

THE JOURNAL
OF THE
Board of Arts and Manufactures
FOR UPPER CANADA.

DECEMBER, 1861.

INTERNATIONAL EXHIBITION, LONDON,
1862.

COMMISSIONERS FOR CANADA:

Sir W. E. Logan, F.R.S., (Director of the Geological Survey) Chairman.

The Hon. L. V. Sicotte, M.P.P., St. Hyacinthe, (President Lower Canada Board of Agriculture).

Col. Thompson, Toronto, (President Upper Canada Board of Agriculture).

J. Beatty, Jr., M.D., Cobourg, (President Upper Canada Board of Arts and Manufactures).

J. C. Taché, Esq., M.D., Quebec.

B. Chamberlin, Esq., B.C.L., Montreal (Secretary Lower Canada Board of Arts and Manufactures).

J. B. Hurlburt, Esq., LL.D., Hamilton.

(CIRCULAR.)

“QUEBEC, 15th November, 1861.

“The Provincial Commissioners appointed to secure a representation of Canadian products in the International Exhibition, to be held in London in the summer of 1862, take the earliest opportunity to make known to the public that they have this day been informed that the sum of \$6,000 has been placed at their disposal by the Provincial Government for that purpose. They are authorized, out of this sum, to pay for the freight and charges on all articles approved by the Commissioners for transmission to London, but are not authorized to purchase any manufactured products.

“Parties desirous of exhibiting articles of Canadian produce will please make application (post paid) to the Commissioners through me, on or before Wednesday the fourth day of December next.

“Articles intended for exhibition must be prepared to be sent in, on or before the 25th day of February next, to places hereafter to be determined upon, of which public notice will be given.

“The Commissioners venture to hope that the public spirit of manufacturers and other producers will induce their general co-operation in the endeavour of the Commission to procure a representation as complete as possible, of the varied products of Canadian Resources and Industry in the forthcoming great Industrial Exhibition of all nations. Wherever it is deemed desirable and advantageous the Commissioners will gladly avail themselves of the assistance of Local Committees.”

B. CHAMBERLIN, Comr.,
Secretary.

The circular of the Commissioners will scarcely reach some intending exhibitors in time for them to make application before the fourth day of the present month. This limitation in point of time is not the fault of the Commissioners, for they state that they “have this day (15th November) been informed that the sum of \$6,000 has been placed at their disposal by the Provincial Government,” and it is very important that the Commissioners should be made acquainted with the various demands for space at the earliest possible date.

The circumstances under which we now draw attention to the representation of Canadian industry at the International Exhibition of 1862, are very different from those which existed when the Committee of the Board of Arts and Manufactures for Upper Canada made their report on this subject on the 14th March. Time for preparation and collection was considered by the Board as the most important element for securing a fair representation of Canadian Productions and Industry.

“The Committee understand it to be the desire of the Board, in thus early adopting measures to facilitate the representation of our civilization, industry and resources at the Exhibition of 1862, before the action of the government or the amount of aid available is made known, to obviate as far as possible the difficulties and disadvantages which were felt previous to former exhibitions, on account of the short notice which was given to exhibitors, that the display would partake of a provincial character, and that aid would be supplied by a public grant.

“A moment’s reflection will suffice to show that if an entire year is not devoted to the collection of some of our natural productions, especially those of the vegetable kingdom, the representation will be incomplete, and therefore, to a certain extent, valueless, as the season in which many necessary specimens are best developed will soon pass away.”*

It is to be hoped that many intending Exhibitors have so far adopted the views of the Committee as to have advanced their preparations without waiting for the announcement that a grant to defray necessary expenses would be made. But the time for making application for space to display their productions is, it must be acknowledged, lamentably short. It is not improbable that, from the wording of the circular, many parties will apply for *permission to exhibit* instead of *for space*, so that additional correspondence will ensue; and if the number of applicants should be equal to those of 1855, the office of Secretary to the Commission will be no sinecure.

The number of Exhibitors in 1855 was three hundred and twenty-one. The correspondence involved in replying to the demands, queries, doubts, &c., of

* Report of the Committee to draft a series of suggestions in relation to the International Exhibition of 1862, page 95 of this Journal.

so many anxious applicants, crowded into a few weeks, will be no ordinary task. The Commission state that, wherever it is deemed desirable and advantageous, they will gladly avail themselves of the assistance of local committees. Unfortunately there does not appear to be *time* for the organization and action of such committees. Before they could communicate with producers and manufacturers, the 4th of December would have passed away; of this the Commissioners are evidently aware, or they would have pressed the point deemed so important in the preparations made for the Paris Exhibition of 1855.

