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EXTRACTS FROM THE REPORTS
ON THE
PARIS INDUSTRIAL EXHIBITION OF 1855,
BY THE
MIXED INTERNATIONAL JURY,
BEING THOSE PORTIONS
RELATING TO CANADIAN PRODUCTS.

PRINTED BY ORDER OF THE LEGISLATIVE COUNCIL.



TORONTO:

PRINTED AT THE "LEADER" AND "PATRIOT" STEAM-PRESS ESTABLISHMENT,
120 KING STREET EAST.

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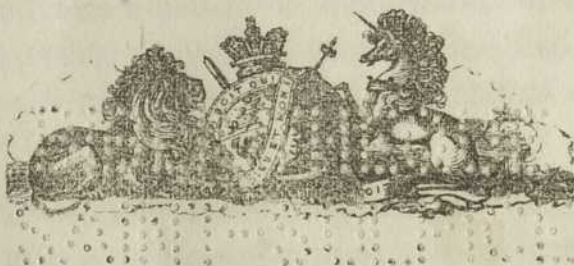
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ABSTRACTS FROM THE REPORTS

EXTRACTS

WORLD INDUSTRIAL EXHIBITION OF 1876

WORLD INTERNATIONAL EXHIBITION

EXHIBITION OF 1876

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EXTRACTS

From the Reports on the Paris Industrial Exhibition of 1855,
by the Mixed International Jury, being those portions
relating to Canadian Products.

FIRST CLASS.

MINING AND METALLURGY.

1st SECTION.—*Statistics and Documents of a general nature.*

GRAND MEDALS OF HONOR.

Canada.

At the suggestion of the Governor of Canada, the Legislature of that Province in 1841, for the first time, voted funds for a Geological Survey, which was commenced the following year by Mr. W. E. Logan, assisted by Mr. A. Murray and with the cooperation, for the chemistry and mineralogy, of one of our colleagues. Since that period, with the aid of fresh grants from the Colonial Government and by means of personal sacrifices, Mr. Logan has prosecuted his difficult task with perseverance and energy deserving of the highest praise. He contributes to the Exhibition, as the result of fifteen years' study, a Geological Map of the Colony, comprising both banks of the St. Lawrence and the borders of the Great Lakes, and also a collection remarkable for the great size of some of its specimens and exhibiting a complete series, classified and ticketed with the greatest care, of the economic minerals and building materials contained in the soil of Canada.

Among these specimens are some magnetic and hematitic iron ores taken from several localities and from beds of remarkable thickness and extent, masses of chromic iron and of titaniferous iron associated with rutile, together with various ores of silver, cobalt, copper, nickel and zinc, amongst which are some from the Bruce Copper Mines, which are now worked on a large scale; gold obtained from the sands of *Nouvelle Beauce*, where it is combined with platinum and with alloys of osmium and iridium; a collection of copper and gold ores presented by Mr. Sleeper, of Que-

bec; a fine collection of minerals, containing in particular some remarkable crystals of phosphate of lime, presented by Doctor Wilson; lastly, some specimens of gypsum, bitumen and carbonate of magnesia, which occur in masses sufficiently considerable to admit of their being worked on a large scale.

The Jury of the First Class consider that independently of the intrinsic merit of Mr. Logan's work, the peculiar difficulties which present themselves to the explorer of a new country like Canada should be taken into account. They have no hesitation in awarding the Grand Medal of Honor to Mr. Logan, Director of the Geological Commission of Canada (No. 8 of the Special Catalogue of that Colony.)—CALLON, *Reporter*.

SECOND CLASS.

WOODS AND FORESTS, HUNTING, FISHING, AND THE GATHERING OF PRODUCE
OBTAINED WITHOUT CULTIVATION.

1st SECTION.—*Statistics and Documents of a general nature.*

§ 2.—*Collections of Products, shewing the resources of particular localities.*

MEDALS OF HONOR.

The Colony of Canada took steps for the exhibition of its products in a masterly manner. At the same time that the Executive Committee for the Paris Exhibition was making a magnificent collection of natural, industrial and commercial products, determined to make known to Europe the vast country made fertile by the hands of its English and French population, they promoted the composition of interesting essays on the actual state of Canada, its commerce, its resources and its future prospects; and lastly, the Commissioners on behalf of the Executive Committee at the Industrial Palace completed its zealous labours by the successive publication of a valuable series of documents on political, commercial and maritime subjects connected with Canada, in 1854, and of a catalogue of the Canadian collection classified in accordance with the system adopted by the Imperial Commission. All these very valuable documents, translated into French when necessary, were freely given to all who applied at the Office of the Commissioners for information on the subject of their country.

Thus prepared and explained the Canadian Exhibition presented itself, moreover, in most excellent and intelligible order. No one can have passed through the gallery on the river-side called the *Annexe* without remarking near the entrance at the North East end a rectangular compartment, the centre of which was occupied by a pyramid of the most beautiful specimens of woods, and in which was brought together a vast and beautiful collection of animal and vegetable products, furniture, vehicles, metals, instruments of labour, articles of luxury, in a word, all the signs of an industrious and a productive community.

Among these interesting objects the Jury of the 2nd class had to examine the productions of twenty-seven exhibitors, The Jury noticed in particular the rich collection of Canadian woods and some magnificent specimens of those beautiful furs which the Hudson's Bay Company annually contributes to the commerce of the world.

The collection of woods made by several exhibitors at the instigation of the Executive Committee, and at the expense of the Colonial Government, is composed of about 120 specimens, the greater number of which are of undeniable beauty. This collection represents important commercial interests in a magnificent manner. The exports from Canada of the products of the forest amounted in value in 1853, to £2,355,255 Sterling, (58,881,375 *francs*) besides timber used in the building of vessels at Quebec, amounting in value to £620,187 Sterling (15,504,675 *francs*.)

The most valuable of the woods so exported are, white pine (*Pinus strobus*); red pine (*Pinus resinosa*); several kinds of oak: white oak, (*Quercus alba et Quercus bicolor*), red oak (*Quercus rubra*) and black oak (*Quercus nigra*); white Elm (*Ulmus Americana*), and red Elm (*Ulmus fulva*.) Besides this important foreign commerce, the domestic consumption of woods of all kinds is estimated at more than £2,000,000 Sterling, (50,000,000 *francs*.) so that the forests of Canada yielded in 1853, products to the value of about £4,552,000 Sterling, (113,800,000 *francs*.)

The partial collections intended to make known the different species of woods which form the staples of Canadian commerce are four in number, to which must be added some solitary or less numerous specimens, furnished by several other exhibitors.

Mr. Andrew Dickson, of Kingston (Upper Canada) has carefully collected, named and made a catalogue of 64 specimens of different woods, one half of which were taken from a superficies of 100 acres. These specimens belong to 16 families and are set forth in the following catalogue, which gives successively the botanical name and the Canadian, English, and French names.

CANADIAN WOODS.

- Liriodendron tulipifera* L., tulip tree or white wood, *bois blanc*;
Tilia Americana L., lime or linden or bass wood, *tilleul* or *bois blanc*;
Rhus typhina L., sumach, *sumac*.
Acer saccharinum L., sugar maple, *érable*;
A. Idem, a variety, rock maple, *érable rouge*;
A. Idem, a variety, curled maple, *érable ondé*;
A. Idem, a variety, bird's eye maple, *érable piqué*;

