read June, 1897.)

In a paper communicated to this society in 1896, Prof. J. G. MacGregor suggested a mode of testing the possibility of calculating, by the aid of the dissociation theory of electrolytic conduction, the conductivity of a solution containing two electrolytes with no common ion. The peculiar difficulty of the calculation in this case is due to the fact that if the solution contain two such electrolytes it will also contain other two formed by double decomposition.

It has been shown by Arrhenius that if such a solution be formed by mixing simple solutions of the four electrolytes, no appreciable change of ionization will occur on mixing, provided (1) the solutions are so dilute that no appreciable change of volume occurs, (2) the concentration of ions of the simple solutions are the same, and (3) the volumes of the simple solutions are such that the products of the volumes of the solutions of electrolytes with no common ion are equal.

Prof. MacGregor proposed, therefore, to draw curves showing the relation of ionic concentration to dilution for simple solutions of each of the four electrolytes, by the aid of observations of their conductivity, and to read off from these curves the values of the dilutions of those solutions of the respective electrolytes which would have any desired common concentration of ions. These solutions might then be prepared. Their dilutions (V) and the number (N) of gramme-equivalents of their electrolytes in any volume (v), their ionic concentrations (α/V), and their ionization coefficients (α) would thus be known. They are then to be mixed in the proper proportions as to volume to ensure that no change of ionization will occur on mixing. For this purpose, calling two of the electrolytes with no common ion, 1 and 2 respectively, and the other two 3 and 4, select arbitrarily any value of v_4 , the volume of the solution of 4 to be mixed with the others. It will contain $N_4 = v/V_4$ gramme-equivalents of 4. Now, if n_1 and n_2 be the number of gramme-equivalents of 1 and 2, which would have to be added to water to make a solution of the same constitution as the mixture, we have $n_1 = N_1 + N_3 = N_1 + N_4$ and therefore $N_3 = N_4$. Hence the volume of 3 to be mixed with the others will be $v_3 = V_3 v_4/V_4$. Next select arbitrarily any value of v_2 . Then, in order that there may be no change of ionization on mixing, we must have $v_1 = v_3 v_4/v_2 = V_3 v_4^2/V_4 v_2$. As in all cases I selected $v_2 = v_4$, it is obvious that $v_1 = v_3$.

The volumes of the simple solutions to be mixed having thus been determined, the mixture may be prepared and its conductivity experimentally determined.

Its conductivity may be calculated by the aid of the expression of the dissociation theory, for the conductivity of a complex solution, viz. :

$$k = \frac{1}{p(v_1 + v_2 + v_3 + v_4)} (\alpha_1 N_1 \mu_{\infty 1} + \alpha_2 N_2 \mu_{\infty 2} + \alpha_3 N_3 \mu_{\infty 3} + \alpha_4 N_4 \mu_{\infty 4}),$$

where p is the ratio of the volume of the mixture to the sum of the volumes of the constituent solutions, which has the value unity if there is no appreciable change of volume on mixing. The value of p may be determined by density measurements ; the α 's, N 's and v 's are known, as seen above ; and the values of μ_{∞} , the specific molecular conductivity at infinite dilution, may in the case of mixtures of sufficient dilution, be taken to be the same as in simple solutions of the respective electrolytes.

At Prof. MacGregor's suggestion I have made a series of observations to test the possibility of calculating the conductivity of solutions containing sodium chloride and potassium sulphate, and, therefore, also sodium sulphate and potassium chloride. These electrolytes were selected because Kohlrausch had determined their specific molecular conductivity at infinite dilution. The observations were conducted in the Physical and Chemical Laboratories of Dalhousie College.

The work included the purification of the salts and of water, preparation and analysis of a series of simple solutions and determination of their conductivity, plotting curves giving the relation of concentration of ions to dilution for these simple solutions, and obtaining from them the dilutions of simple solutions which would have a common concentration of ions, determining the volumes of these solutions to be mixed, preparation of the mixtures, and measuring and calculating their conductivity.

PURIFYING THE SALTS.

The salts were obtained as chemically pure from Eimer and Amend of New York. After being twice re-crystallized no impurities to any extent could be detected.

PURIFICATION OF THE WATER.

The water used was purified by the method described by Hulett,¹ except that a block-tin condenser was used instead of a platinum one. Water purified by this method had at a temperature of 18° C. a conductivity varying from 0.85×10^{-10} to 0.98×10^{-10} , expressed in terms of the conductivity of mercury at 0° C.

¹ Journ. Phys. Chem., Vol. 1, p. 91.

PREPARATION AND ANALYSIS OF SIMPLE SOLUTIONS.

The method adopted was to make up as concentrated a solution as I wished to measure. This solution was carefully analysed, and from this successive multiple dilutions were prepared by adding water, all solutions being prepared at a temperature of 18°C . 50 c.c. of these solutions would be introduced into the electrolytic cell, and successive dilutions prepared from this in the cell itself, by withdrawal of a certain volume and addition of an equal volume of water. As a check upon errors in diluting, after a portion had gone through a certain number of dilutions, it was taken from the cell and carefully analysed, and if found necessary the previous determinations of the concentration were corrected from the data thus obtained.

In these analyses the concentration of the potassium and sodium chloride solutions was determined volumetrically. A solution of silver nitrate standardized at 18°C . was used to estimate the chlorine, neutral potassium chromate being used as indicator. To test the accuracy of this mode of analysis, two solutions of sodium chloride were prepared containing known quantities of the pure fused salt. These were analysed by the above method and results found to be correct to 0.1 per cent. In the case of the potassium and sodium sulphate solutions the concentration was determined gravimetrically, the quantity of salt in solution being estimated from the amount of barium sulphate precipitated by barium chloride when added in slight excess to a known volume of the solution to be analysed. Four determinations of one solution by this method gave a possible error of 0.15 per cent.

All pipettes and burettes used were calibrated by weighing the water they delivered. No pipette was used in which the time of outflow was less than forty seconds. The point of the pipette was allowed to rest against the side of the vessel during the outflow, and when it had ceased the pipette was blown into without removing the point.

PREPARATION OF THE MIXTURES.

Curves were drawn on co-ordinate paper, showing the relation of dilution (V) to concentration of ions (α/V) for solutions of each of the four salts. A common concentration of ions was then selected and the dilution for each salt corresponding to this value of α/V taken off its curve. This gives the dilutions of the solutions to be mixed. The volumes to be mixed, that the dissociation of each electrolyte might not change on mixing, were then calculated as shown above.

Where fractions of one c.c. had to be measured out, a pipette was used the neck of which had been calibrated by weighing the water deliv-

ered from different points on the neck. Weighings were thus made for about every centimetre, and these distances divided into tenths. All points were then tested and corrections applied if necessary.

To find out how accurately the volume of a constituent of a mixture could be measured, the following measured volumes of water which, according to pipette readings, should be equal, were weighed. The volumes given by weighing were 30·550 c.c., 30·560 c.c., 30·564 c.c., 30·540 c.c.; mean=30·553. The probable error would seem to be less than 0·05 per cent.

DETERMINING THE CONDUCTIVITY.

The Kohlrausch method with the telephone and alternating current was used. The measuring apparatus consisted of four resistance coils, and a German silver bridge-wire, about three metres long, wound on a marble drum. The wire was divided into 1,000 parts and had a resistance of about 1·14 ohms. It was calibrated by the method of Strouhal and Barus.¹

The resistance coils were marked 1, 10, 100 and 1,000 ohms. As I used only one coil (that of 1,000 ohms), and as it was not necessary to express the conductivities in absolute measure, I did not need to know the relative accuracy of the coils or the absolute value of the one used.

Two electrolytic cells were used, one for strong solutions, the other for solutions more dilute. They were of the U-form, shown by Ostwald in his *Physico-Chemical Measurements*, p. 226, fig. 178.

The electrodes were of stout platinum foil not easily bent, circular in form and about 3·5 cm. in diameter. Care was taken always to have the electrodes as nearly in the same position in the electrolytic cell as possible. No change in conductivity could be observed for small differences in position, such as could be detected and avoided.

The induction coil was small and had a very rapid vibrator. It was kept in a box stuffed with cotton wool, that the noise might not interfere with the determination of the sound minimum in the telephone. A Leclanché cell was found most convenient for working the coil. With this arrangement the minimum point on the bridge wire could be determined to within 0·3 of a division. This might allow an error of 0·12 per cent. in the determination of the resistance at the centre of the bridge, and 0·15 per cent at the point farthest from the centre used in my experiments.

PLATINIZING THE ELECTRODES.

The electrodes, after being washed in boiling alkali and acid, were placed in a solution prepared from a recipe given by Lummer and Kurlbaum and referred to by Kohlrausch.² This solution consists of one part

¹ Wied. Ann., x. (1880), p. 326.

² Wied. Ann., vol. 60 (1897), p. 315.

platinum chloride and 0.008 of lead acetate to 30 of water. They were then connected with the terminals of two Bunsen cells, arranged in series; the direction of the current being frequently changed. When the electrodes had become covered with a velvety coating of platinum black they were removed from the solution and thoroughly washed with boiling water to remove all traces of the chloroplatinic acid. The platinizing can be done more quickly and better with above solution than with the chloroplatinic acid alone.

REDUCTION FACTOR.

To find the factor which would reduce the observed conductivities to the standard employed by Kohlrausch, the values of the conductivity for a series of solutions of each salt, which were measured for the purposes of calculation, were plotted against the concentrations (gramme-equivalents per litre), and conductivities corresponding to the concentrations examined by Kohlrausch, taken off these curves and compared with the values given by him. The ratio of these values was found to be practically constant for each salt through as wide a range of dilution as it was necessary for me to measure.

TEMPERATURE.

All conductivity measurements were made at 18° C. To make sure of this temperature, the cell containing the solution to be measured was placed in a water-bath, whose temperature was regulated by a thermostat of the form recommended by Ostwald in his *Physico-Chemical Measurements*, p. 59, fig. 42. The regulating liquid, which was water, was inclosed in a brass tube about 35 cms. long and 4 cms. in diameter, bent so as to form three sides of a square. Two vanes fixed horizontally, near the bottom of the bath, to a vertical axis, which was turned by a small hydraulic motor, kept the water of the bath well stirred. The thermometer used was graduated to fiftieths of a degree; and could easily be read to hundredths. Its readings were compared with those of another whose errors had recently been determined at the *Physikalisch-Technische Reichsanstalt*, Berlin. With this apparatus the temperature of the bath could be kept constant to within a fiftieth of a degree for half an hour at a time. A variation of one-fiftieth of a degree might cause an error of 0.05 per cent in the determination of the resistance.

That one might be sure that the temperature of the solution to be measured had come to be that of the bath, two or more determinations of the resistance were always made at intervals of about five minutes, and that reading taken which was found to be the same for successive intervals.

DATA FOR THE CALCULATIONS.

For the simple solutions the ionization coefficients (α) were taken to be equal to the ratios of the specific molecular conductivity to the specific molecular conductivity at infinite dilution. Kohlrausch's values¹ for the specific molecular conductivity at infinite dilution were used. They were taken to be 1220×10^{-8} , 1030×10^{-8} , 1280×10^{-8} , and 1060×10^{-8} , for potassium chloride, sodium chloride, potassium sulphate, and sodium sulphate, respectively, as determined by him.

The value of p in the above formula was found by density measurements before and after mixing. These measurements were carried out with Ostwald's form of Sprengel's pycnometer. Measurements accurate to 1 in the fourth place could easily be made, this being beyond the degree of accuracy required. The value of p was found to be practically equal to unity for the most concentrated solutions examined.

In reading off the dilutions from the curves an error of about 0.1 per cent might be made.

RESULTS OF OBSERVATIONS ON SIMPLE SOLUTIONS.

For the purposes of calculation it was necessary to draw curves for each salt, showing the relation of dilution to ionic concentration. It was, therefore, necessary to know the concentrations and conductivities of a sufficiently extended series of dilutions of each salt. The following table gives the dilution, conductivity, and concentration of ions of each solution examined.

The dilutions are expressed in terms of litres per equivalent gramme-molecule at 18° C.

The conductivities are specific molecular conductivities at 18° C., expressed in terms of 10^{-8} times the specific conductivity of mercury at 0° C.

The concentrations of ions are the ratios of the specific molecular conductivity to specific molecular conductivity at infinite dilution, divided by the dilution.

POTASSIUM CHLORIDE.			SODIUM CHLORIDE.		
Dilution.	Conductivity	Concentration of ions.	Dilution.	Conductivity	Concentration of ions.
20.00	1085	.0445	20.00	898	.0436
15.62	1070	.0561	15.62	890	.0553
12.50	1058	.0694	12.50	880	.0683
10.00	1050	.0861	10.00	866	.0841
6.915	1036	.1227	6.915	853	.1196
5.760	1025	.1458	5.760	838	.1412
3.456	997	.2364	4.800	828	.1673
2.880	986	.2805	4.000	807	.1958
2.400	975	.333	2.880	792	.2668
2.000	959	.393	2.400	778	.315
1.713	954	.456	2.000	759	.368
1.428	935	.537	1.571	732	.452
1.190	924	.636	1.309	720	.534
1.091	921	.692	1.091	702	.624
1.000	918	.753	1.000	695	.674

¹ Wied. Ann., vol. 26, p. 204.

POTASSIUM SULPHATE.			SODIUM SULPHATE.		
Dilution.	Conductivity	Concentration of ions.	Dilution.	Conductivity	Concentration of ions.
100·00	1099	·00858	100·00	907	·00856
66·66	1058	·01240	66·66	868	·01230
40·00	1020	·01992	40·00	846	·01991
33·33	1009	·0236	33·33	830	·0235
20·00	959	·0375	20·00	781	·0370
15·62	934	·0467	15·62	771	·0466
12·50	918	·0574	12·50	753	·0568
10·00	898	·0702	10·00	734	·0692
8·605	893	·0811	7·047	663	·0888
7·173	879	·0957	5·882	651	·1044
5·973	856	·1119	5·313	648	·1150
4·977	830	·1316	3·692	623	·1592
3·456	791	·1787	2·918	598	·1933
2·880	771	·209	2·431	583	·226
2·400	753	·245	2·022	562	·262
2·073	741	·279	1·689	541	·302
2·000	737	·288	1·408	521	·349
1·440	707	·384	1·176	496	·397
1·200	689	·449	1·016	478	·443
1·000	672	·525	·847	456	·507

RESULTS OF OBSERVATIONS AND CALCULATIONS ON MIXTURES.

The table below contains the data necessary for, and the results of, the calculations of the conductivity of each mixture examined. The concentrations of ions are expressed, as in the former tables. Concentrations of solutions, are expressed, in terms of equivalent grammes-molecules per litre at 18° C. Conductivities are specific conductivities at 18° C. in terms of 10^{-8} times the specific conductivity of mercury at 0° C. The column headed: Volumes, gives the volumes (in cubic centimetres) of KCl and NaCl solutions mixed with 25 c.c. each, of the K_2SO_4 and Na_2SO_4 solutions. The differences are expressed as percentages.

CONSTITUENT SOLUTIONS.					MIXTURES.			
CONCENTRATIONS.				Volumes.	Concen- tration of ions.	CONDUCTIVITY.		
KCl.	NaCl.	$\frac{1}{2}$ K ₂ SO ₄ .	$\frac{1}{2}$ Na ₂ SO ₄ .			KCl & NaCl	Observed	Calcul- ated.	Diff. (p.c.)
·5814	·6410	·8460	1·019	43·81	·454	521·7	518·3	- 0·65
·5000	·5393	·7902	·8375	41·88	·393	460·4	458·1	- 0·50
·4166	·4484	·5903	·6711	40·27	·333	380·2	380·0	- 0·05
·3930	·4166	·5540	·6289	40·00	·315	356·9	358·4	+ 0·42
·3566	·3787	·5000	·5617	39·38	·288	331·1	328·8	- 0·69
·3401	·3571	·4739	·5291	38·89	·274	316·0	313·9	- 0·67
·2380	·2500	·3225	·3478	36·56	·196	223·0	223·8	+ 0·36
·2008	·2083	·2702	·2902	36·14	·167	190·9	191·3	+ 0·21
·1675	·1736	·2201	·2374	35·42	·141	162·3	161·5	- 0·49
·1310	·1349	·1674	·1834	34·99	·112	127·8	128·0	+ 0·16
·1219	·1265	·1552	·1700	34·85	·103	119·2	118·8	- 0·34
·1032	·1063	·1287	·1419	34·37	·0887	104·7	104·4	- 0·29
·0787	·0800	·0969	·0984	31·25	·0683	78·00	78·23	+ 0·29
·0648	·0659	·0791	·0800	30·88	·0568	65·29	65·03	- 0·40
·0527	·0536	·0640	·0644	30·57	·0467	52·92	53·03	+ 0·21
·0500	·0512	·0607	·0611	30·53	·0445	50·75	50·91	+ 0·32

It will be seen from the above table that in the case of the six stronger solutions the differences are for the most part considerably beyond the limit of the error of an observation of the conductivity, which would be about 0·25 per cent, and are for the most part also of the same sign. This result was to be expected, as the values of the ionization coefficients were taken to be the ratios of the specific molecular conductivity to the specific molecular conductivity at infinite dilution, which is rigorously admissible only for infinitely dilute solutions. Also, the several values of the specific molecular conductivity at infinite dilution for the electrolytes in the mixture were taken to be the same as the values found by observations on the simple solutions, and these values would only hold rigorously for infinitely dilute mixtures.

In the case of the weaker solutions, the differences are either within or but little beyond the limit of experimental error, and are nearly equally distributed as to sign. Considering the many sources of error in obtaining the data required for the calculations, this agreement between observed and calculated values appears to be very satisfactory, and to

warrant the conclusion that for mixtures containing the above electrolytes of a concentration not greater than 0.5 equivalent gramme-molecules per litre, it is possible, by the aid of the dissociation theory, to calculate the conductivity.

ROYAL SOCIETY OF CANADA

TRANSACTIONS

SECTION IV.

GEOLOGICAL AND BIOLOGICAL SCIENCES

PAPERS FOR 1897

I.—*A Review of Canadian Botany from 1800 to 1895.*¹

PART II.

By D. P. PENHALLOW.

(Read June 21st, 1897.)

The history of botanical progress in the 18th century closed with the memorable work of the elder Michaux. It was therefore peculiarly fitting that the beginning of the 19th century should see his important contributions to the botany of this continent essentially continued by his son, François André, who made a distinct advance upon the work thus admirably laid down, in his *North American Sylva*, a work which, until the last few years, has stood unrivalled, and which has placed the author's name high in the list of eminent botanists.

Following close upon the labours of the elder Michaux there came one whose deep interest in the flora of this region had been aroused by essentially the same influences that led his predecessors, Kalm and Michaux, to undertake a labour which at that time was fraught with enormous difficulties, and which, while it seemed to greatly enrich the science they loved so well, and for which they endured so much, brought to them no gain beyond the reward which springs from the consciousness of a duty nobly conceived and as nobly discharged, and the enduring approbation of their fellowmen. I refer particularly to one whose work was one of the most important elements in the progress of botany in the early part of this century, not only in Canada, but also in the United States, and the close of whose life of toil and suffering among strangers was invested with a pathetic element which yet makes the place of his death and burial of more than ordinary interest to those who cultivate the science of plant life.

Frederick Pursh was born at Grossenhayn, Saxony, in 1774, and educated at Dresden.² In his account of the motives which led him to undertake his memorable work, he says :

“ Among the numerous useful and interesting objects of natural history discovered in the vast extent of the new continent, none claim

¹ For assistance received in the preparation of this paper, I desire to record my obligations to Prof. John Macoun and Dr. J. G. Bourinot, of Ottawa; Mr. Harry Piers and Dr. A. H. MacKay, of Halifax; Mr. John M. Swain, of Prince Edward Island; Mr. G. U. Hay, of St. John, N.B.; l'Abbé Laflamme, of Quebec; Prof. W. J. Fowler, of Queen's College, Kingston; Mr. A. Alexander, of Hamilton, Ont.; Prof. L. W. Bailey, Fredericton, N.B.; Rev. Moses Harvey, St. John's, Newfoundland; Rev. F. W. Vroom, King's College, Windsor, N.S.; Dr. T. J. W. Burgess and Mr. H. Mott, of Montreal.

² Mr. James in the *Journal of a Botanical Excursion*, says he was born at Tobolsk, Siberia, but as he gives no authority for this statement, and as I have been unable to confirm it, I have adopted the data given by Pritzels as the more trustworthy. (Pritz. Thes. Bot. Lit., 1872, 254.)

our attention in a higher degree than the vegetable productions of North America. Her forests produce an endless variety of useful and stately timber trees ; her woods and hedges the most ornamental of flowering shrubs, so much admired in our pleasure grounds ; and her fields and meadows a number of exceedingly handsome and singular flowers (many of them possessing valuable medicinal virtues) different from those of other countries. All these are more or less capable of being adapted to a European climate, and the greater part of easy cultivation and quick growth ; which circumstances have given them, with much propriety, the first rank in ornamental gardening."

"A country so highly abundant in all the objects of my favourite pursuits, excited in me, at an early period of life, a strong desire to visit it, and to observe in their natural soil and climate, the plants which I then knew ; and to make such discoveries as circumstances might throw in my way. This plan I carried into execution in the year 1799."¹

With the exception of his immediate predecessors, no botanist had accomplished more than Pursh to make the vegetation of Canada known, and since his time, very few have contributed in so important a degree to the enlargement of Canadian botanical science. Apart from his published *Flora*, the principal insight into his work in America is to be gained from his journal,² which was found among papers accompanying the herbarium of Dr. J. S. Barton when it was transferred to the custody of the American Philosophical Society of Philadelphia. This manuscript was later published by the society under the editorship of Mr. T. P. James, but unfortunately, it does not deal with that part of Pursh's work which was continued into and ended in Canada. Nevertheless, this record must always have a high degree of interest and value for Canadians as for other botanists, not only because of the valuable notes it contains, but because it gives a clear insight into the man's character and shows him to have been possessed of indomitable perseverance, pursuing his work amid all the harassing discouragements of very limited means which, on one occasion, necessitated the sale of his gun, and borne down by bad health which, on more than one occasion threatened to abruptly terminate his useful work. Amid difficulties which would have forced most men to turn their thoughts and energies in other directions, he preserved a hopeful confidence in his work, which proved the mainstay of all his labours. His entire explorations were made on foot.

Leaving the United States after about twelve years of hard and useful work, he visited the West Indies and thence proceeded to England where he completed the two volume work by which he is known. This done, he sailed for Canada where he spent the remaining years of his life in an effort to prepare a Canadian flora. He made extensive collections,

¹ *Flora Americæ Septentrionalis*, I. v.

² *Journ. of Bot. Excursions* ; Phila. 1807 : *Flora Amer. Sept.*, 1814, I., viii.

chiefly through the province of Quebec, but all the material thus accumulated was subsequently destroyed by fire before it could be put into suitable form for publication, so that we have absolutely no record of his work here.

Pursh was not a voluminous writer. His *énergies* appear rather to have been entirely exhausted in laborious field work to which he devoted so much of his time, in the preparation of his *North American Flora* and in contending with his physical infirmities. His only other publication was his *Hortus Olivienis*, a small work of seventy-two pages published in 1815.

After a labour of only twenty-one years, Pursh died at Montreal on the 11th July, 1820, "so destitute of means that the expenses of his burial and other outlays were defrayed by his friends."

"He was interred in the old cemetery on Papineau Road." There his remains lay until 1857, when the facts becoming known to Dr. James Barnston and other members of the Botanical Society of Montreal, an effort was made to secure their transfer to a more fitting resting place in Mount Royal Cemetery. This was accomplished only in part, and for twenty years all that remained of Pursh, lay buried in one of the cemetery vaults,¹ a failure in the realisation of the original intention which was caused by the death of Dr. Barnston early in the spring of 1858, although some thirty-five dollars had already been subscribed toward the cost of a suitable monument.

In 1877 attention was once more drawn to the matter through the instrumentality of those who had been associated with the earlier attempt, and this time more strenuous efforts were made, not only to secure a suitable resting place, but to provide a monument as well.²

¹ In the *Daily Witness* of June 7th, 1877, an editorial directs attention to this great neglect, while an article in the same issue draws attention to the renewed efforts then being made, and gives in full, a sketch of the life of Pursh prepared twenty years previously by Dr. Barnston.

² An examination of some of the original documents connected with these efforts, kindly placed in my hands by Sir William Dawson, who was president of the Botanical Society at that time, shows that the original subscribers to the monument fund in 1857, included J. W. Dawson (afterwards Sir William Dawson), Dr. Sterry Hunt, George Shepherd, James Barnston, John G. Barnston, William Workman, Jr., and Rev. A. F. Kemp, all of whom contributed in equal amounts of one pound each. The committee entrusted with the responsibility of raising the necessary funds, consisted of Dr. Barnston and Mr. Shepherd. They issued the following circular, which may prove of interest, as showing the actual progress made up to the time of Dr. Barnston's death :

"Circular of the Botanical Society of Montreal, relative to a monument in memory of Frederic E. Pursh, the celebrated botanist.

" MONTREAL, Canada East, January, 1857.

"In the course of last spring the Botanical Society of Montreal became aware that Baron Pursh, the celebrated botanist, died in this city in 1820 and was interred in the old burying ground on Papineau Road. The society immediately felt its

Through the aid of the Natural History Society of Montreal, this was accomplished, the trustees of the Mount Royal Cemetery liberally contributing a lot in a retired and beautiful portion of the cemetery, where it may be seen by all who are interested in the work and sad ending of this most zealous scientist.¹ Pursh was the last of that interesting group of botanical explorers who, gaining a conception of our flora from the specimens transplanted to the gardens of the Old World, wished to extend their knowledge by a more intimate and practical examination of such a great wealth of vegetation on its own ground, and who thereby not only laid the foundations for the development of systematic botany on this continent, but placed all future botanists under obligations which they have been proud to acknowledge. To them our tributes of respect and grateful appreciation, constitute but a slight recognition of the great services they rendered.

One of the noteworthy local events of the period distinguished by the work of F. A. Michaux and Pursh, was the part taken by Dr. A. F. Holmes in advancing our knowledge of the flora of Montreal and its neighbourhood. Dr. Holmes was an enthusiastic botanist, an ardent collector, and a pioneer in the botanical work of this century. He began his studies of the flora of Montreal about 1820, and continued them, apparently, up to the date of his becoming a member of the Medical Faculty of McGill University—that is to say, 1820 is the earliest date appearing in his herbarium, while the latest date is 1825, the greater part of his work having been done in the years 1821 and 1822. Dr. Holmes became connected with McGill University in 1824, and in 1829 he became the first incumbent of the chair of botany in connection with the Faculty of Medicine. His herbarium was presented to the university in 1856, and constituted the nucleus of that now large and rapidly growing collection which has been developed during recent years. His plants

obligations to give tribute to so illustrious a name, and accordingly appointed a committee to transfer the remains to a new lot in Mount Royal Cemetery, purchased for that purpose, and to take steps to raise an adequate sum of money for the erection of a monument to his memory. The remains of Pursh now rest in Mount Royal Cemetery, and the committee take the liberty of soliciting the favour of your assistance in the efforts the society is now making to raise a suitable monument over his grave."

A recent visit to this monument, which is a plain granite obelisk rising from a square base, shows it to be in an excellent state of preservation. The inscription is as follows :

FREDERICK PURSH,
OBT. 1820, ÆT. 46.
ERECTED
BY MEMBERS OF THE
NATURAL HISTORY SOCIETY
OF MONTREAL,
1878.

¹ Can. Nat. N. Ser., ix., 187.

are in an excellent state of preservation, and well represent our local flora. According to a catalogue prepared by Dr. Barnston, who succeeded Dr. Papineau as professor of botany in McGill University in 1857, there are in all about 520 species of spermatophytes and pteridophytes. An inspection of this catalogue reveals many features of great historical interest, disclosing as it does, very striking changes not only in the flora of Montreal but in the growth of the city as well, together with the complete obliteration of localities which must have been remarkable for their vegetation.

Among those of whom there is but scant record, but whose unassuming work is deserving of notice, is the name of Titus Smith, of Halifax. From accessible accounts, it would seem that when a small boy, Smith displayed a taste for languages, and an intellectual capacity far beyond his years. The presentation of the works of Linnæus to his father by Governor John Wentworth, seems to have been the probable source of his taste for botanical science, which, from all accounts of him, he appears to have cultivated to some purpose. Mr. Smith enjoyed a very high local reputation, and although he was engaged in much work of a scientific nature, his very retiring disposition seems to have prevented him from publishing in the scientific journals of the day. Such contributions from his pen as were published always appeared without any signature in local papers. In 1801 he was instructed by the governor of the province to make a tour of the forest lands of Nova Scotia, and to prepare a report on the soil, situation of the lands, the species, quality and size of the timber, and also to make remarks on such objects of natural history as he considered of sufficient importance. The journal of this survey is preserved among the archives of Nova Scotia, and forms a thick folio volume. It contains a vast amount of information, particularly relating to the botany of the districts examined. The manuscript journal of another part of Smith's tour of the province, is preserved in the form of a well filled note book among the books bequeathed to the Nova Scotia Historical Society by the late Dr. T. B. Akins, and so far as at present known, none of this material has ever been published.

For a period of about forty years, or until about 1842, Mr. Smith's time was chiefly spent in making surveys of various parts of the province, so that he came to acquire a remarkably accurate knowledge of the natural history of the country, and for this he was noted. That his botanical knowledge was scientific and accurate, would seem to be implied by the fact that among his correspondents he counted Dr. Graham, of Edinburgh, F. André Michaux, J. C. Leredon, and others who were authorities in their day. And yet it is a singular fact that his name has been completely forgotten. It does not appear in any of the usual lists, and nowhere have I met with it in the descriptive works bearing on the flora of this continent. Hooker makes no mention of him in his *Flora*

Boreali, and we are brought to the conclusion that he belongs to that large number of early botanists who did most excellent work, but of whom there was no special record, and the remembrance of whom has disappeared with the generation to which they belonged.

Murdoch says of Smith that he was "Remarkable for the vast and varied information he acquired in botany, natural history, etc. With a familiar knowledge of most that nature and books could teach an inquiring mind, he united the unfeigned simplicity and kindness that rendered him an agreeable visitor as well in the families of our citizens as in the cottages of the most humble."¹

To these early years of the century belongs also the work of John Goldie. Our former knowledge of the work of this botanist has been recently enlarged by the publication of his diary for 1819² by his son James Goldie, of Guelph, Ontario, to whom I am indebted for a copy. Unfortunately this record, although of great interest and value, does not contain very many notes on the plants of the districts visited, but the preface contains interesting information respecting Mr. Goldie's work.

Mr. Goldie's earliest professional experience was in connection with the Botanic Gardens at Glasgow where, as a fellow-student he became acquainted with David Douglas, afterwards so well known in connection with the botany of the western portion of Canada. Later he was selected as the Government Botanist to the ill-fated Congo Expedition, but at the last moment was fortunately replaced through political influence. In 1817, at the instance of Mr. William Hooker (afterwards Sir Wm.), he sailed for America, where he spent two years in botanical explorations. During this time he made three separate shipments of plants to England, but none of these specimens were ever heard from again, and thus were the fruits of his labours destroyed. It was during this period that he discovered and described the fern (*Aspidium Goldianum*) which Hooker named after him, and the original description of which, together with an excellent figure, is appended to the diary.

Later Mr. Goldie collected for the St. Petersburg Gardens and was enabled to send many rare plants to England. During a second visit to Russia in 1830, he travelled extensively in Siberia. In 1844 he removed to Canada where he took up permanent residence, since which time he appears to have relinquished his interest in active botanical work.

From the time of the last published works of Pursh until 1830, in all about fifteen years, was a period distinguished by remarkable activity in Arctic exploration, beginning with the expedition of Barrow and ending with Parry. It was within this short period that the expeditions of Franklin, Ross and Richardson, of Beechy, Scoresby and Ross and Parry

¹ Hist. Nov. Scotia, III., 220.

² Dairy of a journey through Upper Canada and some of the New England States, 1819; Toronto, Wm. Tyrrell & Co., 1897.

were accomplished, and to them we chiefly owe our early knowledge of Arctic vegetation. The large amount of material gathered by these expeditions stimulated great scientific activity, and for the first time the names of W. J. and J. D. Hooker, as also of Robert Brown, became permanently connected with the history of Canadian Botany. In 1824, David Douglas, whose name survives in our well known Douglas fir (*Pseudotsuga Douglasii*) undertook a journey to the Northwest, and later to other parts of British North American possessions, a work which was destined to leave a marked impress upon the botany of the country.

In 1829, Bachelot de la Pylaie issued a work detailing the results of his observations upon the flora of Newfoundland and the adjacent islands, and to him we owe the first record of the occurrence of *Calluna vulgaris* in America.

Within the same period there was a somewhat remarkable advance in botanical science in the United States, the result of which was an important influence upon the progress of the science in Canada. In 1817 Amos Eaton issued the first manual of botany for North America, and in 1818 Nuttall published his *Genera of North American Plants*, to be followed in 1842 by his important supplement to the work of the younger Michaux on the *North American Sylva*. The year 1820 witnessed the issue of that notable work on the flora of North America by W. P. Barton, and this was almost immediately followed by important contributions from Dr. John Torrey on questions relating to the flora of the Great Lakes and the upper waters of the Mississippi, while in 1825 Schweinitz produced a monograph on the North American species of the genus *Carex*, accompanied in the same year by an account of his expedition to the source of the St. Peter's River, Lake Winnipeg and Lake of the Woods.

Following the expedition of Parry in 1828, there was a period of comparative inactivity, during which but little real progress appears to have been made—a period which was also one of comparative inactivity among American botanists. During the twenty years from 1830 to 1850, not a single Canadian botanist of note appeared, and it is to foreign botanists that we are wholly indebted for such advances as were made during that time. It was within this period that Rafinesque issued his *New Flora and Botany of North America*, and that Torrey and Gray brought out the first part of their *Flora of North America*. In 1845 Tuckermann's first *Enumeration of North American Lichens* appeared, to be followed in rapid succession by other works of the same kind, while in 1847 Sullivant published his first *Contributions to the Bryology and Hepaticology of North America*. All of these contributions, while dealing with the various subjects from the standpoint of the American botanist, were destined to produce a profound impression on Canadian botany, and it yet remains true that we are even now dependent upon

these works and their successors—more particularly those dealing with the mosses and lichens—for our general knowledge of the plants with which they deal.

This period was, nevertheless, notable for two events of more than ordinary significance. In 1836, the results already reached by Arctic exploration were then enlarged by the observations and collections obtained during the expedition of Sir George Back to the mouth of the Great Fish River. In these results we observe for the first time a serious attempt to extend the botanical work beyond the mere collection of plants, and in his phenological observations, especially those relating to the temperature of trees, Sir George Back indicated some of the more important directions in which such scientific work should be prosecuted.

In 1840 the *Flora Boreali Americana* made its appearance. In this very important work Sir William Hooker presented a complete summary of all the results derived from the numerous Arctic and other explorations which had taken place during the preceding thirty years. It was, therefore, at that time, a complete summary of our knowledge of the Canadian flora, and it represents for that time what has been accomplished more recently in a more extended, though different way, by Macoun's Catalogue. It is, in fact, one of the most important of the few landmarks which indicate the various steps in the progress of Canadian botany.

With the exception of Hooker and Back, this period is notable for the absence of local work and our almost complete dependence upon that of American investigators; and we thus find the names of Rafinesque, Gray, Torrey, Tuckermann and Sullivant standing forth with great prominence as exerting a dominant influence. The *New Flora of North America*, which Rafinesque issued in 1836, was intended to be an enlargement upon the work of his predecessors—that it should, in fact, supplant and be additional to all the botanical works hitherto published in North America and the United States.

Torrey had already contributed in important ways to a knowledge of our flora, but in the *Genera of North American Plants*, his studies of the *Cyperaceæ* and more particularly in his *Flora* which was issued as a joint work with Dr. Gray, he added very materially to our knowledge. Gray, who was later to exert an important influence upon Canadian botany through his numerous publications, was, during this period, brought into close sympathy with scientific progress in Canada not only through his joint work with Torrey, but through his later publication of the *Genera of North American Plants*.

To Tuckermann we are indebted for the first and most complete study of the *North American Lichens*, a work which extended from 1845 when his first enumeration appeared, until 1882, the date of the publication of his last efforts. Although Tuckermann's descriptions are usually so

involved in difficult phraseology as to make his meaning obscure to most students, his work was executed with the greatest care and fidelity, and it must necessarily stand as the basis of all future work in this direction.

Yet another new field of study was entered upon during this period by Sullivant who accomplished for Canadian botany in those earlier days what was later done by Lesquereux and James, and within recent years is being done by Kindberg. His accurate and painstaking work in Bryology, stands as a model of what such work should be, and must always secure to him an eminent place among Canadian botanists, as it has among those of the United States. The very valuable collections upon which these studies were based, now form an essential part of the Herbarium of Harvard University.

As already pointed out, the various botanical collections derived from the Arctic expeditions of Ross, Parry, Franklin and others, were chiefly described by Sir William Hooker. The material which thus gradually accumulated during a period of some twenty-five years, was at length to form the basis of the most important contribution to Canadian botany which had yet appeared. In 1840 Sir Wm. Hooker issued his well known *Flora Boreali* or the botany of the northern parts of British America. As we are informed by the little page, dedication and preface, this very noteworthy production was based upon the collections made during the expeditions of Sir John Franklin, by Dr. Richardson and Mr. Drummond under "circumstances of singular difficulty, hardship and danger. Unavoidable circumstances delayed the publication much beyond the intended time, an event, however, which was not without its advantages, since the accumulation of new material, particularly from the collections of Mr. Douglas, Mr. Tolmie and Dr. Gardner, permitted the description of many additional species, although the dimensions which the work thus attained finally necessitated leaving out of consideration the whole of the Cryptogams except the ferns and their allies, and in the exclusion of descriptions of plants already well known."

The title given to this work is in some sense misleading, since as explained by Sir Wm. Hooker himself, it was intended to include the work of all British naturalists "from the days of Newenham¹ and Menzies, to those of Beechy and the officers attached to the Hudson's Bay Company's Factories"; it therefore presents "the vegetation of all that portion of North America proper, which, commencing with the extreme Arctic islands, stretches south to the boundary, so far as it has been ascertained, of the United States and California."²

In his *Flora Boreali*, Sir William Hooker states that "the more densely inhabited parts of Canada have produced many native botanists,"³ and

¹ Rev. Can. Bot., Trans. R. Soc. Can., V. iv. 45.

² Flor. Bor. Amer. I. Pref. iv.; Hook., Bot. Misc. I. 92.

³ Flor. Bor. Amer. I. Pref. iv.

in another place¹ he apparently refers more specifically to them when he speaks of "botanical productions of Canada which have been received from the Lady Dalhousie, Mrs. Percival, Mr. Sheppard and Mr. Todd, etc.," and also refers to "plants of Newfoundland and Labrador, gathered by Dr. Morrison, who afterwards fell a victim to his courage and love of science in exploring Central Africa." To this list may also be added the name of Titus Smith, already referred to, and that of Garry, an officer in the employ of the Hudson's Bay Company, one whose name survives in Fort Garry, now Winnipeg, as also in *Quercus Garryana*, of Douglas. A careful search of the usual records fails to disclose any information concerning any of these botanists, who were evidently well known to Sir William Hooker. It seems probable, therefore, that owing to their work being wholly confined to collecting, and in the absence of published writings, their names have gradually fallen into neglect, and the part they played in the advancement of Canadian botany—important if obscure—cannot now be ascertained, and it is more than probable that there were many others, of whom all trace has been completely lost.

The year 1850 is noteworthy as marking the commencement of a period of exceptional activity in botanical research throughout the civilised world, and in this Canada participated, though not to the same extent as other parts of this continent. Nevertheless, our progress since that time has been due to native botanists in a far greater degree than formerly. It was at the commencement of this period that Dr. Barnston became known as a botanist of enterprise and ability, and one who would, had he lived, have taken an important part in the questions of the day.

It is to this period also that the late Abbé Brunet belongs. This scientist was well known to the leading botanists of his day, and to him we owe the foundation of the first botanical museum in the country. For many years the herbarium at Laval University took precedence over all others. The Abbé Brunet was also well known through several scientific papers, and his death in 1876 involved a distinct loss to the science he represented.

To the Abbé Provancher we are indebted for the first distinctively Canadian work on the vegetation of this portion of the continent, and his *Flore Canadienne* has continued to serve as an important guide to a knowledge of the flora of Quebec. In *Le Naturaliste Canadien*, l'Abbé Provancher also continued to work for the advancement of Canadian botany. During the later years of his life he was local secretary of the Botanical Club of Canada. By his death, in 1892, Canadian science suffered a severe loss, more particularly as he was one of the very few French naturalists among us.

¹ Hook. Bot. Misc., I. 92.

Few men resident in Canada have exerted a more marked influence upon the history of botanical progress in this country than the late Dr. George Lawson, of Halifax. His writings were numerous and valuable, and with one notable exception, were more numerous than those of any other Canadian botanist. He occupied important educational positions, first at Kingston, Ontario, and later at Halifax, Nova Scotia. It was through his instrumentality that the Botanical Society of Kingston was organized, and it was also due to his suggestion and energy that a serious attempt was made to establish a botanic garden at the same place.

Although it has not formed a part of my plan to refer particularly to the works of those who are yet among us, I cannot refrain from making an exception in one case, by reason of the very prominent position his work occupies in our recent progress. Until about 1850, no botanical work involving special research in some of the more difficult problems of the science had been undertaken here. All that had been accomplished was in the study of floras and the classification of plants in accordance with the then prevalent methods. About this time Dr. Dawson (afterwards Sir Wm.) had his attention drawn to the study of fossil plants, which he then took up with great enthusiasm, approaching the question from the standpoint of the more minute anatomy of the internal parts. This was the first attempt of the kind, not only in Canada, but also, probably, on this continent. The introduction of vegetable paleontology into the field of Canadian research marked a distinct era in the history of botanical progress here. Although Sir William's contributions chiefly relate to fossil plants, they include other papers of great importance, and they have now reached the astonishing total of 76,¹ a number just twice as great as that of the next most voluminous writer.²

We are all sensible of the important position which these contributions occupy in our literature, and I trust Sir William will not consider it out of place if I state that no other Canadian has ever exerted so profound an influence upon the history of Canadian botany, especially in its higher aspects.

Arctic expeditions have continued to contribute their share through the collections derived chiefly from those of Kane, Nares and Greely. Foreign botanists have also continued to exercise an important influence, more especially those of the United States, who have been so peculiarly situated as to make direct explorations to the north, or who, from their more special training and ability in the study of particular groups, have naturally been referred to as specialists. About the only English botanist

¹ This includes only those papers which are strictly botanical. The total given is probably much below the actual figure, since I am satisfied that it has been impossible to gain knowledge of the great number of widely distributed papers he has written.

² Dr. George Lawson.

whose name stands forth prominently in this later period is Sir J. D. Hooker, the worthy successor of Sir William Hooker. To him we are indebted for an extension of our knowledge of Arctic vegetation, his studies being based upon material collected during the expeditions of Richardson, Belcher and McClure, of McClintock and Nares, which latter, with the exception of the Greely expedition, was the last to add anything to our previous knowledge of the vegetation of these high latitudes.

Until 1850 no attempt had been made to enter upon a critical study of our marine vegetation. In 1852, however, under the auspices of the Smithsonian Institute at Washington, Harvey commenced to issue a series of studies of the Marine Algæ of North America, a work which was not completed until 1858. Although dealing largely with more southern forms, this work includes a number of species common to the Atlantic Coast of Canada, and it is therefore entitled to a place here. A more direct contribution to the marine flora of our coasts was made by the same author in 1862, being an account of Algæ collected by David Lyall at Vancouver's Island in 1859-61. Minor contributions to Canadian botany were made by Lyall in 1863, W. L. Lindsay in 1865, and by M. J. Berkely in 1875.

Among the American botanists who gained prominence in this period we first encounter the name of Boot, who, as an authority on the Carices, described those plants collected during the expedition of Sir John Richardson. Later, the well-known names of Eaton (D. C.) and Farlow appeared, and within very recent date we find the names of Ellis and Everhart as authorities upon a very extensive and difficult group of fungi. Canadian botany will always rest under the greatest obligations to Prof. C. S. Sargent for the highly important work he has accomplished in advancing our knowledge of that great forest-wealth which is so rapidly disappearing. In his contributions to the 10th Census of the United States on the Forestry of North America, he gave at once the most concise and authoritative work on the distribution of forest trees on this continent ever issued, and as a contribution to scientific and economic botany it must ever hold an important place. The superb *Sylva*, a voluminous work of twelve large volumes, now in course of publication, stands without a peer. It is a worthy compendium of the laborious and accurate work of botanists from the days of Michaux, Pursh and Nuttall to the present time. While it is perhaps a source of mortification to feel that the conditions of scientific progress here are such as to render works of this character practically impossible in Canada, it is also a source of great gratification to feel that the rich endowment of science which is so prominent a feature in the advancement of our neighbours to the south of the line, as also the cultivation of that generous spirit of brotherhood in science, a spirit which recognises no artificial limitations, permits us to share its advantages as if it were our own.

Botanic Gardens,

HALIFAX.

The earliest attempt to establish a botanic garden in Canada, of which there is any record, was made at Halifax, Nova Scotia. At the settlement of Halifax by Cornwallis in 1749, the whole rear portion of the town was set apart as common, to be devoted either to military purposes or the use of the town. In front, on what is known as Citadel Hill, the fortifications were built, while in the rear were marshes, used at that time as shooting ground. Gradually much of this land was reclaimed and converted into fields. About fifty or sixty years ago a number of men interested in the cultivation of fruits and flowers, obtained from the city a concession of several acres of this common which they fenced in, and for many years raised fruit, flowers and vegetables which were sold. An admission to the grounds was also charged. As the holders of this concession gradually passed away, the property became neglected and debts accumulated. Finally, about twenty-five years ago, two zealous flori culturists who were at that time members of the city council—John McCulloch and William Barron—proposed that the council should buy out the interests of the Horticultural Society, the members of which either surrendered their interests or sold them at a nominal rate. The city thus secured the entire property for a few thousand dollars, and at once added a large tract of the adjacent marsh land. This change was rendered possible largely through the generosity and influential representations of Michael Dwyer, Esq., a leading banker and commercial man of Halifax, and a member of the Horticultural Society, in whose hands the property had for so long remained. The garden comprises fifteen and one-half acres, and is diversified with ponds, water courses, arbors and shrubbery, and while no attempts are made to conduct scientific work, the general treatment is designed to promote a knowledge of trees and shrubs, and to some extent also of flowering herbaceous plants. Under the skilful management of the superintendent, Mr. Richard Power, the garden enjoys a wide reputation for beauty.

KINGSTON.

Among the objects specified in the constitution of the Botanical Society of Canada, we find it stated that "the Society shall seek to promote its objects by * * * experiments on the indigenous and domestic plants of Canada; the introduction and distribution of new plants and seeds adapted to the wants of the country; the encouragement of arboriculture, forest conservation, and the culture of fibre, dye, oil, food and medicinal plants, together with the publication of papers embodying the

results arrived at, and the information brought together by the above means. The ultimate establishment of a botanical and experimental garden shall be held in view as an important means of carrying out the Society's objects." ¹

This was the second attempt in Canada to found a botanic garden, a movement which had its origin at the hands of him who also founded the Botanical Society. Like the latter, it was short lived, and for the same reasons ceased to have existence at a time when active work had but fairly begun.

MONTREAL.²

Dating from the year 1850 various suggestions for and attempts to form a botanic garden in Montreal have been made, but it was not until 1885 that these efforts took practical shape, when, under legislative enactment an association was formed under the name of the Montreal Botanic Garden Association, the officers of which were Rev. R. W. Norman, chairman of the board of management; Prof. D. P. Penhallow, director, and H. S. Evans, secretary; these together with Dr. T. Sterry Hunt, Hon. Louis Beaubien and Alderman R. Holland, forming the board of management.³

The work of organization was actively prosecuted and plans for the necessary conservatories were secured. A very large amount of preliminary work was accomplished, and one report was issued.⁴ Private citizens were prepared to contribute largely to the maintenance and endowment of the gardens, but the ultimate failure of the city to grant the necessary land already promised, brought the work to an abrupt termination at the close of the second year's operations.

McGILL UNIVERSITY.

In 1890 a second attempt was made to establish a garden in Montreal. At that time McGill University, feeling that a garden was urgently needed in order to provide opportunities for practical study, secured by lease, a beautifully situated lot of nine acres at Côte des Neiges. To the plant-houses already situated there, the University added another for the special accommodation of the Australasian collection, which now forms a notable feature of the garden resources. The conservatories embrace a total ground area of 4,600 square feet, and com-

¹ Ann. Bot. Soc. Can. 1861, 9, 14.

² For an interesting historical account of the Gardens of Montreal, reference may be made to The Canadian Horticultural Magazine, vol. I, published by the Montreal Horticultural Society.

³ 10th Ann. Rept. Mont. Hist. Soc. 1884. 21.

⁴ 1st Ann. Rept. Mont. Botanical Garden Ass'n. 1886.

11th Ann. Report Mont. Hist. Soc. 1885. 133.

prise three temperate houses and one mixed stove house. The collection includes a large representation of type groups suited to purposes of instruction, and an especially valuable collection of Australasian plants chiefly derived from donations by the late Baron Von Mueller of Melbourne.

The garden proper contains a large representation of plants, and affords invaluable resources in conjunction with the conservatories, for the prosecution of practical studies. About 275 students annually receive the benefits of the advantages thus offered. The gardens are open to the public daily without charge, and students are supplied with special tickets which secure to them the use of such material as they may require for independent study.

OTTAWA.

When the Central Experimental Farm at Ottawa was established in 1887, the plans contemplated the formation of an arboretum and botanic garden, with the object of bringing together all the native species of plants, and also of testing the hardiness and adaptability to the climate of Ottawa, of shrubs and trees growing in northern climates in other parts of the world.

The actual work of the garden was begun in 1889, when 210 species were planted. The direct management, at first in the hands of the entomologist and botanist, Dr. Fletcher, was later transferred to Mr. W. T. Macoun. In 1894 the arboretum and garden included 1,000 trees and nearly 200 species and varieties of herbaceous plants, while the close of the year 1895 saw these numbers raised to 1,800 and 1,000 respectively.

Supplementary gardens are also established at each of the experimental farms for the several provinces, which serve an important purpose in solving questions of a local character and as local centres of distribution.

Botanical Societies.

MONTREAL.

So far as can be learned, only three attempts to found botanical societies in Canada have been made. The first two founded were very short lived, while the third and most recently organized, is altogether too young to admit of any reasonable forecast as to its future career and usefulness.

The first of these societies was founded on the 28th of March, 1855, and was known as the Botanical Society of Montreal, an organization which largely owed its existence to the enthusiasm and energy of Dr.

James Barnston, whose untimely death early in the spring of 1858 brought its short but active career to an abrupt termination.¹

One of the very few mementoes of the society is to be found in an occasional copy of the "Objects and Constitution of the Botanical Society of Montreal," issued in small pamphlet form. From this we learn that although the society was instituted in 1855, it was nearly a year later before a constitution was adopted. Under it, Principal (now Sir William) Dawson was the first and probably the only president, the other offices being filled by Dr. T. Sterry Hunt, John G. Barnston, Dr. James Barnston, Rev. A. F. Kemp, David A. Poe, George Shepherd and — Bergholts. The society left little record of its work. Two papers read before it by George Barnston and Rev. A. F. Kemp appear to summarise the full extent of its work in this direction.² As indicated by the constitution, however, one object of the society was the building up of "a complete herbarium of the native plants of Canada, and the collection of the various vegetable products of the country." This object appears to have been realized only with respect to the first part, and the few hundred plants thus brought together were deposited in the museum of the Natural History Society of Montreal, where they may now be found.

KINGSTON.