In the preliminary report of the Sub-Committee appointed by the Provincial Committee in 1855, the following paragraphs occur :

“After much consideration and discussion, they have arrived at the conclusions—

“That it is absolutely necessary, in order to secure the end desired, that authority should be given to the Provincial Committee *to purchase such articles as they deem essential to that object.* They are of opinion that any attempt to induce voluntary effort by means of local Fairs would be fruitless. The experience of all who were actively engaged in promoting the Canadian Exhibition at the World's Fair in London in 1851, is, that the success of the present effort must depend entirely upon the energy and judgment to be displayed by an efficient Executive to be appointed by the Commissioners.

“They would recommend that the Provincial Committee should delegate their powers to an Executive Committee, to be composed of twenty-one members, fifteen of whom should be in a position to give their attendance at Quebec; two should be resident at or near Montreal, the remainder to be gentlemen specially connected with the industrial resources of Upper Canada.”

The Commissioners for the forthcoming Exhibition are in a totally different position to that of their predecessors in 1855. They have no money to purchase manufactured articles to be sent to London, they are consequently cut off from the only hope which the Committee of 1855 possessed of despatching to Paris a fair representation of our industry. One would almost suppose, from the wording of the circular, that the present Commissioners did not entertain very sanguine expectations respecting their mission to “secure a representation of Canadian products at the International Exhibition,” for they only “venture to hope that the public spirit of manufacturers and other producers will induce their general coöperation.” In the face of the “absolute necessity” for purchasing articles which the Committee for 1855 were governed by, backed by the experience of 1851, the present Commissioners can only fairly express “a hope” that they will receive active coöperation; but we trust that that hope will soon be transformed into a certainty, and that public spirit as well as

private sense of honourable distinction will induce our manufacturers and artizans to exert themselves, in order that the reputation of Canada may be upheld. Knowing, as every one must know, that Canada has made remarkable progress since 1851, it will be galling, indeed, if the criticism upon our appearance in London should imply that we have retrograded, or are become indifferent, or too poor, or too much involved, to make a creditable appearance on the great Exhibition ground of the World. The Board of Arts and Manufactures for Upper Canada will no doubt take all the measures which lie within their power to stimulate manufacturers and artizans to send the productions of their industry and skill, but it is clear that they can do little or nothing before the 4th of December; and without the Commissioners consent to an extension of time during which they will receive applications, little can be done.

Many persons we think take too narrow a view of the advantages which might accrue to Canada if well represented at London. It is not unfrequently urged that it is absurd to send Canadian manufactures to be placed side by side with the highly finished and cheap productions of the skill and capital of Britain or France. We grant willingly that it would be absurd to put them in competition, but it would be wise to display what we have done and can do, in order to advertise the country and call the attention of intending emigrants to its capabilities and the *field for enterprise* which it presents. However meagre may be the display of our manufactured articles by comparison, in such an arena, it will serve the purpose of directing attention to Exhibitors, advertising their goods, and having Canada mentioned continually in the newspapers, periodicals and reports published in Europe. People do not look for such results here as are only attained where capital is abundant, and where skilled labour is cheap. But they would be gratified to find that in this “distant Colony” all the necessaries and many of the luxuries of life are easily and cheaply procured, and that a boundless field is open to their enterprise. A Canadian piano for example, such as was lately exhibited at London, C.W., of Canadian manufacture, down to the most insignificant piece of ironwork, would produce a favourable effect as an advertisement for the whole country, because it is one of those articles which imply taste to appreciate and skill to produce; such as many a penny-a-liner would delight to enlarge upon, and probably take as a text for a wordy column on “Art in the Backwoods of Canada.” We want the well to do emigrant classes of the people of Great Britain and Ireland to see something from Canada, to know that the two millions and a half of their fellow subjects on this side of the Atlantic are as full of enterprise and

ingenuity as themselves, and that in two generations they have not only converted a boundless forest into innumerable fruitful farms, but that their cities and towns all contain the germs of that wonderful industry and skill which has made Britain so powerful, so rich, and so great. Every one feels pleased and gratified at the favourable notices of the press upon our former displays at London and Paris. The regrets of the French at the loss of so fine a colony, whose value they only found out in 1855, were at least flattering, and contained the germ of future commercial advantages. On the same ground is every one disgusted at the ignorance not unfrequently displayed in Europe respecting our resources, climate, and geography.

The remedy is apparent. Make the country known, send the products of your industry to be seen by all, give date, price, cost of material, and every information respecting them, and the knowledge of the resources and civilization of the country will soon spread and be attended with profit to all.

Sir William Logan, the Chairman of the Board of Commissioners, has we understand already despatched into the field a body of competent and active collectors, to bring together an entirely new representation of Canadian mineral productions. Sir William enjoys this great advantage, that he knows exactly where his mineral treasures lie, and he has only to give directions, despatch messengers, and collect his specimens.