- A. dasycarpum* Ehrh, soft maple, *pleine* ;
Prunus Americana Marsh, wild yellow plum, *prunier sauvage* ;
Cerasus Pennsylvanica Lois., red cherry, *cerisier rouge* ;
C. serotina D. C., black cherry, *cerisier d'automne* ;
C. Virginiana D. C., choke cherry, *cerisier à grappes* ;
Crataegus punctata Jacq., dotted or apple thorn, *pommettier jaune* ;
C. coccinea L., red thorn, *néflier* or *senellier* ;
C. crusgalli L., white thorn, *pommettier blanc* ;
C. cordata L., Washington thorn (this is an exotic tree in *Canada*) ;
Pyrus Americana D. C., Mountain Ash, *cormier* ;
Amelanchier Canadensis Gray, June or service berry, *petite poire* ;
Cornus Florida L., Cornel or flowering dogwood, *cornouiller* ;
Fraxinus Americana L., white ash, *frêne blanc* ;
F. sambucifolia Lamb., black ash, *frêne noir* ;
F. pubescens Walt., rock ash, *frêne* ;
F. judlandifolia Lamb., rim ash, *frêne* ;
Sassafras officinalis Essenb., sassafras, *sassafras* ;
Ulmus Americana L., white elm, *orme blanc* ;
U. fulva Mich., red or slippery elm, *orme rouge* ;
U. racemosa Thom., rock elm, *orme blanc* ;
U. idem, grey elm, *orme gris* ;
Juglans cinerea L., butternut, *noyer tendre* ;
J. nigra L., black walnut, *noyer noir* ;
J. idem, a variety, soft walnut, *noyer brun* ;
Carya alba Nutt., shell-bark hickory, *noyer blanc* ;
C. tomentosa Nutt., smooth-bark hickory, *noyer blanc* ;
C. glabra Torr., pignut, *noyer gras* ;
C. amara Nutt., bitternut, *noyer dur* ;
Quercus alba L., white oak, *chêne blanc* ;
Q. bicolor Wild, swamp white oak, *chêne blanc* ;
Q. rubra L., red oak, *chêne rouge* ;
Q. nigra L., black oak, *chêne noir* ;
Castanea vesca L., chesnut, *châtaignier* ;
Fagus ferruginea Ait., white beech, *hêtre* ;
Carpinus Americana Mich., blue beech, or horn beam, *charme* ;
Ostrya Virginica Wild, iron wood, *bois de fer* ;
Betula papyracea Ait., paper or canoe birch, *bouleau blanc* ;
B. excelsa Ait., yellow birch, *merisier jaune* ;
B. lenta L., cherry birch, *merisier rouge* ;
B. nigra L., black birch, *bouleau rouge* ;
Alnus incana Wild, alder, *aune* ;
Salix nigra Marshal, black willow, *saule noir* ;
Populus tremuloides Mich., aspen poplar, *tremble* ;

- P. grandidentata* Mich., large toothed aspen, *tremble* ;
P. balsamifera L., balm of gilead, *liard* ;
P. monilifera Ait., cotton wood or necklace poplar, *peuplier* ;
Platanus occidentalis L., button wood or American sycamore, *platane du nord* ;
Pinus rigida Miller, pitch pine, *pin resineux* ;
P. resinosa Ait., red pine, *pin rouge* ;
P. mitis Mich., yellow pine, *pin jaune* ;
P. strobus L., white or Weymouth pine, *pin blanc* ;
Abies balsamea Marsh., balsam fir, *sapin* or *balsamier* ;
A. Canadensis Mich., hemlock spruce, *pruche* ;
A. alba Mich., white spruce, *épinette blanche* ;
A. nigra Poir., black spruce, *épinette noire* ;
Larix Americana Mich., American larch or tamarac, *épinette rouge* ;
Thuja occidentalis L., arbor vitæ or white cedar, *cèdre blanc* ;
Juniperus Virginiana L., red cedar or sain, *cèdre rouge* ;

Mr. John Sharples, of Quebec (Lower Canada) furnished the Executive Committee with 36 magnificent specimens of the woods of the country, collected by him, and carefully enumerated in a catalogue, with an indication of their uses.

The dimensions of these specimens of woods are really grand ; there may have been seen rising up there, in the elegant central pyramid, boards of three and four *mètres* long by 50, 60 and 70 *centimètres* wide. Some of these pieces were really of remarkable dimensions, considering the substance of which they were composed.

It appears from the remarks annexed to the Catalogue, that in Canada the *Larix Americana*, the *Quercus alba*, the *Ulmus Americana*, and the *Betula lenta* are very generally used in ship-building ; and the *Juglans cinerea*, the *Betula lenta* and the *Acer saccharinum* in cabinet-work ; the *Betula alba* is used in the construction of canoes and in the making of coverings for houses ; the *Tilia Americana* is considered a good material for panels of carriages, because it neither warps nor splits, and takes a beautiful polish.

Besides these, Mr. Sharples' catalogue does not contain any species which does not appear in the foregoing.

A collection of the same kinds, to the number of 17, was furnished by Messrs. Farmer and de Blaquièrre, of Woodstock (Upper Canada.) Mr. Gamble has sent specimens of six of these kinds ; and several other Canadians have added single pieces to them.

In another section I will speak of the specimens of furs exhibited by the Hudson's Bay Company ; these are in truth articles of commerce, the produce of the chase, and not objects intended merely to make known the products of the country.

To sum up, the Colony of Canada has sent to our Exhibition some splendid pieces of indigenous woods, in large boards and in round blocks. Although all these kinds of wood were already known, the care with which the specimens have been selected, their beauty, their richness, could not fail to arrest the attention of the Jury.—The Jury have had occasion to notice also a good number of natural products such as fine samples of potash, maple sugar, &c., which taken together give a correct idea of the commerce of those vast regions. And lastly, the beautiful specimens of skins and furs which accompany these vegetable products complete this rich and instructive collection. The Jury have therefore awarded a medal of honor to the Colony of Canada; and in order to reward those who have seconded the efforts of the Executive Committee, they have also granted a first class medal to Mr. Andrew Dickson, of Kingston, and two second class medals, one to Mr. John Sharples, of Quebec, and the other to Messrs. Farmer and de Blaquièrè of Woodstock.

4th SECTION.—*Hunting of Land and Amphibious Animals.*

The most important article in this section is evidently that of furs. Although, in consequence no doubt of present circumstances, there has been a lamentable deficiency under this head of animal product, we have seen some beautiful things, and it has been our duty to award prizes that have been fairly earned.

I have already, in speaking of the Canadian exhibition, noticed the rich specimens of furs sent, although in small numbers, by the Hudson's Bay Company (No. 55.) of Canada, under the name of Sir George Simpson, their Governor. Among the furs so sent, the following, of which I give the value as stated to us, exclusive of import duties, were particularly worthy of notice.

HUDSON'S BAY COMPANY'S FURS.

Black Bear— <i>Ours noir—Ursus Americanus</i>	180f.00c
Wolverine— <i>Glouton—Gulo luscus</i>	13 00
Raccoon— <i>Raton—Procyon lotor</i>	13 00
Otter— <i>Loutre du Canada—Lutra Canadensis</i>	22 00
Black Fox or Silver Fox— <i>Renard argenté—Vulpis argentatus</i> ...	400 00
Red Fox— <i>Renard roux—Vulpis fulvus</i>	15 00
Cross Fox— <i>Renard—Vulpis Canadensis</i>	80 00
Wolf— <i>Loup blanc—Canis occidentalis</i>	15 00
Fisher— <i>Martre du Canada—Mustela Canadensis</i>	30 00
Martin or Sable— <i>Martre commune—Mustela martes</i>	60 00
Mink— <i>Vison—Mustela vison</i>	12 00
Canada Lynx— <i>Chat cervier—Felis Canadensis</i>	15 00
Beaver— <i>Castor—Castor Americanus</i>	15 00
Young Beaver— <i>Jeune castor</i>	2 50

In fact the mere name of the Hudson's Bay Company suggests the idea of a

trade in furs so extensive that Europe is indebted to it for about half of what it annually consumes in this line. The Jury have awarded a first Class Medal to the Hudson's Bay Company.

5th SECTION.—FISHING.

§ I.—*Fishing for Cetaceous Animals.*

This portion of the subjects of the art of fishing was represented chiefly by products, consisting principally of the oils of various cetaceous animals, which have been submitted to examination in the sixteenth class rather than in this class. I will specify, however, some products of this kind contained in those large collections, which I have already described.

The valuable qualities of the porpoise oil which was seen in the Canadian collection, under the names of two exhibitors, Mr. Keefer, (No. 176,) of Montreal, and Messrs. Lepage and Lévêque, (No. 178,) of Rimouski, could no doubt be advantageously turned to account in the industrial arts. This oil has the property of congealing only at a very low temperature, and it is the only one which can withstand the intense cold of the winter season in that country; accordingly it is much used in the light-houses on the rivers there. From what we have heard it is perhaps employed also in the preparation of certain kinds of varnish. It is obtained from a species of dolphin, the name of which I cannot exactly specify.

In the same Canadian collection Mr. Têtu (No. 82.) of Rivière Ouelle, exhibited whale oil and porpoise oil, and even some leather made of the skin of the last named cetaceous animal.