"Towards the latter end of November, 1860, a proposal was made to organize a botanical society. There being no such institution in operation in Canada, it was thought that much benefit might result from its establishment." Such are the terms in which a description of the origin of the second botanical society to be founded in Canada, finds its introduction. The Botanical Society of Canada, having its headquarters at Queen's College, Kingston, owed its origin to the energy and ability of the late Dr. George Lawson, who was at that time professor of botany at Queen's, and who was destined at a later date to found the Botanical Club of Canada. In consequence of wholly unforeseen circumstances which involved the removal of Dr. Lawson to Halifax, the society came to an abrupt termination within one year. Nevertheless, in the very short period of its existence, it displayed great vigour and gave promise of a most useful career. It published one volume of Annals of 108 pages, from the contents of which we observe that the society was not only able to collect much valuable material, but that it had enlisted the sympathy and active co-operation of a large number of the leading botanists of Europe and America.

¹ Can. Nat. III. 224. Can. Nat., New Ser., IX. 187.

² Can. Nat. II. 12, 145.

BOTANICAL CLUB.

At the meeting of the Royal Society of Canada, held at Montreal in 1891, Dr. George Lawson, of Halifax, introduced to the fourth section a question relative to the expediency of establishing a botanical society for the whole Dominion. Upon the report of a special committee, the section adopted a resolution favouring the organization of such an association to be affiliated with the Royal Society on the same terms as other societies. It was thus that the Botanical Club of Canada came into existence, with Dr. Lawson as its first president and Dr. A. H. MacKay, of Halifax, as its secretary. The scheme of organization contemplated the appointment of a secretary for each province, by whom the work would be distributed through the medium of local secretaries in such districts as would warrant their appointment.

The annual report for 1895 shows that in the three years of its existence, the club has accomplished a large amount of good work, and that its usefulness is growing year by year. The membership at the present time numbers 201, and is steadily increasing. The work of the club is largely directed toward stimulating an interest in the study of botany among the pupils of the various schools throughout the country, and to this end both encouragement and assistance are given in the study of various local floras, and in the formation of herbaria. Plants requiring determination are sent to the secretary of each province, or to Prof. Macoun at Ottawa, who has kindly undertaken to do a large share of this work. Apart from this purely educational work, the club has also undertaken a series of phænological observations, which will continue for a long series of years, and which in course of time must prove of great scientific value.

Scientific Societies.

In addition to those societies which are designed primarily or wholly for the cultivation of botanical science, we find a number of others which include botany among the various subjects with which they deal. The most important of these are the New Brunswick Natural History Society; The Ottawa Field Naturalists' Club; The Hamilton Association for the Promotion of Science, Literature and Art; The Nova Scotia Institute of Science; The Canadian Institute; The Natural History Society of British Columbia. All of these societies have exerted an important influence in the development of Canadian botany, and their publications contain many valuable contributions to this subject, notably those of the Ottawa Field Naturalists' Club; The Natural History Society of Montreal; and the New Brunswick Natural History

Society, and we may therefore look to these publications as authentic sources of the history of botanical progress for the several provinces.

Botanical Collections.

One of the best indications of the position attained by botanical science in any country is to be found in the extent and character of the collections, more especially of the herbaria, since these at once represent the extent to which the science has been made a living one. Although it is impossible to make any correct comparison as to the relative importance of an efficient working library and extensive collections, since each is of the very first importance, and both are absolutely essential in the life of any institution where biological science is made a living force, it is undoubtedly safe to say that in its relation to the public at large, a thoroughly equipped botanical museum in which plants and plant products in their multitudinous forms, as applied to the various wants of man, whether in art, science or industrial processes, are displayed in their proper relations, is an educational factor of the greatest value, offering as it must opportunities for the extension of knowledge along the lines of least resistance. It is an appreciation of this fact which has led to the gradual upbuilding of all the great botanical collections of the world, and in any comprehensive survey of botanical progress they must be taken into consideration.

GEOLOGICAL SURVEY.

The most extensive herbarium in Canada is that of the Geological Survey at Ottawa. This collection had its origin in 1860, when Prof. Macoun commenced systematic collections in various parts of Ontario, and opened exchanges with several of the leading systematic botanists of the United States. At the time of the Centennial Exposition at Philadelphia in 1876, these collections had grown to such dimensions that a large and representative herbarium of specimens from various parts of Canada was exhibited, and afterwards deposited in the herbarium of McGill College. A second collection was exhibited at Paris in 1878, and later deposited in the herbarium at Kew. By 1882 the collections of Canadian plants had become so extensive that the Government was led to purchase it for use in connection with the work of the Geological Survey, and its former owner was appointed as curator.

Since then the herbarium has experienced a rapid growth both by the collection of native species and the acquisition of foreign species through the medium of exchange. It embraces practically all known Canadian species, as well as a very large representation from the United States. Natal, East Africa and Australia are represented by valuable

collections. Through the kind assistance of Dr. Warming of Copenhagen, Prof. Blytt of Christiania, and Dr. Kindberg of Linköping, a very nearly complete series representing the flora of Northern Europe has been obtained.

One of the most important features of the herbarium is a series of plants collected by the earlier explorers, and representative of nearly all the plants described in Hooker's *Flora Boreali Americana*. This very important addition was made through the courtesy of the Director of the British Museum of Natural History. The herbarium, as now constituted, embraces 70,000 sheets.

MCGILL UNIVERSITY.

The foundation of the McGill College Herbarium was laid in the gift of the collections of Dr. A. F. Holmes, the first professor of botany in the Medical Faculty. Subsequently, under the direction of Sir William Dawson, a number of additions were made, chiefly as derived from students' collections. In 1876 Prof. Macoun deposited his centennial collection with the College, and it has lately been incorporated with the University herbarium, to which it was donated by the Geological Survey. In 1883 the material thus brought together was properly mounted and systematically arranged, and since that date extensive additions have been made both by gift and by purchase. These additions are representative of Australasia, India, Japan, South Africa, South America, and Northern Europe. The collection now embraces about 30,000 specimens.

The economic collection includes an important group of plant products chiefly from India, comprising dyes, foods and textiles, and specimens illustrating nearly all the Canadian timber trees, as well as many of those of the United States.

In addition there is a special collection embracing all known species of North American trees and shrubs, prepared for special research work, and represented by (*a*) hand specimens, (*b*) microscopical preparations and (*c*) sections prepared for the microscope, but kept in bulk. These preparations constitute the type material employed by Prof. Penhallow in the prosecution of special researches connected with a classification of woody plants.

LAVAL UNIVERSITY.

The herbarium of Laval University at Quebec is the oldest in Canada, having been formed by the late Abbé Brunet in 1860, during his occupation of the chair of botany. "The Canadian plants which the herbarium now contains were gathered for the most part by himself, and are the

fruit of twelve years of earnest work." ¹ The plan of Abbé Brunet included the formation of a general botanical museum, which now comprises ²:

"1° Une collection de bois canadiens employés dans l'industrie et ayant une valeur commerciale.

"2° Plusieurs collections de bois préparées spécialement pour l'étude. La principale est celle de nos végétaux ligneux indigènes, qui est une des plus complètes de l'université.

"3° Plusieurs collections de bois exotiques: entre autres, une collection très remarquable des bois de commerce qui se vendent sur les marchés d'Angleterre.

"4° Une collection de fruits artificiels d'une rare beauté, auxquels on peut rapporter les nombreuses variétés de pommes, poires, prunes, pêches, etc.

"5° Une collection de champignons artificiels, comprenant les champignons comestibles, les champignons suspects et les champignons vénéneux.

"La dernière salle contient l'herbier, ou plutôt la collection des herbiers de provenances diverses, tous authentiques, qui composent 1° l'herbier Américain (plantes du Canada et des Etats-Unis); 2° l'herbier général. L'herbier Américain se compose des collections de C. C. Parry, E. Hall et J. B. Harbour, de Chs. S. Geyer, de N. Rield, de Leidenberg, de M. Vincent, plus un grand nombre d'échantillons fournis par Moser, Smith et Durand. Plusieurs plantes sont étiquetées de la main même de Nuttall et de Rafinesque.

"Les plantes du Canada ont été recueillies en grande partie par l'abbé O. Brunet. Les individus douteux ont été comparés à ceux de l'herbier de Michaux à Paris, et de Sir W. Hooker, à Kew. D'autres ont été nommés par M. Asa Gray, le Dr. Engelmann et autres botanistes de renom.

"L'herbier de l'université contient plus de 10,000 plantes. Il s'est enrichi dernièrement d'un bon nombre d'échantillons donnés par M. N. St. Cyr, curateur du musée de l'Instruction Publique, et par M. le Dr. Macoun, F. R. S. C., de la Commission Géologique Canadienne. Ces dernières espèces viennent toutes du Nord-Ouest Canadien et présentent par conséquent un intérêt tout particulier.

"Pour avoir une idée plus complète des richesses de ce musée, il faudrait y ajouter une collection des bois de la Nouvelle-Zélande, une autre des bois de commerce du Nord-Ouest et de la Colombie-Anglaise, enfin toute une série de types intéressants, destinée à illustrer un grand nombre de cas de développements anormaux de nos tiges ligneuses, de greffes naturelles, de maladies ou de parasitisme végétal."

¹ Can. Rec. Sec. III., 496.

² Ann. de L'Univ. Laval, 1896-97, 95.

UNIVERSITY OF NEW BRUNSWICK.

At the University of New Brunswick, Fredericton, Prof. Bailey reports that there are about one thousand herbarium specimens, in addition to which there are collections of native woods, seeds and fruits. These collections represent material brought together first by Dr. James Robb, but subsequently greatly added to by Dr. Bailey's own efforts, as well as by purchase and donation.

QUEEN'S UNIVERSITY.

Prof. W. J. Fowler informs me that the herbarium under his care includes about 13,500 species, represented by about 25,000 specimens.¹

KING'S COLLEGE.

The botanical collections of the University of King's College, Windsor, Nova Scotia, are represented by a herbarium containing about 2,000 specimens. There is no special arrangement, but the plants are distributed among several small collections of indigenous and foreign species, the largest individual collection being the Cogswell Herbarium of plants from Great Britain, embracing about 1,000 specimens.

In this presentation no attempt has been made to obtain statistics of private herbaria, of which there are many, some of very considerable importance, and it would be a very decided service to Canadian botany if a reliable list, showing their size, location and special features, were to be prepared. A summary of the herbaria of the various institutions of learning as far as heard from, is as follows :

University of New Brunswick.....	1,000
King's College, Nova Scotia.....	2,000
Laval University, Quebec.....	10,000
Queen's University, Kingston.....	10,600
McGill University, Montreal.....	30,000
Geological Survey, Ottawa.....	70,000

Summary.

As we now look back over the three hundred and thirty-seven years that have passed since Thevet published his account of "The New Founde World," we are naturally led to ask what great movements are to be noted in the development of botanical science here, movements which are purely local in character and origin? Until the close of the eighteenth century but few events stand forth with special prominence. The visit of Diéreville to Nova Scotia in 1706 resulted in the conveyance

¹ Of these, the majority are the private property of Prof. Fowler, so that the University collection is reduced to about 10,600.

to France of very important collections upon which Tournefort based his descriptions of many Canadian species. To the missionaries—Hennepin, who preserved the records of the ill-fated expedition of La Salle, Charlevoix, whose statements of fact are to be taken only after careful scrutiny, and Lafitau, who is chiefly notable for his having brought ginseng into great commercial prominence—we are certainly indebted for some of the most extended accounts of the vegetation of Canada during that early period. But the work which commands special consideration on account of its being the first distinctively devoted to the botany of this country, is the "History of Canadian Plants," published by Cornuti in 1635.

A century later the physicians Sarrasin and Gauthier, attached to the Court at Quebec, performed important services to botanical science, and their names have been perpetuated in the genera *Sarracenia* and *Gaultheria*.

The explorations of Kalm and Michaux, as also of Menzies, greatly enriched our knowledge, but such expeditions as that of Mackenzie in 1789, from which much should have been obtained, were barren of results.

It would thus appear that with the exception of Sarrasin and Gauthier, who were actually in residence and who died here, and also the missionaries Hennepin, Charlevoix and Lafitau, there was no advancement in botanical knowledge from internal sources. And while their work was valuable, it was not extended, and cannot be said to have made any very profound impression upon the development of the science.

The results attained by Kalm and Michaux, as also by Diéreville and Menzies, all had their origin in, and were phases of the development of botanical science in Europe. The same is also true of Cornuti's work. Nevertheless, since the latter, together with Michaux's *Flora Boreali*, are the two works which stand out with greatest prominence, as making a distinct impression upon the development of Canadian botany prior to 1800, they may freely be regarded as the land marks of the science in the earlier colonial period, the one for the middle of the seventeenth, the other forming a fitting close to the eighteenth century.

The great land marks of the present century are to be found first in that very noteworthy production by Sir William Hooker, "*The Flora Boreali Americana*." Although for excellent reasons this work fell far short of the original design, it stands to-day as the best and only work of its kind on the plants which belong distinctively to this part of North America. Being based, as the descriptions are, upon material collected by the various Arctic expeditions, by British naturalists on special missions, and by officers of the Hudson's Bay Company, it stands as an epitome of all those labours which have accomplished so much in the advancement of Canadian botany, but which were, nevertheless, side issues in the development of European botany.

The introduction of paleobotany by Sir William Dawson opened up entirely new fields of research, and has led to results of the highest value respecting our knowledge of the vegetation which flourished in earlier periods of the earth's history. Within recent years, the work accomplished by the Geological Survey as embodied in Prof. Macoun's catalogue, has added immensely to our knowledge of distribution, and it has also brought to light many new species. The significance of this work cannot be properly estimated at this time, for although its value in relation to future systematic studies is well understood, it is impossible to measure the bearing which it must have in time to come, upon the geological relations of plants. Both of these events, therefore, significant as they are, and peculiarly indigenous in their origin and growth, must be regarded as the two great land marks of this century.

As we survey the present position of botanical science in Canada, we cannot feel that either actually or relatively it offers very much for congratulation, a view which is not only justified by the facts as they exist, but one which is also enforced by the conviction that an undue satisfaction with existing conditions, is ample guarantee that the future holds no betterment in view. Our universities are yet doing in large measure what more properly belongs to the high schools, and with one or two exceptions, no attempt is made to carry on the higher work of the science. Of research work comparatively little has been done, that which has been so far accomplished being confined to one or two universities and conducted for the most part under great difficulties. This condition is the necessary result of the fact that in only two of our higher institutions have laboratories for the prosecution of advanced work been established, and our students who wish to engage in the higher problems of the science are, in most cases, compelled to go elsewhere where there are more ample facilities. Botanic gardens have been projected, but in most cases have failed to survive a very brief existence. The garden established at Ottawa under Government patronage and control, seems destined to have a permanent and useful career. The garden of McGill University—established after many years of hard labour, and maintained in the face of great obstacles, is accomplishing an important educational work.

Of botanical societies we have only one, the two attempts made in former years having been abandoned in each case at the end of one year.

Economic questions of broad application and great material importance have as yet taken but little hold either upon the scientific or the political section of the community. In Europe great care is bestowed upon the forests; special schools are maintained for the purpose of securing a scientific training to those who are to have the oversight of this great source of national wealth, and a large and efficient corps of foresters is maintained for this purpose. In the United States the same

question is now seriously engaging the attention of Government, and large sums of money are expended in the prosecution of scientific research bearing upon the preservation of forest lands and the economic application of timber.

Enormous sums of money are annually involved in the destruction of crops by the operation of disease and parasitic growths, and in the investigation of their causes and prevention, the United States Government wisely expends much effort and money. At the present time pathology forms a leading feature in the work of the various experiment stations throughout the United States. Although the Experimental Farm at Ottawa is doing important work in this direction, questions of this kind have, as yet, taken no serious hold with us.

It is therefore clear that so long as we are content with present conditions, we must be satisfied to occupy a secondary position, and continue to be dependent upon others for much that should be reckoned among our common resources.

While, therefore, the immediate future of Canadian botanical science does not seem to offer the brilliant prospect which we all desire, we may hope for much better things than the past has revealed. It is to our universities that we turn in the hope that they may, at an early date, appreciate the need of supplying laboratories for research with all the necessary resources to be found in ample herbaria, gardens and libraries, and thus retain within our own borders those students who are now compelled to seek the advantages they desire in foreign institutions.

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Bib. : Pritz. Thes. Bot. Lit., 6; Proc. Am. Acad., IV., 50; Can. Nat. III., 311; R. Soc. Cat. Sc. Papers, I., 65.

BACHELOT DE LA PYLAIE, AUGUSTE JEAN MARIE.

B., Marseilles, France, May 25th, 1786 ; d., Marseilles, 1856.
Calluna vulgaris probably first observed in Canada by him.

8. Flore de l'Isle de Terre-Neuve et des Isles St. Pierre et Miclon. Paris, 1829.
Ann. Sci. Nat., IV., 174. 1824.
Bib. : Pritz. Thes. Bot. Lit., II. ; Cassell's Biog. Dict., 190; Can. Nat. N. Ser., I., 459.

BACK, SIR GEORGE.

B., Stockport, Eng., Nov. 6th, 1796 ; d., London, June 23rd, 1878.

9. Narrative of the Arctic Land Expedition to the mouth of the Great Fish River. London, 1836.
It contains (a) Temperature of Trees. App. VI., 590.
(b) List of Plants as determined by Sir W. J. Hooker.
App. II., 523.
Bib. : Cent. Dict. of Names ; R. Soc. Cat., I., 146 ; Dict. Nat. Biog. II., 318.

¹ This list extends from 1800 to 1895 only. In a few exceptional cases, where there seemed to be a special reason for so doing, a few later cases have been included.

BAILEY, LORING WOART.

B., West Point, N. Y., Sept. 28th, 1839.

Prof. Chemistry and Natural History, Univ. of New Brunswick,
Fredericton, N. B.

10. Notes on the Diatomaceæ from the St. John River.
Can. Nat., VIII., 92.
11. Notes on the Geology and Botany of New Brunswick.
Can. Nat., N. Ser., I., 81.
12. Woods and Minerals of New Brunswick, being a descriptive catalogue prepared for use at the Philadelphia Exhibition, by L. W. Bailey and Edward Jack. Fredericton, 1876.
13. Elementary Natural History, with special reference to the Minerals, Plants and Animals of New Brunswick. St. John, 1887.
14. Desmids and Diatoms.
Amer. Nat., I., 505-587.
Bib. : R. Soc. Can., XII., 5 ; Bib. Canadensis, Morgan, 1867, 16.

BALL, REV. EDWARD H.

B., England, 1843.

15. Indigenous Ferns of Nova Scotia.
Proc. N. S. Inst. Nat. Sc., IV., 146, V., 13.

BARNSTON, GEORGE.

B., Edinburgh, Scotland ; d., Montreal, Canada, March 14th, 1883.

16. Remarks upon the Geographical Distribution of the Order Ranunculaceæ throughout the British Possessions of North America.
Can. Nat. II., 12.
17. Remarks on the Geographical Distribution of the Cruciferae throughout the British Possessions of North America.
Can. Nat., IV., 1.
18. On a collection of Plants from British Columbia, made by Mr. James Richardson in the summer of 1874.
Can. Nat., N. S., VIII., 90.
19. Geographical Distribution of the Genus Allium in British North America.
Can. Nat., IV., 116.
20. Sketch of the Life of David Douglas.
Can. Nat., V., 120, 200, 267, 329.
21. Observations on the Progress of the Seasons as affecting Animals and Vegetables at Martin's Falls, Albany River, Hudson's Bay.
Edin. New Phil. Jn'l, XXX., 252.
Bib. : Can. Nat., N. Ser., X., 467 ; R. Soc. Cat.

BARNSTON, JAMES.

B., Norway House, Hudson's Bay Territory, July 3rd, 1831 ; d.,
Montreal, Canada, May 20th, 1858.

22. General Remarks on the Study of Nature, with special reference to Botany.
Can. Nat., II., 34.
23. Hints to Young Botanists regarding the Collection, Naming and Preserving of Plants.
Can. Nat., II., 127.
24. Introductory Lecture to the Course on Botany, delivered before the Students of Arts and Medicine, McGill University, Session 1857.
Can. Nat. II., 335.
25. Catalogue of Canadian Plants in the Holmes Herbarium in the Cabinet of the University of McGill College.
Can. Nat., IV., 101.
Bib. : Can. Nat. III., 224 ; R. Soc. Cat.

BARROW, SIR JOHN, BART.

B., 1764; d., 1848.

26. Voyage into the Arctic Regions. London, 1818.

Bib. : Pritz. Thes. Bot. Lit., 471; Appleton's Cyc. Biog., 78.

BARTON, BENJAMIN SMITH.

B., Lancaster, Pa., Feb. 10th, 1766; d., Philadelphia, Dec. 19, 1815.
Bartonia of Wildenow.

27. Geographical View of the Trees of North America between latitudes 71 and 25, with plates. Philadelphia, 1809.

Bib. : Pritz. Thes. Bot. Lit., 1872, 15; App. Cyc. of Biog., 79; Cent. Cyc. of Names, 125; R. Soc. Cat., I., 199; Proc. Amer. Phil. Soc., Phila., 1744-1838, 327, 342, 362, 459; Trans. Amer. Phil. Soc., Phila., I, XVIII.

BARTON, WILLIAM PAUL CRILLON.

B., Philadelphia, Pa., Nov. 17th, 1786; d., Philadelphia, Feb. 29th, 1856.

28. Flora of North America.

3 Vols., ill. Philadelphia, 1820-1823.

Bib. : Pritz. Thes. Bot. Lit., 1872, 15; Cent. Cyc. of Names, 125; R. Soc. Cat., Sc. Papers, I., 200.

BELL, JOHN.

29. The Plants of the West Coast of Newfoundland.

Can. Nat., N. Ser., V., 54, IV., 256.

BELL, ROBERT.

B., Toronto, Canada, June 3rd, 1841.

Assistant Director Geological Survey of Canada.

30. The Natural History of the Lower St. Lawrence, the Saguenay and Lake St. John.

Geol. Surv. of Canada, 1857.

31. Catalogue, with notes, of Animals and Plants collected on the Southeast Side of the St. Lawrence from Quebec to Gaspé.

Geol. Surv. of Canada, 1858.

32. The Northern Limits of the principal Forest Trees of Canada east of the Rocky Mountains, with map of distribution.

Geol. Surv. of Canada, 1879-80.

33. On the Natural History of the Gulf of St. Lawrence.

Can. Nat., IV., 241.

34. The Forests of Canada.

Can. Rec. Sc., II., 65.

35. Catalogue of Plants collected on the South and East Shores of Lake Superior, and on the North Shore of Lake Huron.

Ann. Bot. Soc. Can., Kingston, 1861.

36. The Trees and Shrubs growing around Lakes Superior and Huron.

Ann. Bot. Soc. Can., Kingston, 1861.

Bib. : Trans. R. Soc. Can., XII., 8.

BERKELEY, MILES JOSEPH.

B., Biggin, Northamptonshire, England, April 1st, 1803; d., Sibbestoft, England, July 30th, 1889.

37. Notices of North American Fungi.

Grevillea, I., IV.

38. Enumeration of the Fungi collected during the Arctic Expedition of 1875-76.

Jn'l Lin. Soc., XVII., 13.

39. Contributions to North American Fungi.

Ann. and Mag. Nat. Hist., 2, XII., 417; 3, IV., 284.

Bib.: Pritz. Thes. Bot. Lit., 1872, 24; Jackson, 521; Jn'l Bot., 1889, 305; Scott's Nat. Biog., 1889, 145; R. Soc. Cat., I., 295; VII., 144; IX., 200; Ann. Bot., III., 451; Biog. Ind. Brit. and Irish Bot., 15.

BILLINGS, B.

40. A List of Indigenous Plants found growing in the neighbourhood of Prescott, C.W.

Can. Nat., III., 39; V., 14; Trans. Bot. Soc. Can., Kingston, 1861.

Bib.: Bib. Canadensis, Morgan, 1867, 31.

BONNET, E.

41. Florule des îles Saint Pierre et Miquelon.

Jnl. de Bot., I., 1888.

Bib.: Can. Rec. Sc., VII., 6.

BOOT, FRANCIS.

B., Boston, Mass., April 26th, 1792; d., England, Dec. 25th, 1863.
Genus *Bootia* of Wallich.

42. Table of Distribution of Carices in Journal of a Boat Voyage through Rupert's Land by Sir John Richardson, C.B., F.R.S.

London, 1851, II., 344.

Bib.: Pritz. Thes. Bot. Lit., 1872, 35; Jackson, 524; Proc. Lin. Soc., XXIII.; Gard. Chron., 1864, 51; Dict. Nat. Biog., V. 393; Biog. Ind., Brit. and Irish Bot., 1893; Amer. Jn'l. Sc., XXXVII., 288.

BRAITHWAITE, R.

43. On the Organization of Mosses.

Can. Nat., N. Ser., III., 462.

BRITTON, NATHANIEL LORD.

B., Staten Island, New York, Jan. 15th 1859. Director-in-Chief, New York Botanical Garden.

44. An Illustrated Flora of the Northern United States, Canada and the British Possessions from Newfoundland to the parallel of the Southern Boundary of Virginia, and from the Atlantic Ocean westward to the 102nd meridian.

Vol. I., 1896. (With Addison Brown.)

BROWN, ROBERT.

B., Montrose, Scotland, Dec. 21st, 1773; d., London, England, June 12th, 1858.

The discoverer of the so-called Brownian movement.

45. Flora der Melville Insel.

Flora, 1824, VII., 65-135.

46. General View of the Botany of the Vicinity of Swan River, 1830.

Jn'l Geol. Soc., 1832, I., 17-20.

47. List of Plants collected on the Coasts of Baffin's Bay and at Possession Bay. London, 1819.

48. Extracts from Dr. Richardson's Botanical Appendix to the Narrative of a Journey to the Shores of the Polar Seas by Captain John Franklin. London, 1823.

49. *Chloris Melvilliana*. A List of Plants collected at Melville Island in the year 1820, by the Officers of the Voyage of Discovery under orders of Captain Parry. London, 1823-24.

Bib.: Pritz. Thes. Bot. Lit., 1872, 43; Can. Nat., III., 306; R. Soc. Cat., I., 660; Amer. Jn'l Sc., XXVI., 279; Biog. Ind., British and Irish Bot., 1893; Cent. Cyc. Names, 187.

BRUNET, L'ABBÉ LOUIS OVIDE.

B., Quebec, March 10th, 1826 ; d., Quebec, Oct. 2nd, 1876.

50. Catalogue des plantes Canadiennes, contenues dans l'herbier de l'Université Laval. Quebec, 1865.
51. Énumération des genres de plantes de la Flore du Canada. Quebec, 1864.
52. Catalogue des végétaux ligneux du Canada. Paris, 1857 ; Quebec, 1867.
53. Histoire des Picea qui se rencontre dans les limites du Canada.
Can. Nat. N. Ser., III., 102.
54. Notes sur les plantes recueillies en 1859 par L'Abbé Ferland sur les Côtes du Labrador. Quebec, 18—.
55. Voyage d'André Michaux au Canada. Quebec, 1864.
Translated by Dr. T. Sterry Hunt.
Can. Nat. N. Ser., I., 325.
Bib. : Pritz. Thes. Bot. Lit., 1872, 45 ; Ann. L'Univ. Laval, 1877-78, 43 ;
Can. Rec. Sc., III., 495 ; Tanguay's Dict. Gen., 502 ; Bib. Canadensis, Morgan, 1867, 53.

BURGESS, THOMAS JOSEPH WORKMAN.

B., Toronto, Canada, March 11th, 1849.

Superintendent Protestant Hospital for the Insane, Verdun, Quebec.

56. Canadian Filicineæ, by J. Macoun and T. J. W. Burgess, M.D.
Trans. R. Soc. Can., II., iv., 163.
57. Recent additions to Canadian Filicineæ, with new Stations for some of the species previously recorded.
Trans. R. Soc. Can., IV., iv., 9.
58. Notes on the Genus Rhus.
Jn'l and Proc. Hamilton Ass'n, 1891-92.
59. Botanical Notes from Canada.
Bot. Gazette, VII.
60. A Botanical Holiday in Nova Scotia.
Bot. Gazette, IX.
61. Aspidium oreopteris.
Bot. Gazette, XI.
62. How to Study Botany.
Jn'l and Proc. Hamilton Ass'n, 1887.
63. Orchids.
Jn'l and Proc. Hamilton Ass'n, 1887.
64. Notes on the Flora of the 49th Parallel from Lake of the Woods to the Rocky Mountains.
Jn'l and Proc. Hamilton Ass'n, 1887-88.
65. The Lake Erie Shore as a Botanising Ground.
Jn'l and Proc. Hamilton Assoc., 1888-89.
66. Notes on the History of Botany.
Jn'l and Proc. Hamilton Assoc., 1889-90.
67. Ophioglossaceæ and Ferns.
Cat. Can. Plants, Macoun, Part V., 1890, 253.
Bib. : Trans. R. Soc. Can., XII., 19.

CAMPBELL, REV. ROBERT.

B., Drummond, Ontario, June 21st, 1835.

Minister, St. Gabriel Presbyterian Church, Montreal.

68. Some of the Rarer Summer Flowers of Canada.
Can. Rec. Sci., VI., 342.
69. The Flora of Cap à l'Aigle, P.Q.
Can. Rec. Sc., IV., 54.

70. Specimens of British Wild Flowers in July and August.
Can. Rec. Sc., IV., 309.
71. Supplemental Notes on the Flora of Cap à l'Aigle.
Can. Rec. Sc., V., 38.
72. The Flora of Montreal Island.
Can. Rec. Sc., V., 208.
73. Changes in the Flora of Montreal Island.
Can. Rec. Sc., V., 294.
74. Additional Notes on the Flora of Montreal Island.
Can. Rec. Sc., VI., 397.
- CARDOT, J.
(———, E. Delamere and F. Renauld.)
75. Flora Miquelonensis, 1888.
Bib. : Can. Rec. Sc., VII., 6.
- COCHRAN, WILLIAM.
B., Ireland, 1745; d., Windsor, N.S., Aug. 4th, 1833.
76. List of Plants in "An Historical and Statistical Account of Nova Scotia,"
by T. C. Haliburton, II., 405.
Bib. : Bib. Canadensis, Morgan, 1867, 78.
- CORMACK, W. E.
77. Account of a Journey across the Island of Newfoundland.
Edin. Phil. Jn'l, 1824, X., 156.
Ann. des Sci. Nat., 1824, I., 433.
78. Journey in Search of the Red Indians in Newfoundland.
Edin. New Phil. Jn'l, 1829, VI., 318.
Bib. : Morgan, Bib. Can., 82; R. Soc. Cat., II., 52; Newfoundland, the
oldest British Colony, Hallen & Harvey, 169-177; Can. Rec. Sc.,
VII., 4.
- COULTAS, HARLAND.
B———; d., London, England, Feb. 2nd, 1877.
79. Origin of our Kitchen Garden Plants.
Can. Nat., N. Ser., II., 33.
Bib. : Pritz. Thes. Bot. Lit., 1872, 70; Jackson, 535; Jn'l Bot., 1877, 192;
Biog. Ind., Brit. and Irish Bot., 39.
- DAWSON, GEORGE MERCER, C.M.G.
Director, Geological Survey of Canada.
80. Note on the Distribution of some of the more important Trees of British
Columbia.
Can. Nat., N. Ser., IX., 321.
Bib. : Trans. R. Soc. Can., IX., 653.
- DAWSON, SIR JOHN WILLIAM, K.C.M.G.
B., Pictou, Nova Scotia, Oct. 13th, 1826.
81. Fossils from the Coal Formation of Nova Scotia.
Quart. Jn'l Geol. Soc., II., 132.
82. Calamites in situ near Pictou, N.S.
Quart. Jn'l Geol. Soc., VII., 194.
83. Vegetable Structures in Coal.
Quart. Jn'l Geol. Soc., XV., 626; Can. Jn'l., V., 305.
84. On a New Fossil Fern.
Quart. Jn'l Geol. Soc., XVII., 5; Can. Nat., V., 460.
85. Flora of the Devonian Period in Northeastern America.
Quart. Jn'l Geol. Soc., XVIII., 296; Amer. Jn'l Sc., 1863, XXXV., 311.

86. Further Observations on Devonian Plants from Maine, Gaspé and New York.
Quart. Jn'l Geol. Soc., XIX., 458.
87. On Fossil Plants from the Devonian Rocks of Canada.
Quart. Jn'l Geol. Soc., XV., 477.
88. Modern Submerged Forests at Fort Lawrence, N.S.
Quart. Jn'l Geol. Soc., XI., 119.
89. The Conditions of the Deposition of Coal, more especially as illustrated by the Coal Formations of Nova Scotia and New Brunswick.
Quart. Jn'l Geol. Soc., XXII., 95.
90. On the Structure and Affinities of Sigillaria, Calamites and Calamodendron.
Quart. Jn'l Geol. Soc., XXVI., 488; XXVII., 147; Phil. Mag., XL., 384, 1870.
91. New Erian Plants.
Quart. Jn'l Geol. Soc., XXXVII., 299.
92. On the Primitive Vegetation of the Earth.
Quart. Jn'l Geol. Soc., XXVII., 1; Proc. R. Inst., VI., 165; Amer. Nat., IV., 474.
93. Note on the Vindication of *Leptophlœum rhombicum* and *Lepidodendron gaspianum*.
Quart. Jn'l Geol. Soc., XXIX., 369.
94. Note on a Specimen of *Diploxylon* from the Coal Measures of Nova Scotia.
Quart. Jn'l Geol. Soc., XXXIII., 836; Can. Nat., N. Ser., VIII., 249.
95. On an Erect *Sigillaria* from the South Joggins, Nova Scotia.
Quart. Jn'l Geol. Soc., XVII., 522; Can. Nat., VII., 106.
96. Note on a *Carpolite* from the Coal Measures of Cape Breton.
Quart. Jn'l Geol. Soc., XVII., 525; Can. Nat., VII., 111.
97. Note on the Relations of the supposed Carboniferous Plants of Bear Island with the Palæozoic Flora of North America.
Quart. Jn'l Geol. Soc., XXIX., 24.
98. On New Tree Ferns and other Fossils from the Devonian.
Quart. Jn'l Geol. Soc., XXVII., 269; Phil. Mag., XLII., 231.
99. Synopsis of the Carboniferous Flora of Nova Scotia.
Can. Nat., VIII., 431; Amer. Jn'l Sc., 1864, XXXVII., 419.
100. The Evidences of Fossil Plants as to the Climate of the Postpleiocene Period in Canada.
Can. Nat., N. Ser., III., 69.
101. Notices of some remarkable Genera of Plants from the Coal Formation.
Can. Nat., N. Ser., III., 362.
102. On the Removal and Restoration of Forests.
Can. Nat., N. Ser., III., 405.
103. Notes on some Scottish Devonian Plants.
Can. Nat., N. Ser., VIII., 379.
104. Notes on the Flora of the White Mountains in its Geographical and Geological Relations.
Can. Nat., VII., 81.
105. On Fossil Plants from the Devonian Rocks of Canada.
Can. Nat., V., 1; Quart. Jn'l Geol. Soc., XV., 477.
106. Review of Hooker's Outlines of the Distribution of Arctic Plants.
Can. Nat., VII., 334.
107. Note on a Fern associated with *Platyphemera antiqua*.
Can. Nat., X., 102.
108. On the Varieties and Mode of Preservation of the Fossils known as *Sternbergia*.
Can. Nat., II., 299; Can. Jn'l, 1857, II., 476; Proc. Amer. Ass'n, 1857, 67.

109. Pleistocene Fossils of Montreal and vicinity.
Can. Nat., II., 279.
110. The Silurian and Devonian Rocks of Nova Scotia and their Fossils.
Can. Nat., V., 132.
111. On the Pre-carboniferous Flora of New Brunswick, Maine and Eastern
Canada.
Can. Nat., VI., 161.
112. Prototaxites.
Can. Nat., N. Ser., VII., 173 ; M. Mic. Jn'l, X., 66.
113. Acadian Geology, 2nd ed., 1878.
Chapters on Carboniferous and Devonian Flora of Nova Scotia and
New Brunswick.
114. On Fossil Rhizocarps.
Chicago Acad. Sc., I., 105.
115. Alpine and Arctic Plants.
Montreal, 1862.
116. Reproduction of Forests Destroyed by Fire.
Edin. Phil. Jn'l, 1847.
117. Second Report on Fossil Plants of the Upper Silurian and Erian of Canada.
Rep. Geol. Surv. Can., 1882.
118. The Fossil Plants of the Devonian and Upper Silurian Formations of Canada.
Rept. Geol. Surv. Can., 1871.
119. Fossil Plants from the Lower Carboniferous and Millstone Grit Formations
of Canada.
Rept. Geol. Surv. Can., 1873.
120. Cretaceous and Tertiary Floras of British Columbia.
Trans. R. Soc. Can., I., iv., 15.
121. Mesozoic Floras of the Rocky Mountain Region.
Trans. R. Soc. Can., III., iv., I.
122. Fossil Plants from the Laramie of Mackenzie and Bow Rivers.
Trans. R. Soc. Can., VII., iv., 69.
123. Fossil Plants from the Laramie Formation of Canada.
Trans. R. Soc. Can., IV., iv., 19.
124. Tertiary Plants of the Similkameen River.
Trans. R. Soc. Can., VIII., iv., 75.
125. *Parla decipiens*. (Dawson and Penhallow.)
Trans. R. Soc. Can., IX., iv., 9.
126. The Relations of the Early Cretaceous Floras of Canada and the United
States.
Trans. R. Soc. Can., X., iv., 79.
127. New Cretaceous Plants from Vancouver Island.
Trans. R. Soc. Can., XI., iv., 53.
128. Notes on Fossil Woods and other Plant Remains from the Cretaceous and
Laramie of the Western Territories of Canada.
Trans. R. Soc. Can., V., iv., 31 ; Can. Rec. Sc., II., 499.
129. On Nematophyton and Allied Forms from the Devonian of Gaspé. (Dawson
and Penhallow.)
Trans. R. Soc. Can., VI., iv., 27.
130. New Fossils from the Lower Carboniferous of Nova Scotia.
Mem. Peter Redpath Mus., 1888.
131. New Plants from the Erian and Carboniferous.
Mem. Peter Redpath Mus., 1890 ; Can. Rec. Sc., IV., I.
132. Fossil Plants from the Carboniferous of Newfoundland.
Bull. Geol. Soc. Amer., II., 529.
133. Pleistocene Plants of Canada. (Dawson and Penhallow.)
Bull. Geol. Soc. Amer., I., 311.

134. Notes on Trees Cultivated on the Grounds of McGill University.
Can. Rec. Sc., IV., 407.
135. Notes on the Geology and Fossil Flora of Prince Edward Island.
Can. Rec. Sc., I., 194.
136. On Rhizocarps in the Palæozoic Period.
Can. Rec. Sc., I., 19.
137. The Genesis and Migration of Plants.
Princeton Review, 277.
138. Permian and Triassic Flora of Prince Edward Island.
Contained in a Report on the Geological, Structural and Mineral
Resources of Prince Edward Island. (Dawson and Harrington.)
Gov't Pub., 1871.
139. Geological History of Plants.
D. Appleton & Co., New York, 1888.
140. Note on Fossil Woods from British Columbia, collected by Mr. Richardson.
Amer. Jn'l Sc., 1874, CVII., 47.
141. Carboniferous Conifers of the United States.
Amer. Jn'l Sc., 1875, CX., 301.
142. Fossil Floras and Glacial Periods.
Nature, 1877, XVI., 67.
143. Notes on Prototaxites and Pachythea discovered by Dr. Hicks in the
Denbighshire Grits of Corwen, N. Wales.
Quart. Jn'l Geol. Soc., XXXVIII., 103.
144. Recent Discoveries in the Erian (Devonian) Flora of the United States.
Amer. Jn'l Sc., 1882, CXXIV., 338.
145. New Devonian Plants from the Baie de Chaleur.
Can. Nat., N. Ser., X., 1.
146. Comparative View of the successive Palæozoic Floras of Canada.
Can. Nat., N. Ser., X., 372; Proc. Amer. Ass'n, XXXI., 415.
147. The Successive Palæozoic Floras of Northeastern America.
Rept. Brit. Ass'n, XXXV., 50; Geol. Mag., 1865, II., 568.
148. On Fossil Plants of the Post-pleiocene Deposits of Canada in connection
with the Climate of the Period and the Formation of Boulder
Clay.
Rept. Brit. Ass'n, XXXV., 50; Geol. Mag., 1865, II., 561.
149. On Calamites.
Ann. & Mag. Nat. Hist., 1869, IV., 272.
150. On some New Fossil Plants from Gaspé.
Can. Nat., 1869, IV., 64.
151. Spore Cases in Coal.
Can. Nat., 1870, V., 369; Amer. Jn'l Sc., 1871, CI., 256; Ann. & Mag.
Nat. Hist., VII, 321; M. Mic. Jn'l, VI., 90.
152. Notes on the Structure of Sigillaria.
Quart. Jn'l Geol. Soc., XXVI., 165; Phil. Mag., XL., 74.
153. On the Pre-Carboniferous Floras of Northeastern America, with special
reference to that of the Erian (Devonian) Period.
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154. On the bearing of Devonian Botany on questions as to the Origin and Ex
tinction of Species.
Amer. Jn'l Sc., 1871, CII., 410.
155. Some New Facts in Fossil Botany.
Geol. Mag., VIII., 236.
156. Note on a New Sigillaria showing Scars of Fructification.
Proc. Amer. Ass'n, XXII., 75.
157. On Fossil Coniferous Woods from Prince Edward Island.
Proc. Acad. Nat. Sc., Phila., 1854, VII., 62.

158. Remarks on a Specimen of Fossil Wood from the Devonian Rocks (Gaspé Sandstones) of Gaspé, Canada East.
Proc. Amer. Ass'n, 1856, 174.
159. Recent Researches in the Devonian and Carboniferous Flora of North America.
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Bib.: Trans. R. Soc. Can., XII., 27; Cent. Cyc. Names, 312; R. Soc. Cat., II., 182; VII., 497; IX., 653.

DELAMERE, E.

- (75). (— —, F. Renauld and J. Cardot).
Flora Miquelonensis, 1888.
Bib.: Can. Rec. Sc., VII., 6.

DOUGLAS, DAVID.

- B., Scone, Scotland, 1798; d., Hawaii, Sandwich Islands, July 12th, 1834.
Commemorated in the genus *Douglasia* of Lindley, and in *Abies Douglasia* of the same author.
160. Sketch of a Journey to the Northwestern part of the Continent of North America during the years 1824-1827.
Hooker's Comp. Bot. Mag., 1836, II., 82, 103.
161. Summer Excursions to the Columbia River.
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162. A Journey to Hudson's Bay.
Hooker's Comp. Bot. Mag., 1836, II.
163. Observations Taken on the West Coast of North America.
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Bib.: Can. Nat., V., 120, 200, 267, 329; Pritz. Thes. Bot. Lit., 1872, 90; 1851, 72; R. Soc. Cat., II., 327; Cassell's Biog. Dict., 565; Trans. Hort. Soc., N. Ser., I., 403; Appleton's Cyc. Biog.; Biog. Ind., Brit. and Irish Bot., 1893.

DRUMMOND, ANDREW THOMAS.

- B., Kingston, Ontario, July 18th, 1844.
164. Distribution of Canadian Forest Trees in its Relations to Climate and other Causes.
Can. Economics, 1884.
165. Forest Preservation in Canada.
Amer. For. Congress, 1885.
166. Our Northwest Prairies, their Origin and Forests.
Can. Rec. Sc., II., 145.
167. Affinities of Tendrils in the Virginia Creeper.
Can. Rec. Sc., II., 253.
168. Articles on Forestry and the Lower St. Lawrence Flora, in the Hand-Book for Canada, published for the British Association Meeting at Montreal, 1884.
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Ann. Bot. Soc. Can., 1861, 81.
170. Brief List of Kingston Plants.
Ann. Bot. Soc., Kingston, 1862.
171. Observations on Canadian Geographical Botany.
Can. Nat., N. Ser., I., 405.
172. Catalogue of Canadian Lichens.
Can. Nat., N. Ser., II., 392.

173. Distribution of Plants in Canada in some of its Relations to Physical and Post Geological Conditions.
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DRUMMOND, THOMAS.

B., Scotland ; d., Havana, Cuba, March, 1835.

Assistant Naturalist to the Second Land Arctic Expedition under Franklin.

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D'URBAN, WILLIAM STEWART M.

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EATON, AMOS.

B., Chatham, N. Y., May 17th, 1776 ; d., Troy, N. Y., May 10th, 1842.

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B., Fort Gratiot, Mich., Sept. 12th, 1834 ; d., New Haven, Conn., June 30th, 1895.

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B., Potsdam, N. Y., Jan. 21st, 1829.

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EVERHART, BENJAMIN MATLOCK.

B., West Whiteland, Pa., April 24th, 1818.

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FARLOW, WILLIAM GILSON.

B., Boston, Mass., Dec. 17th, 1844.

Professor Cryptogamic Botany, Harvard University.

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FLETCHER, JAMES.

B., Ash, Kent, England, March 28th, 1852.

Dominion Entomologist and Botanist, Ottawa.

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FRANKLIN, SIR JOHN.

B., April 16th, 1786; d., June 11th, 1847.

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191; App. Cyc. Biog., 303.

FYLES, REV. THOMAS W.

B., Enfield Chase, England, 1832.

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GAIRDNER, MEREDITH.

Pentstemon Gairdneri of Hooker. Surgeon in H. B. C. possessions in British Columbia. Made collections of North American plants. No writings.

Bib.: Fl. Bor. Amer., I., pref. iii.; II., 99; Biog. Ind., Brit. and Irish Bot., 65; R. Soc. Cat., II., 756.

GANONG, WILLIAM FRANCIS.

B., St. John, N.B., Feb. 19th, 1864.

Prof. Botany and Director of the Botanic Gardens, Smith College, Northampton, Mass.

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GIBB, SIR GEORGE D., BART.

B., Montreal, Canada, Dec. 25th, 1821.

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Bib.: Bib. Canadensis, Morgan, 1867, 140.

GOLDIE, JOHN.

B., Maybole, Scotland, March 21st, 1803; d., Ayr., Ontario, Canada, June, 1886.

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GOODE, JOHN B.

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GRAY, ASA.

B., Paris, N. Y., Nov. 18th, 1810; d., Cambridge, Mass., Jan. 30th, 1888.

The very numerous writings of Dr. Gray contain many facts bearing upon Canadian botany, but it is difficult to decide what titles should properly find a place in this list. Those which chiefly touch Canadian botany, and which rightfully have a place here are:

211. Manual of the Botany of the Northern United States.

212. Genera Floræ Americæ.

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213. Flora of North America.

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214. Synoptical Flora of North America, 1884.

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GREELY, ADOLPHUS WASHINGTON.

B., Newburyport, Mass., March 27th, 1844. General U. S. Army.

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(b) Mosses and Lichens determined by Rev. E. Lehnert;

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GUIGNARD, JONATHAN AUGUSTE.

B., Vernoux (Ardeche), France, May 3rd, 1844.

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14th Ann. Rept. Ent. Soc. Ont., 1886, 39-40.

HALIBURTON, THOMAS CHANDLER.

B., Windsor, N.S., Dec., 1796; d., Islesworth, England, Aug. 27th, 1865.

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HARRINGTON, BERNARD J.

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HARVEY, WILLIAM HENRY.

B., Summerville, Ireland, Feb. 5th, 1811; d., Torquay, England, May 15th, 1866.

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Smithson. Contrib., 1852, III.; 1853, V.; 1853, X.

223. Notice of a Collection of Algæ made on the North Coast of North America, chiefly at Vancouver's Island, by David Lyall, in the years 1859-61.

Jn'l Lin. Soc., 1862, VI., 157.

Bib.: Amer. Jn'l Sc., XLII., 129, 273; R. Soc. Cat., III., 207; Pritz. Thes. Bot. Lit., 1872, 136; Biog. Ind., Brit. and Irish Bot., 1893.

HAY, GEORGE UPHAM.

B., Norton, Kings County, N.B., June 18th, 1844.

English Master, St. John Grammar School.

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HINCKS, REV. WILLIAM.

B., Cork, Ireland, May, 1794; d., Toronto, Canada, Sept. 10th, 1871.

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230. On the causes of disjunctions of vegetable substances, especially those which are horizontal.
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232. Considerations respecting anomalous vegetable structure.
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233. On some questions in relation to the theory of the structure of plants of the orders Brassicaceæ and Primulaceæ.
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HOLMES, A. F.

D., Montreal, Oct. 9th, 1860.

A zealous collector, 1820-1825, and Prof. of Botany in the Medical Faculty of McGill University, 1829-1845. Collections in the Herbarium of McGill University.

HOOKER, SIR JOSEPH DALTON.

B., Glasgow, Scotland, 1817.

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HOOKER, SIR WILLIAM JACKSON.

B., Norwich, England, July 6th, 1785; d., Kew, England, Aug. 12th, 1865.

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JAMES, THOMAS POTTS.

B., Radnor, Pa., Sept. 1st, 1808; d., Cambridge, Mass., Feb. 22nd, 1882.

Connected with Canadian Botany through his work in determining material collected by Prof. Macoun, and also by his work on the Mosses of North America.

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JEFFREY, EDWARD C.

B., St. Catharines, Ont., May 21st, 1866.

Lecturer in Biology, University of Toronto.

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KANE, ELISHA KENT.

B., Philadelphia, Pa., Feb. 3rd, 1820; d., Havanna, Cuba, Feb. 16th, 1857.

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B., Greenock, Scotland, 1822; d., Canada, May 4th, 1884.

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B., Carlstad, Sweden, Aug. 7th, 1832.

Prof. in State College (Lector), Linköping, Sweden.

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261. List of Mosses Collected in the Neighbourhood of Ottawa.
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LAWSON, GEORGE.

B., Scotland, 1827; d., Halifax, N.S., Nov. 10th, 1895.

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East.
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298. Introduction to Prof. Howe's paper on the East Indian Herbarium of King's College, Windsor, Nova Scotia.
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LESQUEREUX, LEO.

B., Fleurier, Neuchatel, Switzerland, 1806; d., Columbus, Ohio, Oct. 20th, 1888.

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B., Pictou, Nova Scotia, Sept. 6th, 1852.

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B., Edinburgh, Scotland, Dec. 19th, 1829; d., Edinburgh, Nov. 24th, 1880.

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LOGIE, ALEXANDER.

B., Nairn, Scotland, 16th December, 1823; d., Hamilton, Ontario, 10th Dec., 1873.

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B., Mt. Dalhousie, Pictou, Nova Scotia, May 19th, 1848.
Supt. of Education for Nova Scotia, Halifax, N.S.

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Asst. Botanist, Geological and Natural History Survey of Canada.
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MEYER, ERNEST HEINRICH FRIEDERICH.

- B., Hanover, Germany, Jan. 1st, 1791; d., Königsburg, Germany, Aug. 7th, 1858.
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Leipsic, 1830.
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- B., Versailles, France, 1770; d., Vaureal, France, Oct. 23d, 1855.
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d'employer pour y parvenir; suivi d'un tableau raisonné des arbres de ce pays, comparés avec ceux que produit la France.

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B., Worcester, Mass., June 3rd, 1856.

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MILLER, (MRS.) MARIA MORRIS.

B., Halifax, N.S., 1813; d., Halifax, Oct. 28th, 1875.

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MILLMAN, THOMAS.

B., Woodstock, Ontario, Feb. 14th, 1850.

Asst. Med. Supt. Asylum for Insane, Kingston, Ont.

No publications; collections only.

MOYEN, L'ABBÉ J.

373. Cours Élémentaire de Botanique.

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MUNRO, DAVID RANSOM.

B., St. John, N.B., 1828; d., Roanoke, Va., U.S.A., July 9th, 1890.

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NUTTALL, THOMAS.

B., Settle, England, 1784; d., Nutgrove, Lancashire, England
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OSLER, WILLIAM.

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Can. Nat. N. Ser., V., 142.

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B., Cupar, Fifeshire, Scotland, May 7th, 1847.

Prof. Biology and Geology Ontario Agricultural College, Guelph, Ont.

380. Flora of the Queen Victoria, Niagara Falls Park.

Gov't Pub., 1889.

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PARRY, SIR WILLIAM EDWARD.

B., Bath, England, Dec. 19th, 1790; d., Ems, Germany, July 8th, 1855.

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PENHALLOW, DAVID PEARCE.

B., Kittery Point, Maine, U.S.A., May 25th, 1854.

Prof. Botany, McGill University, Montreal, Canada, and Director of the Botanic Garden.