Sir William Logan has another qualification which is not so widely known, he does not spare his own private purse in the execution of a public object. Many persons have long been aware that the expenses of the geological survey exceed the annual grant, but it is not so generally known that the additional expenses have hitherto come from the private purse of the distinguished Director of the Geological Survey of Canada. We have no fear that the mineral wealth of this Province will be inefficiently represented, although no portion of the \$6,000 grant will go to pay the extraordinary expenses of the Commissioner, and the time for collecting specimens is very limited. We hope that the manufacturing industry of the Province will find equally public spirited men, according to their means, to secure its representation, and that the question, often unfairly asked in a narrow spirit of selfishness, "will it pay?" will receive a manly and patriotic response in the affirmative, with a proper understanding of the advantages to the country at large which a just representation of "Canadian resources and industry" is certain to produce.

When his Royal Highness the Prince of Wales passed through Western Canada, the country people assembled at the railway stations to see the illustrious visitor, frequently gave utterance to such ex-

pressions as the following: "What a sight of money this trip will cost him!" "What can he be coming here for?" "*How can it pay him?*" all tending to show an entire want of thought or knowledge respecting the motives which governed their illustrious visitor, the position he occupied as the representative of the Queen, and the relation which they would some day bear to him. These same suspicious spectators, always accustomed until then to estimate the actions of a man by the money he was going to make, when they heard that the Prince had passed through the United States with equal eclat and expense, and then gone quietly home to resume his studies again, began to receive new impressions of mankind and of the motives which rule in the breasts of a few. They found that it was possible for men to be unselfish as far as money was concerned; that such a thing as a spirit of public good did exist, not necessarily associated with dreams of remuneration; and that there were men who could devote their time, and, what was infinitely more, their hard cash, to the happiness and welfare of their fellow creatures. This enlarged view has happily rooted out many narrow minded and selfish errors of defective early training, or a want of civilized education, now rapidly spreading through the country; and it may be boldly asserted that in no way has the Prince's visit proved so beneficial to Canada, especially at the present juncture, than in the loyal feeling it has created among the backwood farmers, who admire to excess charity, patriotism, glitter and pageantry, when it costs them nothing, and are both astonished and delighted that they have seen one who sets a splendid example of all, and never dreams of asking "Will it pay?"

It is a pleasant task to record the names of those who did honour to Canada in 1851 and 1855, by winning Medals, Prizes, and Honourable Mention, in the magnificent scenes of friendly rivalry at London and Paris. It would indeed be gratifying to find that the experience of the Committee of 1855 did not apply to the people of Canada in 1862; that it will not be "absolutely necessary" to purchase illustrations of our industry, in order to prove that we contain the true elements of civilization; and that we do not all require the stimulus of a few dollars and cents to warm our torpid love of country into a healthy and vigorous glow.

Although the time is short, yet, if the Commissioners consent to receive applications for space until the close of December, much may yet be done by the Boards of Arts and Manufactures, Mechanics' Institutes, and private individuals, and if ordinary zeal is shown we are far from despairing of our representation in London next year. Under all circumstances, it is the duty of every one to give the Commissioners the best assistance in their power, and

we sincerely hope that they will meet with active coöperation in every department, and that many future pages of this journal may be filled with a recital of the successes of our countrymen, together with a long list of names, like those given below, which will always remain a credit and honour to their country in connection with the representations of Canadian civilization and resources at London and Paris.

EXHIBITION OF 1851.

The following table contains the names of the Exhibitors who received prizes, medals, and honourable mention at the London Exhibition in 1851:—

CLASS I.

Mining, Quarrying, Metallurgical Operations, and Mineral Products.

PRIZE MEDAL.

Ferrier, Hon. J. Quality of Iron.
 Montreal Mining Co. Copper Manufacture.

HONOURABLE MENTION.

Chaudière Mining Co. Native Gold.
 Logan, W. E. Manganese and Iron Ores.
 Marmora Iron Company. Iron, &c.
 Wilson, Dr. J. Magnetic Iron Ores.

CLASS II.

Chemical and Pharmaceutical Processes and Products generally.

No prizes awarded to Canada in this class.

CLASS III.

Substances used as Food.

PRIZE MEDAL.

Christie, D. White Wheat.
 Fisher, Arthur. Maple Sugar.
 Jones, D. White Peas.
 Limoges, D. White Peas.
 Reinhardt, G. Ham.
 Robb, J. Biscuits.
 Simpson, J., & Co. Wheat Flour.
 Squair, R. Oatmeal.
 Watts, R. M. Polish Oats.

HONOURABLE MENTION.