6th SECTION.—COLLECTIONS OF PRODUCE OBTAINED WITHOUT CULTIVATION

§ I.—*Alimentary Substances.*

We viewed with interest in the Canadian Exhibition the maple sugar of Messrs. Gasse, (No. 191,) Rimouski; Redpath, (No. 202,) Montreal; Taylor, (No. 207.) of Hatley, and Valois (No. 184,) of Montreal.—Although now very well known, the maple sugar (*Acer saccharinum* and *Acer platanoides*) is nevertheless one of the most curious products of the vegetable kingdom. This sugar is peculiarly valuable to persons living in isolated places, who are forced to depend almost entirely upon nature for the supply of their primary wants.—Each family has its tree or trees, and gathers its crop in a very simple manner. About the month of March a hole is made in the trunk of the tree, into which a small wooden conduit is introduced, and the sap runs out rapidly. The hole is made obliquely upwards, and penetrates about two *centimètres* into the soft wood beneath the bark; two are usually made, about sixty *centimètres* from the ground and on the south side of the tree, because the contrast between the heat of the day and the coolness of the night is indispensably required for causing the juice of the tree to run. The liquid is caught in vessels and immediately boiled in kettles,

to prevent its fermenting; after having been concentrated by evaporation, it is passed through a blanket, then it is boiled to the consistency of syrup and cast in a mould; a single tree will furnish every spring for thirty years from two to three *kilogrammes* of very white and well tasted sugar. In consequence of the ease with which this manufacture is accomplished, three women can look after and work a plantation capable of furnishing 500 *kilogrammes* of sugar.

This branch of industry, however, can only be practised in the country itself, and out of the reach of competition with other sugars, for its products are not very economical. Maple sugar costs about one *franc* and forty *centimes* the *kilogramme*, and maple syrup seventy *centimes*.—Focillon, *Reporter*.

THIRD CLASS.

AGRICULTURE.

1st SECTION.—*Statistics and Documents of a general nature.*

The exhibition has not produced any statistical documents concerning non-European Countries, with the exception of Algeria and Canada.—But these documents exhibit such characteristics of exactness and interest, that it is impossible to abstain from mentioning them here in some detail.

All those who visited the Industrial Palace must surely have remarked the magnificent Algerian and Canadian collections; these collections, being composed almost entirely of agricultural products would not have had their full significance if it had not been possible to obtain circumstantial information as to the articles they contained.

* * * * *

Canada, a country almost as new as Algeria as far as modern agricultural civilization is concerned, presents a striking contrast to the African Colony of France. The progress of agriculture there is almost as rapid as it is in England; there is not an improved instrument invented in Europe which is not immediately used there; the most perfect breeds of animals, Durham cattle, Berkshire pigs and Scotch horses are there in all their beauty. The most improved modes of culture have met with no opposition, but have been introduced there at once. It will be one of the most striking results of the Universal Exhibition of 1855, that it will have made known to Europe the prodigious growth of a Colony which by means of agricultural labour alone has raised itself to a high degree of prosperity.

The Government of Canada has made great exertions to attract attention to this prosperity. Not only was its exhibition highly remarkable, but it had also offered three prizes, for the best essays on Canada and its resources.

The competition on this occasion produced nineteen essays, from which the Jury appointed to examine them selected six, for which prizes were awarded.

The essay which obtained the first prize, written in English, has been translated into French and printed at the expense of the Canadian Government; another, written originally in French, which reminds us that a great part of Canada is in some sort a French country, from the origin and language of its inhabitants, has also been printed.

The two books of Messrs Hogan and Taché have been distributed with great liberality. We shall borrow from them some figures which will speak well for the progress of the agriculture of that vast region of America which was formerly *la Nouvelle France*, and which has preserved the traditions of the mother country.

The entire area of Canada contains 96,000,000 *hectares* lying along both banks of the magnificent River St. Lawrence; this is almost twice the extent of France and three times that of Great Britain; the population is now 2,000,000; it was not 700,000 in 1827. It is chiefly in Upper Canada, or Canada West, that is to say in the region which appertains to English civilization, that this enormous increase has taken place. Lower Canada, which appertains to French civilization, has advanced less rapidly of late years; it does not seem to be animated to the same extent by the spirit of enterprize; the population there is of longer standing, and it does not attract in so great a degree the shoals of emigrants whom Europe is constantly sending to that land which offers a country, property, and a happy though laborious life to those who experienced only suffering and wretchedness on their native soil.

Canada is far from being yet cleared of its forests; the lands hitherto granted, it is an interesting fact to mention, form a small portion of the extent of this colony; they amount to only 7,196,000 *hectares*, which are divided as follows:—

	Upper Canada.	Lower Canada.	Total.
	<i>Hectares.</i>	<i>Hectares.</i>	<i>Hectares.</i>
Ploughed Land.....	920,000	840,000	1,760,000
Gardens.....	24,000	12,000	36,000
Pastures.....	560,000	600,000	1,160,000
Woods.....	2,440,000	1,800,000	4,240,000
Totals.....	3,944,000	3,252,000	7,196,000

It will be readily understood, on comparing these comparatively low figures with those which represent the whole extent of the country, that the British Government warmly encourages emigration to Canada, which it looks upon as a granary for the mother country. Accordingly the Crown Lands are sold to the Emigrants at from 3 to 12 *francs* the *hectare** in Lower Canada, and at from

*The *hectare* is equal to 2.47 English acres; the *hectolitre*, to 22. imperial gallons; and the *kilogramme* to 2.2 pounds avoirdupois.

12 to 60 *francs* the *hectare* in Upper Canada. In the former Province the purchase money is payable in five years, and in the latter in ten years. It is seldom that less than from 40 to 80 *hectares* are sold at a time, and the purchaser must settle upon his new property.

The following are the vegetable products of Canada:—

	hectolitres.
Wheat	6,840,000
Barley.....	600,000
Oats.....	9,080,000
Rye.....	360,000
Indian Corn	800,000
Buckwheat	440,000
Peas.....	1,760,000
Potatoes	3,880,000

The Census of 1851, gives the following numbers under the head of Stock:—

	Upper Canada.	Lower Canada.
Horses	203,000	182,000
Sheep	968,000	630,000
Working Oxen.....	194,000	112,000
Young Stock.....	255,000	180,000
Cows	297,000	285,000
Pigs	569,000	256,000

According to Mr. Taché, the gross value of the agricultural produce per *hectare* of occupied land is 60 *francs* in Canada and 55 *francs* in the United States.—BARRAL *Reporter*.

AGRICULTURAL APPARATUS.

§ III.—*Ploughs*.

1st.—PLOUGHS TRIED BY THE DYNAMOMETER,

j. A plough by Mr. Morse, of Milton, (Canada) having the beam and the handles of wood. The beam bound with iron on its four sides, and having at its extremity the muzzles and in its centre the coulter; a division of iron between the two stays; the right handle attached to the mould-board. Draught, 272.

h. An iron plough by Mr. Bingham, of Norwich, (Canada).—A plough on the Scotch plan, with a division between the stays; coulter in the middle of the beam; screw muzzle on Rose's plan.—Draught, 298.

* * * * *

In the third rank will be placed the ploughs of * * * Morse and Bingham (Draught 250 to 300.)

Second Class Medals.

Mr. L. Morse (No. 105,) of Milton, (Canada).—A plough well and substantially made.

AGRICULTURAL PRODUCTIONS.

Canada presents also one of the most remarkable collections, both for the beauty of the products (it includes the heaviest wheat at the Exhibition) and for the care with which they have been cleaned, put up and arranged in such a way as to be seen to advantage.

I.—COLLECTIONS.

First Class Medals.

The Provincial Government of Canada.—What I have already said of the merit of this perfectly exceptional collection completely justifies this medal.

Second Class Medals.

Mr. Shepherd, (Canada).—A numerous and interesting collection of garden and field seeds.

Honorable Mentions.

The Abbé Villeneuve, (Canada).

I.—WHEAT.

First Class Medals.

The Canada Company, (Canada).—White spring wheat; grain small, very soft, perhaps even too much so; weighs only 77,330 *kilogrammes*, the *hectolitre*.

Mr. Shaw, (Canada).—The heaviest wheat in the whole Exhibition; it reached 83 k., 920.

Second Class Medals.

Mr. Ralph Wade, (Canada).—Very fine spring wheat, weighing 81 k., 980.

Honorable Mentions.

The Abbé Villeneuve, (Canada).—This exhibitor has already been rewarded for other products in the same class.

Mr. Coffin, (Canada).—Spring wheat.

IV.—BARLEY.

Honorable Mentions.

Mr. Fisher, (Canada).

V.—OATS.

Second Class Medals.

Mr. Laurent, (Canada).—This exhibitor has already been rewarded for other products in the same class.

VIII.—INDIAN CORN.

Second Class Medals.

Mr. Alexander Shaw, (Canada).—This exhibitor has already been rewarded for other products in the same class.

X.—DRIED VEGETABLES.