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Trans. R. Soc. Can., IV., iv., 49.

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B., Bécancour, P.Q., Canada, March 10th, 1820; d., Cap Rouge, P.Q., Canada, 1892.
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B., Grossenhayn, Saxony, Feb. 4th, 1774; d., Montreal, Canada,
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RAFINESQUE-SCHMALTZ, CONSTANTINE SAMUEL.

B., Galatz, Constantinople, 1784; d., Philadelphia, Pa., Sept.
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Bib.: Pritz. Thes. Bot. Lit., 1872, 256; R. Soc. Cat., V. 75; Cent. Cyc. Names, 839; Amer. Jn'l Sc., XL., 221.

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(75) (—— E. Delamere and J. Cardot.)
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Bib.: Can. Rec. Sc., VII., 6.

RICHARDSON, SIR JOHN.

B., Dumfries, Scotland, Nov. 5th, 1787; d., Grasmere, England,
June 5th, 1865.

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of the 49th parallel of latitude. II., 264.

(b) List of Trees and Shrubs. II., 284.

(c) Tables showing zonal distribution of Arctic and sub-Arctic
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Bib.: Pritz. Thes. Bot. Lit., 1872, 263; R. Soc. Cat., V., 188; VIII., 744;
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ROBINSON, B. L.

B., Bloomington, Ill., Nov. 8th, 1864.

Curator of the Gray Herbarium, Harvard University.

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ROSS, BERNARD R.

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Bib.: Bib. Canadensis, Morgan, 1867, 326.

ROSS, SIR JOHN.

B., Inch, Scotland, June 24th, 1777; d., London, England, Aug. 30th, 1856.

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London, 1819.

Gives a list of Plants determined by Robert Brown.

Bib.: Cent. Cyc. Names, 868.

SAINT-CYR, DOMINIQUE NAPOLEON.

B., Nicolet, P.Q., Canada, Aug. 4th, 1826.

433. List of Plants gathered on the north shore of the River and Gulf of St. Lawrence from Baie St. Paul to Oreatchechon Bay, and in the Islands of Mingan, Anticosti, Grand Mécatina, &c., during the summer of 1882 and 1885.

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Sessional Papers, Quebec, 49-50 Vict., 37.

SARGENT, CHARLES SPRAGUE.

B., Boston, Mass., U.S.A., April 24th, 1841.

Director of the Arnold Arboretum of Harvard University, Brookline, Mass.

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Tenth Census of the United States, 1880.

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Bib.: Cent. Cyc. Names, 898.

SCHRENK, H. VON.

B., College Point, Long Island, N.Y., March 12th, 1873.

(See Robinson, B. L.)

SCHWEINITZ, LUDWIG DAVID VON.

B., Bethlehem, Pa., U.S.A., Feb. 13th, 1780; d., Bethlehem, Pa., Feb. 8th, 1834.

Schweinitzia of Elliott.

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Ed. by John Torrey, New York, 1825.

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London, 1825.

Bib.: Pritz. Thes. Bot. Lit., 1872, 292; App. Cyc. Biog., 834; R. Soc. Cat. V., 593; Cent. Cyc. Names, 910.

SCHULTZ, SIR JOHN C.

B., Amherstburg, Ont., Jan. 1st, 1840; d., Monterey, Mexico, April 13th, 1896.

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Ann. Bot. Soc. Can., 1861, 25.

SCOULER, JOHN.

B., Glasgow, Scotland, Jan. 31st, 1804; d., Glasgow, Scotland, Nov. 13th, 1871.

Scouleria of Hooker.

Collected in N. W. America in 1825-27.

Bib.: R. Soc. Cat., V., 607; Hook. Bot. Misc., I., 34, 92; Biog. Ind., Brit. and Irish Bot., 151.

SEEMAN, BERTHOLD CARL.

B., Hanover, Germany, Feb. 28th, 1825; d., Javoli Mine, Nicaragua, Oct. 10th, 1871.

The genus *Seemannia* of Regel.

440. The Botany of the Voyage of H. M. S. Herald, under command of Captain Henry Kellett during the years 1845-51.
London, 1852.

Contains Flora of Western Esquimaux Land; pp. 11-56.

Bib.: Biog. Ind., Brit. and Irish Bot., 1893; Pritz. Thes. Bot. Lit., 1872, 293; Jackson, 605; Jn'l Bot., 1872, 1; Proc. Linn. Soc., 1872, LXXIV.; Gard. Chron., 1871, 1878; ALLIBONE, 1866; Amer. Jn'l Sc., 1872., CIII., 153; R. Soc. Cat., VIII., 926.

SMALL, H. BEAUMONT.

B., Market Bosworth, Leicestershire, England, October 31, 1831

441. Development and Progress.

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442. Waterhouse's Lectures.

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443. Pine Life.

Trans. Ottawa Field Nat. Club, 59.

444. Report of the Botanical Branch of the Ottawa Field Naturalist's Club.

Trans. Ottawa Field Nat. Club, III., 21; IV., 69.

SMITH, TITUS.

B., Granby, Mass., U.S.A., Sept. 4th, 1768; d., Dutch Village, Halifax, N.S., Jan. 4th, 1850.

Mr. Smith's writings are scattered through the local press, and always unsigned, so that it is extremely difficult to trace them at the present time. Mr. H. Piers, of Halifax, has, nevertheless, succeeded in tracing a few. These are given below.

445. A List of the principal indigenous Plants of Nova Scotia.

M. Mag., Halifax, N.S., (Feb., 1831) I., 342.

446. On the operation of Fungi in disintegrating Vegetable Substances.

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447. The Vegetation of Nova Scotia.

Mag. Nat. Hist., 1835.

Bib.: Murdoch, Hist. Nova Scotia.

SOMERS, JOHN.

B., St. John's, Newfoundland, March 29th, 1844.

Prof. Materia Medica, Halifax Medical College.

448. On a Correspondence between the Flora of Nova Scotia and that of Colorado and the adjacent Territories.

Trans. N. S. Inst. Nat. Sc., IV., 122, 1877.

449. Introduction to a Synopsis of the Flora of Nova Scotia.

Trans. N. S. Inst. Nat. Sc., IV., 181, 1877.

450. Notes on Nova Scotia Compositæ—Asters.

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451. A Contribution toward the study of Nova Scotia Mosses.

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452. New and Rare Plants.

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453. Nova Scotia Fungi.

Trans. N. S. Inst. Nat. Sc., V., 188, 1880; V., 247, 1881; V., 332, 1882; VI., 286, 1886; VII., 18, 1887; VII., 464, 1890.

SULLIVANT, WILLIAM S.

B., Columbus, Ohio, Jan. 15th, 1803; d., Columbus, April 30th, 1873. Sullivantia of Torrey and Gray.

454. Contributions to the Bryology and Hepaticology of North America, 1847.

Mem. Acad. Arts & Sc., N. Ser., III., 57.

455. Icones Muscorum, or Figures and Descriptions of most of those Mosses peculiar to Eastern North America which have not been heretofore figured.

Cambridge, Mass., and London, England, 1861.

Bib.: R. Soc. Cat., VIII., 1045; Pritz. Thes. Bot. Lit., 1872, 309; Amer. J'n'l Sc., 1873, CV., 481; 1874, CVII., 239; 1873, CVI., 81; Cent. Cyc. Names, 965; Proc. Amer. Acad., IX., 271.

TOLMIE, W. FRASER.

D., Victoria, B.C., 1886.

Tolmiea of Hooker (Cladothamnus) Tolmiea of Torrey and Gray.

No writings, collections only.

Bib.: Amer. J'n'l Sc., CXXXIII., 244; Biog. Ind., Brit. and Irish Bot., 170; Flor. Bor. Amer., I., pref. iii.

TORREY, JOHN.

B., New York, N.Y., Aug. 15th, 1796; d., New York, March 10th, 1873.

Genus *Torreya* of Sprengel.

456. Notice of Plants collected by Prof. D. B. Douglas during the summer of 1820, around the Great Lakes and the Upper Waters of the Mississippi.

Amer. J'n'l Sc., 1822, IV., 56.

457. Catalogue of North American Genera of Plants.

New York, 1831.

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New York, 1838.

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Bib.: Ann. Nat. Hist., I., 130; Pritz. Thes. Bot. Lit., 1872, 320; R. Soc. Cat., VI., 10; Amer. J'n'l Sc., V., 411; XLV., 273; Cent. Cyc. Names, 1003; Nation, No. 403, 197; Proc. Amer. Acad., IX., 262.

TUCKERMAN, EDWARD.

B., Boston, Mass., Dec. 7th, 1817; d., Amherst, Mass., March 15th, 1886.

461. Enumeration of North American Lichens.

Cambridge, Mass., 1845.

462. Synopsis of Lichens of Northern New England and British America.

Proc. Amer. Acad. Sc. 1848, I., 195, 285.

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II.—On the Genus *Lepidophloios* as illustrated by specimens from the Coal Formation of Nova Scotia and New Brunswick.

By SIR J. WILLIAM DAWSON, C.M.G., LL.D., F.R.S.

(Read June 24th, 1897.)

In the flora of the Carboniferous period, nothing is more remarkable than the abundance and wide distribution, as well as the magnitude and complex structure of trees allied to the humble Lycopods or Club Mosses of our modern woods. Trees of this type appear in the preceding Erian or Devonian period, but they attain their maximum development in the time of the deposition of the productive coal-measures, and rapidly diminish in the Permo-Carboniferous, disappearing altogether in the Permian: The great size and peculiar forms and structures of these trees, with the fragmentary state of most of the specimens obtained, have led to much confusion and controversy, and there are still important questions in dispute respecting some of the forms, and very specially in regard to the genus *Lepidophloios* and its allies.

As a contribution to the knowledge of these plants, and with the view of resolving some of the doubts entertained with respect to them, two species are here described, to which the attention of the writer has been directed for many years, and of which he has collected and studied many specimens in different states of preservation. They are those which he had named *Lepidophloios Acadianus* and *L. Cliftonensis*.

It will be instructive, in the first instance, to illustrate these by specimens from the coal-fields of Nova Scotia and New Brunswick, which have been placed with the rest of the author's collections of Carboniferous fossils in the Peter Redpath Museum of McGill University, and which more or less completely display their habit of growth, external parts, reproduction and internal structure.

The first of the species above-named, I met with about fifty years ago. In working at that time in the beds of sandstone containing erect *Calamites* at Dickson's Mills, near Pietou, Nova Scotia, I found lying prostrate among the Calamite stems a trunk, or large branch, with leaves and cones attached. It was mentioned, merely incidentally, in connection with the description of the mode of occurrence of the erect *Calamites*, in a paper in the Journal of the Geological Society of London,¹ and a cone and a portion of the bark, with the leaves attached, were presented to the collection of the society, along with the specimens of *Calamites*, rooted *in situ*, described in the paper. At that time, however, I supposed that the plant in question was referable to the genus *Lepidodendron*, and it was noticed merely as illustrative of the occurrence of other trees in the

¹ Vol. VII., 1851.

brakes of erect *Calamites*, then described with their roots and leaves complete for the first time. I may remark here that while much has been done more recently, by the late Dr. Williamson and others, in developing the internal structure and fructification of *Calamites*, Nova Scotia has taken the lead in the discovery of their habit of growth, external appearance and relations to the accumulation of coal. The species *Lepidophloios Acadianus* was not described by me till 1865, when the characters of other specimens from the Albion Coal Mines and the South Joggins were given in my paper, "On the Conditions of Accumulation of Coal," in the Journal of the Geological Society, vol. xxii. It was included in 1868, in the "Summary of the Coal Flora," in the second edition of "Acadian Geology."

The second species was discovered at a later date, and, for a reason to be explained in the sequel, was also first described as a *Lepidodendron*, under the name *L. Cliftonense*.¹

In the following pages I shall discuss, with the aid of specimens in my collections representing more especially these two species, the following topics:—

- I. The characters of the genus *Lepidophloios*.
- II. The specific characters of *L. Acadianus* and *L. Cliftonensis*.
- III. The relations of these species to others representing them elsewhere, and to the forms known as *Bothrodendron*, *Halonina*, *Lepidophloios*, etc.
- IV. The relations of *Lepidophloios* to other genera of Carboniferous trees.
- V. Its connection with the accumulation of coal.

I. THE GENUS LEPIDOPHLOIOS.

This genus was established by Sternberg in his great "Flora der Vorwelt," (1820) and its structure was illustrated by Corda (though under a new name, *Lomatophloios*, in 1845. Since that time it has attracted the attention of many palæobotanists, but owing to the fragmentary nature of their material much confusion and controversy have arisen, which culminated in the summary of the characters of the family *Lepidodendrea*, attempted by Count Solms-Laubach in his "Introduction to Fossil Botany," (1891) and may be appreciated by a glance at the bibliography of the genus prepared by my friend, Mr. R. Kidston, to illustrate his paper on the Scottish species in the Transactions of the Royal Society of Edinburgh (1893). The last-mentioned paper is of great value in elucidating the difficulties attending the study of *Lepidophloios* in Europe, and especially in Great Britain, where good specimens seem to be very rare.

¹ Bulletin Geological Society of America, 1891.

(1) *Habit of Growth and External Parts.*

Trees, but by no means the largest in the coal forests; branching dichotomously but sometimes unequally, so as to produce branches apparently lateral. Branches usually stout, but, in some species at least, with slender branchlets bearing the strobiles. These may either be spiral or in two ranks, or irregularly disposed, often on thick branches. Fertile branchlets or peduncles, when mature, dropping off and leaving rounded scars depressed in the centre and with a raised rim. Leaves very long, linear, with one rib forming a keel below. The leaves are articulated to the oblong leaf-bases by broadly rhombic surfaces pointed at the lateral ends, and with three dots, the central one of which marks the fracture of the bundle of vessels passing up the middle of the leaf.¹ The leaf-bases are strap-shaped, decurrent on the bark below, but so flat and so loosely attached above that, on the full development of the leaf, they separate at the upper ends from the bark and curve outward, so that the leaf-scar becomes pendant and the leaves seem to be borne on flattened petioles bending downward from their line of attachment. When the leaves have separated, the permanent leaf-bases remain, giving a rugged and scaly appearance to the stem. Finally, in dead or abraded stems, the leaf-bases are entirely stripped off, and a smooth surface of bark remains, on which are seen merely traces of the lines from which the leaf-bases have been torn off, and spirally arranged pits or elliptical spots marking the points of entrance of the bundles of vessels of the leaves into the stem. When in this condition the branches, especially those bearing the marks of the cones, assume forms to which the names *Halonia* and *Bothrodendron* have been applied. The latter term has, however, been used by Grand'Eury and Zeiller for trees which seem to be different from *Lepidophloios*, but which I have not seen, at least in well preserved specimens, in the Acadian coal-fields.

The above description will serve to explain the various views which have been held as to the leaf-bases and scars of *Lepidophloios*. In young and slender branches these are like those of *Lepidodendron*, but as the leaves become developed, the leaf-bases split off from the stem and bend downward, the leaves still remaining attached, but *not inverted*,² as some have supposed. Their lower parts, however, become horizontal, or even bend downward, and do not attain to an upward direction until they have spread out to an inch or more from the stem. When the old stem or branch in this condition is flattened, the leaf-scars appear at the lower instead of the upper sides of the leaf-bases. (Fig. A., p. 60.) A flat-

¹ The name "cushions," sometimes applied to the leaf-bases, is quite inaccurate. They are really flat, strap-like organs.

² Dr. Williamson, Proceedings Royal Society, Vol. lv., No. 334, 1894.

tened fragment of a stem or branch without the leaves, may thus be placed either with the scars on the upper or lower angle of the leaf-base, and they have been figured by authors in both positions. The former is the position when young, the latter when old. In the former condition the plant may be referred to *Lepidodendron*, or to *Lomatophloios* of Corda. In the latter it is the adult condition of *Lepidophloios*. This will appear more clearly in describing the species in detail. (See Plate IV.)



FIG. A.—YOUNG AND OLD LEAF-BASES OF LEPIDOPHLOIOS ENLARGED.

(2) *Internal Structure.*

Only one specimen of the species *L. Acadianus* has afforded to me fairly well preserved internal structure. It was figured and described in my paper of 1865, and some additional preparations have since been made, and have been micro-photographed through the kindness of Prof. Penhallow, of McGill University. (Plate VI.)

The specimen is a portion about two feet in length, apparently of a large branch, with two rows of cone-scars, and is slightly flattened, its longest diameter being about $4\frac{1}{2}$ inches. It is mineralised with clay-ironstone, calcite and pyrite, and was obtained from the workings of the Albion Colliery in Pictou, Nova Scotia. The woody axis is scarcely an inch in diameter, and only its outer portion has the structure preserved, while outside of this a large portion of the stem, probably occupied by perishable parenchyma, has disappeared. External to the last is a ring of fine-grained quadrangular and imperfectly radiating tissue, about a quarter of an inch in thickness, and probably corresponding to what has

in similar stems been regarded as an equivalent of corky bark. This tissue is infiltrated with pyrite, so that it can be seen only as an opaque object, and is very imperfectly preserved. The outer bark and remains of the leaf-bases are in the state of dense shining coal. (Plate VI. and figures in the text.)

The axis in cross-section shows a central space without structure, and with only obscure indications of transverse partitions of the Stern-

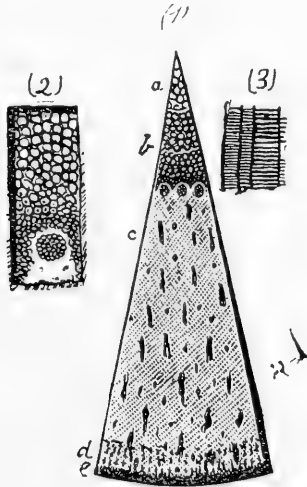


FIG. B.—ORIGINAL SECTIONS OF LEPIDOPHLOIOS ACADIANUS, 1865.

- (1) Cross-section of *Lepidophloios*, showing (a) pith, (b) woody axis, (c) inner bark and leaf-bundles, (d) corky bark, (e) epidermis.
- (2) Part of cross-section more magnified, showing double ring of scalariform fibres and leaf-bundles.
- (3) Scalariform fibres still more enlarged.

bergian type. Surrounding this is a double cylinder of scalariform vessels or fibres,¹ coarser within and finer without, but not showing any radiating arrangement or medullary rays. The outer margin of the cylinder presents a series of loops or notches, each showing the section of one of the bundles of vessels proceeding to the leaves, each of which seems to have been enclosed in a sheath, which has perished. They appear to have run vertically, parallel to the surface of the stem for a space before diverging toward the surface. The cone-scars being placed at intervals of about $2\frac{1}{2}$ inches vertically, are represented only occasionally on the slices by larger bundles. This structure may be considered as identical with that of *Halonia* as described by Williamson as *Halonia regularis*

¹ I do not use the term "tracheids," believing it to be altogether inappropriate to this kind of tissue, though used by many German authorities.

of Binney,¹ as illustrated by a slide, which I owe to his kindness, and also that of the simpler type of *Lepidodendra*, like *L. Harcourtii*, as described by Williamson, in which no secondary or exogenous woody system is developed. My specimen does not, however, show, except in spots, any traces of the inner bark, and the outer or corky layer is, as above stated, pyritized, so that its structure can be seen only imperfectly by reflected light. It is, however, traversed diagonally by the continuations of the leaf-bundles, which show the central bundle of scalariform vessels and two lateral bundles, apparently of hexagonal cells or fibres.

(3) *Fructification.*

The cones or strobiles of *Lepidophloios* are of the type included in the provisional genus *Lepidostrobus*; but are larger and more massive than the cones of ordinary *Lepidodendra*, and, so far as known, are attached to the sides of the trunk and branches by leafy peduncles or branchlets, either singly or in pairs. In two cases only have I found these cones actually in position. One of these is represented in Plate X. The other I cannot figure, owing, in the first place, to the position of the cone on a short peduncle imbedded in the long leaves of the stem or a large branch, and in the second place to the fact that the original specimen passed out of my hands many years ago and cannot now be recovered, so that I have only a rough sketch in my note-book of 1851 to represent it. The greater number of the cones which I attribute to my two Acadian species occur separately, and can be recognized only by comparison of their form and markings. (Plate IV.) None of them show the minute structures, but in one there are rounded bodies which are probably macrospores, scattered in the material occupying the basal portion, so that we may infer that, as in some other Carboniferous trees of *Lepidodendroid* type, there were macrospores below and microspores above. The fertile branchlets, very short in *L. Acadianus* and much longer in *L. Cliftonensis*, seem to have been deciduous or easily broken off when mature, leaving tubercles with a central depression, as observed in the fertile branches in the *Halonian* condition. In the more perfect condition of the branches they are concealed by the long and abundant foliage. In branches approaching to the erect position they may be in two ranks or alternate. When by unequal dichotomy there are side branches approaching to a horizontal position, the upper side of the branch may bear alternating cones, while there may be none on the lower side except at the edges, so that this side may appear to bear fruit in two ranks, while on the upper side the arrangement may be irregular or spiral. (Plates V., VII., VIII.) There is no evidence known to me

¹ Publications of Palæontographical Society, 1872.

of terminal cones, unless we regard the long peduncles of *L. Cliftonensis* as branches, and there is no doubt that as the leaf-bases of these are Lepidodendroid in form and the leaves short, they might, when detached, be easily mistaken for branches of *Lepidodendron* bearing terminal cones

II. LEPIDOPHLOIOS ACADIANUS, Dawson.

(Plates I. to VIII.)

Journal Geological Society of London, 1865, page 163, with figures of stem and branches in different states of leaf and cone, and of the structure of the axis of the stem. "Acadian Geology," second and following editions, 1863, etc., with similar figures and an attempt at restoration. Page 457.

This species, described in 1865, has recently been identified by Mr. R. Kidston in his Catalogue of Palæozoic Plants in the British Museum, and in his paper on *Lepidophloios* in the Transactions of the Royal Society of Edinburgh (1893), with the type species of the genus *L. laricinus* of

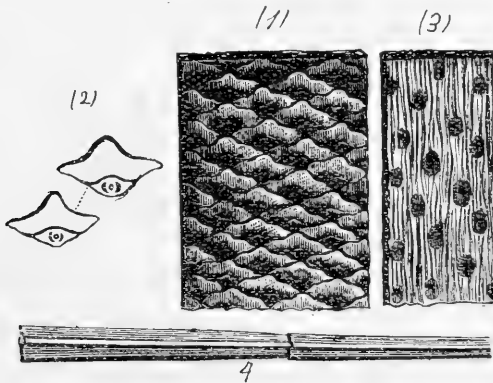


FIG. C.—ORIGINAL FIGURE OF LEPIDOPHLOIOS ACADIANUS, 1865.

- (1) Impression of leaf-bases reduced.
- (2) The same, natural size.
- (3) Surface of middle bark.
- (4) Portion of leaf.

Sternberg. While admitting, however, that portions of the bark of old specimens in a flattened state are scarcely distinguishable from that species, I am not prepared as yet to admit this identification, for the following reasons: First, the leaves, cones and internal structure of the European species cannot be said to be certainly known, and cannot therefore be compared with those of the Acadian form. Secondly, in well preserved specimens of *L. Acadianus* the leaf-bases are shorter in proportion to their width, and less completely reflexed than in Sternberg's species, while they do not show the central keel seen in the best figures

of *L. laricinus*. The fertile branchlets, as figured by Goldenburg, are also longer than in the Nova Scotia species. For these reasons I may still hold that my species is distinguishable, at least as a well-marked varietal form, and not improbably, when all the parts can be compared, as a distinct species.

Compared with its representative in Europe it may not have attained so large dimensions, as I have not found trunks of greater diameter than one foot. Fragments, however, of the bark show flattened leaf-bases, which, as we know that these were capable of enlargement in proportion to the growth of the trunk, may indicate larger trees than any found entire or nearly so. (Plate IV.)

The remarks already made respecting the internal structure of *Lepidophloios*, being based on a specimen of this species from the Albion Mines, Pictou, need not be repeated here.

LEPIDOPHLOIOS CLIFTONENSIS, Dawson.

(Figs. IX. and X.)

Lepidodendron Cliftonense, "The Geological History of Plants," 1888, p. 452; Bulletin Geological Society of America, Vol. II., 1891, p. 533, and Plates 21, Figs. 3, 4 and 22, Figs. 5 to 7.

Sculpture of main stems and large branches resembling that of the previous species, except that the leaf-bases are longer and more thoroughly reflexed, in this resembling those of *L. laricinus* of Europe. In consequence of this the leaves, which are apparently more persistent than those of *L. Acadianus*, are horizontal or droop at their proximal ends, as seen in the photograph (Plate IX.), and only rise upward toward the middle and extremities. This attitude shows that they were still living when the leaf-bases were quite bent downward. The stem forks into branches not more than an inch in diameter (Plate X.), and on these the leaf-bases are still adherent to the branch, and are transversely wrinkled in the manner of *Lepidodendron Wortheni* of Lesquereux. In this state a fragment of a branch might be described as a *Lepidodendron*, and the leaf-bases are not relatively broader than in my *L. decurtatum*, which might well be a leafless branch of this or an allied species. The leaves are in all respects similar to those of *L. Acadianus*, but a very little narrower. They extend on the trunk and thick branches to a length of ten inches without showing the point, and were sufficiently rigid easily to stand erect. The cones are longer and narrower than in *L. Acadianus*, though the scales are broad, as in other species of the genus, and are therefore large in proportion to the breadth of the cone. The cones are supported on long peduncles or fertile branchlets, springing from the sides of the branches and clothed with a few short leaves. The scars and leaf-bases

are similar to those on the smaller ordinary branches, and one of these peduncles found separately, might be taken for a branch of *Lepidodendron* with a terminal cone. The peduncles are seen to bend downward, owing to the weight of the cone.

The internal structure is as yet unknown.

I may have had fragments of the trunk and branches of this species in my collections for many years without being able to distinguish them, and indeed the smaller branches and peduncles would by most collectors be placed with *Lepidodendron*, while fragments of the old stems and branches in the *Halonias* condition, would scarcely be distinguishable from corresponding portions of *L. Acadianus*.



FIG. D.—ROUGH SKETCH OF PORTION OF *L. CLIFTONENSIS*, AS ORIGINALLY SEEN AT CLIFTON. (REDUCED.)

It first became known to me as a distinct species in the summer of 1876, when I made a short excursion along the northern part of New Brunswick, and spent a day in New Bandon at the Clifton sandstone quarries and the shore in that vicinity, to which I was attracted by the fact that Sir William Logan had several years previously collected, in a bed of shale under the sandstone quarried for grindstones, some well-preserved ferns, *Sphenophylla*, and other plants which I had described in "*Acadian Geology*" in 1868.¹ While collecting along the cliffs near the

¹ Pp. 241 *et seq.*, 473 *et seq.*

quarries, I was guided by Mr. Scott, the manager of the Clifton quarry, to a spot where a fall of rock had recently taken place and had thrown down a great slab of argillaceous sandstone or coarse shale, on which was laid out, as if prepared for an herbarium, the specimen represented in Fig. D.

As the mass of rock was too large to be removed entire, I made a rough sketch of the whole plant in my note-book, and cut out specimens as large as I could take away, showing the trunk, branches and cones. Other matters, however, were at the time occupying my attention, and the specimens were not described till 1888, when a short description was given in my "Geological History of Plants," at which time I regarded the plant as a *Lepidodendron*, nearly allied to *L. Wortheni* of Lesquereux. Two years later, a collection of plants from the coal formation of Newfoundland was placed in my hands by the late Mr. Murray, F.G.S., Director of the Geological Survey of Newfoundland, and his successor, Mr. Howley, F.G.S. Among these was a remarkable *Lepidodendron*, which I named *L. Murrayanum*, and which raised a number of questions as to the group to which *L. Wortheni* belongs, and some members of which had been described as *Sigillariae*, because of the apparently vertical arrangement of the leaf-bases. The Newfoundland collection was described in the Bulletin of the Geological Society of America for 1891, and led to the re-examination of the Clifton specimen in the manner shown in the following extract :

III. THE RELATION OF THESE SPECIES TO OTHERS.

"In the coal formation of New Brunswick there is a species which I have described as *L. Cliftonense* from its locality,¹ and of which I have found very perfect specimens. It is in some respects so near to the above that I have doubted its specific distinctness, though on careful comparison there seem sufficient grounds for a difference of name. I therefore figure this species also, more especially as it has not been before figured and as it shows the fruit and habit of growth.

"It will be observed that this species agrees with the last in the forms of the leaf-bases and in the length of the leaves, which are, however, wider and sometimes as much as five inches in length, while the leaf-bases are transversely furrowed above as well as below the scars. The leaf-bases also are somewhat different in shape and more spirally arranged, and the leaves are longer in *L. Cliftonense*. Additional specimens might, however, show them to be varieties of one species. The foliage reminds one at first sight of that of *L. longifolium* of Sternberg, but both leaves and scars are altogether different in detail.

¹ Geological History of Plants, 1888, p. 164.

“I would remark here that the leafy branches in figure 8 (plate 22) are not a ‘restoration,’ but taken from a sketch in my note-book of a specimen exposed on a large slab of sandstone. It is the more necessary to remark this, as several European paleobotanists have borrowed similar figures from my papers without acknowledgment, and have printed them as ‘restorations.’ It may also be remarked that though the leaf-bases of *L. Cliftonense* are smaller in the older part of the stem than those of *L. Murrayanum*, this difference may be more apparent than real, since the specimen of the latter may be from the main trunk, and that of the former from one of the larger branches only.

“These plants raise several interesting points in regard to the *Lepidodendra*. As I have elsewhere pointed out,¹ the growth in diameter of stems of *Lepidodendra* took place in three different ways: In some, as in *L. Sternbergi*, the bark retains its vitality in such a manner that the leaf-bases increase in size and do not become separated from each other. In others, as in *L. Veltheimianum* and *L. Pictoense*, the leaf-bases remain small and the intervening bark becomes torn in strips, leaving wide gashes without any scars. An intermediate type is that which we have in *L. rimosum* and *L. corrugatum*, in which the scars increase only slightly in size and then become separated by rims of slightly wrinkled bark. It would appear, from the observations of Williamson and others, that the first condition appertains to those *Lepidodendra* that possess only a very slight development of the woody axis, while the second occurs in those species in which the woody zone becomes thick and strong.

“The two species above referred to evidently belong to the first category; and, as the stems found are not large, still older stems would probably show larger leaf-bases. Such species of *Lepidodendra* approach nearer than others to the genus *Lepidophloios* in the expansion of the old leaf-bases and the small development of the woody axis; and it is interesting to notice that they also resemble them in the great length of the leaves and the thickness of the branches. The *Lepidodendra* whose branches end in slender sprays are usually, if not always, those in which the woody axis is large and the bark of the old stems torn and wrinkled.

“I may add that these differences are most important in the discrimination of species of the genus *Lepidodendron* by the markings on the stems, though they have been too often overlooked.

“Another noteworthy point is the manner in which the fruit of *L. Cliftonense* is borne on slender branchlets with few and short leaves, extending from the thick branches. Such branchlets might, if alone, be readily mistaken for branches of other species. They also help to explain the scars of fructification often found on *Lepidodendra*, as well as on the so-called *Ulodendra*, some of which, however, are not generically distinct

¹ *Ibid.*, p. 162; also *Acadian Geology*, 1878, p. 452.

from the *Lepidodendra*, and on *Lepidophloios*. In some species, especially of the latter genus, these scars are seen from their form to represent sessile cones, usually of large size; but in other cases they are merely round marks, as if indicating the insertion of branches or buds. The little fertile branchlets of *L. Cliftonense*, which would probably die after the maturity of the fruit, would leave such scars, and may probably account for some of the less intelligible of them.

"If now we compare our two species above described with others found in America and Europe, and most of which are characterized merely by the forms of the leaf-bases and scars, we may exclude from consideration all those in which the leaf-bases do not expand in growth, and confine ourselves to those having living and expanding leaf-bases. At first sight we might imagine that these would be the oldest, as being simpler than the others in structure; but though some of the Erian or Devonian species are probably of this type, in the lower Carboniferous, where the *Lepidodendra* first became important, the species with leaf-bases separated by wrinkled bark or by expansion of the cortical tissues between the leaf-bases are apparently predominant, though others also exist, and the type which we are now considering perhaps culminates in the Coal Formation.

"We may first refer to *L. costatum* of Lesquereux, with vertical rows of corrugated leaf-bases, but separated by distinct longitudinal spaces of wrinkled bark. This is a Lower Carboniferous species, and is compared by Lesquereux with his *L. Brittsi* and with *L. Volkmannianum*, Sternberg, of the European Carboniferous, both of which have strong points of resemblance in the characters of the leaf-bases, though differing in the scars and in the leaves, so far as known. The *L. Wortheni* of Lesquereux is based on fragments closely allied in general form to our species. So also is *L. diplostegioides*, a species found in the lower coals as far west as Arkansas. None of these species are, I think, sufficiently near to be identified with our Newfoundland and Nova Scotia species, though as most of them are known only by the bark of old stems, this may admit of doubt. In any case, *Lepidodendra* of this general type and aspect were widely distributed, both in Europe and America, in the Carboniferous, and especially in the lower portions of the Coal Formation, to which in all probability the Newfoundland specimens belong.

"I may add here that Zeiller¹ figures a species as *L. Veltheimianum*, which can scarcely be that species, and may be a branch of *L. Murrayanum*, with which it agrees very closely. The same plant is figured by Renault.² The leaf-bases of the Newfoundland species have also some resemblance to those of *L. aculeatum*, Sternberg, but differ in detail.

"Another interesting question rises here as to the limits of *Lepidodendron Sigillaria*, as determined by their surface markings. The markings of

¹ *Végétaux fossiles du Terrain Houiller*, 1880, pl. xxii.

² *Cours de Botanique Fossile*, 1881, pl. v, fig. 2.

the latter have usually been considered as characterized by the leaf-scars being placed in vertical rows and often on continuous prominent ribs, and also by the fact that the lateral vascular scars are much larger than the central one; but in such a case as Lesquereux's species, *L. costatum*, the confluent leaf-bases in vertical rows have the effect of ribs, and in a less degree the same remark applies to *L. Murrayanum*. I may add that when one happens to find young stems of *Sigillaria* not compressed, the leaf-bases are seen to project in the manner of those of *Lepidodendron*, and that in some non-ribbed *Sigillarids*, as in *S. elegans*, the very young branches have the scars arranged spirally.¹ In connection with this I may observe that Sauveur² has described two species of *Sigillaria*, *S. angustata* and *S. undulata*, which are scarcely distinguishable, so far as the old bark is concerned, from *L. Murrayanum*; and Goldenberg³ has two similar species, *S. aspera* and *S. coarctata*. Goldenberg's two species are by the character of their scars unquestionably *Sigillaria*, but *S. angustata* and *S. undulata* of Sauveur, especially the former, might well have been lepidodendroid trees very near to *L. Murrayanum*. This, however, could be certainly ascertained only if more complete specimens could be found. On the whole one might infer that as the spiral and Lepidodendroid characters of *Sigillaria* appear most prominently on young branches, the more Lepidodendroid and spiral *Sigillaria* are the lowest in type and the ribbed *Lepidodendra* among the highest of that genus. But such a conclusion must be received as liable to many exceptions."

Subsequently to the appearance of this paper, in which I referred only to the branches and cones, I was led, in arranging the specimens in our museum, to strip off some of the long leaves from the largest slab in my possession, representing a portion of the trunk or a main branch, and was surprised to find that the leaves and leaf-bases were arranged on the plan of *Lepidophloios*. My Clifton specimen thus showed characters which combined those of *Lepidodendron* and *Lepidophloios*, and as the leaves and fruit were those of the latter genus, I have now no hesitation in referring it to this; though it furnishes a very interesting illustration of the close approximation of the two genera, as well as an example of the possibility of referring fragments of *Lepidophloios* to *Lepidodendron*. At the same time, a specimen from the Clifton quarries which is evidently a portion of the surface of a trunk or large branch, shows that in this species, which I think may be referred to *Lepidodendron Wortheni*, the character of the leaf-bases and leaf-scars, which are confined to slender branches in the associated *Lepidophloios*, may be persistent on the main trunk. Were it not for this specimen I would be induced to suggest that

¹ Acadian Geology, 1878, p. 434.

² Fossil Flora of Belgium, 1848, pl. lvi. and lviii.

³ Brit. Mus. Catalogue, 1886, p. 151.

many branches of *Lepidodendra* figured by authors, and of this type might, if better known, be found to be branches of *Lepidophloios*. Yet, though this is possible, there is an equal possibility that they may really be *Lepidodendron*. These facts, however, lead to the discussion of what is known from structure, form and fructification, of the relationships of the *Lepidodendreae* and *Sigillariae*, in referring briefly to which subject I shall depend chiefly on Canadian examples in my own collections, as the current descriptions and figures of fragmentary specimens by authors abroad do not always furnish reliable data for comparison.

IV.—RELATIONS TO LEPIDODENDRON, ULODENDRON AND SIGILLARIA.

We have already seen how easy it would be to refer fragments of *Lepidophloios* to the genus *Lepidodendron*, and in regard to internal structure it is probable that branches of *Lepidophloios* are scarcely distinguishable from those of the simpler styles of *Lepidodendron*, in which an outer cylinder of radiating wood is either absent or developed only on the larger stems. The difficulty is added to by the fact that some *Lepidodendra*, as for example, *L. ornatissimum* and *Veltheimianum* of Sternberg, bear sessile lateral cones on stems or large branches, and it seems certain that some plants of this group, bearing sessile cones in two rows, which have been referred to the genus *Ulodendron* of Lindley and Hutton, are really portions of *Lepidodendra* of this type. In my original description of *Lepidophloios Acadianus* in 1865, I was so far influenced by these apparent connections as to include under this genus not only the *Lomatophloios* of Corda, which is no doubt a synonym, but also the *Ulodendron* of Lindley and Hutton, of which two species or varieties are found in Nova Scotia, and some plants with leaf-scars, similar to those of *Lepidophloios*, but without the long pendant leaf-bases, and which are now usually classed by palaeobotanists with the *Sigillariae*. With regard to the *Ulodendron*, it may be stated that the *Ulodendra* and *Ulodendroid Lepidodendra* cannot be distinguished by the two-ranked cone-scars, because these occur also on *Lepidophloios*, but rather by the fact that the cones were not stalked but sessile by a broad base,¹ and that the leaf-bases and leaf-scars were of different form. I illustrate this by figures of two species or varieties of *Ulodendron*, corresponding to *U. majum* and *U. minus* L. and H., which are found, though rarely, in Nova Scotia, (Plates XI., XII.) In one of them (Plate XII.) the leaves are present, and are more like those of *Lepidophloios* than that of *Lepidodendron*, while the leaf-bases resemble in general form those of a *Sigillaria* of the *Clathraria* type. The plant is like *S. discophora* of Kœnig,

¹ It is quite likely that were the structures of these cones perfectly known, other differences would appear.

but cannot be a new *Sigillaria*. This was named *L. parvus*. In point of fact the Carboniferous forests contained many species of trees belonging to an advanced type of acrogenous structure, and so nearly allied that it is difficult, if not impossible, to distinguish them when in the state of imperfectly preserved fragments. The difficulties of the palæobotanist are increased by the presence of numerous species of *Sigillaria*, which, while for the most part distinguishable from all the *Lepidodendrea*, yet in some of their genera approach them very nearly both in external markings of the stem and its internal structure. On the other hand, there are plants included among the *Sigillariæ* which there is at least reason to suspect belong to a higher type, akin in structure to the modern cycads. In a paper on the affinities of these plants, published in the *Journal of the Geological Society* in 1871, I suggested the following scheme of their affinities, placing the *Sigillariæ* as a group on the confines of the *Acrogens* and *Gymnosperms*. After the lapse of twenty-six years, and in view of the progress of discovery in the meantime, this scheme must require some modification; but we may well make its amendment a basis for discussing the present aspects of the question.

Cycadaceæ.

Favularia ?

Coniferae.

Dadoxylon.

Palæoxylon.

Ormoxylon.

Dictyoxylon.

SIGILLARIÆ.

Rhytidolepis.

Favularia ?

Clathraria.

Syringodendron.

Lepidophloios.

Lepidodendron.

Lycopodiaceæ.

Calamodendron.

Calamopituis.

Bornia.

Calamites.

Equisetaceæ.

In this the *Sigillariæ* are regarded as a central generalized group, from which, in regard to structure and affinities, various genera radiate towards *Cycads* and *Conifers* on the one hand, and *Lycopods* and *Equisetums* on the other.

The *Sigillarian* structure is based on that of a remarkable axis showing structure which I had at that time found in an erect trunk at the South Joggins, and of which the details are figured in the paper above referred to. Though I have since found a still better preserved axis of different type, to be referred to in the sequel, I still hold that my original specimen represents one, and that the more advanced, *Sigill-*

arian type, and approaches very near to tissues of *Cordaites* on the one hand and to that of Cycads on the other.

Other doubtful species mentioned in the original account of *Lepidophloios Acadianus* (1865) above referred to, were those which I named *L. platystigma*, *L. tetragonus* and *L. prominulus*. The first of these has large rhombic leaf-scars like those of *Lepidophloios* placed on confluent uneven leaf-bases, and with a central vascular scar which is double. These characters do not correspond exactly with those of *Lepidophloios*, nor with *Sigillariæ* like *S. Menardii*, Brongniart. The second has perfectly rhombic leaf-bases with a central leaf-scar strictly of *Lepidodendroid* type, though sometimes appearing as a rounded spot without any distinct vascular marks. The third is very near to this, but with more elevated and rugose leaf-bases of smaller size; but this difference may be an accident of condition of growth and state of preservation. Some of my botanical friends are inclined to refer all these to *Sigillaria*, but to this I must demur, unless indeed that genus be regarded as place of refuge for any Carboniferous tree which cannot be conveniently provided for elsewhere, and indeed that has been to a large extent its use.

This being the case, it may be appropriate here to inquire briefly as to the normal characters of *Sigillariæ*, properly so-called.

In regard to external form and markings, the typical *Sigillariæ* are trees often of great size, with the trunks covered with hexagonal or shield-shaped leaf-scars, in each of which is seen a central vascular mark with two elongated and often curved marks at either side. This indicates a leaf with a very broad insertion, and usually long and rigid, and with a midrib containing a vascular bundle and two lateral structures, cellular or vascular, and of uncertain significance. These leaf-scars are placed in vertical rows on the middle of raised ribs which traverse the trunks vertically and become narrower and more numerous toward the upper part of the stem, and disappear by expansion of the bark toward the base.

Sigillariæ of this type have been classed with others having narrow ribs no wider than the scars, to which the name *Rhytidolepis* has been given, and these again pass into others in which the ribs disappear or consist merely of rows of contiguous leaf-scars. To these the name of *Favularia* has been given.

It is obvious that these appearances present some resemblance to those of *Lepidophloios*, but yet in the typical forms there are marked and essential points of difference in the vertical arrangement of the leaf-bases and in the character of the vascular impressions, which imply differences in internal structure and foliage. To these have to be added the fact that the stems of *Sigillariæ* seem to have been either simple or with few branches, and that, so far as known, their fructification was borne in bands placed transversely on the stems and showing numerous small

rounded marks of the insertion of the organs of reproduction, indicating that they were different from those of *Lepidophloios* and *Lepidodendron*. It is to be observed, however, that when one has the opportunity to see stems and branches of Sigillariæ of different ages, the superficial markings present very diverse appearances in different portions of the same tree, and that in the younger branches and the basal portions, the peculiar ribbed appearance to a great extent disappears, and though a great number of species have been described, it seems certain that many of them may be founded on different portions of one and the same tree. In my paper on the Coal Flora already referred to, and in *Acadian Geology*, I have given several examples of this.

It is also to be observed that the fruit-scars seen on the stems of Sigillariæ could not have given attachment to large cones like those of *Lepidophloios* and *Ulodendron*, but only to comparatively slender organs, homologous with leaves rather than with branches, and this accords with the appearance of the slender and long-stalked organs attributed by Goldenberg and Zeiller to *Sigillaria*, and variously interpreted as producing macrospores or pollen sacs. It seems very probable that there are various arrangements of reproductive organs in different types of *Sigillaria*.¹

In addition, however, to the typical Sigillariæ above referred to, there are others included in the group *Clathraria* of palæobotanists which are destitute of ribs and have the leaf-bases arranged spirally, and more of the type of *Lepidophloios*, in which group, as already stated, I had placed them in my paper of 1865, and though I am not now disposed to insist on this, at the same time I am convinced that they present essential generic differences from true Sigillariæ.

As concerns the present subject, I may content myself with pointing out the marked structural difference between the true Sigillariæ and such plants of the *Lepidophloios* type, and also the fact, which I have

¹ One of these is shown by a specimen from Sidney, Cape Breton, now in my collection, and figured on a reduced scale in my paper of 1865 in the *Journal of the Geological Society* and in *Acadian Geology*, p. 432. It is a good impression of part of a stem or branch of a *Favularia* near to *F. elegans*, Brongt. At one side is a short, but distinct branch, slightly ascending, and about two inches long, with an obtuse termination. Near the end it has ovoid leaf-scars, differing in form from those on the main stem, and resembling those of *Clathraria*, but near the base this branch shows clusters of round scars, apparently fruit scars. Another branch at the same level, but at right angles to the first, springs from the main stem, and passes through the slab, being flattened on the opposite side, where it shows similar markings. There would thus seem to have been at least four verticillate branches proceeding from the stem at one level and bearing the fruit, not on cones, but on their sides. This is evidently a special modification of the ordinary mode of rings of fruit scars on the main stem. Whether it imports a specific or generic difference I do not presume to decide. I hope that this and other instructive specimens in our collections will eventually be properly figured, since though they do not show the actual fruit, they illustrate its character and mode of attachment.

already insisted on in my Geological History of Plants, that even in the *Sigillariæ* proper we have probably two types of organization, one approaching to that of Cycads and Cordaitæ and the other allied to *Sigillariæ*. In other words, that the dividing line between *Gymnosperms* and *Acrogens* or *Archegoniata* falls within the great genus *Sigillaria*, as now held by palæobotanists.¹

In proof of this I may refer to the structure of an axis described by me in 1871, and taken from an erect ribbed *Sigillaria*, undoubtedly of that genus, and probably allied to, if not identical with, my *S. Brounii*. I have described the details of this structure in the paper referred to, and may here merely refer to the figures of the more important tissues and invite attention to their resemblance to those of Cordaitæ, as figured by Renault and other French botanists, and to those of modern Cycads.

It may, however, be doubted whether this axis may not have been introduced accidentally into the trunk in which it was found. This would be in the last degree improbable in the case of a trunk not filled with foreign debris, but containing along with sand apparently only fragments of its own interior tissues. Farther, in many erect trunks at South Joggins there are masses of mineral charcoal on the bottom, which have fallen in before any foreign matter entered, and which, when prepared by nitric acid and examined microscopically, show similar structures, as I have shown in my paper of 1860 on Vegetable Structures in Coal.² These observations confirm the impression that this structure, much more advanced than that of any Cryptogams, recent or fossil, was that of many at least of the *Sigillarian* trees.

But another and less advanced structure comparable with that of *Lepidodendra* is also found. Of this an excellent example was discovered by Mr. Albert J. Hill in the coal measures of the Cumberland basin in Nova Scotia, and was described by me in 1877. It was an erect ribbed *Sigillaria*, with broad ribs like *S. reniformis*, and twelve feet in height, filled with sandstone, but having its axis perfectly firm in calcite, and standing, like a pole or the core of a casting, erect in the stem, nearly from the base to the summit, though fallen a little to one side. It will be seen that its structure corresponds with *Diploxyton* of Corda, and with those more advanced *Lepidodendroid* stems which have thick development of radiating tissue.³

¹ Journal Geological Society of London, Vol. XXVII.

² Quart. Journ. Geol. Soc., Vol. XV.

³ Note on a specimen of *Diploxyton*, Quart. Journ. Geol. Soc., Vol. XXXIII.

V. RELATIONS OF LEPIDOPHLOIOS TO THE ACCUMULATION OF COAL.

On this subject it is not necessary to say much, as what is noted of the *Lepidodendra* in my papers on the Accumulation of Coal, in the Journal of the Geological Society (1865), and in the chapter on that subject in *Acadian Geology* covers nearly all that can be said of *Lepidophloios*.

I may merely state that such specimens as I possess, in a flattened and carbonized state, show that in ordinary circumstances the outer bark and leaf-bases have yielded a film of compact coal, perhaps $\frac{1}{100}$ th of the thickness of the recent stem, and that the woody axis will appear usually as mineral charcoal of the same character as that of the *Lepidodendra*. The large cones and their contained sporangia and macrospores must have contributed to the mass of such material which enters into the coarser layers of coal, but can, until the microscopic structure of these organs is better known, scarcely be distinguished from the similar parts of other *Lepidodendroid* trees. The trees of the genus *Lepidophloios* were associated in the Carboniferous swamps with *Sigillaria*, *Lepidodendron*, *Calamites*, etc., and were most plentiful in the Middle and Upper Coal Formations, but do not seem to have been so abundant as either of these genera in any locality in which I have studied them.



DESCRIPTION OF THE PLATES.

PLATE I.

Lepidophloios Acadianus—Impression of the leaf-bases on sandstone.

PLATE II.

Part of the same trunk, and surface of bark immediately below the leaf-bases, and epidermis showing punctiform marks like *Bothrodendron* of Lindley and Hutton.

PLATE III.

The same—Portion of bark with leaves attached.

PLATE IV.

The same—Leaf-bases of a large and old stem, above; below, cones or strobiles seen transversely and longitudinally, also a detached scale or *Lepidophyllum*.

PLATE V.

The same—Horizontal branch showing arrangement of cone-scars above and below.

PLATE VI.

The same—Transverse section of axis, magnified, showing outer and inner ring of scalariform fibres (upper figure $\times 20$, lower figure $\times 48$) with leaf-bundles at outer margin of axis and spaces representing their sheaths.

PLATE VII.

The same, or possibly the upper figure a true *Bothrodendron*. The lower figure a branch in the *Halonina* state, but at one spot near the right hand showing a few perfect leaf-bases.

PLATE VIII.

The same—*Halonina* state of a branch or small stem, showing very distinct cone-scars.

PLATE IX.

Lepidophloios Cliftonensis.—Portion of stem showing reflexed leaf-bases and the drooping position of the basal portion of the long leaves.

PLATE X.

The same—Upper figure a fertile branchlet with cone. Lower figure an ordinary branch.

PLATE XI.

Ulodendron of the type of *U. majum*, L. and H. Half natural size. South Joggins.

PLATE XII.

Ulodendron allied to *U. minus*, L. and H. Upper figure showing cone-scars and leaf-bases. Lower figure, reverse of same specimen, showing leaf-bases and leaves.

PLATE XIII.

Lepidophloios Acadianus.—Rough restorations showing general habit.

PLATE XIV.

Lepidophloios Cliftonensis.—Rough restoration showing general habit. On same plate a fragment of bark with short leaves, perhaps of a *Sigillaria* of the *Clathraria* type.

FIGURES IN THE TEXT.

Fig. A.—Young and old leaf-bases of *Lepidophloios Cliftonensis*.

Fig. B.—Original sections (1865) of *Lepidophloios Acadianus*.

Fig. C.—Original figures of markings, etc. (1865), of *Lepidophloios Acadianus*, with impressions and outlines of leaf-bases, surface of inner bark and leaf.

Fig. D.—Rough sketch of *Lepidophloios Cliftonensis* in situ on a surface of sandstone.

ERRATA AND ADDENDA.

In Sir Wm. Dawson's paper on *Lepidophloios* :

Page 77. Description of Plates.

Plate II.—The lower figure represents another portion of the trunk shown on Plate I.

Plate VI.—Add the words, "From micro-photographs by Prof. Penhallow, of McGill University."

Plate XI.—For "majum" read "majus."

All the specimens figured are from the author's collections in the Peter Redpath Museum of McGill University.