Honorable Mentions.

The Abbé Villeneuve, (Canada).—This exhibitor has already been rewarded for other products in the same class.

XII.—HOPS.

Honorable Mentions.

Mr. Jarvis, (Canada).

XIII.—FODDER AND SEEDS OF PLANTS FIT FOR FODDER.

First Class Medals.

Mr. Lyman, (Canada).—Clover seed, of perfectly exceptional quality.

Honorable Mentions.

Mr. Evans, (Canada).—Timothy seed, of perfectly exceptional quality.

XIV.—CHEESE.

First Class Medals.

G. Cross, of Montreal, (Canada).—A very good imitation of English cheese.

CO-OPERATORS.

First Class Medals.

Mr. Perry, (Canada).—He prepared and organized the whole of the Canadian Exhibition, which obtained a medal of honor, and he is the inventor of several of the improvements, in various agricultural implements, for which medals have been given.—COUNT DE KERGOLAY *Reporter.*

FOURTH CLASS.

INDUSTRIAL MACHINERY IN GENERAL.

8th SECTION.—*Hydraulic Elevating Machines, and other Machines.**First Class Medals.*

Mr. Perry, (No. 130,) of Montreal, (Canada).— Exhibited a very well arranged fire engine, the cylinders of which are inclined in order more completely

to ensure the movement of the piston-rods in a strait line. This arrangement facilitates also the examination of the valves.—The different parts of this engine are well proportioned, and in addition to the usual reservoir for water it is furnished with an air-box for regulating the process of suction, when it becomes necessary to resort to it. At the trial made at the *Conservatoire des arts et métiers* this engine worked at the rate of twenty revolutions in a minute, with a jet of fifteen *millimètres*. The stroke of the piston is perhaps a little too long to admit of attaining the greatest ease in working.

Honorable Mentions.

Mr. Lemoine, (No. 128,) of Quebec, (Canada).—For the very highly finished workmanship of his fire-engine with a single chamber, mounted on wheels.—
GENERAL MORIN, *Reporter*.

FIFTH CLASS.

SPECIAL MACHINERY AND APPARATUS USED IN CONNECTION WITH
RAILWAYS AND OTHER MODES OF TRANSPORT.

LAND TRANSPORT.

II.—*Saddlery and Miscellaneous Articles.*

CANADA.

Honorable Mention.

Messrs. Barrington, Morris and Magloire, of Montreal.—

This State, which is just beginning to be civilized, makes unheard of efforts to create manufacturing establishments; but every thing is excessively dear there, and allowances must be made in its favor on account of the difficulties it has to surmount.

Messrs. Barrington, Morris and Magloire have succeeded in making some very well finished harnesses, displaying a great profusion of ornamental stitching, which seems to be much admired in Canada.—ARNOUX, *Reporter*.

SIXTH CLASS.

SPECIAL MACHINERY AND APPARATUS OF WORKSHOPS

1st SECTION.—*Machines and Tools for working in wood, stone and metal.*

MACHINES FOR WORKING IN WOOD.

First Class Medals.

Mr. W. Rodden, (No. 156,) of Montreal, (Canada).—

1st. **Trenail Machine.** This little machine is intended for making trenails for Ships.

Two arbours placed one over the other are furnished with blades in the form of an S; the edges of these blades form segments of a circle. It is between these two smoothing planes that the article is shaped. The guides are four triangles, armed with a circular line of teeth. This machine appears to be one of ordinary merit.

2nd. Cabinet-maker's lathe—price 600 *francs*. This machine is intended for making round sticks. A hollow arbour carries in front a conical ring of cast iron, which carries within an oblique blade forming a cutter; the wood is rounded in passing through this ring. This machine is of no great importance and seems likely to present some inconveniences.

3rd. A machine for planing deals—price, 800 *francs*.—The piece of wood to be planed is placed upon a wooden table moving by means of a rack upon wooden sleepers fitted with a track of cast iron. The frame of the machine is of cast iron and similar in form to that of an ordinary planing machine. The cutters are two small steel hooks attached to the two extremities of a horizontal bar turning at one end of a vertical arbour. This machine has the advantage of requiring but little force, compared to the cylindrical planing machines. It works well when properly managed, and can take off a considerable thickness at once. It is an excellent machine for use, but one that requires an able workman to manage it.

4th. A Carpenter's Bench—price 2,000 *francs*. This is, properly speaking, only a bench furnished with a very complete collection of tools for working in wood—It is at least as much a specimen as a very practical article.

It has an auger, a circular saw, a whip saw, moulding planes and a tenor-cutter.

The table and many other pieces are of wood; power is applied by means of a belt; the machinery works easily and the tools are well adapted for the work they have to do. Some of the details are ingenious and well carried out. This machine fulfils, in a very satisfactory manner, and at a very cheap rate, all the needful conditions.

Machines for working wood in Canada are constructed on an entirely different principle from those which we have already examined. In their construction, attention has been paid principally to economy and to that facility in repairing and keeping in order which is so desirable in localities at a distance from great machine-shops.

In consequence of the necessity which is sometimes felt for fulfilling both of these conditions, and because machines which can be easily transported are often required, machines in the American style are destined to be of very great service; we will even say that if working in wood is to become general beyond the limits of great workshops, as there is reason to think it will, it is rather, one might even say it is only, with machines constructed like those of Canada, that it will

be accomplished ; they are suited to all the minor departments of joinery and to those workmen who desire to be able to do every thing themselves.

Mr. Rodden is not the original inventor of these machines, but merely the manufacturer of them.

Second Class Medal.

Mr. Munro, of Montreal, (Canada.)—A machine for making flooring—price, 2,800 *francs*. The machine does its work by means of three cylindrical planes, two vertical and one horizontal. The table is of wood, as well as many parts of the machine. The planes are set in motion by belts, and the machine requires very little power, and works with great ease. It is governed by hand, and without the least effort when it is working empty. This machine is well made with reference to the conditions of economy and facility of repair which we have already mentioned.

Honorable Mentions.

Mr. Lellan, (Canada). Before concluding our remarks on the subject of machines for working in wood we must say a few words of one for making mortises founded on a new principle which deserves to be cited.

The chisel is in the shape of a hollow quadrangular prism, the four faces of which terminate in sharp edges placed so as to form four holes towards the angles. Inside the prism a spiral borer works with a circular motion ; the whole of this apparatus moves on together and produces a square hole in the wood. By repeating the operation, the requisite length is given to the mortise.

This implement, which we were told worked with great regularity and rapidity, did not at the Exhibition produce satisfactory results as to neatness, and its system of motion involved great loss of time.

Nevertheless the implement invented by Mr. Lellan seems ingenious, and deserves to attract attention.—POLONCEAU, *Reporter*.

3rd SECTION.—*Apparatus and Machines used in Agricultural operations.*

THRESHING MACHINES.

Second Class Medals.

Mr. Page, of Montreal, (Canada). Mr. Page's machine is intended to be set in motion by horses, by means of a circular-mill or an inclined plane. It has been tried with a steam engine, with very good results. The straw is well shaken and the grain well separated. This machine is very conveniently arranged, and presents several remarkable peculiarities. Makers will find in it the principles of several

arrangements which may be imitated with advantage when by certain improvements the arrangements shall be made more practically available.

Honorable Mentions.

Messrs. Dion and Lepage, (No. 94,) of Rimouski, (Canada).—The model exhibited by these gentlemen is of half size. It gives a very clear idea of the apparatus, and may itself be worked by hand. This threshing machine is remarkable for its extreme cheapness; it is sold in the country for 200 *francs*; its construction is simple and well contrived.

CLEANERS.

Mr. W. H. Rice, (No. 155,) of Montreal, (Canada).—Exhibited a farmer's smut machine, and some hand-sieves. Neither the former nor the latter present any positively novel features; but the smut machine is a good one of its kind and would not disgrace the stock of implements on a farm in our most advanced districts.—Sliding shutters admit of the size of the air-hole in the ventilator being varied at pleasure. This is a very good arrangement, which seems to have originated either in Canada or in the United States, and which, since the London Exhibition all our good makers have been forward to adopt.

5th SECTION.—*Machines peculiar to certain trades.*

Honorable Mentions.

Mr. G. Dunn, (No. 148,) of Montreal (Canada).—A nail-cutting machine. Mr. Dunn, a machine maker, exhibits the only large machine for cutting nails out of iron-plate that figures in the *Annexe*. This machine, solidly constructed in all its part, presented to us nothing novel in its arrangement; we were assured that it could cut eighty nails in a minute, but the Jury have not had it in their power to verify the exactness of this assertion, the motive power at their disposal not being sufficient to produce the necessary velocity.

NINTH CLASS.

INVENTIONS RELATING TO THE ECONOMICAL EMPLOYMENT OF HEAT, LIGHT AND ELECTRICITY.

WARMING APPARATUS.

Second Class Medals.

Messrs. Chinic, Simard, Methot & Co., (No. 162,) of Quebec, (English Colonies, Canada).—A kitchen stove made entirely of cast iron, very conveniently arranged and at a very moderate price.

ELEVENTH CLASS.

PREPARATION AND PRESERVATION OF ALIMENTARY SUBSTANCES.

FLOUR.

Second Class Medals.

Mr. Samuel Platt, (No. 200,) Canada.

Honorable Mentions.

G. Gamble, (No. 190), Canada.

Mr. MacDougall, of Montreal, (No. 196,) Canada.

Mention by way of note.

Mr. Lawson, (No 194), Canada.

BISCUITS.

The Jury tasted all these products with the greatest care and find that the dessert biscuits and other delicacies of the house of Gaillout, of Paris, are delicious, that the Canadian biscuits, and among others those of Mr. Fitts, are light and perfectly dry, so that they will keep a very long time, while they are of a dazzling whiteness, and of such tempting delicacy that one discovers, on examining them thoroughly, something which denotes a French origin.

Second Class Medals.

Mr. Fitts, (No. 189), Canada.—The whiteness, the delicacy, the beauty of all the biscuits from Canada were much admired. The Jury were in doubt for some time to which of the biscuit bakers of that country they should give the second class medal; for the biscuits they exhibited were all remarkably good. Nevertheless Mr. Fitts appeared to us to be entitled to a preference over his competitors, for the variety and perfection of his productions.

Honorable Mentions.

Mr. Nasmith, (No. 199), Canada.

Mr. Robb, (No. 863), Canada.

Messrs. Lawson, Nasmith and Robb exhibited articles almost equal to those of Mr. Fitts.

Mention by way of note.

Mr. Lawson, (No. 194), Canada.—(See above.)

PEARL BARLEY, RICE, GROATS AND INDIAN CORN MEAL.

Honorable Mentions.

For Indian Corn Meal, the Jury have granted two honorable mentions to

Mr. Gamble, (No. 190), Canada.—For his Indian Corn Meal.

Mr. Proctor (No. 201) Canada. For his Indian Corn Meal.

 MANUFACTURE OF SUGAR.

MAPLE SUGAR.

Mention by way of note.

The manufacture of maple sugar is of no great importance, and does not seem likely to increase;—no notable improvement in this branch of industry has been made known to the Jury; they have not thought they would be justified in awarding to the exhibitors of this article either first or second class medals.

The Jury confine themselves to mentioning by way of note the Government of Canada, which has exhibited maple sugar of good quality. This Colony has obtained in the second class a medal of honor for the whole of its collections.

PRESERVED FOOD.

FOREIGN COUNTRIES.

Second Class Medals.

Mr. Idler, (No. 192), of Montreal, Canada, English Colonies.—Hams, of very good quality, cured after the English fashion.

 TWELFTH CLASS.

HYGIENE, PHARMACY, MEDICINE AND SURGERY.

Second Class Medals.

Mrs. Widow McCulloch, (No. 214), Canada.—A very fine methodically arranged Collection of specimens of Canadian ornithology.

Honorable Mentions.

Mr. Lyman, (Canada).—A Collection of pharmaceutical products, and particularly of essential oils well prepared.

Mr. Croft, (No. 210), Canada. An interesting collection of *materia medica*.

 THIRTEENTH CLASS.

MARINE AND MILITARY ART.

I.—Ship-building and equipment of Ships.

We have expressed our regret that the Ship-builders of the United States have not caused their workmanship to be represented at the Universal Exhibition. Their Canadian neighbours have made amends for this omission by sending very

remarkable models ; and the interesting mission recently performed by Captain Belvèze of the Navy in that country has made known to us its rich resources, as well as the adventurous spirit of enterprize of its inhabitants.

Mr. Lee, a French Canadian, of Quebec, is one of the principal and of the most successful Ship-builders in Canada,—we might almost say in the world. The clipper *Marco Polo* came out of his ship-yard. This vessel, which plies between England and Australia, has made on an average the shortest voyages between those countries, and this result has produced a considerable sensation among maritime nations. Mr. Lee built also the *Shooting Star*, of 1,500 tons, chartered at present by the War Department in England, for transport service to the Crimea. This vessel has made the shortest sailing voyage on record from Plymouth to Malta.

The Quebec ship-yards have, indeed, as it were, a monopoly in the building of large merchant vessels, clippers or others. Forty-eight vessels, measuring together 49,000 tons, were built there in 1853, and among them the *Arthur the Great*, which has also made the shortest known voyage to Australia.

Mr. Lee justly enjoys the reputation of being the principal builder of the finest ships ; they are all classed A. 1 at Lloyds ; he employs as many as 700 workmen.

Mr. Cantin sent to the Exhibition only some ash oars, but he is also one of the principal ship-builders in Canada.

This manufacturer, who is also of the old French race still so numerous and so vigorous in that country, has extensive ship-yards at Montreal. He is chiefly engaged in building steamers for the Lakes, makes his own steam-engines and employs not less than 400 workmen.

LIFE-BOATS.—LIFE BUOYS.—LIFE PRESERVERS.

For the purpose of saving lives in cases of shipwreck, Mr. Thomas, a ship captain of Toronto, in Canada, has invented a plan, as simple as it is practical, for improvising a life raft on board of paddle-wheel steamers. This raft is formed simply of the outer vertical surface of either paddle box, merely made a little more solid than usual ; this surface is in that case fastened only by a few hooks. If the vessel goes down, these hooks are easily withdrawn, and that part of the paddle-box falling into the water floats and serves for a life-raft ; it is furnished beforehand for that purpose with short pieces of rope which the shipwrecked persons lay hold of. In case that part of the paddle-box should not detach itself at once, the air rushing up under the paddle-box as the vessel sinks would force it to detach itself.

The idea of this invention was suggested to Mr. Thomas by the following circumstance, which occurred on the occasion of the unfortunate collision which caused the magnificent steamer *Arctic* to go down in so short a time ; at the last moment, when the steamer was going down, the Captain was standing on one of

the paddle-boxes ; the air rushing up under that paddle-box blew off the upper part of it and caused some of the boards to be detached from it, and it was upon those boards that the Captain of the *Arctic* saved himself.

CANADA.

First Class Medals.

Mr. T. C. Lee, (No. 220), ship-builder at Quebec. Mr. Lee is the most eminent ship-builder at Quebec ; he builds immense clippers renowned for their superior speed ; he built amongst others the *Marco Polo* and the *Shooting Star*.

Second Class Medals.

Mr. A. Cantin, (No. 217), ship-builder at Montreal. Mr. Cantin exhibits only some ash oars, but he has a considerable ship-yard at Montreal, where he is ranked by common consent among the number of distinguished ship-builders. He builds steam engines as well as ships.

Honorable Mention.

Mr. Thomas, (No. 221), Ship Captain at Toronto. Captain Thomas makes a raft of the outer side of the paddle-boxes of the gigantic paddle-wheel steamers of North America.

FOURTEENTH CLASS.

BUILDING FOR CIVIL PURPOSES—BUILDING MATERIALS.

I.—NATURAL MATERIALS.**b.—SLATES.****ENGLISH COLONIES.***Honorable Mention.*

The quarries of the Shipton Slate Company, of Canada, are in the Lower Silurian system.

REMARKS.

Other specimens of slates coming from the quarries of Oxford, Westbury and Tring, were also exhibited.

The beds of slate in Canada have been discovered within five years only, and large quarries are already opened there. The slates of Canada are of good quality, they belong to the Silurian system ; those of Melbourne, Richmond and Kingsey are to be referred to the Hudson River group ; those of Westbury and *Rivière du Loup* are found at the base of the Upper Silurian system.

Several slate works in Canada, which have sent slates, are not in operation, or continue to be inoperative.

Shipton Slate Company, (No. 227).—The Shipton Slate Company, of Canada, quarries its slate in the Lower Silurian system.

Specimens of slate have been shewn by three other exhibitors: Mr. John Gray (No. 232), of Melbourne, slate from the Oxford quarry; Mr. James Leslie, (No. 239), of Sherbrooke, slate from Westbury; Mr. Joseph Tardif, (No. 247), slate from Tring.