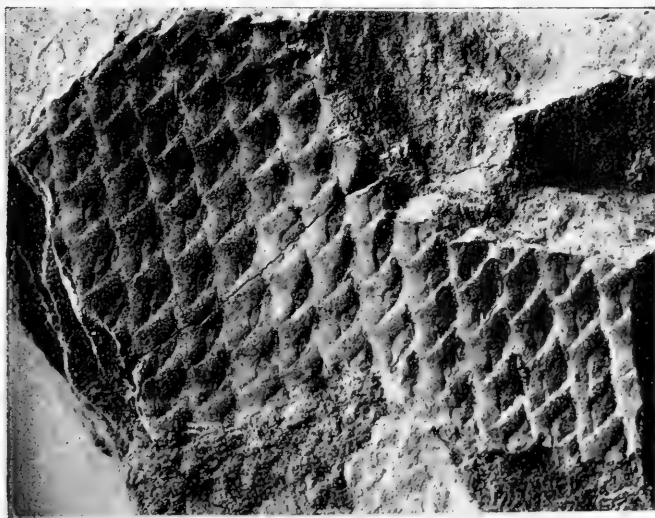


ON THE GENUS LEPIDOPHLOIOS





ON THE GENUS LEPIDOPHLOIOS

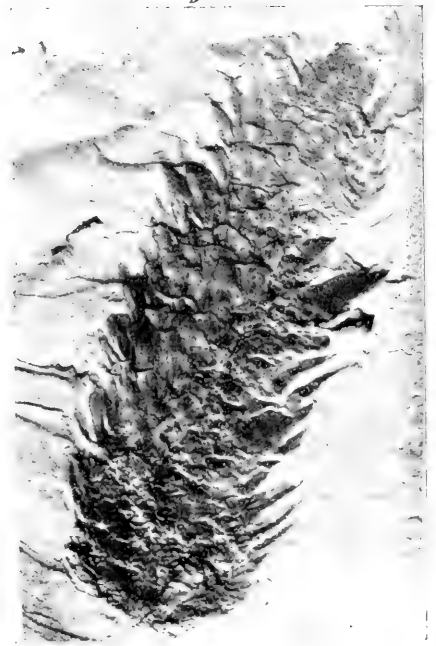
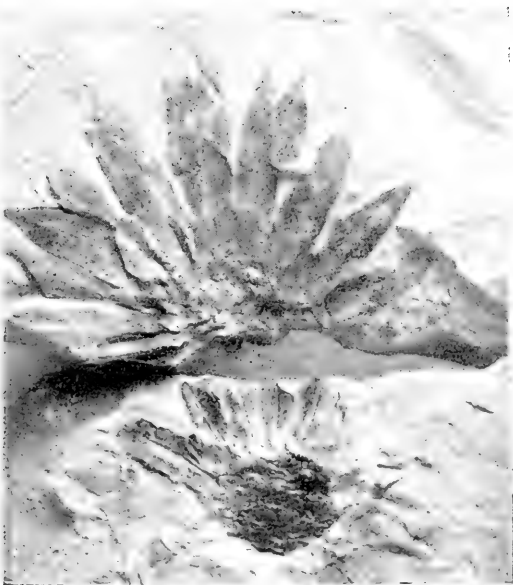
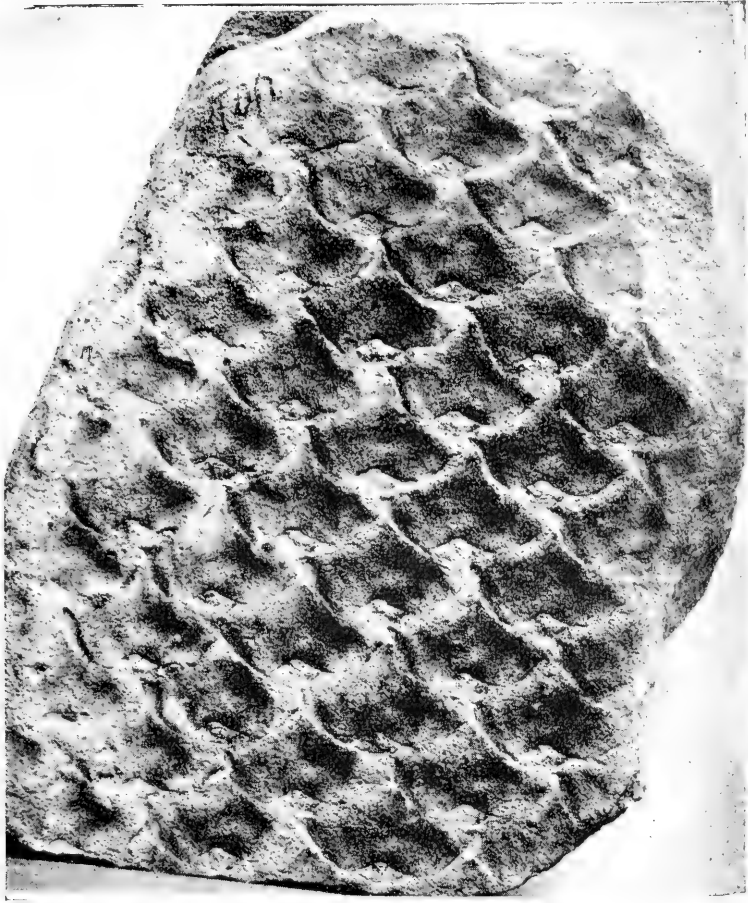








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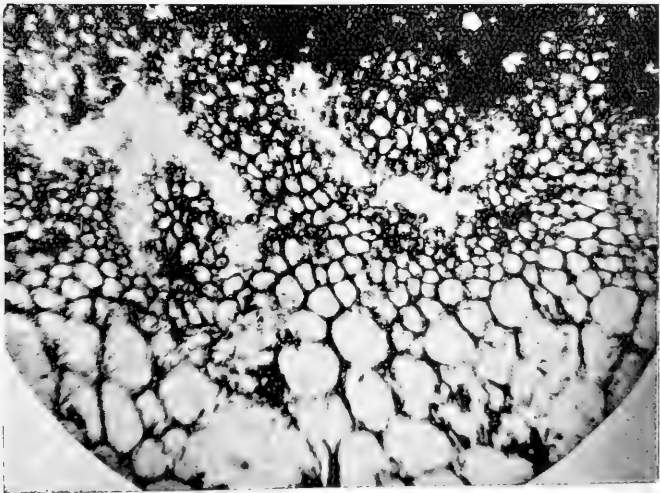
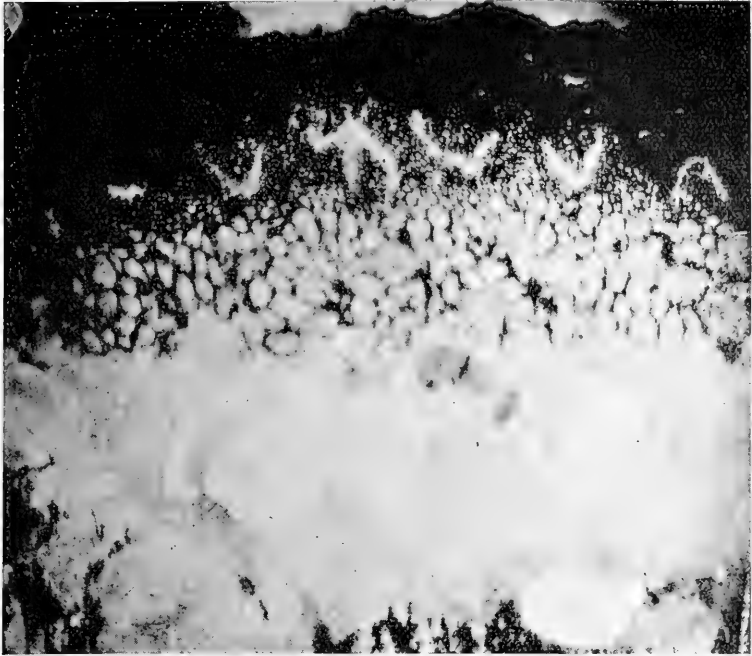


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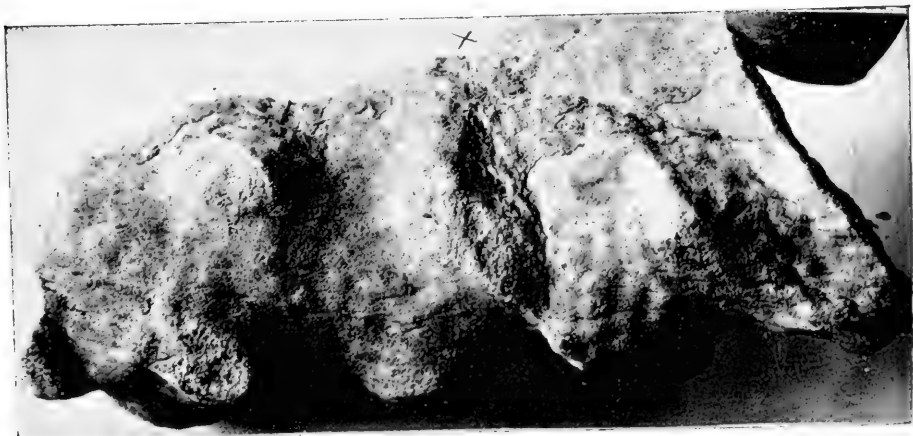


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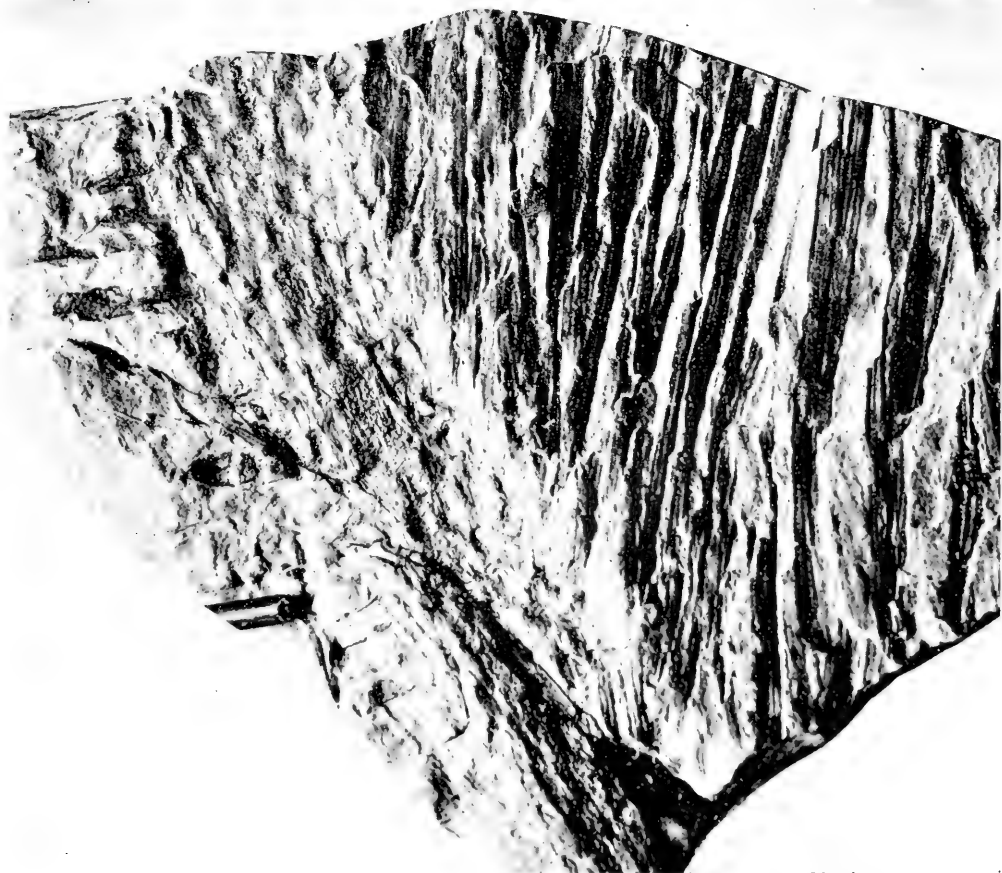
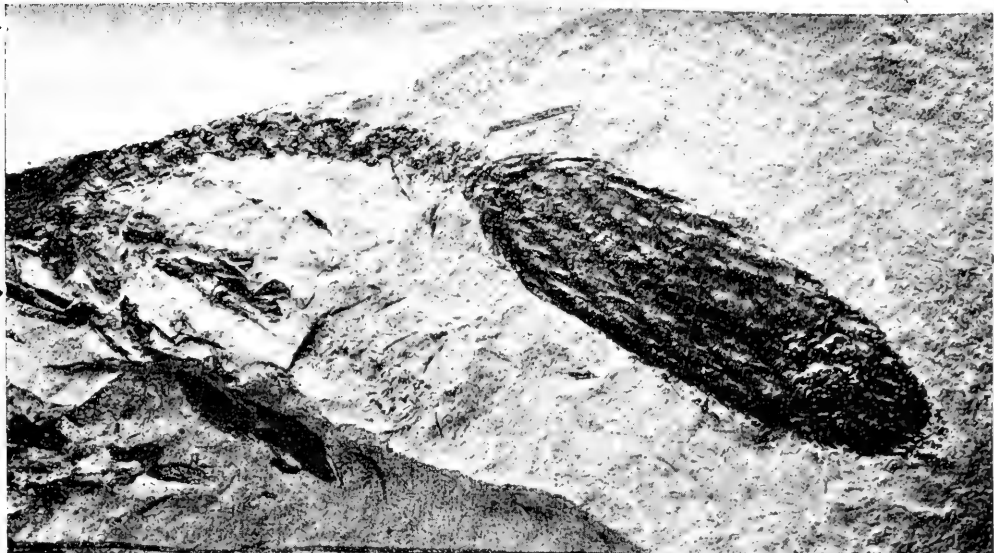


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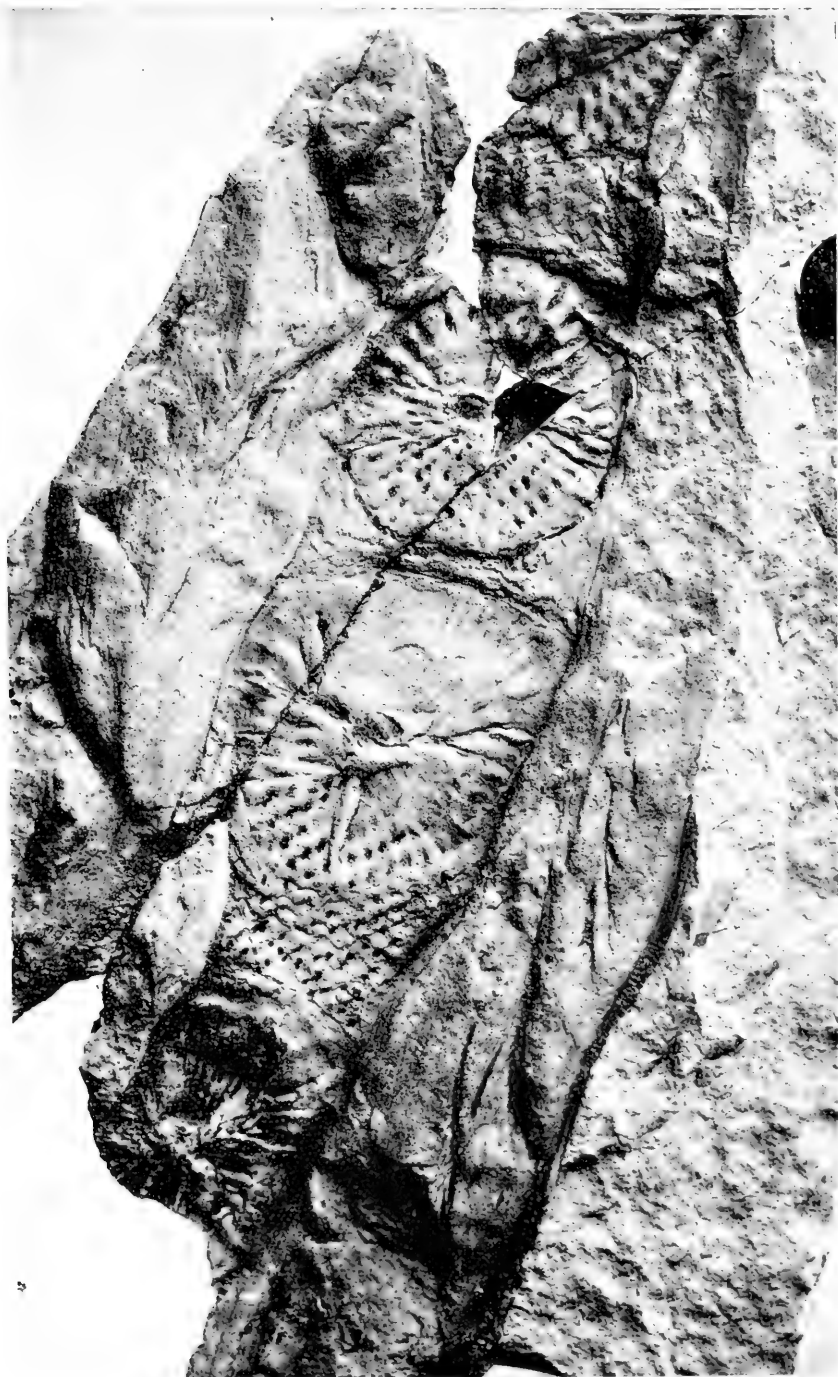




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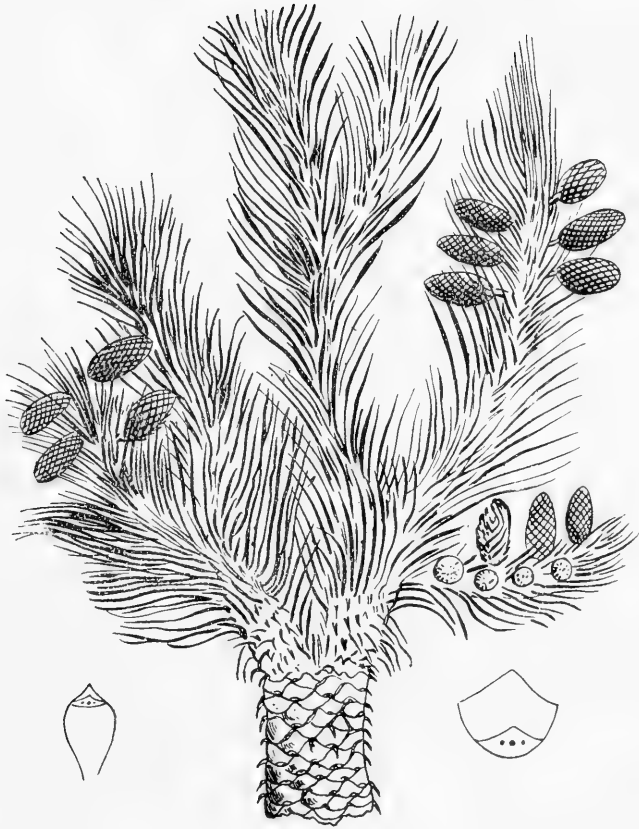


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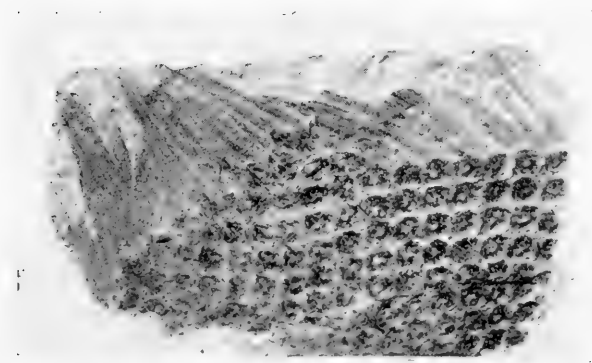


ON THE GENUS LEPIDOPHLOIOS





ON THE GENUS LEPIDOPHLOIOS





III.—*The Bay of Fundy Trough in American Geological History.*

By PROFESSOR BAILEY.

(Read June 23rd, 1897.)

The fact that a northeastern or Acadian basin, not only physiographically distinct from other regions of the American continent, but to a considerable extent independent also as regards its biological progress, was a feature of that continent even from the earliest Palæozoic times, was first brought prominently to notice by the late Prof. J. D. Dana, in the earliest edition (1866) of his *Manual of Geology*. In that work the references to this subject, under the heading of "The Eastern Border Region," were for the most part of a very general character; but in the last edition of the same work, published thirty-one years later, the same idea is elaborated in much more detail, and several successive sketch-maps are presented, embodying the author's views as to the geographical evolution of the region to which they refer. As these views have reference to a most important subject, and are likely to be widely read and accepted, any facts which may tend to confirm or to modify them can hardly fail to be of value. It is the purpose of the present paper to discuss some of these conclusions, especially so far as they relate to New Brunswick and Nova Scotia, in view of such information as recent investigations of the latter are calculated to afford.

Among the features which especially distinguish Prof. Dana's latest presentation of the subject is that of the recognition, among what he terms "areas of geological progress," of an "Acadian channel," this being described as embracing the Bay of Fundy, and thence extending easterly to western Newfoundland, and in the opposite direction along and off the New England coast, probably as far as Narragansett bay. This Acadian trough is further described as persisting through Palæozoic time, and as being separated, at least during the earlier portion of that time, from another and more northerly trough—designated "the Gaspé-Worcester" or "Maine-Worcester" trough—by a range of Archæan rocks, possibly extending across the Gulf of St. Lawrence to Newfoundland; while to the south it was delimited by another Archæan range, termed the "Acadian protaxis," occupying, in particular, central Nova Scotia, and thence extending westerly to Long Island. Finally, in the series of sketch-maps, to which reference has been made, representing the supposed geographical conditions of eastern America in successive periods, various limits are assigned to the submerged and emerged areas, the Nova Scotian protaxis being retained in all.

These views would, therefore, make the origin of the Bay of Fundy trough, as well as the associated ridges and depressions, coincident with and the result of the very earliest orogenic movements of which we have any knowledge, and to any one interested in the probable history of this portion of the country, must be regarded as of extreme importance. We have now to inquire how far they are in accordance with our present knowledge.

In the first place it is to be noticed that in recognizing two belts only of Archæan rocks as traversing the Acadian basin, viz., that of northern or central New Brunswick and that of Nova Scotia, the only group or belt of rocks which in the former province is known to be of the Pre-Cambrian age is entirely overlooked; the great central basin of New Brunswick being at the same time made continuous with the Bay of Fundy trough, from which these Pre-Cambrian rocks now completely separate it. As to the ridges north of the central basin, now occupied by the Coal measures, and dividing the latter from the Gaspé-Worcester trough, it is true that a portion of these have, in the reports and maps of the Geological Survey, been represented as Archæan; but even if this be their age, of which there is as yet no definite proof, the area which they occupy is not large, and no evidence whatever is available to show that they were connected either on the one side with the rocks of Newfoundland, or on the other with those of southern Maine and Massachusetts. It seems much more probable that, if Archæan at all, the rocks in question represent one or more of several insular groups in the Cambrian seas, of which others were to be found in northern Maine, in southern New Brunswick and in eastern Nova Scotia.

If now we consider the facts connected more particularly with the Bay of Fundy trough, we find definite proof not only of the existence of terrestrial areas in this vicinity at the opening of the Cambrian era, but that these were so disposed as to determine a northern border to the trough, not widely different in position from that which now limits it in the same direction. For although among the formations adjacent to the Bay are found representations of all the successive eras, from the Laurentian to the Trias inclusive, they occupy in general very small areas, forming a mere fringe, as it were, to the Archæan ridges, which, for much of their length, rise directly and precipitously from the waters of the bay. That they similarly thus rose in early Cambrian times, or at least that ridges in part above the sea-level were not very distant, is fully shown by the nature and distribution of the Cambrian sediments, by their physical markings and by their contained fossils, as long since pointed out by Matthew. It seems probable, however, that their height was somewhat less to the eastward than to the westward, the Archæan rocks, which to the west of the St. John river form one broad belt, being to the eastward of that stream divided into several, possibly insular, ridges, by intervening parallel troughs of Cambrian sediments.

The northern border of the Bay of Fundy trough being thus fixed for the early Palæozoic with some degree of certainty, though not in the position assigned to it in the manual of Prof. Dana, we have now to inquire as to the corresponding border on the south.

At the present time this southern border is, throughout its extent, marked by the trapeean range of the North Mountains, which cannot possibly be older than the Trias, and is probably Jurassic. Eliminating this and the associated red sandstones, and uniting, as would then be the case, the waters of the Minas basin, Annapolis basin and St. Mary's bay with those of the Bay of Fundy, we find the rocks which next border the trough on the south side to be of Silurian or Eo-Devonian age, resting for the greater part of their length upon the granite ridge of the South Mountains, the latter forming the backbone of the Nova Scotian peninsula. But is the backbone Archæan? It is so represented in Prof. Dana's manual; but it is safe to say that, as regards all that portion at least of the peninsula which now lies south of the present Bay of Fundy, it contains no Archæan rocks whatever. The granites were long since described by Sir Wm. Dawson as being intrusive and of Devonian age, a conclusion which all subsequent investigation has tended to confirm; and though both that author and Dr. Selwyn were disposed to regard the hornblendic and chloritic rocks of Yarmouth as probably Huronian, there is now no question that these too are really more recent, they being a member, and by no means the lowest member, of the same series as the gold-bearing rocks of the southern coast, usually regarded as Cambrian. Thus there are no rocks, at present disclosed to view, in the portion of Nova Scotia lying south of the present Bay of Fundy, which can properly be pointed to as a portion of the "Acadian protaxis"; the only rocks of Archæan age to be found in the province being limited to the island of Cape Breton, and possibly to some portions of the Cobequid mountains.

Before dismissing the Pre-Cambrian rocks it is interesting to note, in the case of those of southern New Brunswick, the large amount of volcanic matter which they contain, and which, in the rocks referred to the Huronian system alone, has been estimated to reach a thickness of at least 10,000 feet. So vast an accumulation of igneous matter along lines parallel with the present course of the Bay of Fundy trough, not only strongly marks out the latter as a subsiding geosyncline as far back as Pre-Cambrian time, but as exhibiting, even then, conditions which, in later eras and in the same geosyncline, were repeated in the igneous extrusions of the Silurian, the Devonian, the Lower Carboniferous and the Trias.

We have now to consider more particularly the information to be obtained from the study of the Cambrian rocks.

The littoral origin of these rocks, as regards their earlier members, is, in New Brunswick, sufficiently attested by the coarseness and bulk of the conglomerate which constitute these members; while their origin is as clearly indicated in the fact that their contained pebbles are identical with that of the Archæan ridges near by. Even higher in the series, though increasing fineness indicates a deepening of the waters in which the beds were deposited, the occurrence of wave-marks, ripple-marks, mud-cracks and worm trails continue to afford conclusive evidence of shallow water origin. And, finally, this conclusion finds confirmation in the nature of the fossils, the well-known studies of which, by Matthew, have enabled him not only to determine, in great detail, the successive changes in that fauna as affected by the varying conditions under which it was developed, but to draw probable conclusions as to its relations with equivalent faunas elsewhere, and possible migrations from one region to another. The most important point in connection with the comparisons, so far as the subject under discussion is concerned, is that of the much closer resemblance of the Acadian Cambrian fauna to that of Europe than to that of interior America. Following the suggestions of Dana, this is believed by Matthew to be due to the existence of a barrier separating the Acadian basin from that of the continental interior, accompanied at the same time by a difference in the temperature of the waters, those of the region east of the barrier feeling, as now, the influence of a comparatively cold Polar current, while those to the west, including the St. Lawrence channel and probably the Gaspé-Worcester channel, were relatively warm. It would seem to follow, as a corollary, if these inferences are correct, that no similar barrier existed between the eastern coast of America and the western shores of Europe; and Matthew, in a map illustrating his views, extends the zones indicating the distribution of the trilobitic fauna directly from the one to the other, Nova Scotia being included in the probably submerged area. So, again, Walcott, in a map showing the supposed distribution of what he terms the Keweenaw land or continent, while recognizing the Archæan rocks of southern New Brunswick as an extension of the Appalachian protaxis, and as being above the sea level, does not include therein any part of Nova Scotia.

Unfortunately, in passing to the last named province, to which we would naturally look for further information, we find this to be of a very unsatisfactory character; for though it is usual to assign to the Cambrian system the great group of rocks along the southern coast, in which are situated the various auriferous deposits now so extensively worked, there is as yet no definite proof that such is their age, and there are those who directly deny it. All, however, are agreed that these rocks cannot be newer than Cambrian, and, although, adopting the latter view as the most probable, we find, as in the case of the St. John rocks, evidence that this source could not have been far distant, there is still no

distinct evidence of its existence within that part of Nova Scotia which now forms the southern boundary of the Bay of Fundy basin.

It is usual to divide the supposed Cambrian rocks of Nova Scotia into two distinct members, of which the lower consists chiefly of quartzites or fine sandstones, with much thinner intercalated slates, and the upper almost wholly of slates, partly light coloured or banded, but mostly very black and pyritous. The thickness assigned to the former by Gilpin is 9,000 ft., by Mr. Campbell it is made 10,000 ft., while W. F. Prest, from measurements both on the Sissaboo and at Waverley, has estimated the same thickness as high as 16,000 ft. It is doubtful whether, in a region so extensively folded and faulted as this, any estimates of thickness can be looked upon with confidence; but no one who has made sections across the supposed Cambrian belt, anywhere between Halifax and Shelburne, can doubt that the thickness, with all allowance for probable errors, is something enormous. That the beds, especially of the lower division, should exhibit such great uniformity, as regards both their extension and their depth, is scarcely less remarkable; while their character is such as to indicate that they could hardly have been deposited in very deep water or that their source was very far distant. It is true that, as compared with the Cambrian rock of New Brunswick, they lack the coarse red beds usually (but not always) found there at the base of the system, but apart from their arenaceous character, the occurrence of ripple-marks and occasionally of pebble beds leaves little doubt of their shallow water origin. And yet over the whole of southwestern Nova Scotia we find nothing to indicate the source from which they came. On the contrary, it is now known that, with the exception of the granite and small areas of Eo-Devonian and Trias, to be presently noticed, no other rocks than those of the Cambrian system (so called) are to be found over all this region. As, moreover, there is reason to believe that the granite itself is but an excessively metamorphosed condition of the Cambrian quartzites (this metamorphism not occurring, however, until a much later period), we are forced to the conclusion that all the portion of Nova Scotia under discussion was, during a large portion of Cambrian time, in a condition of submergence, forming a portion of a subsiding trough, whose southern and eastern limits cannot now be defined.

As regards the slates which overlie the quartzites, it is evident that they indicate a still deeper submergence, possibly to considerable depths. Their thickness has been variously estimated at from 4,000 to 10,000 ft., but if only 5,000 ft., this, if added to 10,000 ft., as a reasonable estimate for the quartzites, would indicate for the whole Cambrian system in Nova Scotia a subsidence of nearly three miles. It may be that this subsidence will, in part, account for the remarkable absence of fossils in the Cambrian rocks, the presence of cold currents traversing the submerged area being unfavourable to the growth or spread of organic forms.

If now we advance a step upward in the geological scale, we find that the information to be obtained is still very scanty. No rocks of undoubted Cambro-Silurian age have been identified in that part of Nova Scotia which lies directly south of the present Bay of Fundy, and they occur very sparingly on its northern border. It is probable, however, that extensive areas of such rocks have been removed by denudation, the *Dictyonema* slates found at the mouth of the St. John river showing such relations to the Cambrian rocks, on which they rest, as to indicate that they at one time completely covered them. (Matthew.) It is probable that they spread over much of Nova Scotia as well, but of this no definite proof has yet been obtained.

In the Upper Silurian the data are more ample. In New Brunswick the rocks of this age are widely distributed, but between those of the northern and those of the southern part of the province a great contrast exists. In the northern portion the rocks are calcareous slates and limestones, and both by their character and fossils (which include many corals), show deposition in clear waters, marking, in fact, the continuance of the old Gaspé-Worcester trough. In *southern* New Brunswick, on the other hand, the rocks are almost exclusively slates and fine sandstones, almost without limestones and corals, but with much volcanic debris, showing, unmistakably, both by their character and distribution, that they were deposited in shallow bays and straits in and among the old Huronian hills, these latter then existing as islands in the Silurian sea.

There can be but little doubt that the source of these materials, so far as New Brunswick is concerned, was still, as in the earlier Cambrian, to be found in the waste of the old Archæan ridges near by, and remnants of which, like islands, are seen projecting through them; but while the northern edge of the trough now occupied by the Bay of Fundy thus continues to be more or less clearly indicated, we are still wholly without evidence as to its southern border. We do, indeed, find, all along the southern side of the Annapolis valley, in the basins of Bear River, Clements, Nictau and Torbrook, a great body of rocks, which are abundantly fossiliferous and contain extensive iron ore deposits, both indicative of their marginal or shallow-water origin; but through much of their length the rocks with which they come into contact are granites, which at the same time show, by their penetration and alteration both of the fossil beds and the ore beds along their line of contact, that they are of later origin. The fossil-bearing strata being clearly of Eo-Devonian age, and the granites as clearly of later Devonian origin, while to the south no rocks more recent than those of the Cambrian are to be found, we are again forced to the conclusion that, as in the earlier Palæozoic, so through the Silurian and Devonian eras, the Nova Scotia peninsula, in its western part at least, still lay below the sea level, the old protaxis, if any, lying outside of and to the eastward of its present limits; also, that

it was to the continued subsidence of the Bay of Fundy trough, of which Nova Scotia may have represented the axial line, that we are to ascribe the vast number of igneous dykes by which, on both sides of the bay, its sediments are intersected, as well, probably, as the origination of the granite which, again on both sides of the bay, was the closing event of the Devonian age.

In the distribution, character, and fossils of the Lower Carboniferous rocks in the Acadian region is afforded pretty satisfactory information as to the condition of that region at this latter period. At its opening the land on either side of the Bay of Fundy trough undoubtedly stood somewhat above its present level, the main difference between its contour at that time and the present being in the absence of the North Mountains, which now mark its border; but as the age advanced, differential movements, with increase of subsidence in the direction of the gulf, led gradually to the expansion of its waters until these, in New Brunswick at least, spread over the highest hills of the southern coast, as they did also over much of the interior and over some of the ridges bounding the Gaspé-Worcester trough. Annapolis and Minas basins, with the lower portions of the valleys of the Avon and Shubenacadie, would then be continuous with the main trough, the southern border of which would be marked by the South Mountains; Nova Scotia would have been separated from the mainland by the submergence of the peninsula now connecting the two, and nearly midway in the strait thus found the Cobequids would have stood as a long island, parallel with the axis of the trough. As in earlier periods, continued subsidence led to igneous extensions, but these, instead of being, as heretofore, of granite, were now confined to more limited areas and took the form of doleritic dykes and overflows, such as everywhere cap the Lower Carboniferous rocks of southern New Brunswick.

In the case of the rocks of the Coal Measures, the principal facts to be noticed are the occurrence of them everywhere around the shores of the Gulf of St. Lawrence, as well as upon Prince Edward Island, etc., indicating their former continuity over the area now occupied by the waters of the gulf; the extension of the latter over the central counties of New Brunswick almost to its western border; similar extension across the Isthmus of Chignecto, indicating similar conditions there; but, finally, with a most wonderful contrast in the thickness of the beds there deposited, as compared with those laid down over the mainland of New Brunswick, the one represented by a thickness of 14,000 ft. or more, while the other probably does not exceed 400 or 500 ft. The attitude of the beds in the interior is nearly horizontal; that of the strata bordering the bay shows everywhere evidence of profound disturbance. Thus, the Bay of Fundy trough as a subsiding area is again strongly accentuated, while the vast thickness of the strata about the head of the bay, as

represented at the Joggins, together with their very sparing occurrence to the westward on the New Brunswick shore, and entire absence on that of Nova Scotia, would seem to indicate either that the conditions for their accumulation were here less favourable, or that, if ever deposited, they have been removed by denudation. Prof. Dana seems to have regarded the coal-making swamps of the Gulf of St. Lawrence as having been connected, through the Bay of Fundy, with those of Massachusetts and Rhode Island; but the facts stated above seem rather to favour the idea that a barrier of some kind existed between the two.

As regards the rocks of the Jura-Trias there is no reason to doubt that the generally accepted view which would make them of estuary origin, and as having been laid down under conditions similar to those of the Connecticut valley, are correct. It is, however, worth noticing that the igneous rocks which here, as elsewhere, form so conspicuous a feature in connection with these beds are wholly confined to the Bay of Fundy depression, being found on both sides of the latter as well as in the island of Grand Manan, but nowhere at a distance from the present limits of the bay. The strata are also faulted in the direction of the axis of the bay.

Of later Mesozoic rocks nothing definite is known, and hence data are wanting from which conclusions can be drawn, except so far as these are afforded by regions outside the limits of the area now under discussion. It has, indeed, been ascertained that a portion, and probably a considerable portion, of the strata of the Annapolis valley, which it has been usual to regard as altogether older than the traps of the North Mountains, contain in places large embedded blocks of such trap, and hence that these strata, if not contemporaneous with, are more recent than the latter, but no fossils have yet been found by which their real age can be determined, and no satisfactory conclusions with regard to them are as yet possible.

It only remains to consider briefly the possible condition of the Bay of Fundy trough in the Quaternary era.

As to the Glacial or Drift Period, the question here, as elsewhere, involves a decision between the rival theories which would, on the one hand, presuppose a general upward continental movement, with a corresponding enlargement, both in extent and depth, of the polar ice-cap, and the consequences incident thereto, and, on the other, would advocate a depression rather than elevation in the higher latitudes, with local glaciation only and a much wider distribution of ice-laden currents. In the one case the Bay of Fundy would be practically annihilated by an elevation of both its bed and borders, as well as by the filling of the former by ice; in the other view, though retaining its general position and form, the bay would have somewhat wider limits, and, as in some earlier periods, would become a strait opening freely into the Gulf of St. Lawrence, leaving Nova Scotia disconnected with the main land. The glacial phenomena of the latter would thus be almost wholly local.

While the subject is too lengthy for full discussion here, the present writer feels compelled to express his dissent from the views lately put forth upon this subject by Mr. Chalmers, of the Geological Survey, as favouring the second of the two hypotheses referred to. While fully admitting the facts brought forward by that gentleman in support of his conclusions, the writer believes that these have all to do with the closing portion of the Glacial Period, and that a far greater array of facts in favour of a previous condition of general or continental glaciation can easily be brought forward. Thus, the vast numbers and the enormous size of the granite and Cambrian boulders strewed over the whole peninsula and upon its highest summits; the fact that here, as elsewhere, the chief movement of the boulders has been in a southerly direction; that among the boulders occurring on Digby Neck and Briar Island are some wholly unlike anything to be found in Nova Scotia, but closely resembling those in southern New Brunswick, while blocks of the characteristic North Mountain traps occur all along the south side of St. Mary's bay, as well as on the Atlantic shore of Yarmouth and Shelburne counties, show a general movement southward, such as could only be possible if the whole peninsula were covered with a single icy mantle, and this a portion of a still greater ice sheet coextensive with the northeastern portion of the continent itself. When to these evidences of continental glaciation we add the wonderfully perfect illustrations of moraines and kames, some of the latter thirty miles in length, with which the interior of the southwestern counties abound; the course and parallelism of the numerous fiord-like indentations of the southern coast, accompanied, as they frequently are, by evidences of glacial ploughing, which are phenomenal in their character; the similar direction and parallelism of the transverse troughs, such as Digby Gut, Sandy Cove, Petite and Grand Passages, which more or less completely divide the North Mountain range, and which again show evidences of glaciation to and below the present sea level; the phenomena, as a whole, appear to be of such a character as to demand some more general and some more energetic source than that of such ice as would gather around a few low islands, or even from the entire province.

That evidences of a northward transfer of drift are to be found in the Annapolis valley, in the occurrence there of numerous boulders derived from the South Mountain granite, is, of course, not to be denied; but, in the writer's opinion, these boulders belong only to the closing era of the Glacial Period, their northward transfer being the natural result of the higher lands, such as the South Mountains, being the last to become freed of their burden of ice, and, therefore, for a time left in the condition of *mers de glace*, from which ice streams might descend in any direction. In partial confirmation of this view it may be of interest to note, that, according to the statements of farmers occupying the Annapolis valley, the granite boulders in question are never met with at depths of more than ten or twelve feet below the present surface.

In contrast with the supposed elevations of the Glacial Period, the evidences of depression in the succeeding Champlain Period are clear and unmistakable. Not only do we find along the New Brunswick shore marine clays, as at St. John and St. Andrews, filled with Post Tertiary fossils, but similar clays and associated sands also occupy, more or less completely, the Annapolis valley, indicating a former considerably greater depth to that valley. At St. John the height of the beds above the present sea level is about 200 ft. ; in Nova Scotia the clays of Middleton, holding marine shells and *Ophiurus*, are not more than twenty or twenty-five feet above the tide ; but it is probable that the total submergence was much more than this, with the result of connecting Annapolis basin eastward with the Basin of Minas and westward with St. Mary's bay the North Mountains and their extension in Digby Neck being reduced to low-lying ridges and islands.

The evidences of modern subsidence in and about the Bay of Fundy, as shown by the submerged forests, eroded shell-heaps, etc., need not, of course, be here dwelt upon, but are in accordance with the movements of earlier times, and similarly point to this Bay of Fundy trough as a probable line of comparative instability in the earth's crust.

In presenting the views advocated in this paper the writer is aware of the objection which may be urged against them as being too theoretical. But the facts of observation are only of interest and value as they are brought into correlation, and used in explanation of the events or processes by which they have been determined ; and, as in every branch of scientific inquiry, the "scientific imagination," as it has been termed by Tyndall, must go hand in hand with observation and trial, he trusts that the efforts here made to discuss some of the probable phases in the development of an important portion of the continent may at least be suggestive of further lines of inquiry.

IV.—*Notes on the Archæan of Eastern Canada.*

By R. W. ELLS, LL.D., F.G.S.A.

(Read June 22nd, 1897.)

Much attention has been directed to the study of the Archæan rocks of Canada during the last fifty years, not only from their economic importance as the source from which many of our most valuable minerals are derived, but from their very extended development throughout eastern and northern Canada. They have been described under various names, such as Primitive, Archæan, Laurentian, Huronian, Azoic, Eozoic, and by other titles, some of which were apparently designed to illustrate some peculiarity of distribution or feature in connection with their structure, while other names have been suggested and adopted by certain geologists, which, in so far as Canadian nomenclature is concerned, in connection with these rocks, are apparently almost without meaning, and tend rather to confusion than to the simplification of the problem as to their true relations.

The greatest area of these rocks, which are undoubtedly the oldest of our rock formations, lies to the north of the St. Lawrence and the Great Lakes; whence it extends northward almost, or in places quite, to the Arctic sea. There are, however, a number of other areas scattered through the provinces of New Brunswick and Nova Scotia, as well as in the eastern portion of the province of Quebec, which have been conclusively shown to belong also to the great Archæan complex, though for many years they were regarded as of much more recent date. Throughout the greater part of these areas there is a marked similarity in the character and general features of the rocks belonging to this great period.

The Archæan is usually divided into two principal portions, viz., the Laurentian and the Huronian. Of these, the Laurentian member has been divided into two, and sometimes three parts, while the upper, or Huronian, has also been, by some, arranged and described as comprising a lower and upper division. The earlier arrangement and classification of the Laurentian by Logan, who may be regarded as the first to attempt the detailed study of the rocks which compose the system, was into a lower and an upper portion. The former of these comprised a great thickness of gneiss and limestone, with quartzite, granites, etc., all, or the greater part, of which were supposed to be originally of sedimentary origin; while the latter comprised a very considerable area of anorthosite rocks, also regarded as altered sediments, which were supposed to rest upon the strata of the lower Laurentian. In this lower division were included the Fundamental Gneiss and the Grenville series of limestone and associated strata.

In the area east of the St. Lawrence the Archæan or Pre-Cambrian rocks have a somewhat extended development. They are found for the most part in a broad belt which extends northeast from the Vermont boundary, in which state they form the ridge known as the Green mountains. In Canada the extension of this range is known as the Sutton mountain, and it is one of the most prominent features in eastern Quebec. With some interruptions it continues northeastwards for nearly one hundred and fifty miles. The range again appears in the peninsula of Gaspé, east of Metapedia lake, and forms a large part of the mountain range known as the Shick Shocks, which lies south of the lower St. Lawrence at about ten to twelve miles distant. On the north side these ridges in Gaspé are overlain by Cambrian sediments, while to the south the adjacent strata are Silurian and Devonian.

In New Brunswick the Pre-Cambrian areas are well seen in two principal belts, one of which traverses the northern portion of the province about the heads of the Tobique, the Nepisiquit and the Miramichi rivers. These rocks are overlain on the north by Silurian sediments, but on the south by a series of black slates and hard sandstones, which, presumably, represent some portion of the Cambrian series of strata. The other great area of the older crystallines in this province extends along the southern portion from the southwest angle, and is well displayed in several well defined ridges to the north of the Bay of Fundy, in the counties of St. John, Kings and Albert. Portions of this area have been classified as Laurentian, in which division are placed certain gneisses and crystalline limestones with quartzites, while other areas of schists and felspathic rocks have been regarded as of Huronian age. These rocks are unmistakable Pre-Cambrian, since sediments containing Cambrian fossils overlie the rocks of the two divisions.

In Nova Scotia the Archæan rocks are developed in the northeastern portion of the province, more especially in the island of Cape Breton. Here certain areas present many of the features found in the rocks of southern New Brunswick, and resemble, in part, the Laurentian, and, in part, the Huronian. At a number of places these are also overlain by sediments of Cambrian age, which are fossiliferous.

The presence of typical Archæan rocks in western and northern Nova Scotia has not been definitely ascertained. Certain areas of schists, in association with the gold-bearing rocks of Yarmouth in the southwestern portion of the province, have been regarded by some observers as of Huronian age; but the most recent observations in this locality tend to show that these schists are altered slates and other rocks of Cambrian age, which have been acted on by igneous rocks of the vicinity.

In the Cobequid mountain range, also, there is a large development of granitic, felsitic and dioritic rocks. These, in general appearance, very closely resemble portions of the Pre-Cambrian of southern New Bruns-

wick, and this feature was pointed out some years ago by Sir Wm. Dawson and Dr. Honeyman. The latter, also, noted their similarity to certain rock masses found in Guysborough and Antigonish, which were also regarded by Honeyman as of Archæan age. This resemblance of the Cobequid mountain crystalline rocks to the recognized Pre Cambrian of New Brunswick, together with the schistose character of certain portions of the series at several points, has led to their provisional classification in the same series. The fact, however, that certain of the igneous masses penetrate the Devonian plant-bearing beds on the south side of the mountain, in which are situated the iron ores of Londonderry, and other places to the east and west, as well as the Silurian of Wentworth on the north side of the range, clearly shows that a large part of these igneous rocks is comparatively recent. These facts, together with the absence of all Primordial rocks in this area, or, in fact, of any strata, in so far as yet observed, older than the Upper Silurian, may be taken as presumptive evidence that the greater portion, at least, if not all, of the rocks of this mountain chain may, with propriety, be regarded as more recent than Pre-Cambrian. Where the intrusions have penetrated the Devonian slates, these are frequently converted into schistose strata, which present features closely resembling the schists of the western areas. Similar instances of the changing of Silurian and Devonian slates into Huronian looking schists occur in the Eastern Townships of Quebec, around the shores of Memphremagog lake, where igneous rocks are also well seen in contact.

It is possible that much of the rock of the Antigonish and Guysborough areas, also at one time regarded as of Pre-Cambrian age, will be found to belong to a more recent date. The granites, felsites and greenstones which there occur are similar to those seen in the Cobequids, and there is also the same absence of Primordial strata, while the overlying associated beds are of Silurian and Devonian age.

The changes which have been made in the last twenty years in the classification and determination of the various rocks which make up the Archæan masses of Canada, and which were formerly assigned to the Laurentian system, have been very marked. Among the most important of these are the results of the examination of the igneous portion of the older crystallines; and a series of observations, both in the field and by the aid of the microscope, has shown conclusively that many of the masses, once regarded as of sedimentary origin, are, in reality, altered igneous rocks. Among the most important of these changes is the placing of the great masses of the Anorthosite rocks north of the St. Lawrence in this category, and their removal from the place they so long held as an upper portion of the Laurentian sediments. It has now been well ascertained that these have penetrated the crystalline limestone and quartzites of the Laurentian, and are, consequently, of more recent date than the Grenville division of that system. They frequently cut off

entirely the limestones and associated strata, and though along the outer zone of the anorthosite areas a certain foliation is observed, which in the gneisses was formerly regarded as proof of their sedimentary origin, this foliation has evidently been induced by some other cause, and has no relation to the planes of true sedimentation.

The removal of the anorthosites from the position originally assigned them as the upper member of the metamorphic sediments, in which category the great mass of the Laurentian was formerly placed, renders the rocks of that system divisible into two great parts, viz., the Fundamental or Ottawa Gneiss, and the overlying series of gray quartzose gneiss, quartzite and limestone, which was included by Logan in the term Grenville series. This latter has for some years been regarded as constituting the upper member of the Laurentian system.

In this series, however, Logan included a great variety of rocks which are now regarded as of igneous origin, among which may be mentioned large areas of pegmatite and other granites, pyroxenic rocks, augen-gneiss, etc. Some of these, as in the case of the anorthosites, are evidently newer than the limestones and other strata with which they are associated. In point of fact, with the exception of the crystalline limestones and certain limited areas of quartzite and gray gneiss, with which these are usually associated, and which are well seen in some portions of the country north of the Ottawa, more especially in the Gatineau district, the rocks which may be regarded as strictly altered sediments are now comparatively limited in extent.

It would appear possible, therefore, to reduce the great series of the so-called Laurentian rocks to two principal divisions, viz., a lower basal or Fundamental Gneiss, in which all traces of sedimentation are wanting, and which may be regarded as representing in altered form some portion of the original crust of the earth; and a newer secondary series, derived, doubtless, from the decay of the former, in which the evidences of clastic origin are manifest. In connection with this second division another group may be mentioned, which has a very considerable development, chiefly to the west of the Ottawa, but is in close association with the Grenville series. This has been styled by Vennor the Hastings series; and, while to some extent different in character from the rocks of the Grenville division, notably in the presence of large areas of hornblendic and schistose rocks, it also in many respects presents a marked similarity in the character of the gneisses and limestones. The Hastings rocks, moreover, furnish unmistakable evidence, in places, of sedimentation in the presence of conglomerates and slates. It appears to be difficult, however, to separate the two series to any great extent, though there are certain portions of the Hastings which are much less highly metamorphosed than the great mass of the Grenville rocks. Some of the limestones of the Hastings are comparatively unaltered, being blue and slaty, but these,

as they approach the masses of igneous rocks, generally become white or cream-coloured, and present the usual aspect of the Grenville crystalline limestones. It would appear, therefore, from the most recent evidence in the field and under the microscope, that the Grenville and Hastings series are portions of one and the same formation with certain points of difference, due chiefly to local causes.

The crystalline rocks of the mountain ranges in eastern Quebec do not present the usual features found in the rocks of the area north of the Ottawa just described. They are largely schistose, micaceous, chloritic and felspathic, with areas of highly crystalline limestone and schistose black slates. The rocks of the series occur in an anticlinal structure and are flanked throughout a great portion of their extension by strata of Cambrian age. They are thus presumably Pre-Cambrian, and in their general character they resemble the schistose portion of the Hastings series of the areas west of the Ottawa rather than any of the divisions of the lower Laurentian. They have usually been considered as more closely related to the Huronian system than to the Laurentian, and they present many features common to the Pre-Cambrian rocks of southern New Brunswick.

The rocks of the Shick-Shock area are also largely schistose, with epidotic, chloritic, hornblendic and serpentinous masses. They presumably represent the same horizon as those of the Sutton mountain anticlinal to the southwest. The characteristic gneiss of the Ottawa district does not anywhere appear in this area, so that these rocks may, in default of better evidence, be considered as intermediate between these and the lowest Cambrian.

In northern New Brunswick the Pre-Cambrian rocks are largely felsitic. In places they assume a gneissic structure, but the Ottawa gneiss does not appear, though there are large areas of granite and syenite. The crystalline limestones are also apparently absent from this area. On the south side they are overlapped by black slates and sandstones, which resemble in some respects the Cambrian rocks of Nova Scotia as well as certain of the Sillery strata of eastern Quebec, though in the absence of fossils their exact horizon has not been ascertained.