C.—SERPENTINES AND CHLORITIC AND TALCOSE ROCKS.

ENGLISH COLONIES.

CANADA.

First Class Medals.

GEOLOGICAL COMMISSION OF CANADA.—(No. 8.)—Serpentines occupy an important place in the Geology of Canada; they occur at Grenville, and they cover an area of fifty leagues in the Eastern Townships. They are enclosed in the metamorphic rocks, and belong to the Hudson River group, which forms part of the Lower Silurian system; others of them belong to the Laurentian system.

The Geological Commission exhibited two polished slabs of serpentine, one from Oxford, the other from Brompton Lake. They are of the variety of ophicalce, somewhat resembling that of St. Verran, *Hautes Alpes*; the carbonate of lime which runs through them in small veins shews a green color lighter than that of the rock. In the serpentine rock of Brompton Lake, the fragments of serpentine are of a blackish-green; they are sometimes surrounded by sinuous veins of a bluish-green color; this last variety especially is very remarkable, and might be employed to advantage as a marble.

REMARKS.

The Colony of Canada exhibited a chlorite schist from Potton, in Lower Canada.

This rock is of a very light greyish-green color. It is soft to the touch. The magnifying glass shews it to be composed of small thin scales of chlorite, all lying in the same direction, which gives it a schistoid structure. It has been found on analysis to be composed of: silica, 29.88; alumina, magnesia and oxyd of iron, 57.85; lime, 0.77; water, 11.50; it is not blended with carbonates, like most of the preceding rocks; it is therefore a schist which appears to be formed entirely of chlorite.

The chlorite-schist of Potton may be cut and dressed with great ease. It may be cut into slabs or flags with a common wood-saw. It is employed in various ways in building. As it stands fire well, it is used particularly for making furnaces. Coffins are also made of it.

It occurs in large beds in the Lower Silurian system, which lies immediately over the Laurentian system. It is sometimes associated with dolomite or with

serpentine, and like this latter rock it contains chromic iron. In Vermont, and at Boston, in the United States, the same chlorite-schist is quarried on a large scale, and forms the subject of an important trade.

It is associated particularly with compact talc or steatite, which is found at a great many places in Canada, particularly at Sutton, at Bolton, at Melbourne, at Potton, at *Vaudreuil (Beauce)*, at Broughton, at *Elzivir*.

The steatite of Canada is used as a fire stone. That of Stanstead and Leeds is ground and used as a paint.*

MARBLES.

CANADA.

Mention by way of Note.

GEOLOGICAL COMMISSION OF CANADA.—The learned Director of the Geological Commission of Canada, Mr. Logan, exhibited a very fine collection of the marbles of Canada.

The most curious is a serpentine marble from Grenville. It is formed of white crystalline carbonate of lime, associated with serpentine of different shades of green. This serpentine was at first considered as a new mineral species, to which Thompson gave the name of retinalite; but Mr. Hunt has ascertained that the retinalite is but an ordinary serpentine. The serpentine-marble of Grenville can be quarried in large blocks. It is more or less serpentinous in proportion to its proximity to a trap dyke.

The Dudswell marble is of a yellowish white, intersected by ochre-yellow veins. It is also yellow and grey. Its age is that of the Niagara limestone, and it contains polypi and fossils of the Upper Silurian system.

The marble of Missisquoi Bay is black with white spots and grey veins. It corresponds with the Trenton group. The quarrying of it has lately been given up, owing to the competition of the quarry of Glenn's Falls, in the United States.

The St. Lin marble has a rather dull chesnut-brown color. It contains polypi and atrypæ. Its age is that of the Chazy limestone.

Although Canada is a new country, the mineral riches of its soil are much better known than those of many portions of Europe. These happy results are due to the persevering efforts of Mr. Logan, and of the Geological Commission of Canada.

Mr. Logan has in fact described most of these beds of marble in Canada; and the Jury have not hesitated in concurring in the decision of that of the 1st class, who awarded a medal of honor to Mr. Logan, as Director of the Geological Commission of Canada.

*W. E. Logan and T. Sterry Hunt: *Geological Sketch of Canada*, page 89.

Second Class Medal.

Mr. Brown, of Rice Lake, exhibited a very crystalline white marble, which might be used in the decoration of apartments, but the grain of which is too coarse to admit of its being made use of in statuary. This marble belongs to the Laurentian system.

REMARKS.

Mr. Cheesman exhibited a yellowish-white marble, belonging to the Trenton limestone, and found at St. Armand, in Missisquoi Bay. It passes into a black limestone, like that of the Trenton formation generally.

Mr. Thomas C. Keefer, of Montreal, sent a blackish-grey marble, with red spots. It is of the Chazy limestone, found at Caughnawaga. It is frequently used in building.

Messrs. Hutchinson and Morrison, of Montreal, exhibit a common laminated black marble, resembling carboniferous limestone. A great part of Montreal is built of this limestone, which belongs to the Trenton formation.

Mr. McDonald, of *Les Chats*, exhibits a white marble, with grey veins of graphite. It contains also some quartz, which would make it hard to saw. This limestone has been employed hitherto only in the making of lime, and as building stone. It has been used chiefly in the construction of docks.

Mr. D. MacLachlan, of Bytown, sent a laminated greyish-white marble, intersected by very undulating veins of graphite, and containing black crystals. This marble has a very good appearance. It is found in considerable quantities at Arnprior, and belongs to the Laurentian system of Mr. Logan.

Mr. Dickson, of Kingston, exhibits a brown marble from Pakenham. The quarrying of this marble has been abandoned on account of its being rather brittle and containing veins of chert.

LIMESTONES.

CANADA.

Remarks.

The Grand Trunk Railway Company have sent a limestone quarried at *Pointe-Claire*, near Montreal, in Canada. This limestone is black, very compact and very durable. It takes a slight polish, and furnishes a marble of inferior quality. It is found over-lying the Chazy limestone. It is being used at present in the construction of the Victoria Tubular Bridge, which will be no less than 2,700 *mètres* long; this bridge is being built by the Grand Trunk Railway Company, under the direction of Stevenson the Engineer, and is intended to cross the St. Lawrence, near Montreal.

II. ARTIFICIAL MATERIALS.

Lime, Cements and Mortar.

CANADA.

Second Class Medals.

Mr. John Brown, (No. 258), of St. Catherines. The Thorold Cement, manufactured at St. Catherines, in Upper Canada, is obtained by burning an argillaceous limestone of the Upper Silurian system. This limestone is of a blackish grey colour and gives when breathed upon an odour of clay. It belongs to the Niagara limestone formation.

On being burnt it yields a cement of a yellow colour. The sample which was placed at our disposal by Mr. Logan did not effervesce when exposed to the action of acids. It contained only 3.37 of water. The setting takes place in fifteen minutes and is attended with heat. A mould immersed ten minutes after it was mixed became set under water, and was as hard as one that was immersed at the end of two hours. Only a small quantity of lime was dissolved from the mould. The power of resistance of this cement to traction is equal to 85 *kilogrammes*.

COMPOSITION.

Lime	55.55.
Magnesia	2.29.
Silica	} 72.58 { 29.88.
Alumina and peroxyd of iron.....	
Sulphate of lime.....	1.58.

This cement belongs to ordinary cements in M. Vicat's classification.

The Thorold cement is sold at 5 *francs* 37 *centimes* for a barrel weighing 300 pounds, English measure, or 136 *kilogrammes*. Nearly 4000 barrels were used last summer in the Victoria Tubular Bridge; it cost 7 *francs*, 50 *centimes* laid down at Montreal. It is much used in Canada, and is even exported to the United States.

Honorable Mention.

Mr. P. Gauvreau, (No. 231)--Quebec cement. At Quebec, in Lower Canada, a limestone, belonging to the Lower Silurian system, is quarried for the purpose of making cement.

The stone which furnishes it was discovered by Captain Baddeley, of the Royal Engineers. It is a compact argillaceous limestone, without fossils, deeply stained of a black colour by a carbonaceous matter. The cement itself is yellow, and effervesces slightly when exposed to the action of acids; its loss in the fire is 11.6; consisting of water and carbonic acid. Its setting takes place in twenty-five minutes; the mould obtained is not so hard as that of the Thorold cement. Its resistance to traction is equal to 49 *kilogrammes*, and it remains very moist.

COMPOSITION.

Lime	52.49.
Magnesia	traces.
Silica	} 39.56 { 72.40.
Alumina and oxyd of iron.....	
Sulphate of lime.....	7.95.

It contains a remarkable proportion of sulphate of lime, owing, no doubt, to the pyrites which generally abound in limestones containing carbonaceous matters.

The composition of the Quebec cement nearly resembles that of the Thorold cement; but it is inferior to it in quality. It has begun to be manufactured within the last year only, and it is probable that it will come into use in Lower Canada.

Mention by way of note.

GEOLOGICAL COMMISSION.—(No. 261). The Geological Commission exhibited a magnesian limestone belonging to the Chazy limestone formation, which might serve to make cement. This limestone, which extends over more than fifty miles, is argillaceous, compact, homogeneous; it effervesces briskly when exposed to the action of acids.

COMPOSITION.

Chazy Limestone.

Carbonate of lime.....	45.30.
“ “ magnesia	12.77.
Argillaceous residue.....	} 32.29 { 19.77.
Alumina and oxyd of iron.....	
Water and loss.....	9.67.

LIME FROM THE ABOVE.

Lime	39.70.
Magnesia.....	9.58.
Argillaceous residue.....	} 50.72 { 30.98.
Alumina and oxyd of iron.....	

On being burnt the Chazy limestone would yield a cement, which would rank as an ordinary one, according to M. Vicat's classification.

Magnesian mortar. The Geological Commission of Canada exhibited a very remarkable stone, composed of carbonate of magnesia. It will be well to give a description of this stone here, on account of the use that may be made of it in the composition of mortar.

The carbonate of magnesia of Canada is so like saccharoidal limestone that it may easily be mistaken for it, and yet it does not contain a trace of carbonate of lime. It is moreover ferriferous. Part of it is tinged with a green colour by

chromic oxyd, and some quartz, in white transparent grains, is scattered through it; when the stone has been treated with acid this quartz remains, forming a skeleton.

An analysis of the specimen exhibited, which came from Bolton, gave us the following result, which agrees with that of Mr. Hunt's analysis:—

Carbonate of magnesia.....	58.29.
“ “ iron.....	9.06.
Carbonate of lime.....	traces.
Quartz.....	30.12.
Oxyd of chromium.....	traces.
Water and loss.....	2.53.

This carbonate of magnesia contains, therefore, about one-third of quartz. There is only eight per cent of it in that from Sutton. When calcined the carbonate of magnesia from Bolton would contain 47.28 of quartz; but it would contain also 43.72 of caustic magnesia.

The carbonate of magnesia of Canada might be turned to good account in the composition of the magnesian mortar, unalterable by sea water, which has been suggested by Mr. J. B. Vicat; perhaps even it might be worth sending, as ballast to some of the European ports.

BITUMENS.

CANADA.

Mention by way of Note.

GEOLOGICAL COMMISSION.—There are in Canada several springs of petroleum and beds of bitumen. The petroleum, as well as the bitumen, proceeds from Utica schists, which contain grapholites and belong to the Silurian system; the schists are sometimes strongly impregnated with it. Petroleum is found at Mosa and on the River Trent, on the River St. John and at *Ruisseau Argentié*.*

At Enniskillen there are also springs of petroleum, and by the spontaneous evaporation of the naphtha they seem to have given rise to bitumen.

This bitumen was shown at the exhibition, we shall therefore speak of it somewhat in detail.

It has been found spread over a surface of several acres and forms three beds, which are 0.65 of a *mètre* thick in certain places. Like most of the bitumens of northern countries, it is very rich in naphtha, in which it was dissolved and which has not entirely evaporated. The consequence is that it is quite soft and glutinous at an ordinary temperature, staining the hands, and that it has a low density.

We found that it was as 1,006, so that it is nearly equal to that of water.

Its melting point is 83° c. Below that temperature it no longer gives out vapour, and becomes pasty.

**Geological Sketch of Canada*, page 48.

When heated it soon begins to boil; it gives out naphtha and various oils as well as water. It diffuses also a disagreeable odour, resembling that of caproic acid. When the temperature is raised still higher concrete bituminous matters and paraffine are obtained; when raised to a red heat in a crucible it yields a light and inflated coke, which is very impure; its weight is at least 11 per cent.

Alcohol dissolves certain portions of the bitumen from Enniskillen, acquiring a light-brown colour. Benzine dissolves it easily and leaves a brownish residue, resembling vegetable mould, and containing organic matters and vegetable remains. When this mould is heated to a low red heat it burns with a flame and diffuses a pungent odour like that of peat. When the combustion has ceased, there remains an argillaceous substance which does not effervesce when exposed to the action of acids, and which proceeds no doubt from the schists which contain the bitumen. If the solution of bitumen in benzine be evaporated, a thick bitumen is obtained, having little ductility and resembling those produced from animal matter.

An attempt was made to purify the bitumen from Enniskillen by warming it in boiling water, as is done with certain bitumens, in order to separate the earthy particles from them; but it spreads itself in liquid layers on the surface of the water, and the earthy powder with which it is mixed is but very imperfectly deposited. In order to purify it, the country people in Canada squeeze it in a cloth, through which it passes, while the earthy particles remain inside.

The Enniskillen bitumen is not yet regularly made an article of traffic.

It will be seen from what we have just said that it contains a great quantity of oil of petroleum, which is now applied to various uses in the industrial arts; and it seems that it would be more profitable to extract this oil than the bitumen itself.

WOOD-WORKS.

First Class Medals.

Messrs. Ostell & Co., (No. 224), Canada, for their joiner's work in pine, exceedingly well made by machinery, and at very moderate prices.

HOUSE-PAINTING WORK.

Honorable Mentions.

Mr. Murphy, (No. 243), Canada. Painting in imitation of wood and marble.

PUBLIC WORKS.

CO-OPERATORS.

Mentions by way of note.

The Board of Works of Canada, (No. 224), exhibited—1st, a map of its canals; 2nd, a plan in relief, showing the old and the new locks at Montreal, at the end of the Lachine Canal; 3rd, models of the sluices of the lock-gates of that canal; 4th, a model of a wooden bridge.

In 1833 Canada commenced works for the opening of a passage for large vessels between the Lakes and the Sea.*

The St. Lawrence Canals comprise nine distinct works, constructed at places where the navigation of the river was obstructed. Their entire length is 42 miles, (67,591 *mètres*); they have 27 locks, with an aggregate of 205 feet (62 *mètres* 48). The locks are 200 feet long, 45 feet wide, and nine feet deep (60m. 96, 13m. 72, and 2m. 74).

The Lachine Canal is one of the links of which we have just spoken; that which is furthest from the Lakes. It passes by the *Saut Saint Louis*; it was built as far back as 1825, but its locks were of small dimensions. In 1846, new ones were built, similar to those of the other portions of the Saint Lawrence Canals.

The Welland Canal unites Lakes Erie and Ontario. Its length is 28 miles (45 *kil.*); it has 27 locks, with an aggregate fall of 346 feet (105m. 47). The locks are a little smaller than those on the St. Lawrence Canals.

Most of the locks of these Canals have wooden aprons, with a depression of two feet six inches (0m 76) in the centre. The side-walls are of stone. The sluices of the lock-gates turn round a horizontal axis; they have the advantage of giving a large opening in a very short time and with little effort.

The Canals have been finished since 1853; they were built by Mr. Killaly, C. E., A. M. T. C. D., under the authority of Mr. Lemieux, M. P., Chief Commissioner of Public Works.

Trade has already resumed in part its natural direction, by the valley of the Saint Lawrence, which it had abandoned for the Erie Canal. But the traffic seems sufficient to ensure the success of both these channels of navigation.

A Company owning a large tract of land on Lake Superior have built a Canal round the Falls of the River *Sainte Marie*. This Canal has been cut on the United States' bank. The fall is overcome by two locks joined to each other. The works were completed in the season of 1855, and Lake Superior is now connected with the vast chain of navigation of the Saint Lawrence and the Hudson.†

The bridge exhibited belongs to the category of American bridges. The mode of uniting the stretching piece to the compressing one is nearly the same as Mr. Howe's. The supports are strengthened by arches as in Burr's system. The bridge of which this is a model has not been built; but a bridge of the same kind, and of 150 feet) 45m. 73) has been built at Rock Island.

*In the Fifth Volume of the *Professional Papers* there is a very interesting paper by Lieutenant-Colonel Phillpotts, R. E., on the Canals in Canada.

†We derive the information which we give on the subject of the *Saut Sainte Marie* Canal from M. Rivot, who has recently returned from Canada. In the *Annales des Mines* (1855) is to be found a memoir of a former voyage which this engineer made to Lake Superior; but that memoir being devoted chiefly to geological studies, the works of the Canals are very briefly noticed in it.