In the Archæan areas of southern New Brunswick the rocks present more of the characters seen in the Grenville and Hastings series of Ontario and Quebec. They have been divided into two principal portions, viz., the Laurentian and the Huronian. To the former has been assigned a considerable thickness of gneiss and syenite, the colour of the rock in places assuming a greenish tinge, as if from the presence of chlorite or talc. These rocks do not exactly resemble the reddish and reddish-gray Fundamental Gneiss of the Ottawa district, but as they are evidently the lowest known series in this province, they may presumably be regarded as their equivalents in point of age. They are succeeded by an upper

member in which gneiss and syenite are also found, but which also embraces a considerable thickness of quartzite, crystalline limestone, and mica schist, which in many points resemble the strata usually described under the term "Grenville series" in the province of Quebec. In this group were also included at one time certain bands of black graphitic slates, found at the suspension bridge near the city of St. John, which have, however, recently, been found to contain fossils (*Graptolites*) similar to those found in the Lévis slates, and which are consequently now referable to the base of the Cambro-Silurian system.

The rocks of the Huronian system in this province have been divided into three groups, viz., the Coldbrook, Coastal and the Kingston. The former comprises a considerable thickness of felsitic rocks, red, gray and blackish coloured, with breccias and ash rocks, felspathic sandstones and diorites. The Coastal consists largely of chloritic, felspathic and talcose schists, in places with a conglomerate structure, along with purple ash-rocks, conglomerates and clay slates, and with rusty-weathering felsites and felspathic quartzites. The Kingston consists principally of felsitic and schistose rocks with diorites, granitoid and gneissic strata, and heavy beds of slate conglomerate, and with some clay slate in the upper portion. Some of the beds in this division are hornblendic.

It is to be presumed that a large portion of the rocks which make up the mass of the several divisions of the Huronian are of igneous origin. The presence of conglomerates, slates and limestones at a number of places, however, shows that a portion of the series is clearly of sedimentary origin; and while the relations of the several divisions to each other are not always quite clear, they are as a whole, doubtless, newer than the gneisses and limestones which compose the division regarded as upper Laurentian. In character this division presents a marked resemblance in the slaty conglomerate and blue slaty limestones to the members of the Hastings series, west of the Kingston and Pembroke railway, in Ontario, while in the schistose and slaty character of much of the Coastal and other rocks of the Huronian divisions, there is a strong resemblance to the strata found in the Sutton mountain anticlinal in eastern Quebec, and which may be presumably regarded as the equivalents of the New Brunswick rocks in point of age.

The three divisions of the Huronian in this province underlie the lowest Cambrian there known, and are therefore intermediate between the rocks of this system and the Laurentian limestone and quartzite series. Like the rocks of eastern Quebec, they have usually been described in the official reports simply as Pre-Cambrian.

The Archæan rocks of eastern Nova Scotia, where these are more particularly developed, resemble very closely those of southern New Brunswick as well as of certain portions of the areas in Quebec and Ontario. To the west of the Strait of Canso, in the counties of Antigon-

ish and Guysborough, they are largely felsitic and syenitic in character, with considerable areas of diorite, but there is only a small development of the crystalline limestones. In certain of the calcareous strata, however, serpentinous bands occur in which an Eozöonal structure is apparent. In the adjacent island of Cape Breton their development is much more extensive. Felsitic and syenitic rocks are, however, the most abundant, and make up the great bulk of the Pre-Cambrian, both to the north and south of the Bras d'Or lakes; but at a number of places in the northern prolongation of the island, areas of crystalline limestone are seen, which are associated with syenites, quartzites, felsites, greenstones and schists of various kinds, the series in this respect resembling very closely much of the great Archæan complex, as seen in the Hastings series of Ontario and the Grenville series of Quebec. Very full descriptions of these rocks have been given by Mr. Hugh Fletcher in the reports of the Geological Survey. Following the determinations, as adopted in the provinces to the west, they have been classed partly as Laurentian and partly as Huronian. In their lithological aspect they also very closely resemble the rocks of the several divisions of the Pre-Cambrian of southern New Brunswick, including both the Laurentian and Huronian of that province.

As in the case of the Laurentian of the Ottawa district, portions of the granite and syenite rocks are probably more recent than the limestones with which they are associated, and which in places overlies the granitic masses, but which are also sometimes penetrated and altered as if by the action of igneous intrusions. As a whole, however, the great mass of the Archæan of this portion of the province appears to more closely resemble what has been regarded as the upper member of the Archæan of the west, which is apparently more nearly related to the Huronian than to the Laurentian proper.

In Cape Breton their Pre-Cambrian age is determined, as in New Brunswick, by the fact that they are overlain at different points by fossiliferous sediments of Cambrian age, but the areas west of the Strait of Canso appear to be surrounded by metamorphic sediments, which belong to the horizon of the Cambro-Silurian and Devonian rather than to the Cambrian, so that the Pre-Cambrian age of most of these felsitic and syenitic rocks is here not so well established as in the case of the areas further to the east.

A careful review of the evidence relating to the distribution of the Archæan rocks of eastern Canada, therefore, leads one to the inference that the greater portion of these, as developed east of the St. Lawrence, differs in character somewhat from the great mass of the Laurentian complex, which occupies so large a portion of northern Canada, and that, as a whole, these are presumably somewhat more recent in age. There is a manifest similarity in all the areas throughout eastern Canada, in this respect, that there is in every one a marked predominance of schists and felspathic rocks, with a small development of the so-called Laurentian

gneisses and limestones, which, when present, apparently constitute the lowest member ; while their resemblance to the rocks of the upper division in Canada is also well seen.

The question has lately arisen as to the most suitable line of division between the Laurentian and Huronian systems. Under the new determinations as to the origin of the Laurentian gneisses, it is now generally admitted that the greater part of these is of igneous instead of sedimentary origin ; while portions of the Grenville series, usually regarded hitherto as an integral portion of the Laurentian, are as clearly sedimentary in character. The original view as to the position of the Hastings series, according to Vennor, who first made a careful study of the rocks of this division, placed these above the gneiss and limestone of the Grenville series, and regarded them as probably Huronian. The recent studies of the whole series over a very large area, both in Ontario and Quebec, tend to show that the rocks of the Grenville and Hastings series may be classed together, and that, while containing large areas of clearly igneous material, they both contain a large development of altered sediments. If, then, the Hastings may be regarded as Huronian, as from their lithological character and position they were originally considered, the sedimentary portion of the Grenville may, with equal reason, be assigned to the same place in the geological scale. This scheme would then give a convenient basis of classification for the entire sedimentary series, and the arrangement of the systems for eastern Canada would thus fall under the following order :

LAURENTIAN, NON-SEDIMENTARY.

Felsitic or Fundamental Gneiss (Ottawa gneiss), representing in altered form the original crust of the earth, and the lowest known series of rocks ; without evidence of sedimentary origin.

HURONIAN, PARTLY SEDIMENTARY AND PARTLY IGNEOUS.

Grenville and Hastings series, comprising limestones, quartzites, gneisses, etc., of Ontario and Quebec, in the Ottawa district.

Schists and altered slates, chloritic and other crystalline rocks of the Eastern Townships of Quebec, and the Gaspé peninsula.

Felsitic and gneissic rocks of northern New Brunswick.

Gneiss, quartzite and limestone, of the so-called Laurentian of southern New Brunswick, regarded as the equivalents of the Grenville and Hastings series, felsites and schistose rocks of the Coldbrook, Kingston and Coastal divisions, the apparent equivalents of the rocks of the Sutton mountain anticlinal.

Felsitic and syenitic rocks of eastern Nova Scotia and northern Cape Breton, with their associated crystalline limestones and serpentines.

CAMBRIAN.

Cambrian slates, sandstones and conglomerates.

V.—*John Goldie, Botanist.*

By G. U. HAY, PH.B., M.A.

(Read June 23rd, 1897.)

It is not inappropriate, in connection with the Cabot celebration, to introduce the name of John Goldie, botanist, who, 80 years ago, in June, 1817, at the instance of Sir Wm. Hooker, left Leith and shortly after landed in Halifax to make investigations of the flora of Canada and the United States. His researches were rewarded by the discovery of many new plants, but most of these unfortunately were lost in transportation to Great Britain; and his notes, containing sketches and descriptions of his discoveries, were destroyed by fire at a later date. Sufficient, however, has been handed down to show his great industry in botanical research, and the importance of his discoveries. He had many of the characteristics, too, of the discoverer. Of a hardy constitution, fearless disposition, patient in his investigations, accurate in his judgments, and with a fondness for his favourite science that no fatigue or discouragements could overcome, he is not unworthy of a place among those brave spirits of the old world who became the pioneers of research in Canada.

It is to be regretted that the botanical journal in which Mr. Goldie kept a record and descriptions of the plants discovered, was destroyed. A diary of a journey through Upper Canada and some of the Northern States in 1819 has been preserved, and was published this year (1897) in Toronto. A list of the new and rare plants found by Mr. Goldie during his two years' explorations in America was published in the *Edinburgh Philosophical Journal* for April, 1822. This contains a brief account of his journey with descriptions of new plants. To both of these the writer has had access, and with additional information kindly furnished by Mr. James Goldie, of Guelph, Ontario, son of the botanist, and himself a botanist and horticulturist, he has obtained materials for this sketch. which, meagre in regard to scientific information of his researches, may be found to possess some interest to botanical and general students, interwoven as it is, to some extent, with the purpose that brings the society together at this time and place.

During his lifetime Mr. Goldie carried on an extensive correspondence, particularly after he came to Canada to reside, with many prominent botanists of the old world, and especially with his friend, Sir Wm. Hooker. But no permanent record of the results of this correspondence has been preserved, except such as has found its way into the published writings of these botanists, to which, however, no access has been possible in the preparation of this memoir.

In the diary of his journey through Upper Canada and a portion of the Northern States. Mr. Goldie does not give us any distinctly scientific account of his observations on plants. The strictly botanical journal which Mr. Goldie kept during the journey described in this diary, was lost by fire. It contains, rather, general impressions of the aspect of the country through which he passed, the character of the people, soil, productions, coupled with observations on the weather, as the occurrence of storms, highest readings of the thermometer each day, general notes on the flora, &c. It is written in a quaint, simple style, characteristic of the man, and is of interest in comparing the country and some of its features eighty years ago with the present.

In the article published in the *Edinburgh Philosophical Journal*, after Mr. Goldie's return to Scotland, there is a description of over a dozen new plants, with notes on rare and ill-determined species. The conciseness of his descriptions and the acuteness with which he notices points of differences in plants, which seemed to have escaped the eyes of other botanists, places the stamp of originality and accuracy of judgment upon his work. The stately *Aspidium*,¹ named in honour of its discoverer, is a rare fern in this part of Canada. It was a great pleasure to present to Mr. Goldie's son, on his visit to St. John last summer, one of the two living specimens of this fern that I possessed.

John Goldie was born in the parish of Kirkoswold, Ayrshire, Scotland, on the 21st of March, 1793, and died at Ayr, Ontario, July, 1886, in the 94th year of his age. In early life he was a great lover of plants, and making collections and classifying these was his greatest pleasure. He served an apprenticeship as a gardener and afterwards entered the Glasgow Botanic Gardens, and there received a thorough scientific and practical training in botany. Later he graduated from the University of Glasgow, where he was distinguished for skill in language and science. In 1815, the English Government having to send an expedition to the west coast of Africa to explore the Congo River, Mr. Goldie applied for and obtained the position of botanist, conditional on his passing the required examination. Having satisfied the examiners he proceeded to join the expedition, but at the last moment was superseded through adverse political influence. The disappointment was most fortunate for him. The coast fevers of Africa were too much for the Europeans, and the expedition was forced to return to England shortly afterwards without its botanist, who had succumbed to the fever.

In the spring of 1817, by the advice of Dr. Hooker, afterwards Sir William Hooker, Mr. Goldie sailed for America accompanied by his brother-in-law, Robert Smith. By stress of weather the vessel was obliged to put into Halifax. Here he left the ship and spent several days in exploring the neighbourhood of the city and examining its flora. He

¹ *Aspidium Goldianum*, Hook.

mentions several interesting plants, among them a yellow flowered variety of *Sarracenia purpurea*, which he never noticed elsewhere. From Halifax he proceeded to the north shore of New Brunswick, where he spent some time. He often mentioned the beautiful orchid—*Calypto borealis*—found near the Baie de Chaleurs. He made numerous sketches of the coast scenery, with notes on the geology and botany of the various places visited. From New Brunswick he proceeded to Quebec, carrying with him all the roots and specimens that he had obtained, which, with the results of two weeks' exploration in the neighbourhood of Quebec, he placed on board a vessel bound for Greenock, but never heard of them afterwards. The same fate awaited two collections afterwards made, the one shipped from New York, the other from Montreal.

From Quebec Mr. Goldie proceeded to Montreal, where he met Frederick Pursh, author of the North American Flora, who gave him much information which guided him in his future movements. Mr. Pursh advised him to turn his course to the northwest and promised to secure for him permission to accompany the traders leaving Montreal the following spring.

I shall let Mr. Goldie tell his own story of his wanderings in America, with its hardships and disappointments, quoting from the *Edinburgh Philosophical Journal* :

“Leaving Montreal, I travelled on foot to Albany, and then proceeded by water to New York. I remained but a short time in this last place, for I explored the eastern part of New Jersey, a country which, though barren and thinly inhabited, yet presents many rarities to the botanist, and gave me more gratification than any part of America that I have ever seen. At a place called Quaker's Bridge I gathered some most interesting plants, and having accumulated as large a load as my back would carry, I took my journey to Philadelphia, where I staid but a very short time; for, knowing that a ship was about to sail from New York to Scotland, I hastened to return thither; and having again entrusted my treasures to the deep, I had again, as the first time, the disappointment of never obtaining any intelligence whatever of them.

“My finances being now extremely low, and winter having commenced, I hardly knew what to do; but after some delay went up the Mohawk river, where I found employment during that season as a schoolmaster. I quitted this place in April, 1818, and proceeded to Montreal, expecting to be ready to depart on my journey towards the northwest country. I was disappointed in finding that Mr. Pursh had left Montreal for Quebec, and that even if present, his interest would scarce have been sufficiently strong to have obtained for me the assistance and protection which I desired. My only alternative was now the spade, at which I worked all summer, excepting only two days in each week, which I devoted to botanizing, and went also a little way up the Otoway or Grand

river, the only excursion of any length which I accomplished. In the autumn I shipped my collection of plants, and in two months had the mortification to learn that the vessel was totally wrecked in the St. Lawrence. Thus did I lose the fruit of two years' labour. During the next winter I did little, except employing myself with such small skill as I was able in designing some flower pieces, for which I got a trifle. Early in the following spring I commenced labour again, and by the beginning of June had amassed about fifty dollars, which, with as much more that I borrowed from a friend, formed my stock of money for the next summer's tour. I started in the beginning of June from Montreal, and passing through Kingston went to New York, to which, after an excursion to Lake Simcoe, I returned; then visited the Falls of Niagara and Fort Erie, and crossed over to the United States, keeping along the eastern side of Lake Erie for ninety miles. I afterwards took a direct course to Pittsburgh on the Ohio, which, owing to the advanced state of the season, was the most distant point to which I could attain. On my return I kept along the side of the Alleghany river to Point Ollean, in the state of New York; then visited the salt works of Onondago and Sackett's Harbour on Lake Ontario, whence, proceeding to Kingston, I packed up my whole collection, with which I returned to Montreal, and embarking on a vessel which was bound to Greenock, got safely home; the plants which I carried with myself being the whole that I saved out of the produce of nearly three years spent in botanical researches.

"In spite of the ill-fortune which has hitherto attended my endeavours, I have still so great a desire to bring plants and seeds to this country that I purpose, in the ensuing spring, if my pecuniary circumstances will permit me, to make another excursion to that country for the purpose of exploring the forests which lie toward the west."

Mr. Goldie was not able to carry out his intentions.

In 1824 he was employed by the Russian government to assist in the formation of the new Botanic Gardens at St. Petersburg, after which he obtained passports to visit different parts of Russia and was thus enabled to examine its plants. When he returned to Scotland he took with him a number of plants not before introduced into that country, among them *Abies Siberica*, *Paeonia tenuifolia*, and many others.

About the year 1830 Mr. Goldie again visited Russia, and the government, in recognition of his skill, asked him to investigate and report upon the flora of some of its recently acquired territory, but owing to business engagements at home he was compelled to decline the congenial task.

In the course of his wanderings through Canada, Mr. Goldie had formed a favourable opinion of the country, and came with his family, in 1844, to Ayr, Ontario, where he settled and continued to reside until his death.

Two of the new plants described by Mr. Goldie are not found in our manuals, and I have been unable to trace them owing to the want of access to a botanical library. These are *Lithospermum linearifolium* and *Primula pusilla*. The *Primula*, as figured in the plate in the *Philosophical Journal* of 1822, is a beautiful little plant not exceeding two or three inches in height. Quoting from Mr. Goldie's description: "From *P. mistassinica* it differs by its very much smaller dimensions, shorter capsules, and particularly its flowers, of which the calyx is oblong and almost equal to the tube of the corolla in length. The divisions of the corolla are considerably broader and more obtuse—more resembling those of *P. farinosa*, or even *P. Scotica*, from which two species again the form of its leaves keeps the *P. pusilla* distinct. The flowers are from four to eight in number."

What has become of this plant? Was Goldie mistaken in its identity?

Caprifolium pubescens, now *Lonicera hirsuta*, and *Xylosteum oblongifolium*, now *Lonicera oblongifolia*, are two new plants described by Mr. Goldie. The latter plant, known as the Swamp honeysuckle, was found on Montreal island, and has not since been found east of that place until last summer, when the writer discovered it in the northern part of New Brunswick.

In his description of *Viola Selkirkii* there are two points which I cannot make agree with the plant as I have seen it. He describes its general aspect as very similar to that of *Viola blanda*, and gives July as its time of flowering. The plant flowers with us early in May—I have seen it in flower in April—and is a very small plant with pale blue flowers, with a very long spur. Mr. Goldie adds this note to his description: "I showed this plant to Mr. Pursh, at Montreal, and he informed me that it was what he called *Viola Selkirkii*, and hence I have thought it right to adopt his name." I have never found this plant in flower later than May.

A new *Drosera* (*D. linearis*) was discovered by Mr. Goldie on the shores of Lake Simcoe, and a small primrose (*Oenothera Canadensis*), which is not now found in the manuals; *Stellaria longipes*, *Ranunculus rhomboideus* and *Corydalis Canadensis* (perhaps the *C. glauca* of Pursh) were also discovered by him.

He appears to have made a mistake in *Habenaria orbiculata*, a large form of which he takes for a new species—*H. macrophylla*. He says: "Of all the orchideous plants I have seen in America, this is without a question the largest and most striking (*Orchis* of Pursh and Nuttall), having like it two plane orbicular approaching to elliptical leaves, . . . which in this plant are four times as large as those of *H. orbiculata*, measuring six to eight inches in length." He also describes the flower as white. All who have met with this remarkable plant, with the many

varieties and shapes of its leaves, will hardly blame Goldie for his mistake, if mistake it was. Last summer I found in the rich woodlands of the Upper Restigouche a plant strikingly like the plant described by Goldie, and which ought, perhaps, to be regarded as a variety of *H. orbiculata*. It was growing in tropical luxuriance, with leaves roundish-oval, from seven to eight inches in length, and a spike of white flowers fully six inches long.

The *Osmunda alata* of Goldie, found on the island of Montreal and along the Ottawa river, has few specific differences to distinguish it from *O. cinnamomea*, but these are well marked, and Macoun and Burgess have placed it in their monograph on the Ferns of Canada as a variety of *O. cinnamomea*.

Aspidium Goldianum is thus described: "From one and a half to two feet in height. Allied to *Aspidium cristatum* more than to any other species in the genus; but abundantly distinguishable by the greater breadth of the frond, which gives quite a different outline, and by the form of the pinnae, which are never *broader* at the base, but are, on the contrary, *narrower* than several of the segments just above them. These segments, too, are longer and narrower, slightly falcate, and those of the lowermost pinnae are never lobed, but simply serrated at the margin. The serratures are likewise terminated by more decided, though short spinules. The *fructifications* are central, near the mid-rib, and this circumstance prevents the species from bearing, as it would otherwise do, no inconsiderable affinity to *A. marginale*.

"Specimens of this plant, cultivated in the Botanical Garden at Glasgow, from roots which I brought from Canada, retain all the characters which I have above described."

VI.—*Upon Raised Peat-Bogs in the Province of New Brunswick.*

By W. F. GANONG, M.A., Ph.D.

[Contributions to the Ecological Plant-Geography of New Brunswick, No. 1.]

(Presented by Professor L. W. Bailey, June 23, 1897.)

Along a part of the coast of the Bay of Fundy, in the province of New Brunswick, occur many peat-bogs, amongst which the raised type is developed to a rare degree. Flat bogs are common enough everywhere in glaciated North America, and others of an intermediate sort are not unusual, but no such perfect examples of the raised form have been described from elsewhere in this country. I called attention to them in the *Botanical Gazette* in 1890 (9), and during the summers of 1895 and 1896 was able to give them further study, of which the results are presented in this paper.

The American literature of peat-bogs is extremely scanty ; indeed, from the biological point of view, hardly any exists. There are several systematic papers upon the Sphagnum mosses, and the text-books of geology and many geological reports, notably one by Shaler (18*a*), treat of them from the geological stand-point, and also of their economics ; but on the organisms which inhabit and compose them in their relations to one another and to external physical conditions, we have only two or three short papers, including Professor MacMillan's on Sphagnum Atolls in Minnesota (13*a*), and on Muskeag in Minnesota (13*b*) and mine mentioned above. On those of New Brunswick there are notes by Chalmers (3). This paucity of literature shows how little they have been studied, which is due no doubt in part to their distribution, the best types occurring far from the botanical centres, and in part to their small economic value in this country ; the index to Experiment Station literature contains but a single reference to the subject. But in Europe the conditions are very different. Great bogs occur within easy reach of the botanists of Germany, Switzerland, and Scandinavia, and their great economic value in those countries has led to their exhaustive study both by individual workers and by government commissions. A copious literature has resulted, some of the more important works of which will be found cited below. It is important to note here that Dr. Früh and Dr. Schröter of Zürich, two of the leading authorities, have in preparation a monograph of the entire subject.¹

¹ In 1890 a commission, with Dr. Früh as chairman, was appointed by the "Schweizerische Botanische Gesellschaft" for the study of moors and bogs. A very valuable pamphlet (8), intended as a guide in all moor problems, has been issued by the commission, and is sent gratis to all applicants.

To make plainer the interest of these raised bogs, I shall insert here a brief description of them in comparison with the commoner types.

Of peat-forming vegetation there are many kinds, but of those made up principally of mosses, there is a graded series from the typical flat bog on the one hand to the typical raised bog on the other. The basis of the common flat bog is a mixture of mosses of the genera *Hypnum*, *Dicranum*, etc., with some *Sphagnum*, the latter playing, however, a very subordinate part. The bulk made by mosses may be equalled or even exceeded by other vegetation, such as sedges and other grass-like plants, water-plants, shrubs, principally *Ericaceæ*, and even small trees. The species average of rather more northern aspect than those of the vicinity about the bog. The whole is saturated with water, deep brown in colour, of rather low temperature, carrying lime salts in solution and much vegetable matter in suspension. Beneath the surface the plant-remains are slowly altered chemically and mechanically, forming ultimately compact peat. Heavy growths of shrubs and even trees may occur upon them. Their surfaces are either flat or else they rise gently towards the centre, but they never present abrupt slopes. In contrast with these at nearly all points, are the best examples of the raised bogs, though it is to be remembered that every gradation exists between them. These are composed of nearly pure *Sphagnum*, with only traces of other mosses, mixed with a few culms of sedges and the slender roots of dwarfed woody perennials. Throughout they are saturated with water, which is always cold and clear and free from salts of lime. In them there is no decay, and such slight alteration of the plant substance that from top to bottom they consist of compacted moss, slightly altered chemically, forming a very spongy peat, and never, except at the very bottom, the compact peat of the flat bogs. Their surfaces are without large vegetation and bear but a scanty growth of dwarfed shrubs and trees and a few herbs, all of northern aspect. The surfaces are always raised to a convex form, and the slopes are often abrupt. Such are the bogs which form the subject of this paper.

1. THE GEOGRAPHICAL DISTRIBUTION OF THE RAISED BOGS.

The raised bogs of which I write occur in the counties of Charlotte and St. John, in New Brunswick, between Beaver Harbour on the west and Spruce Lake on the east. All are within five miles or less of the coast, and are subjected to a summer temperature which is kept very low by the frequent fogs, and especially by the nearness of the very cold waters of the Bay of Fundy, into which its great tides sweep the icy Labrador current. Within these limits about twenty-four of the raised bogs are known, in area from a few up to over three hundred acres. Three are of exceptional size and perfection, one at Spruce Lake, owned by Mr. W.

F. Todd, one at Little Lepreau, owned by Mr. Oscar Hanson, and one at Seely's Cove, owned also by Mr. Todd. Of these the Lepreau bog is, on the whole, the most perfect, though some single features are better shown by the others. The principal bogs of this district are located by the accompanying map. (Fig. 1.)

Raised bogs occur elsewhere in the province, notably at Caraquette, Miscou, and near Richibucto,¹ but the descriptions show that in perfection of development of the raised type none excel, even if any equal, those I am describing, and certainly nowhere in the province do so many occur in so limited an area, a fact amply explained by the unusually favourable physical conditions. Professor Bailey tells me they occur abundantly in Nova Scotia, and Professor Shaler says he has seen fine ones on Anticosti; no doubt they are common in Newfoundland. I do not know positively of the occurrence of good raised forms in the United States, though they

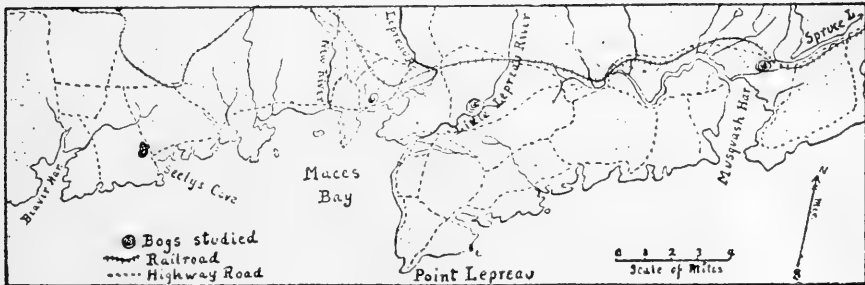


FIG. 1.—TO SHOW LOCATION OF THE PRINCIPAL BOGS STUDIED.

must be present. In Europe such bogs, called in German "Hochmoore," occur in glaciated regions, particularly in the Alps, the South Bavarian Plateau, North Germany, Poland and Scandinavia, and have often been described.

2. THE FLORA OF THE RAISED BOGS.

In the flora of the raised bogs the *Sphagna* which compose them are of course of first importance. Two distinct sets of these have been identified by two of the most eminent specialists in this group. Three years ago Mr. W. F. Todd collected in his bog at Spruce Lake specimens of all of the mosses he could find, and sent them to the late Professor D. C. Eaton, of Yale University, who identified them as follows. I copy the names from Professor Eaton's letter, dated New Haven, Conn., June

¹ The distribution of peat-bogs in New Brunswick is clearly shown on the admirable maps of Mr. Robert Chalmers to illustrate the surface geology of New Brunswick; published by the Geological Survey of Canada.

23rd, 1894, now before me ; the notes are by Mr. Todd, and accompanied the specimens :

1. *Sphagnum cuspidatum*. Edge of bog in drain.
2. *Sphagnum medium*. Edge of bog in drain.
3. *Sphagnum fuscum*.
4. *Sphagnum imbricatum crispatum* } These two are most abundant and make
up the bulk of the bog.
5. *Sphagnum tenellum* ? Edge of bog.
6. *Sphagnum recurvum*. Edge of bog.
7. *Sphagnum tenellum rubellum*. Mixed with 3 and 4 in the mass of the bog.
8. *Hypnum Schreiberi*. Dry edge of bog.
9. *Dicranum spurium*. In tufts of No. 7 and not plenty.¹

Another set was collected by myself in 1896 in the Lepreau bog and sent to Herr Karl Warnstorf, of Neurippen, Germany, the most distinguished living student of Sphagnaceæ, and he has had the great kindness to identify them for me. The notes are my own made on the spot :

1. *Sphagnum fuscum*, Klinggr. The species which makes up the bulk of the drier parts of the bog.
2. *Sphagnum tenellum*, var. *rubellum* (Wils.) f. *dasyclada*, W. The species which occupies the wetter places on the high part of the bog.
3. *Sphagnum imbricatum* (Hornsch) Russ. On dry parts with *S. fuscum* but much less abundant.
4. *Sphagnum acutifolium* (Ehrh.) Russ et W.. Occasional clumps near margin of the bog.
5. *Sphagnum medium*, Limpr. Near edge of bog.
6. *Sphagnum subnitens* var. *flavicomans* (Ren. et Card.) Near edge of bog.
7. *Sphagnum tenellum*, Klinggr. Near edge of bog.
8. *Sphagnum recurvum* (P. B.), Russ et Warnst., var. *mucronatum*, Russ. On edge of bog.
9. *Sphagnum recurvum*, var. *parviflorum* (Sendt.) W. On edge of bog.
10. *Sphagnum Lindbergii*, Schpr. Extreme edge of bog.
11. *Sphagnum Girgensohnii*, Russ. Extreme edge of bog.

The exact part played by each of the more important species in the bog-building will be explained later in the discussion of the mode of growth of the bogs.

Of other mosses the most important is *Polytrichum strictum*, Banks, rather common on the drier knolls, and *Polytrichum commune*, L., near the extreme edge of the bog. These species have been identified for me by Mrs. E. C. Britton.

In the descriptions of the European bogs, some of these species are mentioned, and others in addition. Früh (7b) gives *Sphagnum cymbifolium* as the principal species, and *S. acutifolium* as of second importance, which is also the statement of Christ (4). Lists of the species are given in most papers dealing with the bogs, but the whole subject of comparison is so difficult, both because of the great number and small differences of the species, and also from the involved nomenclature, that only a specialist in Sphagnaceæ can treat it.

¹ Professor Eaton states in another letter (of April 30th, 1893): "In our bogs here [i. e. in Connecticut] the most abundant species are *S. quinquetarium* and *S. medium*. *S. fuscum* is very rare, and *S. tenellum* is not very common."

On the surface of the bogs another group of cryptogamous plants is well represented—the Lichens. I made a careful collection of the species on the Lepreau bog, and these have been studied and determined for me by Miss Clara E. Cummings, of Wellesley College, one of our best authorities on American Lichens, and to whom I wish to express my best thanks for this assistance. In the list following, the notes in italics are by her; the others are by myself, made at the time of collection.

1. *Cladonia rangiferina*, (L.), Hoffm.
c. *alpestris*, L. Common in hollows on higher parts of the bog.
2. b. *sylvatica*, L. *Very well developed*. Mixed with 1.
3. form *major*, Floerk. *Very large*. From low places.
4. *Cladonia uncialis*, (L.), Fr. In dense clumps. Not rare.
5. *Cladonia Boryi*, Tuck. *Above the average size*. Not uncommon on high parts of the bog.
6. *Cetraria Islandica*, (L.), Ach. Not uncommon.
7. form *platyna*, Fr. *Very large*.
8. form *between type and platyna*, Fr. *Very large*. Not common.

On the stunted trees on the bog grow:

1. *Alectoria jubata* (L.).
a. *bicolor*. *Not very distinct*. *Might almost as well be b. chalybeiformis*, Ach.
2. *Parmelia saxatilis* (L.), Fr. Common.
3. *Parmelia physodes* (L.), Ach.
4. *Usnea barbata* (L.), Fr.
c. *dasyppoga*, Fr. *Young specimen; may be form hirta*.
5. *Cetraria lacunosa*, Ach.

In reporting upon these Lichens Miss Cummings remarks upon the unusually luxuriant growth of some of them, a point of much interest in comparison with the very stunted growth of other plants in the same situations. In general, she says, those growing on the surface of the bog are larger than usual, and those on the trees are smaller than usual. The exact part taken by these Lichens in the bog formation will be discussed later.

Of other cryptogamous vegetation there is little. Fungi occur on the other plants, of course, but there is no trace of moulds, bacteria, etc. On the walls of ditches at the Spruce Lake bog a toadstool, probably a *Hygrophorus sp.*, grows on the walls of ditches, and in a ditch at the Lepreau bog, in cold, clear, running water, grows a bright green filamentous Alga, probably a *Stegoecium*.

In enumerating the flowering plants they will be listed for biological reasons as trees, shrubs and herbs. Two sets were collected, one from Spruce Lake in 1895, and the other from Lepreau in 1896. The determinations of the species have been made for me by Mr. Walter Deane, of Cambridge, which is sufficient guarantee of their correctness, and whom I wish here to thank for his kind assistance. The notes are mine, made on the spot.

Trees.—Around the bog is a dense spruce and larch forest with trees of ordinary size, which on its margin become smaller and smaller the farther removed they are from the shore until on the raised part they become reduced to a foot or less in height.

1. *Larix Americana*, Mx. Up to a foot high; dense in growth; parts small; one 8 in. tall above moss and $\frac{3}{8}$ in. diameter had eighteen annual rings; bark thick; Mycorrhiza on roots.
2. *Picea nigra*, Link. Size and dwarfing as in preceding, but not so far out on the bog. Roots very long; in an 8-in.-high stem one was over 8 feet. A stem 7 in. above moss, $\frac{3}{8}$ in. diameter, had twenty-eight rings, and one $\frac{3}{8}$ in. diameter had fifteen rings.

Shrubs.—As with the trees, these around the bog are of ordinary size, become dwarfed on its margin and slopes, and on its raised part rarely exceed six and never eight inches in height. Nearly all have long under-moss parts.

3. *Ledum latifolium*, L. Common. Rarely over 6 in. tall. Running stems over 4 feet.
4. *Cassandra calyculata*, Don.
5. *Kalmia glauca*, Ait. Six inches high, with small cluster of small leaves and do. of flowers.
6. *Kalmia angustifolia*, L.
7. *Empetrum nigrum*, L. Most common and characteristic plant of the high and dry parts.
8. *Rubus Chamemorus*, L. Most common and characteristic everywhere on the bog. The under-moss stems run for immense distances. I traced one over 17 feet.
9. *Vaccinium Canadense*, Kalm. Not abundant.
10. *Vaccinium Pennsylvanicum*, Lam.
11. *Vaccinium cespitosum*, Mx.
12. *Pyrus arbutifolia*, L. f. Six or eight inches high.

On the extreme margins of the bog and on the highland near it occur the following, which I did not find on the high part of the bog itself. *Rhododendron Rhodora*, Don. *Amelanchier Canadensis*, Torr. and Gray.

On the Spruce Lake bog occur in addition—

13. *Gaylussacia dumosa*, Torr. and Gray.
14. *Nemopanthes fascicularis*, Raf. Dwarfed to a few inches in height. Also on the Seely's Cove bog and that at New River abundantly, but not observed at Lepreau.
15. *Pyrus arbutifolia* var., *melanocarpa*, Hook.

Herbs.—These are not numerous, and, like the trees and shrubs, are dwarfed very greatly and blossom later than the same species off the bog.

16. *Scirpus cespitosus*, L.
17. *Eriophorum vaginatum*, L. The two most characteristic and abundant Phanerogams of the high part of the bog, and so abundant as to make parts of it appear from a distance like a sparse meadow. The Lepreau bog is for this reason often called "Hanson's meadow." They are about equally abundant; the former, perhaps, more frequent on the hummocks, latter in hollows. Those interested in the economics of the raised bogs use the "meadow" appearance as a guide to the purest and best spots. Their culms, called by the workmen "wild oats" and "cedar bark," are found at all depths in the bog.

18. *Eriophorum alpinum*, L. With the others.
 19. *Vaccinium Oxycoccus*, L. Abundant, especially on the moist places. Small.
 20. *Sarracenia purpurea*, L. Very small on high parts, but large on the margin.
 21. *Drosera rotundifolia*, L. Very small on high parts; leaves rarely containing insects.
 22. *Arctusa bulbosa*, L. Especially near margin.
 23. *Comantra livida*, Richardson. Occasional.
 24. *Solidago neglecta* var. *linoides*, Gray. Abundant on the Seely's Cove bog. It is of rather southern range.

While as a whole the flora of the different bogs is the same, there are yet minor differences between them which I have not worked out.

It is desirable now to compare with this flora that of the European "Hochmoore," and the following synopsis will make this clear.

The Augustmal moor,¹ on the border of northeastern Prussia, contains *Sphagnum acutifolium*, *cymbifolium*, *cuspidatum*, *Scirpus cespitosus*, *Rhynchospora alba*, *Vaccinium Oxycoccus*, *Rubus Chamæmoros*, *Andromeda polifolia*, *Empetrum nigrum*, *Calluna vulgaris*, *Ledum palustre*, *Betula pubescens* (dwarfed), and groups of dwarfed pines.

Sendtner (15) gives as characteristic plants in Bavaria, *Calluna vulgaris*, *Andromeda polifolia*, *Vaccinium Vitis-Idæa*, *Myrtillus*, *uliginosum*, *Oxycoccus*, and *Pinus pumilio*.

Senft (16) gives for typical Hochmoore, *Sphagnum capillifolium*, *cuspidatum*, *molluscum*, *subsecundum* as "the first colonists of the future moor," on which grows *Calluna vulgaris*, *Erica Tetralix*, *Ledum palustre*, *Andromeda polifolia*, *Myrica Gale*, *Oxycoccus vulgaris* (7. *Oxycoccus*), *Empetrum nigrum*, *Vaccinium uliginosum*, *Eriophorum vaginatum*.

Christ (4) gives amongst others for Swiss Hochmoore in the mountains, *Pinus montana*, *Betula nana*, *Salix aurita*, *repens*, *Lonicera cærulea*, *Vaccinium uliginosum*, *Oxycoccus*, *Myrtillus*, *Vitis-Idæa*, *Andromeda*, *Calluna*, *Empetrum nigrum*, *Scirpus cespitosus*, *Eriophorum alpinum*, *vaginatum*, *gracile*, together with many herbs. Six species of *Sphagnum* build the bog.

Früh (7b) gives as the three most characteristic plants of the Hochmoore, *Sphagnum cymbifolium*, *Eriophorum vaginatum*, *Calluna vulgaris*.

Baumann (1) gives in addition to *Sphagnum*, *Calluna vulgaris*, *Eriophorum vaginatum*, *Vaccinium uliginosum*, *Pinus pumilio*.

The lists given by Fischer-Benzon (5) show a similar assemblage for the moors of Schleswig-Holstein, especially in the Essinger moor (pp. 9-11).

Sernander and Kjellmark (17) give for the Gottersätermoor in Province Nerike, Sweden (pp. 319-321), a list of species which includes, among others, *Eriophorum vaginatum*, *Rubus Chamæmoros*, *Andromeda polifolia*, *Empetrum nigrum*, *Calluna vulgaris*, *Vaccinium uliginosum*.

Warming (21) gives for the Hochmoore (p. 169), *Sphagnum cymbifolium*, *fuscum*, *Austini*, *rubellum*, *teres*, *recurvum*, *medium*; and *Vaccinium Oxycoccus*, *uliginosum*, *V. Vitis-Idæa*, *Andromeda polifolia*, *Ledum palustre*, *Erica Tetralix*, *Calluna vulgaris*, *Empetrum*, *Myrica Gale*, *Rubus Chamæmoros*, etc.; *Salix repens* and *Betula*, *Pinus sylvestris* and *pumilio*.

From the above lists, in comparison with our own, the following conclusions may be drawn :

1st. The flora of our raised bogs is on the whole very similar to that of the Hochmoore of Europe. This is to be expected ; for peat bogs, like

¹I have not the authority for this list; it is from a translation of a German paper made by the late Edward Jack.

mountains, are islands on which colonies of northern species are able to survive amidst more southern forms, and the more northern any species are, the wider in general is their circumpolar range.

2nd. The resemblances consist in the presence in both, of species of northern range native to both countries (species of *Sphagnum*, *Eriophorum vaginatum*, *Scirpus cæspitosus*, *Rubus Chamæmorus*, *Andromeda polifolia*, *Empetrum nigrum*, *Vaccinium Oxycoccus* and *Vitis-Idæa*), and also in the presence of others which are representative, as *Ledum latifolium* vs. *palustre*; *Vaccinium cæspitosus*, *Canadense* and *Pennsylvanicum* vs. *Myrtilus*. It is remarkable that *Sphagnum cymbifolium* and *Vaccinium uliginosum*, both of which occur in this country, have not been seen in the three bogs I have studied, but further search may reveal them.

3rd. The differences consist chiefly in the absence from the bogs of each country of genera and species not native to it, and their replacement by native species of rather more southern range than the species common to both (*Calluna vulgaris*, *Erica Tetralix*, *Pinus pumilio* and *Salix repens*, and others, less common, in Europe, vs. species of *Kalmia*, *Cassandra*, *Gaylussacia*, *Larix Americana* and *Picea nigra*); and in the extreme development of some species in our bogs (*Empetrum*) allowed by the absence of ecologically similar forms, (*Calluna*), as will later be discussed along with other related questions connected with the ecological characteristics of the vegetation of the bogs.

The grouping or association of these plants as they occur in the Lepreau bog, which is a type of them all, is thus:—Nearly all around the bog is a low, dense spruce forest, with bushy undergrowth, which the bog is overwhelming; at the line of contact the trees are dying and the branches die from below upward, until often only a green tuft remains above. From the forest the steepest slopes of the bog rise, on which the trees and bushes become generally smaller, until, when the high part is reached, they are few and dwarfed to a few inches in height. Where the bog, however, comes in contact with a steep land slope, there is between the two a strip about five to eight yards wide of very wet bog, in the bright red moss of which grows luxuriantly *Smilacina trifolia*, *Sarracenia*, *Arethusa* and other Orchids, etc.¹

The high part of the bog is made up of nearly pure *Sphagnum* bearing the scanty dwarf trees and shrubs, and it is these two characters, the pureness of the moss, and the great dwarfing and scantiness of the woody plants, which in combination with the raised form, distinguish the raised from the flat bogs. The surface of the moss forms rounded hummocks and hollows, with radii averaging about a foot or less. The hummocks are of *Sphagnum fuscum*, which grows in such rounded radiating masses

¹ I do not find in these bogs as definite a zonal arrangement as MacMillan (13b) describes for the Muskeag areas of Minnesota.

that it reminds one of the *Raoulia* or "Vegetable Sheep,"¹ and the resemblance is yet closer when, by drying, it assumes a grayish colour. According to the other plants which grow on the hummocks, the top of the bog assumes one of two distinct appearances. First, on the drier parts grows a great abundance of *Empetrum nigrum*, which almost hides the moss, and which thus seems to play exactly the same part which *Calluna vulgaris* does in those of Europe. This may be called the "Sphagnum-Empetrum" bog. On the top of these knolls, also, the capsules of *Polytrichum strictum* often show abundantly. In the hollows between the hummocks, though also, but less abundantly, on them, grow the many large lichens, which must find here very favourable conditions, since they grow to such an unusual size. These Lichens, however, are most abundant on the parts away from the highest areas, especially on the drier parts away from the basins. I could not determine whether they grow mostly in the hollows because the conditions there please them better, or whether their presence in certain places had hindered the growth of the moss, thus making the hollows. On this part of the bog the dwarf shrubs and trees are most abundant. Second, at other and decidedly less dry places, there is an abundant growth of the two Sedges, *Eriophorum vaginatum* and *Scirpus cespitosus*, mixed together, but with perhaps a tendency for the former to occupy the hollows and the latter the knolls. This may be called the "Sphagnum-Carex" bog. The Lichens and Empetrum are not absent here, but less abundant. At other places, even on almost the highest parts, are very wet, nearly level places, where the bright red *Sphagnum tenellum*, in its two varieties occurs, and here *Vaccinium Oxycoccus* and *Drosera rotundifolia* are most characteristic plants, while the shrubs are rare and greatly dwarfed, and the trees are altogether wanting. Of the two species of trees, *Larix Americana* grows farthest out, and answers plainly to the *Pinus pumilio* of the European Hochmoore, but *Picea nigra* is not far behind. Nearly everywhere are the leaves of the *Rubus Chamamorus* from hidden stems.

On the Lepreau bog on the highest and driest parts, are several small islands composed of dense clumps of *Picea nigra*, some of which are fifteen feet high, and four inches in diameter. Around them are a few small larches. These islands grew directly upon the moss, in which they are rooted but a foot or two deep.

The surface is everywhere firm and elastic; even in the wettest places one's feet sink but a few inches.

On the Seely's Cove bog are spots which lack living vegetation, which will later be described.

Animal life is very rare on the bogs, and seems to be confined to a few insects; the most common is a spider, which builds its web across the mouths of the pitchers of *Sarracenia*s. The *Drosera*s rarely hold an

¹ See Figure in Goebel (11) II. 43.

insect, and as one walks over the bogs there is no rising of insects about his feet, as is the case in fields at the same season. The bogs always seem larger than they are, and objects seen on them seem smaller than they ought for the distance. They at all times convey an impression of loneliness, not unpleasant, and recalling the feelings inspired by the desert.

3.—THE ECOLOGICAL CHARACTERISTICS OF THE VEGETATION OF THE RAISED BOGS.

The features which the flowering plants of the bogs have in common are as follows :

1. Northern range.
2. Xerophilous structure.
3. Depauperation in size.
4. Late unfolding of leaves and flowers.
5. Great extent of under-moss parts.

The northern range of the species growing in great peat bogs is very well known and understood, and its causes have already been briefly referred to. In New Brunswick, the presence of these northern forms has been investigated by Matthew (14a) and Fowler (6), though not especially as to their occurrence in the bogs.

The xerophilous, or water-saving, character shows itself in three ways : 1st. In the groups which comprise them ; nearly all of the flowering plants of the bogs belong to the three families, Ericaceæ, Coniferæ and Cyperaceæ, all of them families of marked xerophilous tendencies. 2nd. In the depauperation, though not as the chief cause of this. 3rd. In the tendency to condensed form, leathery texture, infolded leaves, which the plants on the high bog show in comparison with the same species off the bog. The ecological significance of xerophily in bog plants has been most satisfactorily shown by Goebel (11) and Kihlman (12) ; it lies primarily in the fact that when the temperature of the soil is reduced below a certain point, which may be considerably above freezing, the roots are unable to take up moisture, and unless provision is made to prevent too great evaporation, the plant may die of thirst though immersed in water. This low temperature must often be reached in these cold bogs.

The very marked depauperation of the flowering plants affects all parts of their structure. Trees 20 or 30 years old are under a foot in height and less than a half inch in diameter, and shrubs are but 6 inches high and bear but few leaves, branches, flower-clusters and flowers ; and all are much smaller than the normal ones off the bog. One cause of depauperation has been mentioned—xerophily ; but this alone is not sufficient to explain the facts, for on flatter bogs the same species are always larger. It cannot be coldness of the water retarding growth, as

I formerly supposed (9), nor the wetness of the bog, for both of these conditions prevail in the flat bogs as well. There must be a cause connected with physical conditions prevailing in the raised and not in the flat bog, and we find such a difference in the poverty of the raised bog in mineral salts necessary for growth, particularly Potassium, Calcium and Phosphorus, and the all-essential Nitrogen. All analyses emphasize the poverty of the Hochmoore in these substances, and the following, abridged from Baumann (1), is typical:¹

A kilogramme of dry peat, contained in grammes, from the

	NITROGEN.	POTASSIUM.	CALCIUM.	MAGNESIUM.	PHOSPHORUS.
Chiemsee Hochmoor	1.387	0.20	1.23	0.21	0.90
Chiemsee Flat Moor	2.690	0.44	23.34	0.56	1.40

It is well known that raised bogs form only over waters with little lime-salts in solution, because the latter are inimical to the growth of Sphagnum. The scarcity of Nitrogen compounds in the raised bogs is, no doubt, connected with the scarcity, even the absence, of Bacteria from the bog, which is shown by the entire absence of any decay, and caused, doubtless, by an actively antiseptic quality of the bog water. As the fixation of free nitrogen in the soil, and the transformations to bring nitrogen compounds into the nitrates utilizable by the plants are effected by Bacteria, their absence means depauperation to higher vegetation. It is possible the Sphagnum can use simpler nitrogen compounds than the other plants of the bog.

Another peculiar nutrition-condition is the presence of mycorrhiza on the roots of the dwarfed *Larix Americana*. As pulled from the bog, the young roots, frequently in dense clusters, are at the tips swollen and whitish, and under the microscope, in very thin sections, this appearance is found to consist of the fine threads arranged as figured for mycorrhiza. In the fresh moss there can hardly be any humus for this to absorb, and another meaning may have to be found for it.

The plants on the high bog put out both leaves and flowers later than the same species on the flat bog. While *Ledum*, *Kalmia*, etc., are in full bloom on the margin, they are only in bud on the raised part. This is probably due to the much slower warming up of the high bog in spring, a fact proven by the temperature measurements to be given later. It can hardly be connected with difficulty of obtaining minerals, for the buds develop from materials laid up the year before.

¹ Other figures of similar import are given by Drude in *Botanisches Centralblatt*, LXVIII. 173.

Most of the ericaceous plants on the bog have stems of great length running just beneath the surface, which, as Warming (21, p. 169) points out, is characteristic of bog plants. In one, *Rubus Chamæmoris*, I followed a stem over seventeen feet without finding an end, and in *Ledum* and *Cassandra* for lesser, though considerable distances, also without finding the ends. These stems run nearly horizontally, branch frequently, and send out roots at intervals. The same stem varies in thickness in different parts; is now thicker, now thinner, showing a more active growth at some times than at others. It is clear, also, that these stems are now alive only at their tips, the under-moss parts being preserved from decay by their position. When one traces what appears to be a clump of young plants of *Ledum latifolium*, he often finds that they are all branches of one plant connected beneath the surface, and he cannot find the end of any one of them; and this is true also of other species. The question now arises, when and how have such plants started, and how do they come to an end? Since the different branches can grow on continuously, and, making their own roots, become independent of one another and of the original plant, and can grow upwards continuously with the growth of the moss, there seems to be no logical limit to their growth, and no cause for death, such as brings most other woody perennials to their end in other situations. Some of them may then be as old as the bog itself, and thus would be amongst the longest lived of phanerogamic vegetation. Yet a comparison between their age and that of a tree, for example, would not be a fair one; physiologically, their longevity should be compared rather with that of those lower organisms, which grow by continuous fission.¹ This continuous life of the bog plants, however, is pure theory; its demonstration is attended with great practical difficulties. To some extent this mode of growth is found also in the trees. In the spruces on the islands, on the Lepreau bog, one may observe how the moss is rising and burying them. As it buries the lower branches, these put out new roots, turn upwards at their tips, and grow as independent stems.² This growth probably, however, does not go on indefinitely, since the trees are ultimately overwhelmed and destroyed by the moss.

¹ Something similar occurs in plants which grow continuously from root-stocks in soil, but there is a difference in that the bog is continuously growing and giving support, and a fresh field to the plants on it. The only reference to this continuous growth that I have noticed is that in Warming (21, p. 160 and 169), "such as occur on the Sphagnum, must have the power to grow up with the growing surface." I have not been able to see the paper by Müller, which he there cites.

² An interesting problem in relation is here opened up. Does the connecting branch die, removing its growing point from correlation with the parent plant allowing it to become independently apogeotropic, or is it the presence of the moss on its stem which gives the stimulus, changing its diageotropism to apogeotropism?

4. THE PHYSICAL CHARACTERISTICS AND MODE OF GROWTH OF THE BOGS.

For the full understanding of the ecology of the raised bogs it is needful to consider :

1. Their extent, outline, and relation to the surrounding topography.
2. Their contours and relation of surface to bottom.
3. Their water supply and temperature conditions.
4. Their internal structure and mode of growth.

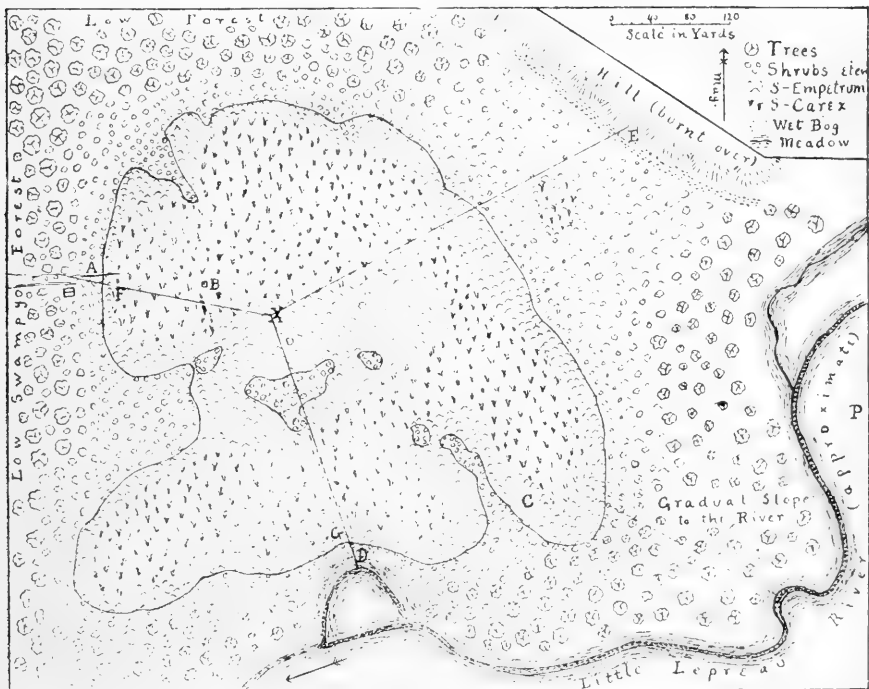


FIG. 2.—MAP OF THE LEPREAU BOG.

S—Empetrum = Sphagnum—Empetrum bog, etc. Dotted lines are those of the survey. B—Station for temperature measurements. XA, XD, XE are lines of levels shown in profiles in figs. 4, 5, 6, 7. The Islands are in a line south of XE. Other features explained in text.

The region in which the bogs occur is underlaid by hard Pre-Cambrian rocks, rising into low rounded hills, not over 200 to 300 feet high. In the basins between them, and not over 50 to 100 feet above sea level, occur the bogs.

The outlines and surroundings of two of the bogs are sufficiently illustrated by accompanying maps,¹ (Figs. 2 and 3.) Though in many features different, they have yet some of importance in common. Both slope away by steep grades to streams on one side, to swampy forest on another, and to contact with high land, from which they are separated by a peculiar wet

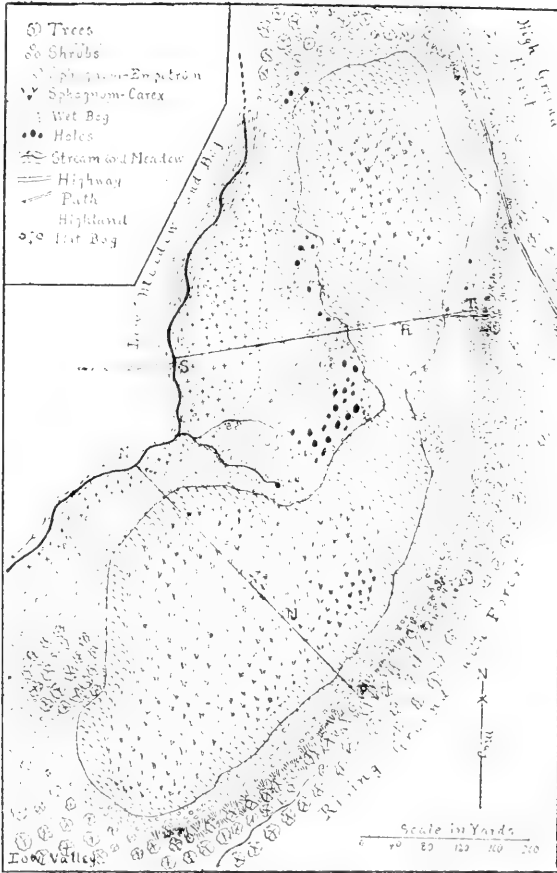


FIG. 3.—MAP OF THE SEELY'S COVE BOG.

Dotted lines are those of the survey. The outlines are only approximate. SRT and NMP are lines of levels shown in profile in figs. 8, 9. Other features explained in text.

¹ From surveys made by myself and an assistant. At the Lepreau bog, angles were taken with a small pocket compass, and distances measured with a good tape-line, and the results when plotted came out accurately. At the Seely's Cove bog the angles were taken with a good compass with sights, and the distances paced, but in plotting the survey the lines came far from meeting as they should, and I found later that iron screws in the tripod disturbed the compass. The latter map is, therefore, less accurate than the former, and in details both are only approximate.

strip, on another. The Spruce Lake bog, of about the same size, is more irregular in outline than either of the others, and more mixed as to its raised and flat parts, and it has on it three ponds (at least one on the raised part), and shows rocky ledges breaking through it at one place, and here and there tree-bearing islands, which occur also on the Lepreau bog. Near New River there is a remarkable bog, higher above the sea and very much drier than the others, and held up apparently by rocky ledges.

A striking and important feature of these bogs is the raised form. In cross section the surface rises at first rather abruptly, then more gently, and finally on top may become gradually flattened to a level, as is shown by figures 4 and 5, made from actual levels.¹ Theoretically the raised parts form convex curves, most abrupt at the margin, and less curved on the tops, as is shown by the exaggerated vertical scale of figure 6. The cause of this form will be discussed later. The angle of slope is shown in true scale in figures 4 and 5, but they are not extreme cases. At the Spruce Lake bog I estimated a slope near the highway road as rising 6 feet in 66, a slope of 1 in 11. At the Lepreau bog I found by a level, near the river, east of the point D, Fig. 2, a slope of 8 feet in 39.8 inches, or 1 in 5; at another place, by what seemed a water outlet, then dry, it was 8 feet in 21, or more than 1 in 3, and in one part of this it was 5 feet in 5.10 inches. The latter slopes are, however, probably determined by local conditions, apart from the bog structure. Not all slopes on the bog are steep, for some of them merge down very gradually into the flat bog. It is difficult to estimate the height above the margin, since it is impossible to say exactly what the margin is. The results of my levels were as follows:

Lepreau bog. Height of highest point X above clay at A (fig. 2),
 three levels at different times, 13 ft. 3½ in. (Sept.),
 13 ft. 4½ in. (July), 12 ft. 11 in. (July). *Mean*,
 13 ft. 2⅓ in.²

Height of X above water in Little Lepreau river at D (fig. 2), two
 levels, 23 ft. 3 in. (July), 22 ft. 8 in. (Sept). *Mean*, 22 ft. 11½ in.

¹ These levels were taken by myself and an assistant, with a simple home-made level consisting of a good brass spirit-level, to which was attached a straight glass tube of small bore for sighting through, the whole attached to a brass joint, which could be adjusted at any angle, mounted on a tripod. That this instrument gave fairly accurate results is shown by the fact that three distinct lines of level at different times, and by different routes between the same points, varied by only a few inches. I consider the error in these heights is not greater than six inches.

² The differences may be due to error of the instrument, but allowance must also be made for both daily and seasonable variations in height of the bog, discussed later.

A clay bottom was found near the river, 1 ft. 8 in. above its level, and the bog proper begins about 3 feet above its level. (See figure 4.)

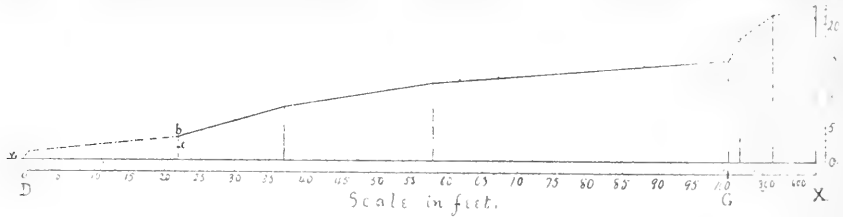


Fig. 4

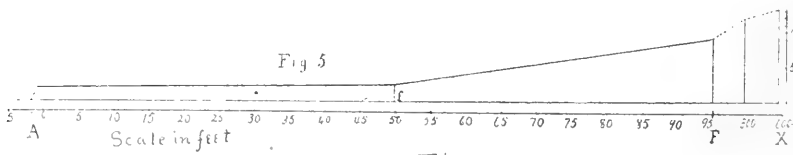


Fig 5

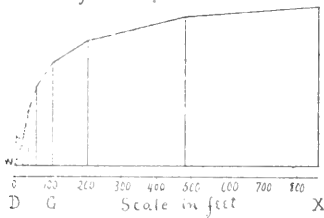


Fig 6

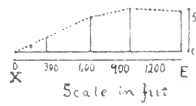


Fig. 7.

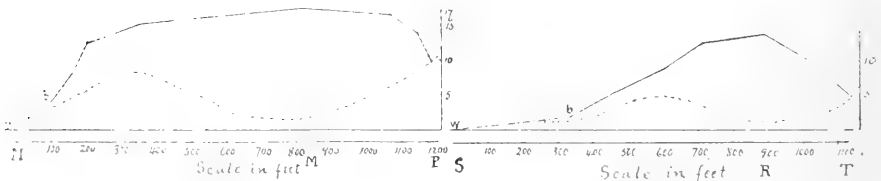


Fig 8

Fig 9

Figs. 4 to 9.—Elevations from lines of levels in the Lepreau and Seely's Cove bogs.

Letters answer to those on figs. 2 and 3. Vertical scale the same in all figures.

Fig. 4.—Shows the elevation of the Little Lepreau river at W. The bog proper begins at b; below that is boggy meadow. Clay bottom was found at c. D to G horizontal, and vertical scale are the same, hence the slope is true scale.

Fig. 5.—Shows the elevation of the bog above the clay bottom at the margin. A to f, flat bog. A to F drawn to true scale, thus showing the slope.

Fig. 6.—Same section as in fig. 4, but with horizontal scale diminished; shows exaggerated the curve of the bog.

Fig. 7.—The height of the bog above the wet strip along the high land. The levels showed that the point X is not the highest spot on the bog, as was previously supposed, but that a spot northeast of it is some inches higher.

Fig. 8.—Cross-section of Seely's cove bog. Scale diminished greatly horizontally. Bog proper begins at b; water of the brook at w.

Fig. 9.—As in fig. 8. The dotted lines show the supposed bottom of the bog.

The clay bottom is 12 to 14 feet below the surface, between D and G.

Height of highest part above wet strip at E, 5 ft. 9 in.

Seely's Cove bog. Height of M above water of brook, 17 ft. 4 in.

(Fig. 3).

Height of M above wet strip at P., 7 ft. 4 in.

Height of R above water of brook at S, 13ft. 3½ in.

Height of R above wet strip at T, 8 ft. 7 in.

Mr. Todd has told me that levels on the Spruce Lake bog have made its height 12 feet above the margin.

As the real height of the raised bog must be considered to be its height above the point at which it is flowing out over a level margin, and as this condition is found at the point A in fig. 2, we may take its height to be about 13 feet.

I have not been able to find very satisfactory data about the height of the raised part of the European Hochmoore. The figures of Sendtner (15) of 25 Bavarian feet (= about the same as ours), and of Senft (16) of 37 feet, must be too great. Christ (4) says of the Swiss moors, that "their cross-section makes a convex line, of which the centre can be up to 4 metres (13 feet) higher than its edge." Fischer-Benzon (5, p. 6) gives a total height of 6½ to 7½ metres for one; but this, probably, includes some flat bog. The meaning of the heights, and of seasonal and daily variations in them, will presently be discussed.

In depth, the bogs vary greatly in different parts. By the courtesy of Mr. W. F. Todd, owner of the Spruce Lake bog, two of his men were placed for a day at my disposal, and made for me a large series of soundings in that bog. An iron rod was used, 14½ feet long, with a working length of 16½ feet, by using it in holes, cut for the purpose, in the moss. We found many places where bottom could not be reached by our rod, and Mr. Todd has sounded in places to 24 feet without reaching it. The details of the soundings are not here important, but they demonstrated the important fact that there is no relation whatever between surface and bottom contour. Depths too great for our rod occurred sometimes over high, sometimes over low, places, and shallow places are equally irregular in distribution. It is evident that the bottom is as irregularly broken into hollows and knolls, ridges and valleys, as is the surrounding country, and that the growth of the bog, as a whole, is independent of any special basins. At the Lepreau bog our 15-foot rod often failed to reach bottom in the area north of X; and Mr. Oscar Hanson, jr., has told me he has found no bottom in places with a rod of 24 feet. South of X, however, depths of but 12-14 feet were found.

In the bogs of Europe, Sendtner (15) mentions as extreme depths, 20 to 40 feet, with which Senft (16) agrees. Fischer-Benzon (5) gives 8 to 20 metres, and mentions (p. 49) an extreme case of 26.6 metres. These depths include, of course, flat bog under the Hochmoore. The irregu-

larity of bottom is mentioned, also, by Fischer-Benzon (p. 11), and others, though the older writers appear to have believed that the highest are over the deepest parts.

The islands bearing trees are, on the Spruce Lake bog, usually the summits of rocky knolls, but in the Lepreau bog this is not the case, for soundings of over 12 to 14 feet occur among them. The islands are not persistences from earlier times, for when they are dug up, they are found to extend down only a foot or two, and below them is pure moss to the bottom. The oldest tree I could find upon them was $6\frac{1}{2}$ cm. diameter, and had 95 rings.

A leading characteristic of peat bogs is the great amount of water they contain and its coldness. The raised bogs are formed, as all students of them agree, by the pure Sphagnum growing upward and carrying the water by capillarity with it. There is, however, one fact about them which I do not find discussed in any of the peat-bog literature accessible to me, i. e., the presence of much standing water near the surface of the higher parts. On the Lepreau bog, near its highest part (between B and X, Fig. 2), I made several holes a foot or two deep, and in them several inches of water always collected. This shows that there is an immense amount of water in a hydrostatic, as well as a capillary, condition in the bog; and the question arises, what prevents it from flowing out from the great spongy structure by its own weight down to its proper level? To some extent it does this, inasmuch as the extreme margin of the bog is often very wet; as, for example, at A, Fig. 2, but most of it remains at the higher levels. The only answer to this puzzling question in hydraulics, that I can suggest, is the following: The Sphagnum is able, by capillarity, to raise water to about 12–13 feet above the water level of the basin over which the bog is growing, and the meaning of this height, which is characteristic of the raised bogs, is that this represents the extreme height to which the Sphagnum can, by capillarity, raise the water above the surface level of the basin. Perhaps, with a larger supply, it can raise it somewhat higher, and hence grow higher in wetter seasons or periods. The water held by capillarity, not only in the moss-tissues, but also between the compacted leaves and stems, is held there so strongly that when more water is added from above, as from rainstorms, the capillary water yields and falls but slowly, so that the rainwater stands for some time before it is absorbed. It can hardly be believed that it can stand thus indefinitely, for what would hold it up? This view could be tested by observing whether the quantity of standing water diminishes regularly after rainstorms.¹ The weight added to one of these great bogs during

¹ In July, 1897, I made such a test, as follows: I dug a row of 12 pits in the moss at intervals from A to X (Fig. 2), and set stakes in them driven 4 feet into the bog, and on these placed gauges. Morning and evening for seven days the level of the water on these was read. These figures, tabulated, show clearly that after a rainstorm the hydrostatic water in the bog steadily but slowly falls, and also, what is

rain must be very great. It is probable that the possibility of holding this water and growing upward is largely dependent upon the way in which the whole mass is held together by the innumerable long, tough, interlacing roots and under-moss stems of the woody perennials, which form a great system of binding cords, without which the Sphagnum alone would be so weak and yielding that it could hold up but little weight of water. The bursting of bogs in Ireland, so destructive to life and property, is, I suppose, the result of accumulation of more water than the structure is strong enough to hold up, and it gives way suddenly.¹

For the formation of the raised bogs, all authorities agree that an abundant supply of water free from salts of lime is necessary, and it is generally agreed that these conditions are best attained where impervious basins store water from a copious rainfall. These are the conditions which prevail in the region we are considering, and explain fully the source of the water in these bogs. The country here is covered by glacial deposits, and the soundings show the bottom of the bogs to be a compact clay, which is true, also, of those of Europe. The rainfall is copious. The meteorological tables from the Canadian Statistical Year-Book show that the average precipitation for the province of New Brunswick, for a period of twenty years, 1874 to 1894, was 31.70 inches of rain and 101.7 of snow; but the detailed tables for the different stations in the province show that the precipitation for St. John, Point Lepreau and Grand Manan is greater than for other parts of the province; hence, for the vicinity of the peat bogs, it is considerably greater than the average above given. But abundance of water supply depends not only on precipitation, but also upon rate of evaporation, which, in turn, depends upon temperature, sunshine and amount of moisture in the air. The mean summer temperature of Point Lepreau is the lowest of any place in the province, while Grand Manan and St. John follow closely. Moreover, this whole coast receives in summer a great deal of fog, which often lasts for days together, both hiding the sun and preventing evaporation. In the aggregate, therefore, the conditions are unusually favourable for the receiving and retention of copious rain water.

The distribution of the drier and wetter parts of the bogs bears no constant relation to their outline. In the Lepreau bog the wettest part is northwest of B (Fig. 2), where it is within two or three feet of the height

equally important, falls more rapidly on the higher parts and less on the lower parts, showing some settling of the water towards the margins of the bog. That this fall in level was not due to evaporation from open pits was proven by covering other pits with moss, and in them the rate of fall was the same. See Appendix.

¹ A monograph on bog-bursting has recently been published by Früh. Ueber Moorausbrüche, Vierteljahrsschrift der Naturforschenden Gesellschaft in Zürich, XLII., 1897, 202-237. The author can find no record of a bursting of a bog in America.

of the highest part, and it is fairly wet over much of the *Carex* bog north of D. In general it becomes drier south and east from this part. The explanation, probably, is that the storage basin from which the main supply comes is under the part northwest of X, and from it the water works out to the other parts. Perhaps a channel connects with the wet area at C, though this may be another basin. This is confirmed by the depths, which are greatest over the northwestern part. The wet strip at E, probably, is caused by the stoppage of the spreading of the water by the high land. At the Seely's Cove bog there are, probably, two basins under the two *Carex* parts. It may be a general rule that the wettest places are over the basins, and these would usually be the highest parts.

An important feature of water supply, on which I have no data, is the relation of varying quantities upon the height of the bogs. Is the bog higher in a wet year, or series of years, than in drier times? It seems probable; and, if well marked, and cycles of drier alternate with wetter years, they might periodically increase and recede as the glaciers do in Europe, and for a similar reason. If they are now increasing, we would have an explanation for the belief of the dwellers in their vicinity that they are rapidly growing in height. This is universally asserted by them, and each one has a favourite illustration to offer in evidence. There are, however, sudden variations in height, as the following fact will show: On September 4th, in the evening, a stake was set on the edge of the bog, near A, on the Lepreau bog, and driven into it four or five feet, and so adjusted that by standing in a certain position upon it, I could just see the top of a newly shingled barn beyond the bog, in the direction P (fig. 2). This was to give a basis for measurements to be made another year. The next morning, after a frosty night, on trying again to see the barn, it was not visible, and it required an elevation of nine inches above the stake before it could be seen. As there was no possibility of settling of the stake, the bog must have risen in the night. As the distance of the barn and of the part of the bog intercepting the view were unknown, the rise could not be exactly calculated, but it must have been three or four inches. An interesting problem is thus opened up. Possibly the warmth of the rising sun, after the cool evening, had something to do with it, or possibly a change of barometric pressure may allow the elastic mass to rise. That day a storm gathered, which broke the following day.¹

¹ In July, 1897, I built a stand near A (Fig. 2), supported on the firm earth, and by sliding sights tried to measure and determine the cause of the rise and fall of the surface. I settled that it does rise and fall a few inches within a few hours, but in spite of careful observations, I could not tell to what it is due. It seems not to be connected with the height of the barometer. In general it seemed to rise in bright sunlight and to fall in the evening and in dark weather. The whole question of this movement, as well as that of water levels and temperatures in these bogs, offers some fine problems in physics.

There seem to be no regular outlets for water from the bog, unless a series of remarkable holes on the slopes of the Seely's Cove bog, but found upon it only, are of that nature. (See fig. 3). These are of various sizes, from 30 by 12 feet down to a few inches. They are a foot or two deep, have perfectly level bottoms of black muck, sometimes so dry as to crack in the sun, in others moist, and in others covered with water, the latter being at the lower and the former at higher levels. Nothing whatever grows on the bottoms, except that a bright red *Sphagnum* grows out from the banks in places, forming over the muck a thin radiating carpet which one can roll up, for it has for some distance from the tips no roots into the bottom. The banks go down very steeply, and in places islands of moss have floated away from them and lie in such a position as to make it evident that at some times the holes contain water. There is a suggestion in them of the presence of something inimical to the *Sphagnum*, and one wonders whether they may not be places where springs of lime-carrying water break through, but in most of them the sounding iron showed depths of 10 or more feet of moss-peat. They do not communicate with one another, nor have they outlets, and if they are outlets for water they must be used only at certain seasons. These appear to be the places spoken of by Blytt (2 *b*, p. 81), who considers them evidences of the drying up of the bog, but this does not explain them.

The temperature of the bogs is well known to be low, and the expression, "cold bogs," is frequent in our floras. No measurements of temperature, however, are known to me, though they have undoubtedly been made. The European students of the bogs seem to consider the low temperature as due to evaporation from the immense number of tiny leaves, etc., but this seemed to me altogether inadequate. I have supposed it due rather to a persistence of the winter cold, which in such a huge non-conducting mass would last through the summer. It is easy to test these two hypotheses, for if the former be true there should be little change in the temperature conditions after the summer average is once attained, or even the bog might be somewhat lower in temperature when the season is hottest, and hence evaporation most active; if the latter be true the bog should steadily rise in temperature through the summer. To test this, very careful temperature measurements were made on the Lepreau bog with the following results. Good standard chemical centigrade thermometers, carefully selected, were used.¹ The station shown at B on Fig. 2, was placed on a typical part of the raised bog. The thermometer over the bog was well shaded from the sun.

¹ They were set in sockets in slender wooden stakes, pushed down to the proper depths. They were read by rapidly pulling up the stakes and observing them before the warmer air had time to affect them.

DATE AND TIME.	AIR OVER BOG.	1 FOOT DEEP.	3 FEET DEEP.
Monday, June 29th..... 12 m.	18°	11½°	
“ “ 7 p.m.	16	11	4½°
Tuesday, June 30th. 6 a.m.	12¾	10½	4½
“ “ 12 m.	20	11	4½
“ “ 7 p.m.	13¾	10½	4½
Wednesday, July 1st.... 6 a.m.	10¼	10¼	4½
“ “ 3 p.m.	24	11	5
“ “ 7 p.m.	17¾	10½	4½
Thursday, July 2nd..... 6 a.m.	16¼	10½	4
“ “ 1 p.m.	22	10½	4
“ “ 7 p.m.	16½	10½	4
Friday, July 3rd..... 6 a.m.	15	10¼	4½
“ “ 1 p.m.	19½	11	4½
“ “ 6 p.m.	15	10½	
Saturday, July 4th..... 6 a.m.	11	10½	

In September the same thermometers were placed in the same holes, with the results as follows :

Thursday, Sept. 3rd..... 7 a.m.	12°	12½°	9°
“ “ 12 m.	14½	13	10
“ “ 6 p.m.	13	12½	9¾
Friday, Sept. 4th..... 7 a.m.	11	12	10
“ “ 12 m.	17	12½	9¾
“ “ 6 p.m.	11½	12½	9¾
Saturday, Sept. 5th..... 7 a.m.	3½	12	9½

From these figures it is very evident that the interior of the bog was slowly warmed up during the summer, rising in two months an average of 2° at one foot under the surface, and 5° at three feet beneath the surface.¹

¹ In July 23rd to 31st, 1897, (a year later), I made another set of measurements with the same thermometers, in the same holes. I need not here give the particulars, but the general results are as follows: air over bog, 11° to 24°; at one foot, 12¾ to 14°, average, 13¾; at three feet, 7° to 8½°, average, 7¾. One would from the dates expect these figures for 1 and 3 feet to be intermediate between those of early July and September, 1896. As a matter of fact, while this is true for three feet, it is not for one foot, for in this the average for late July, 1897, is higher than for September, 1897. Probably this is accounted for by the heavy rains in 1897, for I have noticed that the bog warms slightly near the surface after a rain.

This seems to dispose effectually of the cold-from-evaporation theory, and to show that the low temperature is a hold-over from the winter. There are, also, other facts pointing in the same direction. On a very bright, windy day (July 1), the following tests were made. A thermometer, 1 foot long, was placed with its bulb at different depths, and gave readings as follows :

TEST No. 1.		TEST No. 2.	
In sun, 2 in. over bog,	26½°	In sun, 6 in. over bog.....	27¼
Resting on surface.....	27½	Bulb in moss.....	29
Bulb sunk in bog.....	27½	“ 2 in. under bog.....	25¼
Bulb 2 in. under surface.....	26	“ 4 in. “ “	23½
“ 4 in. “ “	22	“ 6 in. “ “	18
“ 6 in. “ “	17½	“ 8 in. “ “	12
“ 8 in. “ “	13½	“ 10 in. “ “	12
“ 10 in. “ “	11	“ 12 in. “ “	11½
“ 12 in. “ “	11	.....	.....

Of further value is the fact that on July 1 we found in the Lepreau bog, near the centre of the high part, about a foot under the surface, sheets of ice 6 to 8 inches thick and several feet square, extending over an area of about an acre, and this was still undiminished when we left the bog on July 4th, though it had disappeared on our second visit on September 2nd. This can be explained only by a persistence from the preceding winter, and probably the bog does not freeze much deeper. As showing the low temperature prevailing in this region I may add, that on the night of September 4th-5th, water froze in a pail in front of our tent, on the flat edge of the bog, to such a thickness that it took a smart blow to break it; this was several days before the local papers reported the “first ice.”

The temperatures above given prevail well out on the raised part; near the edges the temperature is higher. July 2nd, near the margin of the bog, at 3 feet of depth, in several places the temperature was 6° C.

As to temperatures deeper down in the bog I know nothing positive, though I made some observations in the sides of the drainage ditches, but these must be so much affected by the air temperature as to be little reliable. I made an effort to use, for this purpose, the valuable new

¹ A good maximum and minimum thermometer, one foot above the bog, in the night of July 26-27, 1897, fell to 36½° F.; 27-28 to 33° F.; 28-29 to 34° F.

Thermophone recently invented,¹ but it was impossible to force the temperature coil down to any depth, though one could, no doubt, be specially constructed for the purpose.

It is impossible to learn much about the internal structure of the bogs, since they are hardly at all worked, and one must depend upon the shallow holes he can dig, upon the soundings he can make with iron rods, and upon the very few ditches which have been dug. In the Lepreau bog a single ditch (at A, Fig. 2) has been dug, some 8 feet deep and 50 feet long, making a section through the margin to the high part. At the Spruce Lake bog a much larger ditch, 12 feet deep, has been carried out 50 yards into the bog. The ditches and soundings show that these bogs are composed of pure Sphagnum, penetrated everywhere by the slender roots and stems of the woody perennials, and with some culms of sedges. At any depth the moss can be torn out by handfuls, and though it becomes darker and somewhat more compact towards the bottom, it does not form except on the very bottom, true compact peat.² It is entirely the kind known to European students as "Moostorf" (Fischer-Benzon). From top to bottom it shows little other differentiation, though here and there occur thin black streaks, said by the workmen to be burnt places, but probably due to some other cause. There are no stumps present, except a single layer on the bottom, which seems to be everywhere present, and this testimony of the ditches is confirmed by the soundings. On the higher parts of the bog the rod meets no stumps nor bottom; but in other places, where the rod strikes wood, it is necessary only to move it a short distance and push it deeper to find the bottom, which is usually of clay, though sometimes of bleached gravel, which, no doubt, has clay beneath it. It seems plain that the raised bog has in it no layers of stumps, except that which rests directly on the ground. What lies in the deeper parts I have no means of knowing.

No foreign bodies of any sort—bones, works of man, etc.—have yet been found in the bogs.

¹Made by E. S. Ritchie & Sons, Brookline, Mass. Described in *Technology Quarterly* for July, 1895. Its use in New Brunswick is described in Bulletin of the Natural History Society of New Brunswick, No. 14, 1896, 47-52.

²I have examined microscopically samples of moss from different levels in the ditch at the Spruce Lake bog, with this result: From all levels down to 6 feet there was no marked change in structure; it became darker brown with the descent, but the cell walls were distinct, with little or no distortion. My specimen, from 7 feet, is missing, but in that from 8 feet there is a change not easy to describe. The greater part of the cells are still distinct, but many of them have rolled and clotted together. This clotting is clearly a step towards peat formation, for in a specimen of commercial peat from Germany all of the cells showed a clotting, and it was plain, too, in a specimen taken from a flat bog a foot or two under the surface.

The nature of the peating process is well known. It is not at all a process of decay by action of micro-organisms, but the result of a slow chemical alteration of cellulose lignin, etc., into a series of ulmin and humin substances. The subject has been studied particularly by Früh (*7a*).

The tops of the stumps in the ditches are always irregular and blackened, and said by workmen to be burnt. I sent pieces from two of them, taken by myself from a depth of 8 feet, to Professor Penhallow, of McGill University, who has had the kindness to examine them, with the following result: The two specimens were *Pinus strobus* and *Larix Americana*. "The superficial discoloration of the latter was wholly the result of decay, in part a discoloration of the membranes, but more particularly due to the great numbers of very dark and large mycelia. There is no evidence whatever of the action of fire." These facts, together with what we may observe on the margins of the bogs, makes clear the process of killing of the trees by the moss which is overflowing them. As the moss advances over the roots of the trees, these are able to hold their own for a time, or until the moss has advanced some distance up their trunks; the cutting off of the oxygen then kills them and decay begins at the surface of the moss and goes on until the trees fall, while the parts under the moss are preserved by the antiseptic qualities of the bog water. The same process is illustrated by the surveyors' stakes on the Lepreau bog, set up 40 or 50 years ago. Above the surface they are weather-beaten and lichen-covered; at the bog surface they are nearly decayed through, while under the moss they are as fresh and hard as if cut yesterday. There has been some difference of opinion as to the cause of the preservative qualities of the bog. It has been considered to be due to the presence of germicidal ulmiates, (Warming, (21); but Früh (7a) considers this not proven, and that most of the preservative effects could be produced simply by exclusion of oxygen. But lately it has been shown by Stutzer and Burri (20) that peat powder has a germicidal action on the cholera bacillus.

The comparatively homogeneous structure of these bogs from top to above the bottom, makes it plain that they have been exposed to no such alternations of climate as have left traces in many of those of Europe. In Scandinavia, for example, a cross section of the bogs shows one, two, or three layers of stumps, separated by strata of peat of considerable thickness. The best examples, as given by Blytt (2b), who has been the most careful student of these questions, show above the bottom three layers of stumps and four of peat, and the many plant-remains preserved with the stumps allow of the determination of the flora, and hence to some extent of the climate during the different periods. Blytt considers that these show the alternation of moister with drier periods since the glacial period, the trees forming during the dry times. Many bogs, however, contain but two, or even one, layer of stumps, and Blytt has shown (2a) that the number depends on their height above sea-level. The land is there rising, and the lower and newer bogs have the fewer layers, because they have been the shortest time above the sea level, and hence exposed to fewer of the alternations of climate. The absence of layers of

stumps above the bottom of our bogs may be explained in either of two ways: 1st, there have been no such alternations of climate in this region; 2nd, the bogs have formed entirely since the last change of conditions. An explanation of the latter view could be found in it if it could be shown that our bogs answer to the lower and one-layered bogs of Scandinavia, or in other words if it could be shown that this region has been in recent times under the sea. At present there is evidence that this coast is sinking,¹ but not to a great extent. Before this began, however, in the Champlain epoch, as has been shown by Matthew (14*b*) the sea stood some 200 feet above its present level, a height which would certainly submerge the sites of all of these bogs. Similar conditions appear to prevail in the great bogs of the north shore of the province, for in the several accounts by Chalmers of the bogs of Point Escuminac, Point Cheval, and elsewhere, which are being cut away by the sea, exposing natural sections, layers of stumps on the bottom are described, but none above them are mentioned. It seems to me plain, therefore, that all of our bogs yet examined are in basins comparatively recently raised above the sea, so recently that the bogs have grown within a single one of the alternating periods, which, it is logical to suppose, our climate has experienced in common with that of Scandinavia, though perhaps not contemporaneously.² To find evidence of such climatic changes it will be necessary to find bogs of over 200 feet elevation above sea-level. But when found they will teach little without the cutting of expensive trenches.

In this connection an important question arises as to the present condition of the bogs, whether they are now growing or not. I have already mentioned the belief of those who live near them, which is, however, of very little value as evidence. One fact, however, shows they are still growing with some rapidity. Around the islands the moss may plainly be seen to be rising on the trunks of the small trees. Also, on the high part of the bog, the young larches when pulled up show a number of their short branches buried several inches deep in the moss, showing that the moss has grown up that distance in the time these trees have been growing. One plant, 4 inches high above the moss, had 3 inches bearing branches below it, and a top-root of 8 inches below that; and several others show this feature to even a greater extent. It is not a case of root-contraction drawing the stem downwards.³ On the drier

¹ Trans. Royal Soc. Canada, VIII., Sect. IV., 179. Also Report Geol. Survey Canada, 1887, N. 25.

² Blytt (2*a*) traces these alternations to the precession of the equinoxes, which theory requires that our bogs shall be in a wetter condition than those of Europe, which seems true.

³ There is, however, another way in which this may be explained. The bog is constantly compacting, and hence sinking, and some upward growth of the moss to compensate this could take place without increasing the height of the bog, and thus trees may be buried.

parts of the raised bog the moss is perhaps not growing, except here and there in very small spots, though it is by no means dead, and does not at all answer to the very dry condition described for many of the bogs of Europe. Over the most of the raised part the moss is certainly alive and vigorous. Moreover, even on the very driest parts of the bog, if one digs a hole but a foot deep, water at once collects in it, and a handful of moss taken anywhere just beneath the surface, contains so much water that a considerable quantity may be squeezed out by the hand. Immediately under the roots of the trees on the small islands, water is abundant, and I doubt if these islands are gaining ground. The larger trees on them are either dead or only alive at the top, and the moss has grown up so high about them that the trunk of each one stands in a pit a foot or more deep. The greatly dwarfed trees scattered over the bogs are certainly not gaining, for most of them are dead at the top, and seedlings are so rare that I could find but two or three after hours of search. The presence of the islands seems to me by no means to imply that we are at the beginning of a period of drying up of the bog, but simply that on the spots where they occur, the bog has attained to the greatest possible height to which it can lift the water, or rather to the greatest dryness which the conditions of its water supply allow. This driest part of the bog, not necessarily its highest part,¹ is just dry enough to allow the spruces to secure a precarious foothold, and one which at the present day they are losing rather than gaining. This helps to explain the difference between the vegetation of the islands, nearly all spruces, and of the other parts of the bog where larches are more abundant. The larches can stand the wetness better than the spruces, but where the ground is drier the latter can drive out the former. Our bogs, then, seem not to be in a dry period of our history, nor even necessarily at the beginning of one. Blytt states (2*b*) that the present is a dry period for those of Europe, but ours seem not to be in so dry a condition and to be still growing.²

On the mode of growth of the raised bogs I have nothing new to offer. This is well known and stated in various works, such as those of Solms, Warming, Fischer-Benzon, Shaler, Chalmers. I shall simply summarize here what our bogs show in this respect. Probably they originate in basins on flat bogs. Baumann (1) holds that not only do raised bogs

¹ It may be a resultant between height and distance from the basin; where the water-supply is all drawn from a certain basin, the surrounding bog would grow progressively drier away from it, especially on the surface, and hence its driest part may come some distance away from the highest part.

² Senft (16) speaks of periods of more and less active growth in those of Europe, and cases of very rapid growth are known. Geikie (10) mentions a growth of 3 to 4 feet in 24 years near Constance, and of 4 to 6 feet in 30 years near Hanover; but, doubtless, these rates are exceptional and due to local causes. Lequereux, quoted by Wright (22), estimates an average rate of one foot a century.

usually originate on flat bogs, but that the latter necessarily give origin to the former if they grow large enough, a raised bog always arising when the available mineral substances have been used up in the formation of flat bog. Once started, the Sphagnum, if backed by an abundance of mineral-free water, grows upwards, taking the water by capillarity with it. The water falling in rain upon it settles, especially towards the edge, and the growth is there active, so that it overflows its basin, joins with the moss from other overflowing basins, fills new ones, and flows down and up slopes. If a forest stands in its way, as is usually the case, it is overwhelmed. The limit to the growth in height depends on water supply, and may be reached either when the utmost height to which the moss can raise water by capillarity is reached, or when by climatic or other changes the supply is diminished. The lateral growth would be limited only by geographical conditions or water supply, but it could go on long after the growth in height has stopped.

I hope to make further studies upon the flat bogs of the province, especially those of the North Shore, which show natural sections cut by the sea.

Finally the Economics of the raised bogs merit some attention.¹ In Europe the moss from them has long been used, and in great quantities, as a bedding for horses and for various sanitary purposes, for which its antiseptic qualities and great absorptive power make it especially adapted. It can absorb some twenty times its own dry weight of water, and in stables, by absorbing all liquid matters and allowing the water to evaporate, it retains the nitrogenous matter and becomes a valuable fertilizer. Considerable quantities are imported into New York from Germany for stable use, but no attempt to utilize our own bogs for this purpose appears to have been made until a few years ago, when a company, attracted by the great purity of the Spruce Lake bog, attempted to work it. It was soon found that natural methods of drying the moss as practised in Europe are not here practicable, partly on account of the cost of labour, partly on account of the foggy weather. Five years ago the bog came into the hands of Mr. W. F. Todd, of St. Stephen, N.B., who attempted to make steam and machinery supplant hand labour, and artificial replace natural heat. After long experimenting an ingenious system of machinery was constructed by which moss was dug from the bog, passed through presses and hot air chambers and over hot air cylinders, and pressed into bales and ready for shipment, all within three hours from the

¹ See note on this subject by Chalmers. Report, 1895. M. 121.

Important data on the usefulness of the moss for sanitary purposes, etc., are contained in Bulletin No. 49, 1897, of the Laboratory of the Inland Revenue Department, Ottawa. Attempts have been made to work a bog in Welland Co., Ontario of which a full account with other matter of value is contained in an article Thos. W. Gibson in Proc. Canadian Institute, 1897, 51-54.

time it was in the bog, and without being touched by a workman from start to finish. The German process requires weeks of time and many handlings. The product of the new process is a spongy, finely divided substance, which, I am told, is considered by good judges to be greatly superior to the imported material. In the autumn of 1895 the buildings were burnt and have not been rebuilt. The supply is exhaustless, and if the many new uses occasionally reported for the fibre prove to be extensive, or if its preparation for stable purposes can be made profitable, it will be the basis here of a large industry.

APPENDIX.

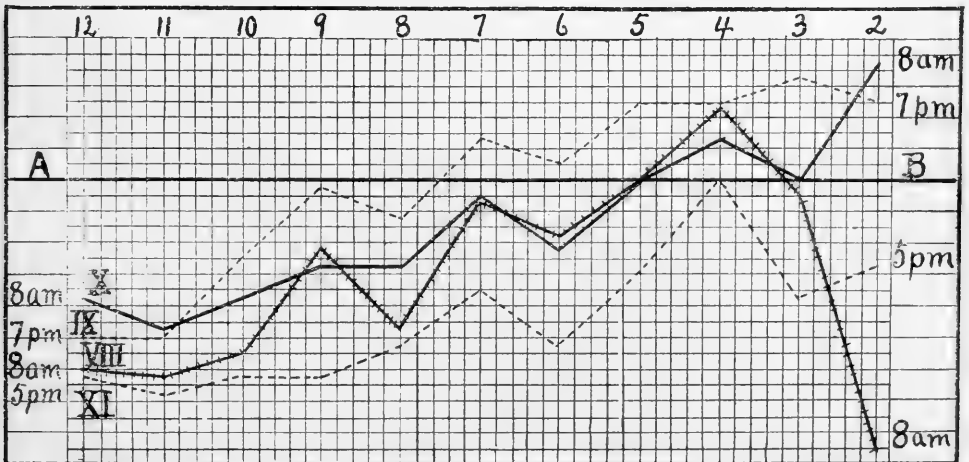
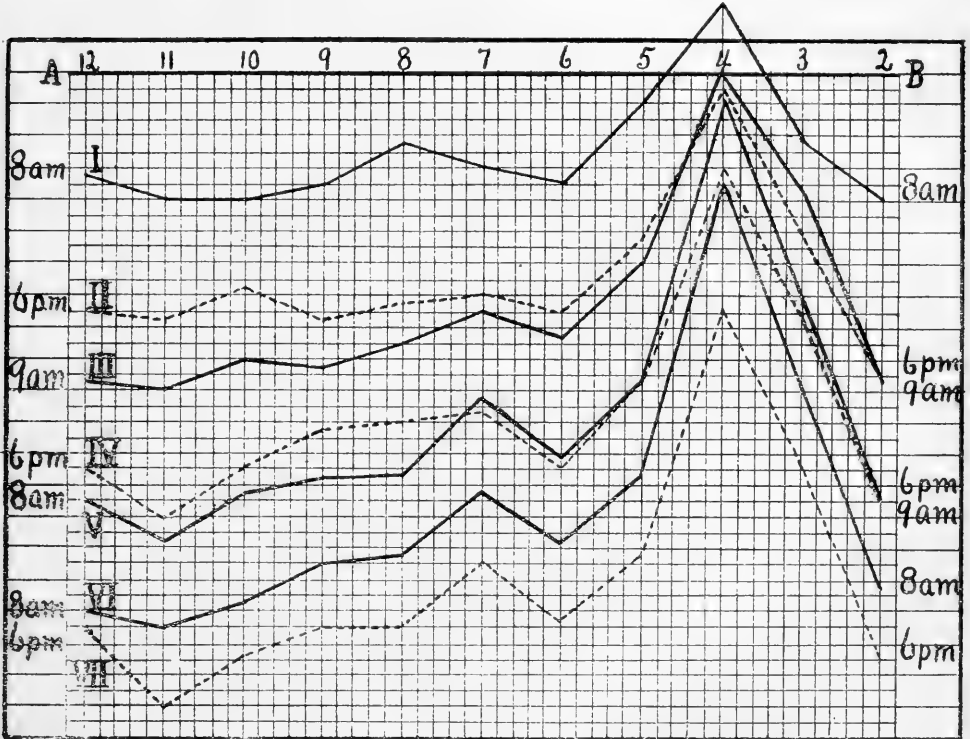
WATER-LEVELS IN THE LEPREAU BOG.

The results of the observations referred to on page 148 were tabulated too late for insertion in their proper place, and are added here.

On Saturday, July 24th, 1897, a row of pits, each about eighteen inches deep, was dug in the moss of the Lepreau Bog, from the flat margin near *A* in Fig. 2 to the highest part at *X*. No. 1 (at *A*, Fig. 5) was hardly on the bog at all; No. 2 was low down on the slope (near *f*, Fig. 5); 3 was on the middle of the slope (half-way between *f* and *F'*); 4 was near the top of the slope (at left of *F'*); 5 was well on top of the raised part above the slope; 6 was well out on the raised part; 7 still farther out; the others up to 12 were at regular intervals out to *X*. From 2 to 6 the intervals were 10 yards; 6 to 7, 20 yards; 7 to 12, 30 yards. After the pits were dug, several hours were allowed to pass in order that the water might attain its proper level, and then stakes four to five feet long, graduated near their upper ends in centimetres above and below a zero mark, were driven into the moss of each pit to such a depth that the zero mark in every case stood exactly at the surface of the water. The zero mark varied from 18 to 25 cm. from the surface of the moss. They were then left until Monday at 8 a.m., when the first observation was made, and these were then continued at the times and with the results stated in the following table. The figures express centimetres and millimetres above and below the zero mark in each pit; all of the figures in ordinary type are below zero, while all in heavy face are above zero.

No. of Pit.	I. Mon. 8 a.m.	II. Mon. 6 p.m.	III. Tues. 9 a.m.	IV. Tues. 6 p.m.	V. Wed. 8 a.m.	VI. Thurs. 8 a.m.	VII. Thurs. 6 p.m.	VIII. Fri. 8 a.m.	IX. Fri. 7 p.m.	X. Sat. 8 a.m.	XI. Sat. 5 p.m.
2	1·6	3·9	3·9	5·4	5·4	6·5	7·4	3·5	1·0	1·5	1·1
3	0·8	2·1	1·5	3·1	2·9	4·0	5·0	0·2	1·3	0·0	1·5
4	0·8	0·2	0·0	1·2	0·5	1·4	3·0	0·9	1·0	0·5	0·0
5	0·4	2·1	2·4	3·9	3·9	5·1	6·1	0·0	1·0	0·0	1·2
6	1·4	3·0	3·3	5·0	4·9	5·9	6·9	0·7	0·2	0·9	2·1
7	1·2	2·8	3·0	4·3	4·1	5·3	6·2	0·3	0·5	0·2	1·4
8	0·9	2·9	3·4	4·4	5·1	6·1	7·0	1·9	0·5	1·1	2·1
9	1·4	3·1	3·7	4·5	5·1	6·2	7·0	0·9	0·1	1·1	2·5
10	1·6	2·7	3·6	5·0	5·3	6·7	7·4	2·2	1·0	1·5	2·5
11	1·6	3·1	4·0	5·6	5·9	7·0	8·0	2·5	2·0	1·9	2·7
12	1·3	3·0	3·9	5·0	5·4	6·8	7·0	2·4	2·0	1·5	2·5
	Very clear.		Very clear.		Clear.	Cloudy.		Showers.		Clear.	

To make the results more plain, they are plotted as follows:—*AB* is the zero line; the figures along it are the numbers of the pits; each vertical space represents 2 millimetres of rise or fall in the pits; the numbers I., II., III., etc., represent the columns with the same numbers in the table of figures.



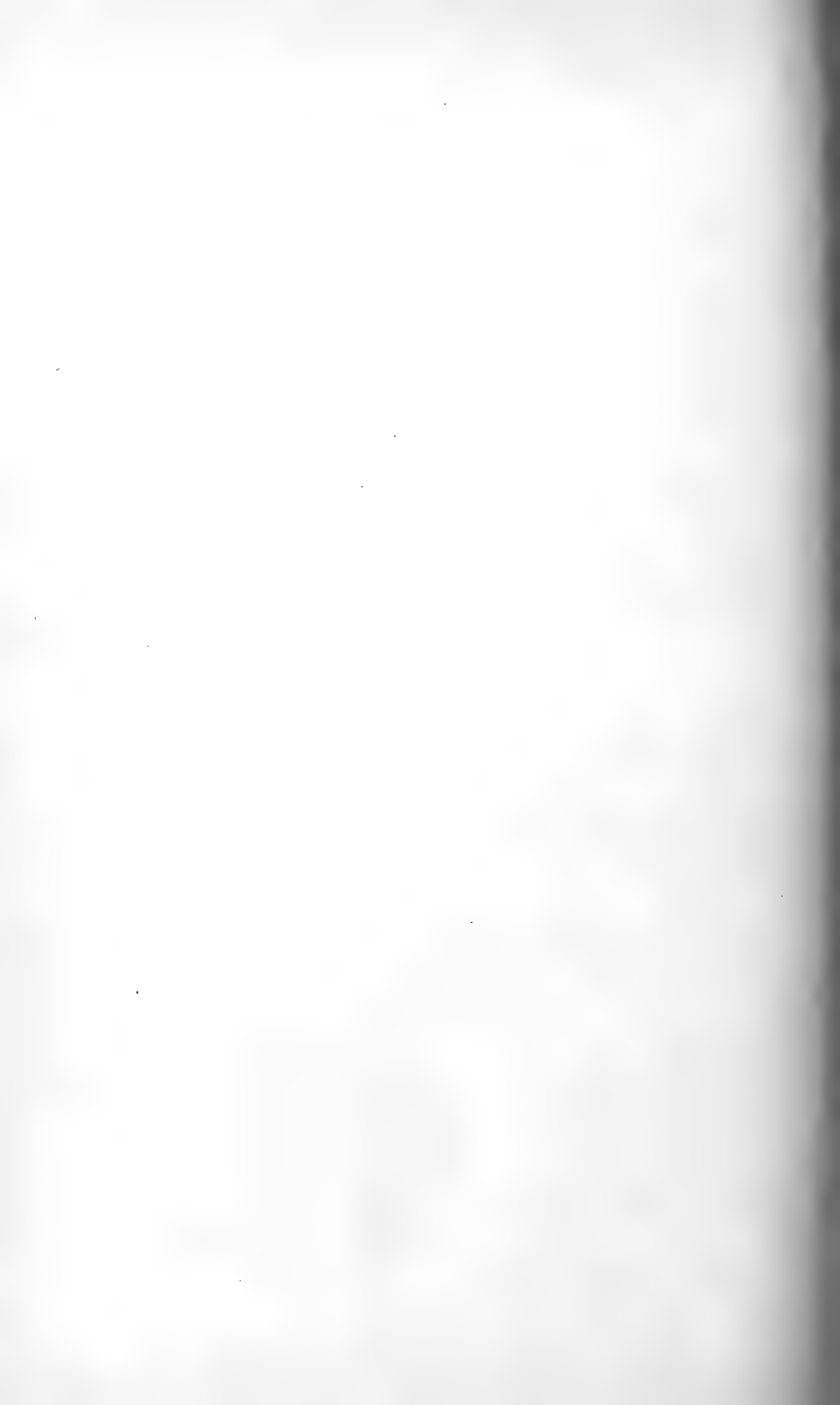
For three or four days before observations were begun, there had been a good deal of rain. The stakes were set at 3 p.m. Saturday, and the level of the water at that time would of course be expressed by the straight horizontal line *AB*. Later in the day there were showers, and Sunday was cloudy. There was a rise above zero of line I. at 4, but a marked fall in the other pits, no doubt all due chiefly to a settling of the water towards the margin. At 6 p.m., after a clear day, II., there was a fall in all of the pits, but this was least in 4 and greatest in 6 and 11. During the night, III., there was further sinking, but much less than during the day, showing that the drop is largely due to evaporation, and not simply to draining away. But in pit 4 during the night the water rose a little, showing that the water in the bog settled out towards the edge more than evaporation there could compensate. Lines IV. and V. give the same result. Unfortunately, no observation could be made Wednesday evening. Thursday night it rained heavily, thus raising the level in all of the pits; and to prevent confusing the diagram for the earlier days, I have made a separate one for the remaining observations. Thus, line VIII. shows a general rise above VII. in all of the pits, even rising above zero at 4, but the pit 2 does not rise in the same proportion as the others, showing that the water had not yet settled appreciably towards the extreme edge of the bog. There was more rain during the day, of which the effects are seen in line IX., which rises above all others, and the rise at 3 and 2 shows a settling towards the edge of the bog. There was little or no rain in the night, as shown by X., whose great rise at 2 shows a marked settling towards the edge of the bog. Saturday was fine, and there was a further drop in all of the pits, as shown by XI.

It is plain that while on the high part of the bog the fall in general is greater the higher the part, there are some exceptions. Thus, the drop in 6 is greater than 7, and greater in 11 than in 12. I think, but am not sure, that 6 and 11 are in somewhat drier parts of the bog than are the others. Since the fall is more rapid by day than by night, it must be due largely to evaporation. But since evaporation must be nearly even over all the surface, the lesser drop near the edge must indicate a slow settling in that direction. The conclusion, then, seems justified that the hydrostatic water of these bogs is derived from rain-fall; that after a rain it not only evaporates, but settles slowly towards the margin. But why it stands at such a height, and does not break through the lower margin, I do not understand. It is purely a question of physics, why it settles so slowly. It is to be remembered that actually the pits are at successively lower levels from 12 (or at least 11) to 2, which makes the slowness of the settling all the more remarkable. The study of the physics of these bogs would yield good results to a competent student.

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VII.—*Studies on Cambrian Faunas.*

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(Read June 22nd, 1896.)

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PART I.

ON A NEW SUB-FAUNA OF THE PARADOXIDES BEDS OF THE ST. JOHN GROUP.

Introduction.