The Canadian Exhibition is worthy of notice. The canals are works of very great importance. The Jury award a first class medal to the Board of Works of Canada.

FIFTEENTH CLASS.

STEEL, WROUGHT AND UNWROUGHT.

III.—*Files and Tools.*

CANADA.

North America distinguishes itself greatly in the manufacture of tools. The people of the United States have a genius for machinery and implements. They distinguish themselves particularly in the manufacture of tools adapted for the clearing and cultivation of land. The American axe is proverbial for its perfection. Unfortunately the American Union is unrepresented at the Exhibition, as far as tools are concerned; but Canada, which borders on it, and in which the same genius is seen, has exhibited some remarkably good tools. They are chiefly those which are absolutely necessary for the pioneer.

Second Class Medals.

The Jury award the second class medal to three Canadian exhibitors:—

Mr. Higgins, of Montreal, who exhibited several edged tools, and especially axes.

Mr. Wm. Parkin, of Montreal.—Same kind of tools.

Mr. R. Scott, of Montreal.—Same kind of tools.

Honorable Mentions.

Mr. J. Dawson, of Montreal.—Planes.

Messrs. H. & H. Date, of Galt.—Edged Tools.

Mr. D. F. Jones, of Gananoque.—Planes.

Mr. Alex. Wallace, of Montreal.—Planes.

SIXTEENTH CLASS.

ORDINARY METAL WORK.

4TH SECTION.—VARIOUS WORKS IN METALLIC WIRES AND ALLOYS.

Honorable Mentions.

Mr. Rice, of Montreal, (Canada). Iron-wire-cloth; manufactured on a large scale.

5TH SECTION.—COARSE LOCKSMITH'S WORK, IRONMONGERY, AND NAIL MAKING.

Messrs. T. Peck & Co., of Montreal, (Canada).

Mr. M. F. Dunn, of Montreal, (Canada). Nails made by machinery, and well finished.

TWENTY-THIRD CLASS.

MANUFACTURE OF HOSIERY AND CARPETS, LACE-MAKING AND EMBROIDERY.

CARPETS AND TAPESTRY-WORK.

Honorable Mentions.

Miss Parthenais, (No. 276), of Montreal, (Canada).

Mrs. Jones, (No. 236), of Montreal, (Canada).

HOSIERY AND LACES,

Second Class Medals.

To the City of Kingston, Canada, (English possessions). This city sent a large collection of articles of hosiery, manufactured in the country. We remarked among them some netting done by hand and some done on a frame, both very successful; the Jury had not supposed this branch of industry so far advanced in that country.

TWENTY-FOURTH CLASS.

FURNITURE AND DECORATION.

I.—*Cabinet-work, Veneering, Sculpture, Tapestry, &c.*

CANADA.

Second Class Medals.

Messrs. J. & H. Hilton, of Montreal, sent a set of black walnut furniture covered with silk, which gives us a good idea of their excellent workmanship.

Mr. W. Dunn, of Quebec,—Chairs of carved wood, covered with moose skin and embroidered with porcupine's quills, original in appearance, of a pleasing design and highly finished.

Honorable Mentions.

Mr. Bevis, of Hamilton.—A round table of inlaid woods.

Mr. Owen McGarvey, of Montreal.—Rocking-chairs of turned wood.

Miss Widder, of Toronto.—A drawing-room chair of turned and carved wood ornamented with tapestry-work embroidered in small stitch.

TWENTY-FIFTH CLASS.

ARTICLES OF CLOTHING AND OF FASHION OR FANCY.

MEN'S CLOTHING.

Second Class Medals.

Messrs. Henderson & Co., (No. 300), of Quebec and Montreal, (Canada).—Make up furs on a very large scale; their work is good, their prices are moderate, and they have a great export trade.

Honorable Mentions.

Mr. Ed. Gauthier, (No. 299), of Montreal, (Canada).—Clothing of very substantial country cloth.

ARTIFICIAL FLOWERS AND FEATHERS.

Honorable Mentions.

The Sisters of Providence, (No. 315), of Montreal, (Canada).—Fruits in wax-work.

BOOTS AND SHOES.

Second Class Medals.

Messrs. Smith & Co., (No. 314), of Montreal, (Canada).—An important house, established on a good footing. They manufacture both for the home and for the foreign trade, and have exhibited elegant boots and shoes.

Mr. J. Barbeau, (No. 291), of Quebec, (Canada).—Exhibits boots and shoes of good and substantial workmanship.

India Rubber Company, of Montreal, (Canada).—Manufacture of India Rubber goods on a large scale; agency for sale of goods at Quebec; large domestic and foreign trade; exhibit a variety of articles, of very good workmanship.

Honorable Mentions.

Messrs. Scandritt & Robinson, (No. 311), of Toronto, (Canada).—Exhibit boots and shoes of good workmanship.

Messrs. Merryfield & Sheridan, (No. 307), of Toronto, (Canada).—Exhibit well made boots and shoes.

SUNDRY COLLECTIONS.

Second Class Medals.

COLLECTION OF WORK DONE BY THE INDIANS OF CANADA. (No. 306.)

This interesting collection is composed of clothing, moccasins, and various other things, covered with embroidery having a pleasing effect. These productions are the work of a race that is becoming extinct, not having been able to ac-

commodate itself to modern civilization. A peculiar taste and a happy combination of colours are apparent in the embroidery-work of these Indians.

Honorable Mentions.

Mr. Mercier, of Quebec, (Canada).—For the pains he took to form the above mentioned collection of work done by the Indians of Canada.

TWENTY-SIXTH CLASS.

Drawing and Modelling applied to Manufactures, Printing with Types and Copper-plate Printing, Photography, Engraving, &c.

INDUSTRIAL DRAWINGS.

Second Class Medals.

Miss Sheppard, (No. 360).—Her drawings of Canadian fruits and vegetables are very faithful; the coloring is remarkably true to nature.

Photography.

II.—LANDSCAPES.

Honorable Mentions.

Mr. Doane, (No. 320), of Montreal, (Canada).—Views of Canada, well taken, and very good portraits.

V.—DAGUERREOTYPES.

Honorable Mentions.

Mr. Palmer, (No. 324), of Toronto, (Canada).—Exhibits some very successful portraits.

MOULDINGS AND MATERIALS FOR MOULDING.

The Sisters of Providence, (Canada).—Fruits and vegetables in wax, moulded, of unimpeachable fidelity as to form and colour. The produce of the sale of this excellent work is devoted by these good souls to the support of a hospital, and to the relief of the poor.

Miss Cochrane, of Quebec, (Canada)—Moulded fruits. True to nature both in form and colour.

BOOK-BINDING.

Honorable Mentions.

The British Colonies have obtained three honorable mentions, which were gained by Mr. Miller, of Montreal, (Canada), Mr. Young, of the same city, and Messrs. Waugh & Cox, of Sydney.

THIRTY-FIRST CLASS.

PRODUCTS IN THEIR RELATION TO DOMESTIC ECONOMY.

Alimentary Substances.

IV.—MILK, CHEESE.

Mention by way of Note.

Mr. George Cross, of Lower Canada, exhibited cheeses of good quality, at a low price.—(See *Third Class*.)

IX.—MEATS.

Mention by way of Note.

Hams, by Mr. Idler, of Canada.—(See *Seventh Class*.)

READY-MADE CLOTHING AND BOOTS AND SHOES.

Mention by way of Note.

Mr. Smith, (No. 314), of Montreal.—Exhibits boots of a remarkably substantial make, at very moderate prices. It is impossible to find any thing of better quality than Mr. Smith's boots at 12 francs 50 centimes.—(See *Twenty-Fifth Class*.)

EXHIBITS
OF THE
CANADIAN
COMMISSIONERS

THIRTY-FIRST CLASS

PRODUCTS IN THEIR RELATION TO DOMESTIC ECONOMY.

Manufacture of Sugar.

IV.—SUGAR CLASS.

Mention by way of Note.

Mr. George Cross of Lower Canada, exhibited choice of good quality at a low price.—(See Third Class) 333.

IX.—SUGAR.

Mention by way of Note.

House by Mr. Allen of Canada.—(See Fourth Class)

THE READY-MADE CLOTHING AND FOOT AND SHOES.

Mention by way of Note.

Mr. Smith (No. 314) of Montreal, exhibited boots of a remarkably substantial make at very moderate prices. It is impossible to find any thing of better quality than Mr. Smith's boots at 12 francs 50 centimes.—(See Twenty-Fourth Class)

THIRTY-FIRST CLASS