In the beginning of this year (1897) the writer undertook the examination of material collected some years ago on the south shore of the Kennebecasis R. in the province of New Brunswick, Canada, at a place called Hastings Cove, about three-quarters of a mile from Torryburn Station on the Intercolonial Railroad. Other collections made at this locality a few years ago by Dr. W. D. Matthew and a small lot gathered by the writer in the previous summer (1896) were examined at the same time. The earlier collections were not sufficient to differentiate the fauna from that of the Paradoxides Abenacus Sub-zone, but from the later collections important results have been obtained.

Hitherto we had failed to discover in the Paradoxides faunas of America, anything corresponding to the grouping of species that exist in the "Upper Paradoxides Beds" of Sweden, so that an important fauna of that country had so far been wanting in America. The fullest expression of this upper fauna of the Paradoxides beds is found in the Andrarum Limestone of Sweden and in corresponding deposits in Norway. It is marked by the appearance of the genera *Anomocare*, *Dolicho-*

metopus, and *Centropleuria* (*Anopolinus*?) and of certain species of *Agnosti*.

The new sub-fauna of the St. John Group has all these characteristics, except the presence of *Centropleuria*. In place of this genus with its spined pygidium, we have another which also has a spined pygidium, viz., *Dorypyge*. This genus was first defined by W. Dames, who found it in a collection of trilobites from China. He found *Anomocara* to abound with it, and decided for this reason and others that the rock in which it occurs was of the age of the Andrarum limestone of Sweden. These indications point to the conclusion that the rocks which contain the new sub-fauna on the Kennebecasis River are of the age of the "Upper" *Paradoxides* beds in the north of Europe.

Further, it is important to observe that the new sub-fauna contains genera, and even species of the *Olenellus* Fauna of America, which are absent from the other *Paradoxides* sub-faunas of the St. John group. Thus, either from similarity of environment, or actual chronological approachment, or other cause, this sub-fauna is more like the fauna of *Olenellus* than any other hitherto found in Northeastern America. This leads one to suspect that the *Olenellus* Fauna is not of such great antiquity as of late years it has been thought to be.

DESCRIPTION OF THE MEASURES.

The Cambrian measures at Hastings Cove form a narrow strip of sediment, raised to a vertical position, resting on their south side against a precipitous hill of Laurentian rocks, and passing on the north beneath the waters of Kennebecasis Bay. The Laurentian rock immediately adjoining is a quartz-diorite, of which a narrow dyke forms the first brow of the hill, but which is overtopped by a great mass of limestones, which, with some slates and quartzites, form a geological basin of about a mile and a half in width in the older Laurentian rocks. The quartz-diorite is similar to other intrusive masses in the Laurentian area which have been studied by Dr. W. D. Matthew, and which by their contact effects are shown to be more recent than the limestones. But as these quartz-diorites are intruded only in Laurentian rocks (including the limestones), it is judged that they are Pre-Cambrian.

This hypothesis is supported also by the fact that the Cambrian rocks at Hastings Cove contain conglomerate bands (interranged conglomerates), among whose pebbles well rounded fragments of quartz-diorite are found, and less frequently pieces of the Laurentian limestones. The conglomerate bands are usually calcareous, the pebbles being buried in a calcareous paste, and in this paste most of the species described in this paper were found.

Associated with the pebbles and limestone paste are scattered masses of phosphate of lime irregularly distributed; this substance is also a

matrix for the fossils, and helps to indicate that in the sediments immediately adjoining the quartz-diorite we have those of an ancient shore line of Cambrian age. Studies of the Cambrian sediments of central and northern Sweden made by J. G. Anderson and H. Hedström, lead us to suppose that the presence of calcium-phosphate in rocks indicates shallow water or a shore line. The former found it in association with glauconite, and always with a fauna such as would exist in a shallow sea; and the latter contends that this mineral is deposited either on the land or on the immediate shore line, being there often the result of submerged deposits made on the land. Whichever view we adopt the presence of phosphates in sediments indicates shallow water.

On the shore of the Kennebecasis, where these fossils are found in the Cambrian measures, there is no trace of the lowest portion of the Cambrian system, namely, the basal quartzites, the sandstones and shales containing the *Protolenus* Fauna and the shales containing three sub-faunas of *Paradoxides*, and as the Cambrian sediments here begin with a sandstone containing a *Paradoxides* Fauna, it would seem that the other beds never were deposited on this ridge.

The measures actually present consist of about 20 feet in thickness of greenish-gray sandstones next the quartz-diorite, about 10 feet of gray shale, and about the same thickness of black shale. Any higher measures which may be present are concealed beneath the waters of the cove. Both the sandstones and the gray shale weather to a rusty brown colour from the presence of disseminated pyrites. The upper part of the sandstone and the whole thickness of the gray shales contain thin, irregular beds and lentils of limestone, and calcareous conglomerate, containing fragments of the Laurentian quartz-diorite and limestone, as mentioned above.

Sandy layers are also found in the lower beds of the black shales, most of which have abundant fragments of minute trilobites. The black shale itself is mostly quite siliceous, and breaks into cubical pieces, so that it is difficult to get recognizable portions of the larger trilobites from it.

We suppose these measures to be equivalent to certain barren dark gray shales, which often have thin sandy seams, and which in the St. John Basin of Cambrian rocks lie above the beds of Division 1, which have been found fossiliferous. While, therefore, they belong to Division 1 by their fauna, they are above that part of the division which has been found fossiliferous in the more southerly basin.

Were we to depend upon lithological resemblances we would come to a different conclusion, for comparing the sedimentation along the Kennebecasis with that of the St. John Basin, the sandstones at the base compare with Division 1*b*, which carries the *Protolenus* Fauna; the gray shales, with Division 1*c*, which contains the two sub-faunas of

Paradoxides lamellatus and *P. etemicus*; and the black shales with Division 1*d*, which is characterised by the sub-fauna of *P. abenacus*. But when we check the lithology by the palæontology we note that whereas only one sub-fauna can be found in the measures on this south shore of the Kennebecasis, one fauna and three sub-faunas as well, characterise the resembling measures in the St. John Basin. Other objections to considering the two sets of beds as quite synchronous will be apparent when we come to speak of the sub-fauna at Hastings Cove more in detail.

DESCRIPTION OF THE SPECIES.

About twenty-six species and varieties of the new sub-fauna are described in this article. They belong to the genera *Linnarssonina*, *Acrothele*, *Agnostus*, *Microdiscus*, *Conocoryphe*, *Paradoxides*, *Agraulos*, *Liostracus*, *Ptychoparia*, *Solenopleura*, *Anomocare*, *Dolichometopus* and *Dorypyge*.

Of the species (usually represented by a varietal form) three are Bohemian, two British, twelve Scandinavian, two *Olenellus* Fauna of the Western States, three *Olenellus* Fauna of the Eastern States, nine are found in the older sub-faunas of the *Paradoxides* Beds of the St. John Group. In the above reference to resembling species, some are representative, not identical species, and the comparisons are made in most instances with descriptions and figures of those species, the types not being within reach of the author.

BRACHIOPODA.

ACROTRETA, Kutorga.

A poorly preserved example in a phosphate nodule shows the presence of this genus.

ACROTHELE, Linnarsson.

ACROTHELE MATTHEWI, Hartt. mut. MULTICOSTATA.

A form of this species occurs in the dark siliceous shale, the ventral valve of which is marked by numerous narrow, obscure, radiating ridges. The ridges are seen only on the flattened outer two-thirds of the shell.

A costate variety of this species is found in Band *b* of Division 1 of the St. John Group, and Dr. Pompeckj has described a form *A. quadrilineata* from a conglomerate below the *Paradoxides* Beds in Bohemia. The form from Hastings Cove differs from either of these in the more numerous, though obscure ridges.

LINNARSSONIA BELTI Dav. mut. MAGNA n. mut. (Pl. I., Figs 1a
and b.)

A small species which differs in the position of the muscle-scars, etc., from *L. transversa* Hartt and others, belongs to this sub-fauna.

Form orbicular, valves equal, strongly convex. The ventral valve sub-conical, the dorsal valve flatter.

The interior of the ventral valve has a semilunar boss in front of the foraminal opening, behind which is a crescentic depression with a (muscle ?) pit at each end; in front of the boss are two faint converging raised lines inclosing a narrow pear-shaped area, which extends to the middle of the valve; the front bounding line of this area is extended on each side for the width of the area. This line is supposed to limit in front the muscular area of the valve.

The interior of the dorsal valve has a median ridge, broadening forward, and with its end at the middle of the valve. On each side are lateral ridges, beginning one-quarter of the length of the shell from the hinge line, and extending nearly as far as the mesian ridge; they also widen, and are as broad at the anterior end as the mesian ridge; each lateral ridge terminates in a muscle scar, the front of which is about half way from the hinge to the anterior edge of the valve. On each side of the mesian ridge at its extremity are small, narrow, longitudinal pits, that mark the position of small central muscles. Just in front of the hinge is an oblately oval impression, divided in the middle by the mesian ridge; this impression holds the position of the posterior muscles. Considerably outside of the muscle-bearing area of the valve, runs a circular groove, interrupted on the mesian line and there flexed outward; this will be the impression of the vascular trunks, whose extremities end about one-quarter of the length of the valve from its front.

Sculpture.—The outer surface of the valves is marked by fine concentric striæ, made visible by a lens, and there are seen by the same means, very faint interrupted radiating striæ.

Size.—Length and width each 3 mm.

Horizon.—Found both in the limestone bands of the gray beds and in the black siliceous shale; frequent.

This species is easily distinguished from *L. transversa*, Hartt¹ of Div. 1c and d by the more circular form, as well as by the narrow mesian ridge; it is distinguished from *L. misera* Bill² by the form and by the much heavier mesian ridge. It is distinct from *L. taconica* Walc.³ by the smaller boss of the interior of the ventral valve, and the

¹ Trans. Roy. Soc. Can., Vol. III., Sec. iv., p. 35, Pl. v. figs. 11, 11a to e.

² Trans. Royal Soc. Can., Vol. III., Sec. iv., p. 35, Pl. v. figs. 12, 12a to e.

³ Fauna of the Upper Taconic, Am. Jour. Sci., Vol. XXXIV., p. 187, Pl. 1 figs. 18, 18a to d.

shorter mesian ridge of the interior of the dorsal valve. From *L. sagittalis* Salt¹ it is distinct by the shorter mesian ridge of the dorsal, and the absence of a bilinear furrow of the interior of the ventral valve. It is nearer to *L. Belti* Dav.² especially in the markings of the interior of the dorsal valve, but even here the posterior muscles occupy a larger space, and the bilinear groove of *L. Belti* is absent.

OBOLELLA, Billings.

A minute shell, a ventral valve, which from the form and size may perhaps belong to this genus is found in the dark shales. It is about $2\frac{1}{2}$ mm. long and 2 mm. wide. The object is too defective for further description.

PROTORTHIS, Hall & Clarke.

Several examples of a species of this genus or of *Orthis* were found in phosphate nodules, all, however, too imperfect for description.

MOLLUSCA.

ORTHOTHECA, Novak.

Fragments of a small species, oval in section, with a smooth interior, occur in the phosphate nodules.

HYOLITHES, Eichwald.

Remains of two species were observed, one with a diameter of about 8 mm. at the large end, and having fine, distinct, equal, arched transverse striae on the dorsal side. This occurs in phosphate nodules.

Another is a small species 8 mm. long and 2 mm. wide. It is found in the black shales. Both species are too imperfect for further description.

TRILOBITA.

AGNOSTUS, Brongniart.

The forms of *Agnostus* preserved in the limestone bands and dark siliceous shales of Hastings Cove, show as clearly as do those of the Andrarum limestone the development of this type of trilobite during the time marked by the deposition of the *Paradoxides* beds.

As in Sweden so in this country, the *Limbatus* section, so prominent in all the lower sub-faunas, is poorly represented here (or absent, for we have found no examples). The *Longifrontes* on the contrary are com-

¹ Earliest forms of *Brachiopoda* Geol. Mag., London, Vol V., p. 309, Pl. xv., figs. 17 to 24.

² *Ibid.*, figs. 25 to 27.

mon, and one species appears that is not present in the older sub-zones in the St. John group. The species that are continued from the lower sub-zones are mostly imitations of the earlier forms. Of the several sections of the Agnosti occurring in this sub-fauna, the Parvifrontes are the most numerous in individuals. The species *A. umbo* is the most common, and seems to be the highest expression of variation into which the Parvifrontes run. The Lævigati appear in the Acadian Cambrian Faunas here for the first time, and the impression of the glabellar margin on the inside of the test shows that they originated from the same stock as *Agnostus umbo*.

Thus this sub-fauna, like that of the Andrarum limestone at the summit (almost) of the Paradoxides beds in Sweden, exhibits the extreme variation of the Agnostoid stock, though ours, as yet, not in the same rich variety as that of the Old World.

AGNOSTUS NATHORSTI, BRÖGG. ? mut. (Pl. I., fig. 2).

Agnostus Nathorsti, W. C. Brögger, Paradoxides skifrene ved Krekng, i Nytt Mag. f. Naturvid., 24 Binds 1 Hefte, p. 68, tab. v., fig. 1.

Agnostus Nathorsti, S. A. Tullberg, Agnostus arterna v. Andrarum.

Agnostus Nathorsti Faunas of Paradoxides beds Trans. N. Y. Acad. Sci., vol. xv., p. 29, fig. 9, pl. 16, fig. 9a and b.

A pygidium which will probably be found to belong to this species, though differing from that which occurs with the *P. Abenacus* sub-fauna in the St. John Basin, is present in the dark siliceous shales.

This pygidium is less elongate than the form figured by Tullberg and Brögger as occurring at Andrarum, and the marginal spines are placed further back. The rachis is shorter and less acuminate, and the anterior lobe is wider and larger. It is less quadrate than the form in Div. 1d. i. (*Abenacus* sub-fauna) of the St. John Group, and the lateral spines are less prominent, and further back on the margin; otherwise it agrees better with this than with the Scandinavian form.

AGNOSTUS FISSUS, Lundgren.

Agnostus fissus, Lundg. Linnarsson, Om faunan i Kalken med Conoc. exsulens p. 23, taf. ii., fig. 34.

Agnostus fissus, Tullberg, Agnostus arterna v. Andrarum, p. 16, pl. i., fig. 3.

Agnostus fissus, Faunas of the Paradoxides Beds in E. North America. Trans. N. Y. Acad. Sci., p. 230, pl. xvi., fig. 10.

A single head-shield, poorly preserved, has the characteristic furrow on the anterior lobe of the glabella, and the long tubercle on the front of the posterior lobe. It is from the dark siliceous shales.

AGNOSTUS PUNCTUOSUS, Angelin, var. (Pl. I., fig. 3).

Agnostus punctuosus, Ang. Palæontolog. Scand., p. 8, tab. vi., fig. 11.

Agnostus punctuosus, Brög., l. c., p. 67, tab. vi., fig. 11.

Agnostus punctuosus, Tulb., l. c., p. 17, taf. 1, fig. 5, §

Agnostus punctuosus, Faunas of Paradox. Beds of E. N. Am., p. 232, pl. xvi., fig. 11.

Two undersized individuals (two-thirds of the diameter of the one figured by Tullberg) are indicated by a pygidium found in one of the limestone bands, and another in the black siliceous shale. This variety differs from the Scandinavian form in the backward projecting spine of the middle lobe of the rachis, in this resembling *A. aculeatus*, Ang., which has a still longer spine. It also possesses a tubercle on the marginal fold on each side, where a lateral spine is attached in other species; no such tubercle is figured by Tullberg or Brögger for the Scandinavian form. The pits or tubercles (which are apparently low tubercles with depressed margin) are obscure in the Canadian form.

AGNOSTUS PARVIFRONS, Linnarsson (Pl. I., figs. 4a and b).

Agnostus parvifrons, Linns. Om Vestgot. Camb. o Silur. aflagr., p. 82, tafl. 2, figs. 56, 57.

Agnostus parvifrons, Brög., l. c., p. 71, tab. v., figs. 3a to d.

Agnostus parvifrons, Tulb., l. c., p. 34, tafl. ii., figs. 26 to 28.

Agnostus parvifrons, Faunas of Paradox. Beds, p. 220, pl. xvi., figs. 3, a to c.

An *Agnostus* which presents the characters of this species is found in the dark siliceous shale. The glabella is somewhat conical and is about half as long as the head-shield, no tubercle was observed on this part. The anterior marginal fold is narrow and of comparatively uniform width.

A pygidium which belongs to an *Agnostus* of the Parvifrontes section occurs in one of the limestone bands, and may be of this species; it differs from that of *A. umbo* mut. (described below) with which it is associated in having a more cylindrical rachis, and in having the marginal furrow effaced behind.

The head-shield described above is near the type of the Scandinavian species; it differs from *A. parvifrons* var. *tessella* of the horizon Div. 1d. 1. of the St. John Basin, in having a rounded front to the glabella, and no trace of a suppressed anterior lobe to the glabella as var. *tessella* has.

cf. var. NEPOS Brögger (Pl. I., fig. 5).

c.f. *parvifrons* var. *nepos* Brög., l. c., p. 72, tab. vi., fig. 2.

Associated with the above and with *A. umbo*, mut. (see below) is a pygidium which is nearly of the form of the above variety of *A. parvi-*

frons as described by Brögger, which is remarkable for the long rachis of the pygidium. The rachis of the Canadian form is shorter, and the shield possesses a broad, flat border fold. Two rings are faintly indicated on the front half of the rachis, of which the posterior is crowned by a small tubercle; var. *nepos*, however, has distinct rings in the rachis of the pygidium.

AGNOSTUS UMBO, mihi, mut. (Pl. I., figs. 6a and b).

Agnostus umbo, Trans. Roy. Soc. Can., vol. iii., sec. iv., p. 71, pl. vii., figs. 8a and b.

Agnostus umbo, Fauna of Paradox. Beds of E. N. A., p. 222, pl. xvi., figs. 4a and b.

A variety of this species is somewhat common in the limestone bands. It is distinguished from *A. umbo* type by the very weak marginal fold of the head-shield, while on the contrary the marginal fold of the pygidium is somewhat heavier than that of the typical form. In other respects the two forms are much alike.

A. parvifrons var. *mamillata* of Brögger is near this form, but the rachides of the shields are in higher relief, and it has a heavier marginal fold to the head-shield; this feature and the longer rachis of the pygidium also separate from it Tullberg's *A. parvifrons*, form 2.

The Agnosti which in the St. John Group represent Tullberg's forms 2 and 3 of *A. parvifrons*, viz., *A. parvifrons* var. *tessella* and *A. umbo* are clearly distinct species; both the glabella and the rachis of the pygidium have constant differences, and the two forms show no tendency to grade into each other. Form 1 of Tullberg we have not found in the St. John Group.

AGNOSTUS LÆVIGATUS, Dalman, var. (Pl. I., fig. 7).

Battus levigatus, Dalm. Vetensk. Akad. Årsber, p. 136.

Agnostus levigatus, Ang. Pal. Scand., p. 6, tab. vi., fig. 3.

Agnostus levigatus, Brög., l. c., p. 74, tab. v., fig. 6, and tab. vi., fig. 5.

Agnostus levigatus, Tullb., l. c., p. 27, tab. ii., fig. 17.

Agnostus levigatus, Faunas of the Paradox. Beds of E. N. America, p. 233, 234, 235, pl. xvii., figs. 1a and b, 2a and b, 3a and b.

Two heads belonging to a variety of this species have been found. They differ from the examples found at Andrarum, figured by Tullberg in having a narrower posterior lobe to the pygidium, and are smaller. A dark line in the shell indicating a thickening of the test, outlines the effaced glabella, and shows its relation to that of *A. parvifrons*, for it is of the same form.

Sculpture. The surface is minutely granulated.

Size. Length and width of head-shield, each $3\frac{1}{2}$ mm.

Horizon. In limestone band of the gray shales.

MICRODISCUS, Emmons.

MICRODISCUS PULCHELLUS, Hartt (?)

Microdiscus pulchellus, Hartt (M.SS.)

Microdiscus punctatus, (Salter) Walcott, U. S. Geol. Surv., Bull. 10, p. 24, pl. ii., figs. 1a to c.

Microdiscus punctatus, var. *pulchellus*, Trans. Roy. Soc. Can., vol. iii., pt. iv., pl. vii., fig. 12a to c.

Microdiscus pulchellus, Faunas of Paradox. Beds, p. 242, pl. xvii., figs. 8a to f.

A few heads show the presence of this species or of *A. punctatus* Salt. The material is too imperfect to determine between the two species, but from the presence of well cut glabellar furrows these examples are supposed to be of Hartt's species.

CONOCORYPHE, Corda.

CONOCORYPHE PUSTULOSA, n. sp. (Pl. I., figs. 8a and b).

A minute species with highly ornamented surface. The centre piece of the head-shield is elongate semi-circular. Dorsal and marginal furrows deeply impressed. Glabella broad and elevated, having three pairs of faintly marked furrows, the anterior pair pit-like; the posterior near the occipital furrow, which is impressed all across. Occipital ring projecting behind, pointed. Anterior marginal fold strong, armed at the front with a spine. Fixed cheeks tumid, connected in front of the glabella by a narrow ridge. Posterior marginal furrow strongly marked and fold sharply elevated.

Movable cheek and other parts of the body unknown.

Sculpture.—The surface, except in the furrows, is covered with prominent tubercles, in rows; the tubercles are largest on the fixed cheeks, which carry three principal rows, the foremost arching around within the marginal furrow, the second straight across the length of the cheek, the third arching backward; one row goes along the summit of the ridge, connecting the two cheeks in front of the glabella; there is an alternate double row on the anterior marginal fold. On the glabella the tubercles are arranged rudely parallel to the furrows; a few tubercles show on the posterior marginal fold.

Size.—Length of the middle piece of the head, exclusive of the spines, 4 mm.; width, $5\frac{1}{2}$ mm.

This little species adds another to the peculiar final types of the Conocoryphe; its armature in front is unique for the genus. In its approximated glabellar furrows and comparatively large anterior lobe of the glabella, it approaches Walcott's *C. reticulata*; but it is quite distinct

from that species in the general form of the glabella and in the surface markings. It might, when imperfectly exposed in the matrix, be mistaken for *C. variolaris*, Salt., of the *P. Davidis* zone in Wales.

This is, perhaps, the latest of the Conocoryphea, and is not only dwarfed, but possessed a protective armature unknown in any of the earlier species, viz., the projecting anterior spine. A similar protective process is found in two species of the next sub-fauna of the St. John Group, viz., *Anomocare stenotoides* (in the young) and *A. (Olenus?) spinosus* (in the adult), and becomes common in certain trilobites of the Ordovician system (Ampyx, etc.)

PARADOXIDES, Brongniart.

PARADOXIDES ABENACUS, mut. (Pl. I., figs. 9a to c.)

Paradoxides Abenacus. Tran. Roy. Soc. Can., vol. iii., pt. iv., p. 78, pl. vii., figs. 17a to d.

A form which, on account of the narrow free cheek and short posterior extension of the dorsal suture, we refer to this species rather than *P. Tessini* or *P. Bohemicus* occurs in the calcareous bands of the gray slate. The fixed cheek is narrower than in the type, which is found in the horizon, Div. 1d in the St. John basin, and the posterior extension of the dorsal suture is unusually short.

Sculpture.—The test is smooth, except for small scattered tubercles, visible only with a strong lens. The fixed cheek is not wrinkled, as in *P. Abenacus* type. A fragment of the hypostome shows strongly marked raised lines, about 2 or 3 in the space of one millimetre, on the anterior lobe, and less prominent and more distant raised lines on the anterior marginal fold. The pleura and rings of the thorax seem quite smooth.

Horizon, as stated above.

FORM 2. (Pl. II., figs. 1a to d.)

A somewhat different variety occurs in the black siliceous shales. It has a broader and shorter fixed cheek. The test is thin and wrinkled and freely studded with tubercles, which are larger than those of the preceding form, and thus simulate the ornamentation of *P. Forchammeri* of the Andrarum limestone; but if Angelin's figure of this species is correct this form cannot belong to *P. Forchammeri*, owing to differences in the dorsal suture, movable cheek, etc.

The interrupted thread-like ridges which are found on the front slopes of the glabella are more obscure than in *P. Abenacus* type, and the eyelobe and fixed cheek are smaller. The last segment of the thorax

also is proportionately more slender; otherwise the three posterior segments and the pygidium are almost identical with those of the type.

Size.—Length of the head, 35 mm.; width of the middle piece of the head at the front and back, 47 mm.; at the eyelobes, about 44 mm.

Horizon, as noted above.

This form differs from *P. Bohemicus*, *P. Tessini* and *P. Davidis* in that the last pair of pleuræ are weaker than the others.

AGRAULOS, Corda.

AGRAULOS CETICEPHALUS, Barr., var. CARINATUS, n. var. (Pl. II., Figs. 2a and b.)

Arionellus ceticephalus, Barr., Faune Primordiale dans la chaîne Cantabrique, p. 526, pl. vi., figs. 13 to 17.

A head shield, which by its size and general form, appears to belong to Barrande's species cited above, occurs sparingly in this sub-fauna, but it differs to some extent from the European form.

The glabella is more sunken, but though the dorsal furrow is faint, the prints of the glabella furrows are distinct, and the occipital furrow does not cross the axis of the shield. The back of the occipital ring is broken away, but there probably was a spine. There is a marked ridge which traverses the head-shield on the axial line, except on the low, narrow, anterior marginal fold.

A young head of the form of this species has an occipital spine nearly as long as the glabella; the dorsal furrow is more distinctly defined, and the anterior marginal furrow and the ocular fillet more prominent.

Sculpture.—The surface is minutely punctate.

Size.—Length of the head-shield, except the spine, 10 mm.; width of the middle piece of the head at the front, 10 mm.; at the eyelobes, 13 mm.; at the back, 15 mm.

Horizon.—In a limestone band of the gray shale. Scarce.

AGRAULOS HOLOCEPHALUS, mihi. (Pl. II., figs. 3a and b.)

Agraulos holocephalus. Trans. Roy. Soc. Can., vol. viii., pt. iv., p. 138, pl. xi., figs. 5 a to d.

This species was discovered some years ago in the black siliceous shales. In most examples of the head the glabella is more distinctly outlined than in the type, but in others it is quite as obscure; the occipital furrow is slightly marked at the sides of the glabella, in some examples it does not cross the axis. It is a smaller species than *A. ceticephalus*; but,

like it, has a punctate surface. It shows no furrow on the glabella, thus differing from *A. ceticephalus* var. *carinatus*. It differs from *A. Roberti* (see below) in its narrower marginal fold, both before and behind the head-shield.

AGRAULOS ROBERTI, n. sp. (Pl. II., figs. 4 *a* and *b*.)

Only the middle piece of the head is known; this is subtrapezoidal in form. The anterior marginal fold is flat, wide and crescentic, and the anterior furrow in most examples fades out at the axial line. The front area of the cheeks is wide and rather flat; this and the fold are together equal to the width of the glabella at the front third. The glabella is conical, somewhat longer than wide, and smooth; and the posterior furrow is faintly distinguishable. The occipital furrow is distinct, but shallow. The occipital ring is rather narrow, and terminates in a slender spine about as long as the ring is wide, and directed upward. The dorsal furrow is distinctly but moderately impressed. The fixed cheeks are narrow, the width of the cheek and eyelobe being equal to the length of the head between the glabella and the front margin. The ocular fillet is faintly discernible, and the ocular lobe is narrower and low. The posterior marginal furrow is distinct, but not deep, and its fold is strongly angulated in the middle. The facial suture is nearly straight, and parallel to the side of the glabella.

Sculpture.—The surface of the shield is minutely punctate.

Size.—Length of the head, exclusive of the spine, 9 mm.; length of the spine, 1 mm.; width of the middle piece of the head, 9 mm.

Horizon.—Found with the preceding species.

This species resembles *A. Whitfieldianus* of the horizon, Div. 1 *c*, 1, but differs in the wider frontal area of the cheeks, the more conical glabella, the narrower occipital ring, and the flatter contour of the shield. *Anomocare* (?) *parvum* of Walcott might be a larval or dwarfed form of this species.¹ *A. Roberti* differs from *A. ceticephalus*, Barr., in the more direct posterior extension of the dorsal suture, the wide angulated posterior fold and the form of the occipital ring and spine.² From *A. difformis*, Ang., it differs in the more conical glabella, and the absence of a transverse furrow in front of the glabella.³

This species is named for Mr. Robert Matthew, who placed his yacht at the disposal of a committee of the Natural History Society of New Brunswick for the investigation of this fauna and others.

¹ Fauna of the Olenellus Zone, p. 209, pl. xxv., fig. 1.

² Barrande and de Verneuil, l. c., p. 526, pl. vi., figs. 13–17.

³ On *Paradoxides skifrene* v. Krekling, p. 58, tab. iv., figs. 1 to 8.

AGRAULOS (?) *NANUS*, n. sp. (Pl. II., figs. 5 *a* and *b*.)

A small species, of which only the centre-piece of the head-shield is known. Anterior part of the head-shield strongly deflected downward. Marginal fold as broad as the area in front of the glabella. Glabella cylindro-conical, as wide as long, scarcely distinguishable from the cheeks in front, bordered by a broad, shallow furrow behind; no glabellar furrows. Occipital ring heavy, depressed behind. Fixed cheeks, narrow; ocular fillet, faintly shown; eyelobes long, about one-third of the length of the suture. Suture parallel to the side of the glabella, except behind the eyelobe, where it projects. Posterior marginal furrow, shallow, broad outwardly; the posterior marginal fold, narrow.

Sculpture.—The surface of the shield shows a very minute granulation.

Size.—Length of the head, 6 mm.; width of the middle piece of the head in front, 5 mm.; at the eyelobes, 7 mm.; at the back, about 7 mm.

Horizon.—Limestone band of the gray shales.

The wide glabella of this species distinguish it from others; the width of the fixed cheek and eyelobe together equals only that of half the glabella.

This species has points of resemblance to *Conocephalites miser*, Bill., as identified by Walcott, but it differs in the smooth and shorter glabella.

It is difficult to determine where this species should be placed; viewed from above it has the form of *Ptychoparia*, but the bending down of the shield in front and the effacement there of the dorsal suture is common in *Agraulos*, the heavy occipital ring and shallow occipital furrow also point to that genus; but, on the other hand, a large glabella, such as this species has, is more common in *Conocephalites*.

AGRAULOS (?) *PUSILLUS*, n. sp. (Pl. II., figs. 6 *a* and *b*.)

Minute.—Only the middle piece of the head-shield known. This has a lunate anterior marginal fold, nearly as wide as the front area of the cheeks; the two together are equal to the occipital ring, including the occipital spine. The glabella is conical, rounded in front and about twice as wide as one of the fixed cheeks, and has three faintly marked pairs of furrows. The fixed cheeks are tumid and are crossed by a faint ocular fillet; the eyelobes are opposite the front third of the glabella. The posterior and occipital furrows are distinctly impressed, and the occipital ring terminates in a strong spine. The dorsal furrow is distinctly impressed all around.

Sculpture.—The surface is covered with closely set granulations visible with a lens.

Size.—Length (including the occipital spine) and breadth of the centre piece of head-shield, each about $4\frac{1}{2}$ mm.

Horizon.—Found with the preceding species.

This species has a general resemblance to *Agraulos Whitfieldianus* of the Eteminicus sub-fauna of the St. John basin, but is much smaller and has a proportionately larger glabella. Both these species are from limestone conglomerate bands, but at different horizons in the St. John Group.

The preceding small species *A. (?) nanus* and *A. (?) pusillus* are of those forms which approach Ptychoparia, about whose proper generic place there is doubt. This one has the deep dorsal furrow of Solenopleura, but the straight dorsal suture and the arched anterior outline of the head are Agrauloid.

LIOSTRACUS, Angelin.

LIOSTRACUS VALIDUS, n. sp. (Pl. II., figs. 7 a and b.)

Only the middle piece of the head-shield is known; this, exclusive of the occipital spine, is sub-trapezoidal in outline. The front margin is upturned, and the marginal furrow shallow and broad. The width of the front area and fold is equal to that of the cheek behind the eyelobe, or of the occipital ring and spine together. The glabella is conical, rounded in front and without furrows. The fixed cheek is two-thirds of the width of the glabella, has a faint ocular fillet and the eyelobes are opposite the anterior third of the glabella; there is no occipital furrow on the axis of the shield, but the glabella passes by a gentle curve into the occipital ring. The posterior furrow and fold are well marked, and the dorsal furrow well defined.

Sculpture.—The surface is smooth.

Size.—Length of the head-shield, including the occipital spine, 11 mm.; width of the middle piece at the front, 17 mm.; at the eyes, 10 mm.; at the posterior angles, 13 mm.

Horizon.—From a conglomerate-limestone band in the gray shales. Infrequent.

In the form of the middle piece of the head-shield this species is closely related to *L. Ouangondianus* of the St. John basin, and to *L. aculeatus* of the Paradoxides beds of Sweden. It differs in having a larger glabella and stouter occipital spine. As only the middle piece of the head is known, no comparison can be made with other parts of the animal.

PTYCHOPARIA Corda.

PTYCHOPARIA LIMBATA, n. sp. (Pl. III., figs. 1a to d.)

The glabella and cheeks of this species are in low relief, and the dorsal furrows lightly impressed.

The anterior marginal fold is less than half of the width of the front area of the cheeks. The glabella is cylindro-conical, and is marked by three flat, obscure furrows. The occipital ring is narrow and crowned by a low tubercle. The fixed cheek has a distinct ocular fillet, and, with the eyelobe, is as wide as the glabella is in front. The posterior marginal fold and furrow are distinctly impressed. The eyelobes are small and suture runs back from them, curving outward in a double curve towards the genal angle; in front of the eyes the suture runs more directly to the margin.

In the cheek found loose with this species, the area is about three times as wide as the marginal fold. Only the base of the genal spine is preserved.

A pygidium found loose with this head has six rings (beside the half-ring) in the axis, and three broad diverging ribs faintly mark the lateral lobes of the pygidium. There is a faintly marked lateral border and a more distinct anterior border fold. The side lobes of the pygidium are rather flat.

Sculpture.—This consists of minute granulations.

Size.—Length of the head-shield, 11 mm.; width of the middle piece at the eyelobes, 13 mm.; at the posterior angles, 18 mm. Length of the movable cheek, exclusive of the spine, 8 mm.; width, 5 mm. Length of pygidium, 4 mm.; width, 7 mm.

Horizon.—Found in the limestone bands of the gray shales.

This species is allied to *P. microphthalma* (= *Anomocare microphthalmum*, Ang.) of the Swedish Cambrian rocks, but differs in its wider free cheek and narrower pygidium. In the wide margin of the head-shield and the flattened border of the pygidium it is like an *Anomocare*. Its resemblance to this genus will also appear if we compare it with *Conocephalites* (*Anomocare*) *tucer*, Bill., of the Vermont Cambrian. (See Pl. IV., fig. 8.)

PTYCHOPARIA ADAMSI, Billings sp. var. (Pl. IV., fig. 9.)

Conocephalites Adamsi, Bill., Geol. Vermont, vol. ii., p. 950, fig. 355.

Ptychoparia Adamsi, Walcott, U. S. Geol. Survey Bull. 30, p. 195, pl. xxvi., figs. 1 a to c.

Ptychoparia Adamsi, Wale., Fauna of Olenellus Zone, p. 649, pl. xcvi., figs. 1 a to c.

Among the fossils from Hastings Cove are a number of examples which agree fairly well with Billings's description of this species, which is as follows :

"Head, broad, semi-circular, moderately convex ; glabella, oblong-conical, nearly two-thirds of the whole length of the head ; the front, obtusely rounded or somewhat straight ; the anterior angles, narrowly rounded ; the sides, nearly straight from the anterior angle to the neck furrow, just in advance of which is the widest part. The neck furrow, well defined all across ; the glabellar furrows, indistinct ; the dorsal furrow, well defined all around the glabella. The cheeks are moderately tumid ; a line drawn across the glabella, about the mid-length, would pass through the eyes. The distance of the eyes from the dorsal furrow is equal to the greatest width of the glabella ; the eye appears to be very small. The margin in front of the glabella is equal in width to about one-third of the whole length of the head ; it is bordered by an obtuse, narrow, elevated rim, just within which is a groove which is more deeply impressed on each side than directly in front of the glabella, there being at this place a gently convex elevation resembling that which occurs in Barrande's species, *C. Sulzeri* and *C. coronatus*. The ocular ridge is well defined where the surface is preserved, but is rarely visible in the sandstone casts. Most of the specimens are distinctly carinate along the median line of the glabella. It is possible that there may be a tubercle on the neck segment, but none of our specimens have this part sufficiently well preserved to show it. The following are the dimensions of a specimen of the average size : Length of head, 5 [$3\frac{1}{2}$]¹ lines ; length of glabella (and occipital ring), $3\frac{1}{4}$ [$2\frac{1}{2}$] lines ; greatest width of glabella, 2 lines ; width of glabella in front, $1\frac{1}{4}$ lines ; distance of eye from the side of the glabella [nearly], 2 lines. Dedicated to Prof. C. B. Adams, late State Geologist of Vermont. *Locality and Formation*—Highgate, Vermont, in the Potsdam Group, about a mile east of the Highgate Spring. *Collectors*—Rev. J. B. Perry, Dr. G. M. Hall and E. Billings."

Among the fossils from Hastings Cove there are a number of heads which agree fairly well with this species. All are somewhat narrower, and they are devoid of the swelling of the area in front of the glabella, which is mentioned by Billings as a character of *C. Adamsi* ; he does not, however, show any such swelling in his figure of the species. The form from Hastings Cove, however, shows on some examples a character common in the *Conocoryphea*, viz., an enlargement or boss on the ocular fillet close to the glabella.

The proportion of the parts of the head in the Hastings Cove form are closely those given above by Billings for the type, except that the

¹The corrected dimensions are in accord with Billings's description, figure, and the supposed type in the Museum at Ottawa.

middle piece of the head is not quite so wide, and that some examples have shallow furrows on the glabella; some, however, have none, and even the ocular fillet is nearly effaced.

A pygidium found with this species has all the characters ascribed by Mr. Walcott to that of *P. Adamsi*.

Sculpture.—The surface has a velvety appearance, due to the minute tubercles that cover the surface, and are distinguishable with a lens. Some heads show closely set striæ just visible to the naked eye, radiating from the glabella and ocular fillet to the anterior marginal furrow, such as are found in *Anomocare (Ptychoparia) microphthalmia* and *Ptychoparia striata*; these are most distinct on the under surface of the test.

Size.—Length of the head shield, 8 mm.; width of the middle piece at the eyes, 9 mm.: at the posterior angles, 12 mm.. Length of pygidium, 3 mm.; width, 7 mm.

Horizon.—Conglomerate limestone bands in the gray shales. Common.

NARROW FORM. (Pl. III., figs. 2 a and b.)

Heads of the length of 5 mm. show persistently considerably less width than the full grown heads, and among some of the larger heads are some that are considerably narrower than others, but in other respects agree with the normal form. Similar differences have been noted in the *Ptychopariæ* of the old sub-faunas, and are only varietal or sexual.

SOLENOPLEURA, Angelin.

SOLENOPLEURA ARENOSA, Billings sp. (Pl. IV., fig. 10.)

Conocephalites arenosus, Bill., Palæoz. Foss., vol. i., p. 15, fig. 18.

Conocephalites arenosus, Walc., U. S. Geol. Surv. Bull. 30, p. 195.

Original description by Billings:

"Glabella conical, about three-fourths the length of the head; convex, well defined by the dorsal furrows all around; neck furrow all across; posterior glabella furrows represented by obscure undulations, which appear to be directed obliquely backward from near the middle length to near the neck furrow. Front margin with an elevated rostrum and transverse groove, the latter passing at about one-third from the front of the glabella. Ocular ridge well defined.

"Length of head, $3\frac{1}{3}$ lines; of glabella, $2\frac{1}{2}$ lines; width of glabella at the base, $1\frac{2}{3}$ lines; at one-third of the length from the front, $1\frac{1}{3}$ lines.

"The character of the impression taken to be the posterior glabellar furrows are not well ascertained."

var. ANGLILIMBATA, n. var. (Pl. III., figs. 3 *a* and *b*.)

The form we suppose to represent this species is of the size of the type, and nearly the same proportions; it differs in having a narrower anterior marginal fold. It has two obscurely marked glabellar furrows, like Billings's species, and shows the same narrow area in front of the glabella; it differs in that the ocular fillet is scarcely raised above the level of the cheeks, but as Billings's type is a cast (in sandstone), the fillet is more distinct than in ours. There is a distinct tubercle on the middle of the neck ring in the Acadian variety, and the glabella is obtusely carinate along the median line. The posterior glabellar furrows on some examples are scarcely discernible. The eyelobes are long, and are about as far from the posterior margin of the head as the width of the occipital ring.

Sculpture.—The surface is minutely granulate, except in the furrows.

Size.—Length of the head-shield, $6\frac{1}{2}$ mm.; width of the middle piece at the eyes, $7\frac{1}{2}$ mm.; at the back of the shield, $8\frac{1}{2}$ mm.

Horizon.—Dark sandy layers in the black shales.

Billings's type is not by any means perfect, as his figure does not show the back of the fixed cheeks. This part in the St. John form is narrow, being (inside of the eyelobe,) only half as wide as the glabella, and the posterior angles are not much extended. The neck ring is wider than shown by Billings's figure for the Vermont example.

Walcott makes Billings's *C. arenosus* a variety of *C. Adamsi*, but the latter's figures and descriptions preclude us from accepting such a conclusion.

SOLENOPLEURA ROBBII, Hartt, mut. PARVA. (Pl. III., figs. 4*a* and *b*.)

Conocephalites Robbii Hartt, Acad. Geol., 2nd Ed., p. 648.

Ptychoparia Robbii, Walc., U. S. Geol. Surv., Bull. 10, p. 36, pl. vi., fig. 1.

Solenopleura Robbii, Trans. Roy. Soc., vol. v., pt. iv., p. 153, pl. ii., figs. 3*a* to *l* and 4*a* to *e*.

There are a few heads which appear to agree in the proportion of the parts and the contour, with Hartt's species above cited. They are however, considerably smaller than those of that species. They resemble, also, Angelin's *S. brachymetopa*, but are not more than half of the length of that species.

Horizon.—Found both in the limestone bands of the gray shale and in the overlying black shales.

ANOMOCARE, Angelin.

ANOMOCARE MAGNUM, Brögger? var. (Pl. III., figs. 5a to e.)

Anomocare (?) magnum, Brög. Paradoxides skifrene v. Krekling, p. 56, tab. iii., figs. 15 and 15 a.

cf. *Anomocare majus, planum* and *subcostatum*. W. Dames, On the Cambrian trilobites of Liau-tung (China), pl. i., fig. 19, and pl. ii., figs. 8 and 15.

The material for this form is inadequate for certain determination. The small glabella and broad marginal fold show we are dealing with an *Anomocare*, but the broken condition of the head-shield makes it uncertain where the eyelobe is placed, and if the front margin is entire.

A movable cheek, too small for the head-shield, figured, has the usual broad fold, shallow furrow, and short obtuse flattened spine of an *Anomocare*.

A pygidium found with the head has a length about equal to the width of the rachis and one side lobe. The axis has six rings and the side lobes three obscure ribs; the margin is flattened and without a fold.

Another pygidium of larger size is wider, and has four or five rings in the rachis; there are only two faint ribs on the side lobes, and the area of the limb is hollowed.

Sculpture.—Surface of the head marked by minute punctations.

Size.—Length of the head shield, 8 mm.; width of the middle piece at the front, 7 mm.; at the eyes, 9 mm., and at the back, 12 mm. The movable cheek figured is 8 mm. long and 3 mm. wide. The pygidium, 7 mm. long and 9 mm. wide. The other pygidium of *Anomocaroid* type, 10 mm. long and 20 mm. wide.

Horizon.—Limestone bands of the gray shale.

The head figured herewith, if of *A. magnum*, is that of a young individual. The small pygidium figured does not belong to *A. magnum*, but the larger one has a general resemblance to the type figured by Brögger, and has the same number of ribs in the side lobes as the tail-piece of that species.

DOLICHOMETOPUS, Angelin.

Among the genera of Regio B. (Paradoxides beds), described by Angelin, the above seems to be rare, as it has not been reported from other countries than Sweden; or if it has been found elsewhere, has not been recognized and referred to its proper genus. A trilobite from Hastings Cove seemed to come within Angelin's diagnosis, though evidently a different species from his, and I therefore wrote to Dr. G. Lindström, keeper of the State Museum at Stockholm, for information regarding

Angelin's species. He was so good as to obtain from his artist, Mr. G. Liljevall, a beautifully drawn figure of the type of the genus; this is reproduced as an etching on one of the accompanying plates (Pl. III., figs. 7 *a* and *b*). The description of the species found at Hastings Cove is as follows:

DOLICHOMETOPUS ACADICUS, n. sp. (Pl. III., figs. 6*a* to *d*.)

Body covered with a very smooth test.

Head-shield margined all round and having an intra-marginal furrow. Eyes large, furnished with a semi-circular orbital lobe. The facial suture curves backward and downward behind the eyes, and has a direct extension forward before the eyes. Glabella distinctly outlined, bent downward in front, sub-clavate, without furrows, rather squarish in front, extending to the anterior marginal fold, about twice as long as the width at the base. Occipital ring lenticular in outline, divided from the glabella by a shallow furrow. Fixed cheeks narrow, width about half of that of the glabella at the base. Posterior angles of the middle piece produced backward and bent downward. The eyelobes are as long as the width of the glabella in front.

In the confused mass of parts of trilobites, with which the lentiles at Hastings Cove are filled, there seems to be a somewhat definite association of a *Paradoxides*-like cheek with the head of *Dolichometopus*; the flattened margin is nearly as wide as the area within; the cheek has no posterior border fold, and it terminates in a flat ear-like spine; it thus resembles the movable cheek of an *Anomocare*; the long eyelobe which marks this cheek seems to indicate that it belongs with the head-piece of *Dolichometopus*.

A pygidium, which also occurs with the above heads and cheeks, is not unlike that of an *Anomocare*, but differs in having a blunter and stouter rachis than it is usual with pygidia of this genus; we regard it as probably the pygidium of the *Dolichometopus*. It has a rather narrow, prominent rachis, having four faintly marked rings, beside the more distinct half-ring in front; the side lobes have three faintly marked ribs, beside that at the front margin; the lateral margins are flattened and without a fold.

Sculpture.—This consists of a minute granulation, made visible only with a lens.

Size.—Length of the head-shield, 11 mm.; width of the middle piece of the head, 10 mm. Length of the movable cheek, 10 mm.; width, 5 mm. Length of pygidium, 6 mm.; width, 10 mm.

Horizon.—The conglomerate limestone bands in the gray shales. Frequent.

This species differs from the Swedish form figured by Angelin,¹ in having a more direct suture before and behind the eye, and a longer eyelobe. It differs from the same species as figured by Brögger² in the course of the dorsal suture, and in the less numerous joints in the rachis of the pygidium.

This species differs from *Zacanthoides Eatoni* (which appears to be a Dolichometopus) in its more obscure glabellar furrows, its narrower area in front of the eyes and narrower occipital ring, but as *Z. Eatoni* seems to be a young head, these differences may be due to the immaturity of the specimen.³ The distorted head figured with *Olenoides Marcoui* appears, also, to be that of a Dolichometopus, though its condition of preservation makes this uncertain.⁴ *Bathyurus senectus* of Billings has relations to Dolichometopus, but differs in a more prominent glabella and distinct glabellar furrows.

Prof. W. B. Dwight has described a fauna occurring in limestone and shale near Poughkeepsie. The species described are in Duches county, State of New York; they are not numerous, but are interesting, as showing a grouping corresponding to that of the fauna described in this paper. Three cephalic shields of a trilobite, described as *Olenoides Stissingensis*, are figured,⁵ of which the central one (fig. 15) appears to be a Dolichometopus, and if it were not for the furrows represented on the glabella, the two other heads would be referable, with equal reason, to that genus; the flat profile, figured with fig. 10, points to the same conclusion. But we do not as yet know of any spined pygidia referable to the genus Dolichometopus, and the known examples of Dorypyge show a higher relief to the head-shield.

DORYPYGE, Dames.

Mr. Walcott has placed a number of forms under *Olenoides*, Meek, which, it seems to the author, more properly belong to the above genus. *Olenoides* was a form of which Mr. Meek had very imperfect material, and the definition of the genus put forward by Mr. Walcott is based on Meek's *Paradoxides* (?) *Nevadensis*, and Walcott's own *Olenoides typicalis*, chiefly the latter. In this genus (1886) the latter author has placed a good many diverse forms, and among them a group of species which is excluded by those points in the diagnosis of the genus which relates to the eyes and the course of the dorsal suture.

¹ Palæontolog. Scand., pl. xxxvii., figs. 9 and 9 b and c.

² On Paradox. skifrene v. Krekling, tab. iii., figs. 12 and 12 a.

³ Fauna of the Olenellus Zone, pl. xciv., fig. 6.

⁴ Ibidem, fig. 2.

⁵ Am. Jour. Sci., vol. xxxviii., Aug., 1889, p. 139, pl. vi.

This type of trilobites had already been characterized by Dr. W. Dames as the genus *Dorypyge*, a genus based on certain Cambrian trilobites from China.¹ These are certainly a distinct type from those which Mr. Walcott has referred to in his description of the genus *Olenoides*, and I have preferred to use Dames' name in describing them.

It appears that at the time of the publication of his work (U. S. Geol. Surv. Bull. 30), Mr. Walcott became acquainted with Dames's work on the Chinese Primordial trilobites (p. 221), and implies (p. 222) that it is a synonym of *Olenoides*. But Dames's genus has precedence of Walcott's *Olenoides* by three years, and was well characterized.

Subsequently Mr. Walcott transferred several species that he had arranged under *Olenoides* to a new genus, *Zacanthoides*;² these are *Olenoides typicalis*, *O. spinosus*, *O. levis* and *O. flagricaudus*, leaving in *Olenoides* the group of species to which I have referred, that properly belong to *Dorypyge*.

In describing the fauna of the *Olenellus* Zone he referred to *Dorypyge* as a sub-genus of *Olenoides*, the new species, *O. desiderata*, and suggested a division of the species there grouped, setting off this granulated form to *Dorypyge*. Granulation of the test is a matter of degree of sculpturing, which is variable, and the following of this rule would break up *Paradoxides* and other genera into several groups.

It seems to the author that if *Dorypyge* Dames is to be divided, the peculiar protopygidium of Dames species is a more radical point of difference than variation in the sculpturing of the test, as the former is an early larval feature. This species has a large sub-spherical protopygidium at the posterior end of the axis of the mature pygidium, showing three distinct somites, a character not described for any of the American species. But, notwithstanding this peculiarity of the Chinese species we look upon *Dorypyge* as a very compact genus, and we think it contains the following species:—Species with six pairs of marginal spines to the pygidium, *D. Richthofeni*, *D. Wasatchensis*, *D. quadrans*, *D. Ellsi*, *D. Fordi*, *D. horrida* (n. sp.). Species with seven pairs of spines, *D. Marcoui*. Species with three pairs of spines, *D. desiderata*. Species with one pair of spines (?), *D. parvula*, Bill. sp.

The three species *D. Fordi*, *D. horrida* (n. sp.) and *D. Marcoui*,

¹ See "Notes on the Cambrian Trilobites of Liau-tung in Richthofen's China, tab. i., figs. 1 to 6, 1 a and 2 a.

² Am. Jour. Sci., 3d ser., vol. 36, 1888, p. 165. *Zacanthoides* having *Olenoides typicalis* as one of its typical forms, and this species being that on which Mr. Walcott had based his description of *Olenoides* (for both the description of the genus and the imperfect condition of its companion fossil, *O. Nevadensis*, show that *O. typicalis* is the actual type of *Olenoides*), it is evident that Mr. Walcott has left *Olenoides* to its fate. I have, therefore, the less hesitation in transferring the remainder of the species to *Dorypyge*, where they belong.

have a spinous or strongly tuberculated axis to the pygidium, and in this respect appear to differ from the others.¹

Three species of this genus have been found in the conglomerate-limestone bands of the gray shale at Hastings Cove.

DORYPYGE WASATCHENSIS, Hall & Whitfield, sp.

Dikellocephalus Wahsatchensis, H. & W. Geol. Expl., 40th par., vol. iv., p. 241, pl. i., fig. 35.

Dikellocephalus gothicus, H. & W., Ib. p. 242, pl. i., fig. 36.

Olenoides Wahsatchensis, Walcott, U. S. Geol. Surv. Bull., 30, p. 189, pl. xxix, figs. 2, 2a.

var. ACADICA, n. var. (Pl. IV., fig. 1.)

We have remains of two pygidea which appear not to differ much from this species. The original description of the pygidium on which (*D. gothicus*) was founded is as follows :

"Pygidium semiovalate or short paraboloid, with a very strong central axis and spinose margin, anterior margin straightened for about two-thirds of the width of the lateral lobes, where it curves abruptly backward to the lateral angles. Axial lobe strong, cylindrical and prominent, forming one-third of the entire width, exclusive of the spines, and reaching almost to the posterior margin of the shield; obtusely rounded at the extremity, and marked by six annulations exclusive of the terminal ones. Lateral lobes very moderately convex, and marked by four divided ribs on each side, each terminating in a strong and proportionately long marginal spine; central area of each rib depressed, forming a flattened groove, extending to the base of the marginal spine. Border of the ribs elevated, the anterior one strongest and prominent, gradually widening from its origin to the margin of the shield; posterior border narrow and rounded, separated from the next succeeding rib by a sharply depressed, narrow groove. This peculiar form of rib gives to the shield an appearance similar to the grooving of a gothic arch. Margin of the shield surrounded by twelve long, rather strong spines, four of which on each side are about equal in size and strength, while the four occupying the posterior border are shorter and unequal, those in the middle being shortest.

"The peculiar feature in the specimen consists in the divided ribs of the lateral lobes, and the spinous margin."

In the Acadian form the rachis of the pygidium is narrower, but unfortunately, being broken away its surface is unknown. The ribs on the side lobes of the pygidium have the double groove described by

¹ Walcott's figures do not show this for *D. Marcoui*, but Whitfield's original ones do.

Messrs. Hall and Whitfield, but the main pleural furrow does not run down on the spine, there being a flattened margin all around that limits it. Our example is larger than the type, and shows only five lateral spines, but there may be six on a perfect shield.

Sculpture.—Under a strong lens the surface is seen to be very finely granulose, especially on the spines.

Size.—Length of pygidium, 15 or 20 mm.; width exclusive of the spines, 30 mm.

Horizon.—Limestone bands of the gray shales.

DORYPYGE QUADRICEPS, Hall & Whitfield, sp. (Pl. IV., figs. 2*a* and *b*.)

Dikellocephalus quadriceps, H. & W. Geol. Expl., 40th par., vol. iv., p. 240, pl. i., figs. 37 to 40.

Dikellocephalus quadriceps, Walc., U. S. Geol. Surv., vol. viii., p. 45, pl. ix., fig. 24.

Olenoides quadriceps, Walc., U. S. Geol. Surv. Bull., 30, p. 187, pl. xxix., figs. 1, 1*a* to *c*.

var. VALIDA n. var. (Pl. IV., figs. 2*c* and *d*.)

Among the pygidia of the fauna under consideration is one which does not seem to be specifically distinct from the species above quoted. Apparently it differs only in having a wider and more prominent rachis.

The description of Hall and Whitfield's type is as follows: "A pygidium associated with the glabella is paraboloid in form and surmounted on the margins by twelve short, rather strong spines, the four on the posterior margin being shorter than the others. Axis narrow, highly convex, two-thirds as long as the shield, and marked by four rings exclusive of the terminal one; lateral lobes, broad, and marked by four low rounded ribs, the anterior one much narrower than the others; each of the four ribs terminating in one of the lateral spines."

The St. John variety differs in having a broader rachis, which is more markedly elevated at the extremity than that of Hall and Whitfield; the ribs also are more prominent at the ends and are marked by a faint pleural groove the terminal lobe of the rachis is shorter, and the flattened border more abruptly divided from the costæ.

Sculpture.—The surface is covered with minute granulations, visible with a lens.

Size.—Length of the pygidium exclusive of the spines, 4 mm.; width at the front, 8 mm.

Horizon.—Found with the preceding, also in phosphate nodules in a conglomerate band.

DORYPYGE HORRIDA, n. sp. (Pl. IV., figs. 3a and b.)

Head and thorax unknown.

Pygidium elongate-subtrapezoidal, with prominent rachis, rather flattened side lobes and recurved border. Rachis of six convex annulations, of which the first four are crowned by spines, the fifth by a tubercle, and the sixth is short. Lateral lobes marked by five broad shallow furrows, which diverge in a fan-like manner. Pygidium bordered by a flattened margin having the outer border recurved and fringed on each side with six spines directed somewhat backward and upward; of these spines the penultimate pair are longer than the others.

Sculpture.—The surface viewed with a strong lens appears minutely tuberculate.

Size.—Length of this pygidium, exclusive of the spines, $4\frac{1}{2}$ mm.; width, exclusive of the spines, 8 mm.

Horizon.—Phosphate nodule in a limestone band of the gray shales.

Owing to the strong spinous rachis of the pygidium, I was at first disposed to think this a young stage of *D. Marcoui* Whitfield sp., which, indeed, it may possibly be; for although Mr. Whitfield estimates a possible ten segments in his species, this is beyond the analogy of other species of the genus, and the number of rings shown in the rachis of the pygidium which he figures as defective may be the complete number; even then, however, it has one segment more than the normal number, or than the St. John example. Owing to this and some differences of form it seems desirable to assume that the latter is a distinct species.

The St. John pygidium seems to come nearer in form to the example figured by Mr. Walcott as *Olenoides Marcoui*, but he represents the species as smooth on the rachis of the pygidium, which is certainly not the case with the St. John form. Walcott's trilobites are therefore of another species; one is figured with six, the other with seven spines on each side of the pygidium.¹

Since Bulletin 30 was issued Mr. Walcott has described another species of Dorypyge (*Olenoides Fordi*)² which with a rachis having a row of tubercles along the summit, has a narrower pygidium and spines directed backward; it is about one and a half times as long as our species, and more convex. It is from Washington County, New York, and occurs with *Elliptocephala asaphoides*.

List of the Species.

The following list will show in brief the relation of this fauna to the corresponding faunas in other lands. As has been remarked, this is

¹ U. S. Geol. Surv. Bull., 30, pl. xxvi., figs. 5a and 5b.

² Fauna of the Olenellus Zone, pl. xciv., figs. 3, 3a and b.

mostly by varieties ("v") or by representative, nearly allied species ("r"). The *Olenellus* Fauna referred to here is the restricted grouping associated with *Olenellus Thompsoni*. Identical species are indicated by "x."

	Bohemia.	G. Britain.	Scandinavia.	Western N. America.	<i>Olenellus</i> Fauna.	St. John Gr. Div. I & I.
<i>Acrotreta</i> sp.						
<i>Acrothela</i> Matthewi, Hartt, mut. <i>multicostata</i>	r					x
<i>Linnarssonina</i> Belti, Dav. mut. <i>magna</i>		x				
<i>Obolella</i> ? sp.						
<i>Protorthis</i> , or <i>Orthis</i> , sp.						
<i>Orthotheca</i> , sp.						
<i>Hyalithes</i> , sp.						
<i>Agnostus</i> Nathorsti, Brög. mut.			v			v
A. ——— <i>fissus</i> , Lungr.			x			x
A. ——— <i>punctuosus</i> , Ang. var.			v			
A. ——— <i>parvifrons</i> , Linsr.			x			x
A. ——— ——— c.f. var. <i>nepos</i> , Brög.			v			
A. ——— <i>umbo</i> , mut.						v
A. ——— <i>levigatus</i> , Dalm. var.			v			
<i>Microdiscus</i> pulchellus, Hartt ?			r			?
<i>Conocoryphe</i> pustulosa, n. sp.						
<i>Paradoxides</i> Abenacus, mut.	r		r			r
<i>Agraulos</i> cepticephalus, Barr. var. <i>carinatus</i>	v					
A. ——— <i>holocephalus</i>		r				
A. ——— <i>Roberti</i> , n. sp.						
A. ——— (?) <i>nanus</i> , n. sp.						
A. ——— (?) <i>pusillus</i> , n. sp.						
<i>Liostracus</i> validus, n. sp.			r			r
<i>Ptychoparia</i> limbata, n. sp.			r			
P. ——— <i>Adamsi</i> , Bill. var.					v	
<i>Solenopleura</i> arenosa Bill. var. <i>angilimbata</i> ,.....					v	
S. ——— <i>Robbii</i> , mut. <i>parva</i>						v
<i>Anomocare</i> magnum, Brög. (?) var.			v			
<i>Dolichometopus</i> Acadicus, n. sp.			r			
<i>Dorypyge</i> Wasatchensis, H. & W. var. <i>Acadicus</i>				v		
D. ——— <i>quadriceps</i> , H. & W. var. <i>valida</i>				v		
D. ——— <i>horrida</i> , n. sp.					r	

Elements Contained in this Sub-fauna.

One feature apparent at first glance in this sub-fauna is the great abundance of trilobites; other orders and classes seem insignificant in

comparison. It is to the trilobites, therefore, that we look for the comparative standing of this sub-fauna and its chronological position.

On examining the confused assemblage of parts of trilobites which the limestone conglomerate and limestone bands free of pebbles contain, we are struck by the prevalence of pygidia with flattened margins and narrow, prominent rachis; this form of pygidium is associated with heads that have a comparatively small glabella, and the two together are common features of the genus *Anomocare*. With these are not uncommonly found head-shields of the genus *Dolichometopus*, a genus heretofore known only in the Cambrian terrane of Sweden, and there characterizing the Upper Paradoxides Beds.

The grouping of the *Agnosti*, also, is such as to show a progressive change from the assemblage found in the Paradoxides beds, as hitherto shown in this part of America. The section *Limbati*, which is most prevalent in the *Eteminicus* sub-fauna, and is found in diminished numbers in the *Abenacus* sub-fauna, is absent from these beds at Hastings Cove, or rare. The *Longifrontes* still maintain a fair proportion in this sub-fauna, but the *Agnosti*, which are found in the greatest numbers, are the *Parvifrontes*, and the most abundant form of this section is (*A. umbo*) the one with the shortest glabella. Here the modification of form has not stopped, as in this sub-fauna we meet for the first time (as far as the St. John Group is concerned) the highly modified section of *Lævigati*; *A. lævigatus* is occasionally found, a species in which the glabella is almost entirely effaced. The types of trilobites above described, viz., *Anomocare*, *Dolichometopus* and the *Lævigata Agnosti* are, in Sweden, peculiar to the Upper Paradoxides beds.

If we consider the species, the connection with the upper part of the Lower Cambrian (Paradoxides beds) is equally close. Of *Agnosti* there are five Old-World species of the middle and upper Paradoxides beds. Of *Microdiscus*, one species of the middle Paradoxides beds. Of *Agraulos*, two of the species belong to the same part of the Cambrian system. *Conocoryphe* might, as a genus, be considered to mark specially the Lower Paradoxides beds; but the species from Hastings Cove is unique in its minute size and strongly tuberculated surface. The Paradoxides is *P. Abenacus*, the American representative of *P. Tessini*, which ranges from the middle to the highest Paradoxides beds. Of *Dolichometopus* we have already spoken. Of *Anomocare*, though we have not recognized the two typical species described by Angelin, those which are present are quite as well characterized as the Chinese species described by Dames.

Though the sub-fauna at Hastings Cove contains a larger percentage of forms of the *Abenacus* sub-fauna, this is to be ascribed to the fact that the two sub-faunas flourished in closely contiguous basins, and are separated by no great period of geological time. And, further, there is nothing to indicate that any great physical disturbance expelled the

earlier sub-fauna before the introduction of the later. We have every reason, therefore, to think that this sub-fauna is homotaxically as recent as that of the Andrarum limestone.

Beside the species derived from the Acadian Middle Paradoxides sub-fauna and those common to the European Upper Paradoxides beds, there is a third element in this sub-fauna, with its fullest expression in the Cambrian of the Hudson-Champlain valley, and in that of the slopes of the Rocky Mountains, though present, also, in those of China; this is the genus *Dorypyge*, easily recognized by its markedly spiniferous pygidium. Three species of this genus are found in the sub-fauna, two of which are mere varieties of the western species, *D. Wasatchensis* (= *gothicus*, and *D. quadriceps*. The third is a species which had a row of spines along the rachis of the pygidium, and which, in this respect, was like *D. Marcoui*, Whitfield, of the Lake Champlain Cambrian, but had fewer segments in the pygidium, and so, probably, a separate species.

RELATION TO THE OLENELLUS FAUNA.

Through the above genus it would seem that a strong connection is established with the *Olenellus* fauna of the Hudson-Champlain valley and the Western States. This genus *Dorypyge* appears to be unknown in the Lower Cambrian of Europe and Eastern Canada (Acadia). In both these regions there is a continuous succession of sub-faunas in the Lower Cambrian, in which no trace of this genus has been found, but it makes its appearance here in the upper part of the Lower Cambrian and in the Western States, characterizes the Middle Cambrian (probably the lower part), a fauna which contains it, therefore, cannot be regarded as Lower Cambrian, unless an upper portion of that section of the Cambrian system. The connection of *Olenellus* with this genus suggests that the place of *Olenellus* is above *Paradoxides*, or in the upper sub-zones which carry this genus.

The non-occurrence of the two latter genera in the same beds, or at least their rare occurrence together, may be due to the fact that one was an inhabitant of shallow, warm, sandy shores; and the other, colder, deeper water, more freely laden with muddy sediment. Both in Scotland and in the Rocky Mountain region, *Olenellus* is found in thin shaly partings at the top of great thicknesses of sandstones or quartzites.

If we depended solely on the lithology of the beds, we would say that the place of the Hastings Cove fauna was between *Protolenus* and *Paradoxides*, as the sandstones below are lithologically like those that carry the former fauna (*Protolenus*, etc.), and the black shales above certainly contain the latter (*Paradoxides*, etc.) But such a conclusion would be quite at variance with the succession of faunas which have been established in Scandinavia, Wales, and elsewhere in Eastern Canada, in the Lower Cambrian beds. We are, therefore, compelled to assume that the Hastings Cove fauna is as recent as the Upper *Paradoxides* beds.

PART II.

BILLINGS'S PRIMORDIAL FOSSILS OF VERMONT AND LABRADOR.

As I found in studying the fossils of Hastings Cove that I was treading very closely on the confines of the *Olenellus* fauna, it seemed to me important that I should see the types of those fossils of the Champlain and St. Lawrence valleys, and of Labrador, which Billings, the late palæontologist of the Canadian Geological Survey, had described as Primordial forms of the Potsdam Group. I therefore applied to the present director of the Canadian Geological and Natural History Survey for permission to examine these forms. This request was considerably granted, and I have carefully examined these fossils, and made fresh drawings of them, as the originals were woodcuts and too small to show properly the specific characters.

While these are ostensibly Billings's types, it is only proper to remark that Mr. J. F. Whiteaves, the present palæontologist of the Survey, has warned me that too much reliance should not be placed in these types, as the original had in some cases been detached from their tablets, and it was not certain that in all cases the specimens were those studied by Mr. Billings.¹ I have, however, carefully compared such of these fossils as I have had occasion to describe in the sequel, with Billings's descriptions, both as regards dimensions and form, and find reason to think that the majority at least are authentic.

In this paper I have not taken up all of Billings's Primordial fossils, described at the beginning of "Palæozoic Fossils," but only such as it was necessary to examine in connection with the sub-fauna of Hastings Cove. The other Primordial forms described by Billings therein, were the two *Olenelli*, *O. Thompsoni* and *O. Vermontana*, two *Salterellas*, and *Plantæ*, *Protozoa* and *Brachiopoda*. From the following remarks it will be seen that in the opinion of the writer the study of Billings's types has thrown considerable light on the geological horizon of *Olenellus*, and appears to link this genus with the middle rather than the lowest Cambrian.

It is only just to Prof. Jules Marcou to say that this is the position which he has contended for as the true age of *Olenellus*, determined by him from a study of the geology in the vicinity of Swanton, Vt., and Point Levis, near Quebec. I think he is the only American geologist who has held rigidly to this view ; or at least the only one who has contended

¹"In the case of a few of the species described by Mr. Billings in the very early part, say the first eighteen pages of the first volume of the Palæozoic fossils, it is doubtful whether the specimens in the Museum are always what they are said to be on the labels, and there is reason to believe that some of the types are lost or mislaid."—J. F. W.

actively against Mr. Walcott's reference of this fauna to a position below that of *Paradoxides*.

In November, 1861, Mr. E. Billings published descriptions of the Primordial fossils referred to above, and they were subsequently reprinted in the first volume of his *Palæozoic Fossils* under the caption :

“On some new or little known species of Lower Silurian Fossils from the Potsdam Group (Primordial)”.

“The fossiliferous rocks on the north shore of the Straits of Belle Isle, from which a portion of the species hereinafter described were produced, consist of the following in descending order :

“1. LIMESTONES.—Reddish and greenish-colored limestones, varying in some places to grey, with some red and green shale (Fossils are mentioned). Thickness, 141 feet.

“2. SANDSTONES.—Grey, red and reddish grey sandstones, the lower beds with pebbles of white quartz. Thickness, 231 feet.

“These rocks rest upon Laurentian, and their fossils show them to be of the age of the Potsdam Group.

“Another exposure of rocks of the same age occurs about three miles east of Phillipsburg, in the County of Missisquoi, and extends south into the State of Vermont, where it is largely developed, and constitutes the red sandrock of the geologists of that State. During several visits made to this exposure last summer, I could find no fossils on the Canadian side of the boundary line, but several important localities occur in the immediate neighborhood in Vermont. At one of these, $1\frac{1}{2}$ miles east of Swanton, a number of species have been found by Rev. J. B. Perry and Dr. G. M. Hall, of that town.” (Other particulars are given.)

BATHYURISCUS, Meek.

One of the most noticeable of the genera of the fauna described by Billings is *Bathyuriscus*, Meek, which the former palæontologist described under the head of *Bathyurus*, but as *Bathyurus* is an Ordovician genus, and the type of the genus is quite different from this trilobite, the generic name given by Meek is preferable. The genus was based on a trilobite found by Meek in Montana, and extended by Walcott to some species found in Nevada. It does not differ greatly either in the head or pygidium from Angelin's *Dolichometopus*, but may be distinguished by the higher relief of the head-shield and the more distinctly marked furrows of the glabella. The distinction is no greater than that between the more vaulted and the flatter species of *Agraulos* (*Arionellus*) ; it is, therefore, thought to be a sub-genus of *Dolichometopus*.

BATHYURISCUS SENECTUS, Billings sp. (Pl. IV., fig. 4.)

Bathyurus senectus, Bill., Geol. Vermont, vol. ii., p. 953, figs. 359, 360.

Bathyurus senectus, Bill., Palæozoic Fossils, vol. i., p. 15, figs. 19, 20.

Protypus senectus, Walcott, U. S. Geol. Surv., Bull. 30, p. 213, pl. xxxi., figs. 2, 2 b and 2 c.

Protypus senectus, Wall., Fauna of Olenellus Zone, p. 655, pl. xeviii., figs. 7, 7 b and c.

On comparison of Billings's description with his figure, certain discrepancies of measurement are observable. The figure does not show the eye even of the length given by that author (three-quarters of a line), and the cheek has the appearance of having been broken away. The length of the glabella is given at $3\frac{1}{2}$ lines—it is actually $2\frac{1}{2}$; the difference appears to be due to a practice of Billings of including the occipital ring in the measurement of the glabella. It is evident that the type specimen preserved in the Museum at Ottawa is not the example figured by Billings, as it shows more than he describes, but it is of the same form and dimensions; it shows the entire head-shield, except the apex of the occipital ring. It, therefore, seems probable that Billings, getting a more perfect specimen than the one he had described, used it as the type.

This fossil has all the characters of an ancestral or larval form of *Ogygia* (*Bathyuriscus*) *producta*, Hall and W., probably the former. I find the eyelobe somewhat longer than Billings gives it, being about one line (2 mm.) long; the posterior angle of the head-shield (not described by Billings) is somewhat extended, the posterior marginal fold being as long as the width of the glabella in front: owing to the width of the posterior marginal furrow at its outer end, the eyelobe becomes almost continuous. There are three furrows, as Billings has said, on the glabella, but the distance of the anterior from the middle furrow led me to suspect that there should be a fourth furrow; this penultimate furrow (counting from the back of the glabella) is obsolete, but its place is determinable by a change in the ornamentation of the test; the presence of this fourth furrow, the general outline of the shield, and the surface ornamentation, shows that this species is a derivative from the *Paradoxides* phylum. Billings does not describe the course of the occipital and glabellar furrows; the outer third of the occipital furrow is turned backward, and the middle third arched forward; this allows of a wide occipital ring. The first pair of glabellar furrows also turn backward, and are impressed only in the outer third the second furrow, which impresses the side of the glabella only, is more direct, but turns back at its faint inner end. The third pair of furrows, as we have said, are obsolete, and their place is a little behind the ocular fillet. The fourth pair is marked only by a pit at the edge of the glabella, just opposite the end of the ocular fillet. This fillet is broad and flat, and crossed by the surface ornamentation.

Sculpture.—This consists of anastomosing raised lines (as in several species of *Paradoxides*) on the front half of the glabella; these become broken into a granulated surface on the back of the glabella and cheeks, with finer granulations in the furrows than elsewhere. The anterior marginal fold has fine parallel raised lines, and is convex, becoming flatter toward the dorsal suture.

The whole contour of the head-shield of this species is very *Paradoxides*-like, the difference from *Paradoxides* being in the more direct and shorter anterior extension of the dorsal suture and the obsolete third furrow on the glabella; the glabella, also, is more squarely rounded in front than in *Paradoxides*. As a connecting form between this genus and the western *Bathyrisci*, Billings's species is of interest.

DORYPYGE, Dames.

DORYPYGE PARVULA, Billings sp. (Pl. IV., figs. 5 and 5 a.)

Bathyrurus parvulus, Bill., Geol. Vermont, vol. ii, p. 953.

Bathyrurus parvulus, Bill., Palæozoic Fossils, vol. i., p. 16, fig. 21.

Protypus senectus (part), Walcott, U. S. Geol. Surv., Bull. 30, p. 213, pl. xxxi fig. 2 a.

Protypus senectus (part), Walcott, Fauna of Olenellus Zone, p. 655, pl. xviii., fig. 7 a.

On examining Billings's type specimens I find them to consist of a cast of the middle piece of the head-shield in fine sandstone, and five examples of the same portion of the head in limestone. The limestone is of three different textures, and one larger varietal form in gray limestone is marked as from Long Beach, Anse au Loup.

The head in sandstone appears to have been the one figured by Billings, as it is of the size and proportions described and figured by him, but the description of the surface markings seem to have been based on the examples in the limestone, most of which are smaller than that in the sandstone. I think the cast in sandstone differs enough to be a variety, as the glabella is sensibly narrower, and there is scarcely a trace of furrows on it. Billings says that *Scolithus linenaris* was the only fossil found in the sandstone at Anse au Loup, so we may presume that the heads preserved in limestone are the types; the cast is, therefore, distinguishable as var. *angifrons* (Pl. IV., figs. 6 and 6 a.), and may possibly be from a Vermont locality.¹

In the limestone fossils the ocular fillet is far forward on the cheek, close to the anterior marginal furrow; it was most distinct near the glabella.

¹ I have, through the favour of Dr. Ami of the Canadian Geological Survey, the head of a *Dorypyge* collected from sandstone at Port Henry, N. Y., by Prof. H. M. Seely, which is not unlike Billings's *D. parvula*. It has a somewhat wider glabella.

Sculpture.—Billings makes no reference to the surface marks which are similar to those of the preceding species, but less prominent and not running into tuberculations on the posterior half of the glabella; the flattening of the ridgelets on the surface of the test in the small examples gives their surface a more glossy aspect than is found on the larger example from Long Beach.

Billings says the posterior glabellar furrows are barely perceptible; in the small specimens from the limestone they are distinct, but not deep, and the place of the two next furrows is clearly indicated by a variation of the surface markings. The large specimen shows very distinct anastomosing raised lines on the glabella.

Billings does not mention the small spine in which the occipital ring ends, this being deficient in the sandstone cast.

The description of the characters of the glabella in *Olenoides Ellsi*, as given by Walcott, strikingly conform to those of this species, but the ocular fillet is represented as further from the marginal furrow than I find to be the case in *D. parvula*. The pygidium given as that of *Ellsi* also differs from the one I find with *D. parvula*, and has the typical number of spines of a Dorypyge. The variation in the furrows of large and small heads in the last-named species also follows the rule found by Walcott in heads of *D. Ellsi*.¹

Three examples of a pygidium are associated on the tablet with the heads of *D. parvula*, but as Billings does not mention the pygidium, it would appear that they were not before him when he wrote his description of the species. Nevertheless, as they are interesting forms of the Dorypyge type they are figured here. Though not having the typical number of spines of a Dorypyge pygidium they have its general aspect. The normal number of spines is twelve, but, as remarked in a previous part of this article, one occurs with six spines, and this one has only two.

ANOMOCARE, Angelin.

ANOMOCARE TUCER, Billings sp. (Pl. IV., fig. 8.)

Conocephalites Tucer, Bill., Geol. Vermont, vol. ii., p. 951, fig. 356.

Conocephalites Tucer, Bill., Palæoz. Foss., vol. i., p. 13, fig. 16.

Ptychoparia Tucer, Walcott, U. S. Geol. Surv., Bull. 30, p. 197, pl. xxvi., fig. 3.

Ptychoparia Tucer, Walc., Fauna of Olenellus Zone, p. 652, pl. xxvi., fig. 3.

The sides of the middle piece of the head-shield figured by Billings are crushed in, hence the form is not as he represents it; the position of the eyelobe is given, allowing for the distortion. As restored from the two examples preserved, I suppose this species to be an Anomocare, though the furrows and form of the glabella are more like *Ptychoparia*.

¹ Olenellus Fauna, page 642, last paragraph.

² U. S. Geol. Surv., Bull. 30, p. 201, pl. xxvi., figs. 2 and 2 a.

This species will be seen to resemble *P. Piochensis*, Walc., from the Upper Cambrian of Nevada.¹

PTYCHOPARIA.

PTYCHOPARIA ADAMSI, Billings sp. (Pl. IV., fig. 9.)

Conocephalites Adamsi, Bill., Palæoz. Foss., vol. i., p. 12, fig. 15.

Conocephalites vulcanus (?), Bill., Palæoz. Foss., vol. i., p. 14, fig. 17.

Ptychoparia Adamsi, Walc., U. S. Geol., Bull. 30, p. 195, pl. xxvi., figs. 1, 1 a to c.

Ptychoparia Adamsi, Walc., Olenellus Fauna, p. 649, pl. xevi, figs. 1, 1 a to c.

For description of the species see p. 181.

The species is represented in the collection by two specimens, casts in sandy shale, one quite too imperfect to be used. The other shows a better outline of the shield than Billings gives, as he had not developed the posterior angle. The matrix is too coarse to show the fine details of the surface. Only the middle piece of the head-shield is known; this may be somewhat widened by pressure.

For some cause the measurements given by Billings are incorrect, and do not agree with his figure. The example before me has the following dimensions: Length of the head, $3\frac{1}{2}$ lines; length of glabella, 2 lines; width of glabella, scarcely 2 lines; width at the front, $1\frac{1}{2}$ lines; distance of eye from the side of the glabella, nearly 2 lines.

It is, perhaps, doubtful if the species figured by Walcott is the same as that described by Billings, for it has a narrower fixed cheek.

On examining the fossil described by Mr. Billings as *Conocephalites Vulcanus*, it appears to the writer to be a specimen of *P. Adamsi*, which has been distorted by a backward pressure in the shale.

SOLENOPLEURA, Angelin.

SOLENOPLEURA ARENOSA, Bill. sp. (Pl. IV., fig. 10.)

Conocephalites arenosus, Bill., Geol. Vermont, vol. ii., p. 950, fig. 355.

Conocephalites arenosus, Bill., Palæoz. Fossils, vol. i, p. 15, fig. 18.

Ptychoparia Adamsi (part), Walcott United States Geological Survey, Bull. 30, p. 195.

For description see p. 182, ante.

This is one of the Primordial species most imperfectly shown by Billings, but his figure does not exhibit all there is in the specimens, which are casts or moulds in slate, of the middle piece of the head-shield.

It appears to the writer that this species should be referred to the genus *Solenopleura*, since it possesses deep furrows around the glabella,

¹ Compare the furrows with those of *A. microphthalmus*, Ang., Palæontolog. Scandinav., p. 25, tab. xviii., fig. 4.

and within the anterior marginal furrow. The fixed cheeks are quite narrow, and in this respect, as well as others, it differs from *P. Adamsi*; the area of the cheeks in front of the glabella is about half of the width of the anterior marginal fold, which is wide; reversed proportions hold in the species last cited.

CONOCEPHALITES, Barrande.

CONOCEPHALITES MISER, Billings. (Pl. IV., figs. 7 and 7 a.)

Conocephalites miser, Bill., Geol. Vermont, p. 950, fig. 354.

Conocephalites miser, Bill., Paleoz. Fossils, vol. i., p. 12, fig. 14.

Ptychoparia miser, Walcott, U. S. Geological Survey, Bull. 30, p. 199, pl. xxvii., fig. 2.

Ptychoparia miser, Walcott, Fauna of Olenellus Zone, p. 651, pl. xcvi., fig. 8.

Billings had only the glabella when he described this species, but among the examples in the museum collection are three heads, two of which have exactly the features described by that author.¹ They are more perfect, showing the whole of the middle piece of the head-shield; from this the species appears to be a true *Conocephalites*, though with a somewhat short eyelobe. The glabella reaches the front marginal furrow, and the fixed cheeks are not much wider within the eyelobes than the lobes of the glabella; the posterior angles of the middle piece are narrow and prolonged.

The third head shows varietal differences. It is a quarter longer than the others, has more deeply cut furrows, and of these the middle pair are scarcely connected.

This species is one of those which serves to add to the Middle Cambrian facies of this fauna. Except the *Conocephalites ornatus* of Brögg, from the Paradoxides beds of Norway we do not know of any species of this type from Lower Cambrian beds, but it appears in the Fauna of Hof in Bavaria (*C. Wirthi*), in the St. Croix Fauna of the Mississippi valley (*Dikelocephalus misa*), and elsewhere in the Middle and Upper Cambrian rocks.

Altogether it seems to the author that so far as one can form a judgment from a comparison of Billings's species with those of other countries where the exact horizon of the resembling species is known, it would be in favour of a Middle rather than Lower Cambrian age for his Primordial trilobites, e.g., of Swanton and Anse au Loup.

¹ Billings's remark that the "width of the glabella in the middle is equal to half of its length" agrees if the occipital ring be included in this measurement.

DESCRIPTION OF THE PLATES.

PLATE I.

- Fig. 1.—*Linmarssonia Belti*, Dav. mut. *magna*, n. mut. *a* Dorsal valve partly exfoliated, Mag. $\frac{1}{2}$. *b*. Ventral valve exfoliated at the beak, Mag. $\frac{1}{2}$.—*a*. From conglomerate limestone, *b* from dark gray shale. Both of Div. 1d³. Hastings Cove. See p. 169.
- Fig. 2.—*Agnostus Nathorsti*, Brögg. var. Mag. $\frac{1}{2}$. From dark gray shale. Div. 1d³, Hastings Cove. See p. 171.
- Fig. 3.—*Agnostus punctuosus*, Ang. var. Mag. $\frac{1}{2}$. From conglomerate limestone. Div. 1d³, Hastings Cove. See p. 172.
- Fig. 4.—*Agnostus parvifrons*, Linrs.—*a*. Head-shield of a young example. Mag. $\frac{1}{2}$.—*b*. Pygidium (supposed of this species) Mag. $\frac{1}{2}$.—*a* from dark shale, *b* from conglomerate limestone. Both from Div. 1d³, Hastings Cove. See p. 172.
- Fig. 5.—*Agnostus parvifrons*, cf. var. *nepos* Brögg. Pygidium, Mag. $\frac{1}{2}$. Conglomerate limestone. Div. 1d³, Hastings Cove. See p. 172.
- Fig. 6.—*Agnostus umbo*, mut. Mag. $\frac{1}{2}$.—*a*. Head-shield—*b*. Pygidium. From conglomerate limestone of Div. 1d³, Hastings Cove. See p. 173.
- Fig. 7.—*Agnostus laevigatus*, Dalm. var., Headshield. Mag. $\frac{1}{2}$. From conglomerate limestone of Div. 1d³, Hastings Cove. See p. 173.
- Fig. 8.—*Conocoryphe pustulosa*, n. sp. Middle piece of the head-shield. Mag. $\frac{1}{2}$. From a phosphate nodule of the conglomerate limestone, Div. 1d³, Hastings Cove. See p. 174.
- Fig. 9.—*Paradoxides Abenacus*, mut. From the conglomerate limestone.—*a*. Middle piece of the head-shield natural size.—*b*. a pleura Mag. $\frac{1}{2}$.—*c*. a posterior joint of the thorax. Mag. $\frac{1}{2}$.—All of Div. 1d³, Hastings Cove. See p. 175.

PLATE II.

- Fig. 1.—*Paradoxides Abenacus*. Form 2.—*a*. Middle piece of the head-shield, natural size.—*b*. Movable cheek, natural size.—*c*. Anterior lobe of hypostome. Mag. $\frac{1}{2}$.—*d*. Last three joints of the thorax and the pygidium. Mag. $\frac{1}{2}$. (The broken parts are restored from a specimen of the *P. Abenacus* Subzone.) All from dark gray siliceous shale. Div. 1d³, Hastings Cove. See p. 175.
- Fig. 2.—*Agraulos ceticephalus*, Barr var. *carinatus* n. var.—*a*. Middle piece of the head-shield. Mag. $\frac{1}{2}$.—*b*. The same in profile. From conglom-limestone. Div. 1d³, Hastings Cove. See p. 176.
- Fig. 3.—*Agraulos holocephalus*.—*a*. Middle piece of the head-shield. Mag. $\frac{1}{2}$.—*b*. Same in profile. From conglom-limestone. Div. 1d³, Hastings Cove. See p. 176.
- Fig. 4.—*Agraulos Roberti*, n. sp.—*a*. Middle piece of the head-shield. Mag. $\frac{1}{2}$.—*b*. Same in profile. From conglom-limestone. Div. 1d³, Hastings Cove. See p. 177.
- Fig. 5.—*Agraulos (?) nanus*, n. sp.—*a*. Middle piece of the head-shield. Mag. $\frac{1}{2}$.—*b*. Same seen in profile. From conglom-limestone. Div. 1d³, Hastings Cove. See p. 178.
- Fig. 6.—*Agraulos (?) pusillus*, n. sp.—*a*. Middle piece of the head-shield. Mag. $\frac{1}{2}$.—*b*. Same seen in profile. From conglom-limestone. Div. 1d³, Hastings Cove. See p. 178.
- Fig. 7.—*Liostracus validus*, n. sp.—*a*. Middle piece of the head-shield. Mag. $\frac{1}{2}$.—*b*. Same in profile. From siliceous shales. Div. 1d³, Hastings Cove. See p. 179.



PLATE III.

- Fig. 1.—*Ptychoparia limbata*, n. sp.—*a*. Middle piece of the head-shield—*b*. Same in profile—*c*. Movable cheek—*d*. Pygidium found with this species. All Mag. $\frac{2}{3}$. From conglom-limestone. Div. 1d³, Hastings Cove. See p. 180.
- Fig. 2.—*Ptychoparia Adamsi*, var.—*a*. Middle piece of the head-shield—*b*. Pygidium found with this species. Both Mag. $\frac{2}{3}$. From conglom-limestone. Div. 1d³, Hastings Cove. See p. 182.
- Fig. 3.—*Solenopleura arenosa*, var. *angilimbata*, n. var.—*a*. Middle piece of the head-shield. Mag. $\frac{2}{3}$. From dark siliceous shale. Div. 1d³, Hastings Cove. See p. 183.
- Fig. 4.—*Solenopleura Robbii*, Hartt., sp. var. *parva*—*a*. Middle piece of the head shield. Mag. $\frac{2}{3}$ —*b*. Same in profile. Conglom-limestone (also siliceous shale). Div. 1d³, Hastings Cove. See p. 183.
- Fig. 5.—*Anomocare magnum*, Brögg. (?) var.—*a*. Middle piece of the head-shield.—*b*. Movable cheek found with this species.—*c*. Another movable cheek.—*d*. Pygidium found with this species. All of these Mag. $\frac{2}{3}$.—*e* larger pygidium with lateral spines. Nat. size. All from conglom-limestone. Div. 1d³, Hastings Cove. See p. 184.
- Fig. 6.—*Dolichometopus Acadicus*, n. sp.—*a*. Middle piece of the head-shield.—*b* Same in profile.—*c*. Movable cheek, supposed to belong to this species.—*d*. Pygidium supposed to be of this species. All Mag. $\frac{2}{3}$. From conglom-limestone. Div. 1d³, Hastings Cove. See p. 185.
- Fig. 7.—*Dolichometopus Suecicus*, Ang.—*a*. Figure of the type specimen in the State Museum, Stockholm. Drawn by G. Liljevall, artist of the museum. From the Andrarum limestone, Sweden. See p. 185.

PLATE IV.

- Fig. 1.—*Dorypyge Wasatchensis*, Hall & W. sp. var. *Acadica*, n. var.—Pygidium, Nat. size. From conglom-limestone. Div. 1d³. Hastings Cove. See p. 188.
- Fig. 2.—*Dorypyge quadriceps*, Hall & W. sp. Middle piece of the head-shield, after Walcott. Mag. $\frac{2}{3}$.—*b*. Same in profile.—*c*. var. *valida*, n. var. Pygidium. Mag. $\frac{2}{3}$.—*d*. Same in profile. The pygidium from conglom-limestone. Div. 1d³, Hastings Cove. See p. 189.
- Fig. 3.—*Dorypyge horrida*, n. sp.—*a*. Pygidium. Mag. $\frac{1}{2}$.—*b*. Same seen in profile. (The marginal spines are not so much upturned as they are represented to be in this figure). From conglom-limestone. (Also in phosphate nodules). Div. 1d³, Hastings Cove. See p. 190.
- Fig. 4.—*Bathyuriscus senectus*, Bill. sp. Middle piece of the head. Mag. $\frac{2}{3}$.—*a*. Same in profile. *b*. Pygidium found with this head on the museum tablet. From limestone containing *Olenellus Thompsoni*, at Anse au Loup, Labrador. See p. 196.
- Fig. 5.—*Dorypyge parvula*, Bill. sp. Middle piece of the head-shield. Mag. $\frac{2}{3}$.—*a*. Same in profile.—*b*. Pygidium found with same on museum tablet. Mag. $\frac{1}{2}$.—*5c*. Same in profile. Same horizon at Anse au Loup. See p. 197.
- Fig. 6.—*Dorypyge parvula*, var. *angifrons* n. var. Middle piece of the head. Mag. $\frac{2}{3}$.—*a*. Same in profile. From gray sandstone at Anse au Loup, Labrador (?) See p. 197.
- Fig. 7.—*Conocephalites miser*, Bill. Middle piece of the head-shield. Mag. $\frac{2}{3}$.—*a*. Same in profile. From limestone with *Olenellus Thompsoni* at Anse au Loup, Labrador. See p. 200.

- Fig. 8.—*Anomocare Tucei*, Bill. sp. Form restored from two examples. Middle piece of the head-shield. Mag. $\frac{2}{1}$. From dark olive sandy shale near Swanton, Vt. See p. 198.
- Fig. 9.—*Ptychoparia Adamsi*, Bill. sp. Middle piece of the head-shield. Mag. $\frac{2}{1}$. From reddish sandstone, Highgate, Vermont. See pp. 180 and 199.
- Fig. 10.—*Solenopleura arenosa*, Bill. sp. Middle piece of the headshield. Mag. $\frac{2}{1}$. From olive gray flaggy sandstone on road from St. Armand, Canada, to Highgate, Vt. See pp. 182 and 199.

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Plate I

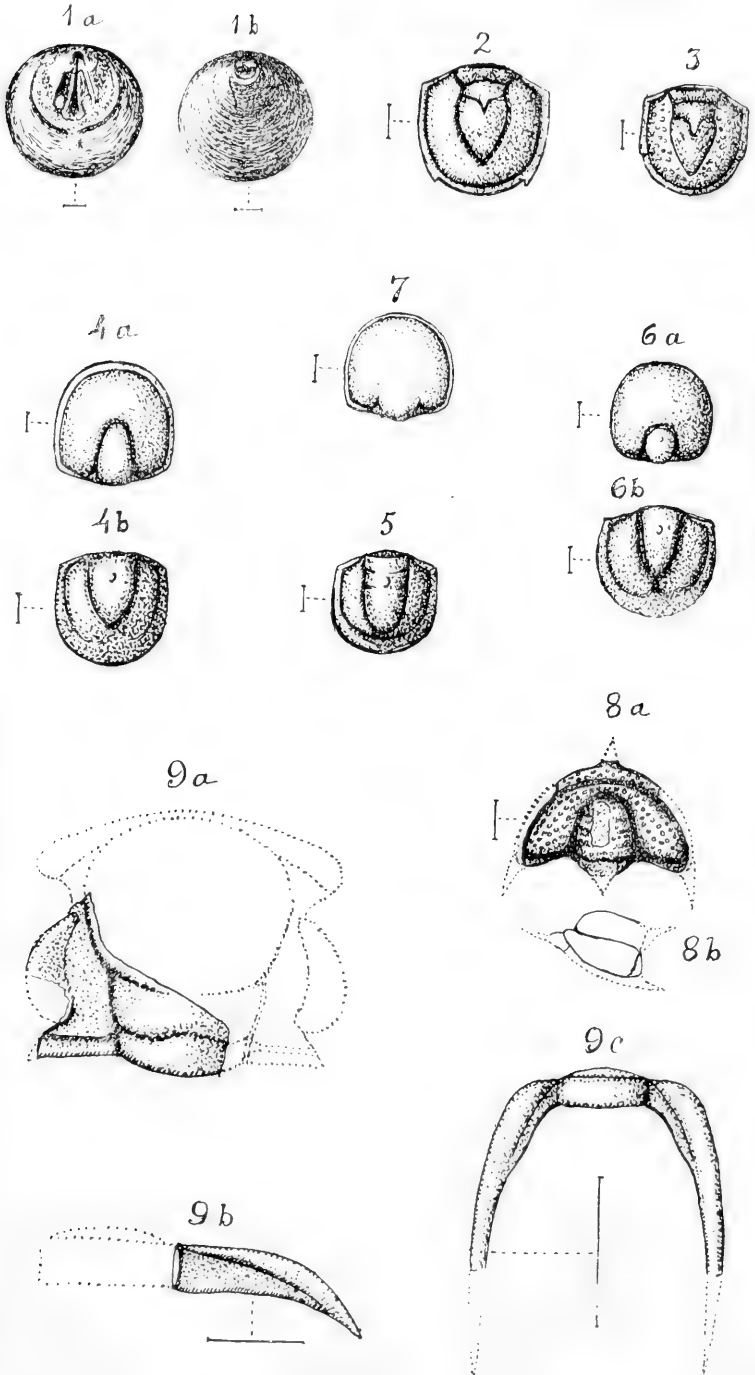


Plate II

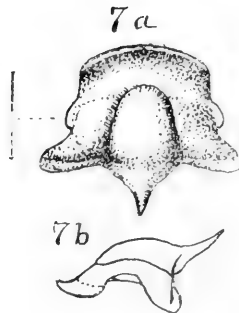
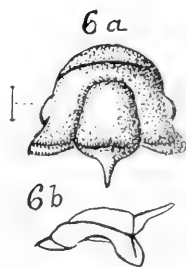
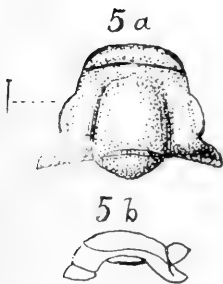
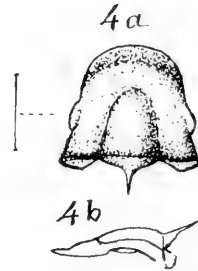
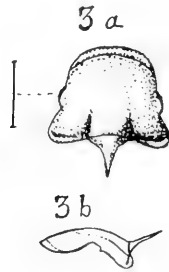
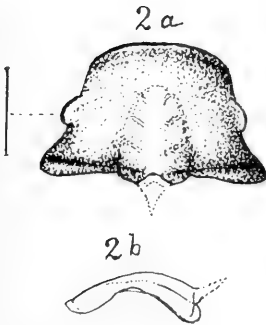
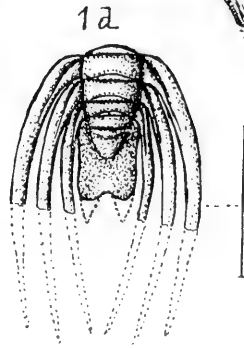
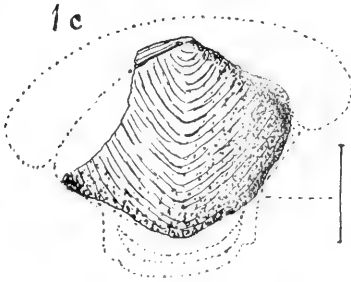
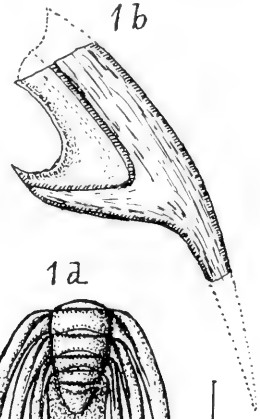
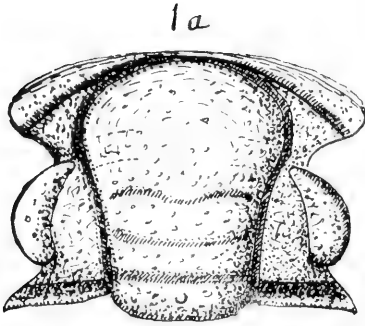


Plate III

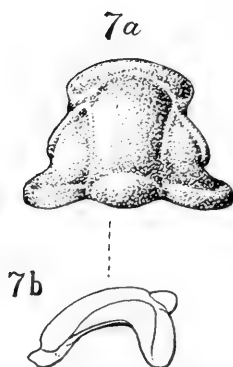
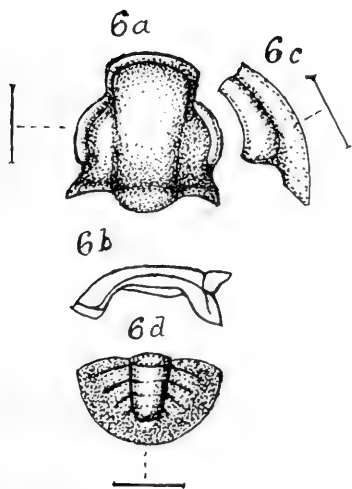
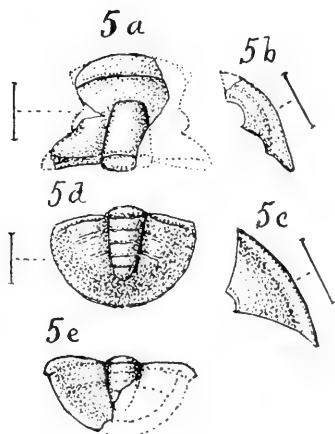
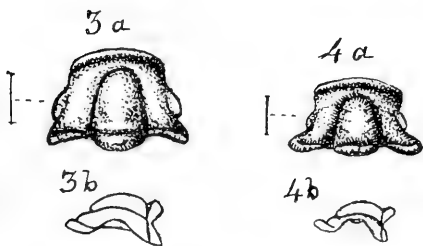
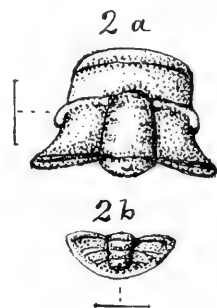
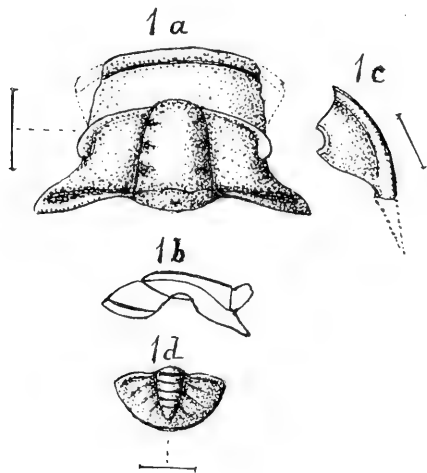
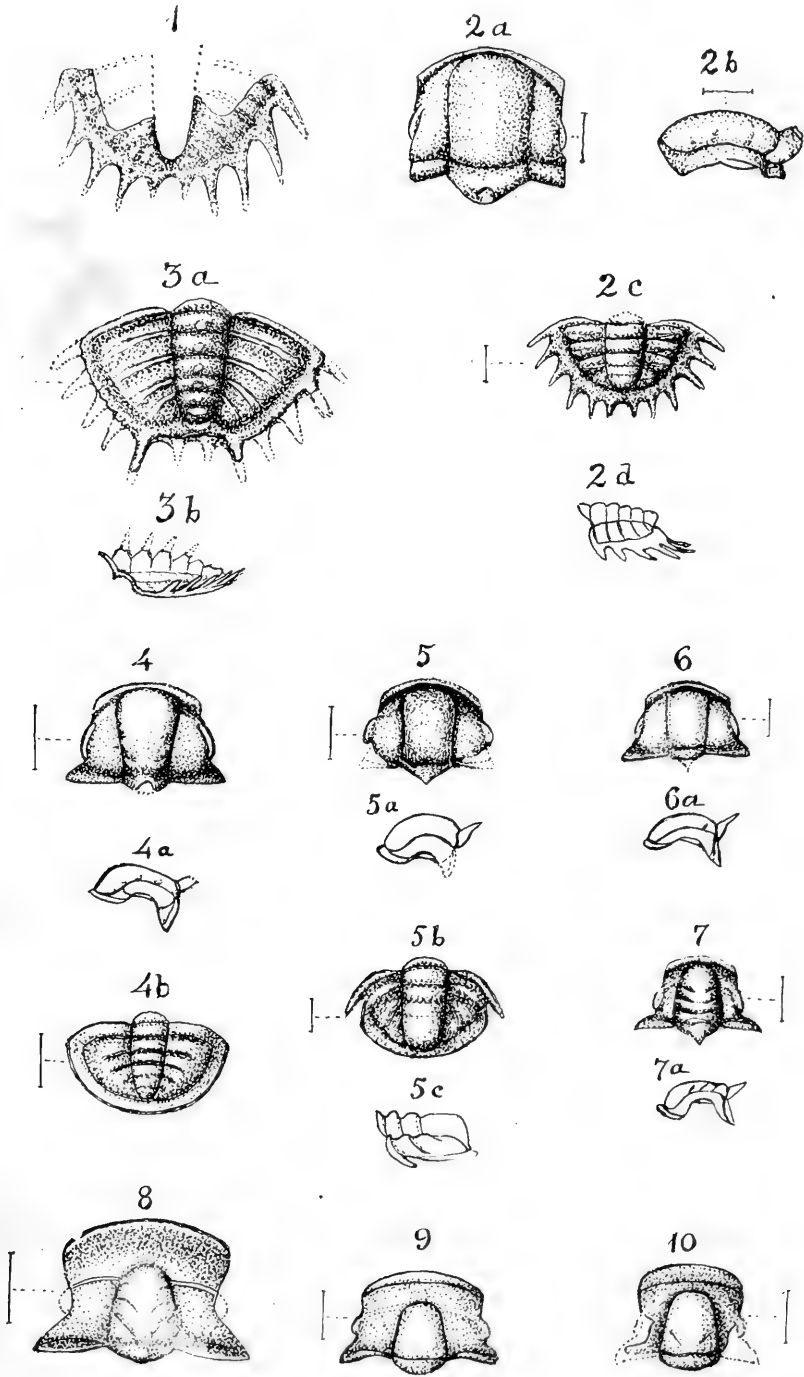


Plate IV







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