Bales, J. Maple Sugar.
 Bucke, R. Arrowroot.
 Davies, Thomas, & Sons Hops.
 Fisher, J. Seeds of Cameline.
 Gillespie & Co. Wood Vinegar.
 Jeffries, G. Clover Seed.
 Levey, J. Tobacco for Cigar making.
 MacGinn, T. Timothy Grass Seed.
 Trenholme, E. Buckwheat and its Flour.

CLASS IV.

Vegetable and Animal substances chiefly used in Manufactures, Implements, or for Ornament.

PRIZE MEDAL.

Montreal Central Commission Collection of Woods.
 Reed and Meakins. Hard Woods.

HONOURABLE MENTION.

Allon, J. Tannery substances.
 Bastein, M. Flax.
 Brunsdon and Shipton. Starch.
 Egan, J. Woods.
 Fisher, J. Woods.
 Grice, F. Flax.
 Hewson, J. Woods.
 Tètù, C, A. Fish Oils (Porpoise).
 Mackay & Co. Silk.
 Parisault, J. Woods.
 Prendergast. Gums, &c.

CLASS V.

Machines for direct use, including Carriages and Railway and Naval Mechanism.

PRIZE MEDAL.

Perry, G., & Brothers. Fire Engine.

CLASS VI.

Manufacturing Machines and Tools.
 No awards in this class to Canada.

CLASS VII.

Civil Engineering, Architecture, and Building contrivances.
 No awards in this class to Canada.

CLASS IX.

Agricultural and Horticultural Machines and Implem'ts.
 No awards to Canada.

CLASS X.

Philosophical Instruments and Processes depending upon their use, Musical, Horological and Surgical Instruments.
 Higgins, P. The quality and cheapness of a Violin.

CLASS XI.

Cotton.
 No award in this class to Canada.

CLASS XII.

Woollen and Worsted.
 Gamble, W. Blankets.

CLASS XIII.

Silk and Velvet.
 No award in this class to Canada.

CLASS XIV.

Manufactures from Flax and Hemp.
 No award in this class to Canada.

CLASS XV.

Mixed Fabrics, including Shawls, but exclusive of Worsted Goods.
 No award in this class to Canada.

CLASS XVI.

Leather, including Saddlery and Harness, Skins, Fur Leathers, and Hair.

PRIZE MEDAL.

Tètù, C. A. { Curried Porpoise Leather
 and samples of Leather
 from the skin of a Whale.
 Morris, R. A set of double Sl. Harness

HONOURABLE MENTION.

Henderson J. Sleigh Robes & other Furs.
Stewart, W..... A set of sing. Sl. Harness.

CLASS XVII.

Paper and Stationery, Printing and Bookbinding.
No award.

CLASS XVIII.

Woven, Spun, Felt and Laid Fabrics, when shown as specimens of Printing or Dyeing,
No award in this class to Canada.

CLASS XIX.

Tapestry, including Carpets and Floor Cloths, Lace and Embroidery, Fancy and Industrial Works.
No award in this class to Canada.

CLASS XX.

Articles of Clothing for immediate personal or domestic use.

HONOURABLE MENTION.

Adams. W. H. F. Cloth made up into coats.
Barbeau, T..... Deer Skin Boots.

CLASS XXI.

Cutlery and Edge Tools.

HONOURABLE MENTION.

Ladd, C. P..... Axes.
Leavin, G. Axes.
Scott & Glasford.... Axes.
Shaw, Samuel..... Axes.
Wallace, A..... Planes.

CLASS XXII.

Iron and general Hardware.
Cheney, G. H..... Stoves.
Ladd, C. P. Balance Scale.
Rice, W. Wire Fencing.

CLASS XXIII.

Working in precious metals and in their imitations, Jewellery, &c.
No award in this class to Canada.

CLASS XXIV.

Glass.
No award in this class to Canada.

CLASS XXV.

Ceramic Manufactures, China, Porcelain, Earthenware, &c.
No award in this class to Canada.

CLASS XXVI.

Decorative Furniture and Upholstery, &c.
No award in this class to Canada.

CLASS XXVII.

Manufacture in Mineral substances, &c.

HONOURABLE MENTION.

Hammond, R. A polished stone table.

CLASS XXVIII.

Manufactures from Animal and Vegetable substances, not being woven or felted.

PRIZE MEDAL.

Baily, J. Pails.
Dunn, W..... Chair, Porcupine Quill.
Marshall, R. Dinner Mats.

HONOURABLE MENTION.

Nelson & Butters. Brooms.

CLASS XXIX.

Miscellaneous manufactures.
Henderson Clay Pipes.

CLASS XXX.

Sculpture, Models, and Plaster Art.
No award in this class to Canada.

The remarks of the jurors on the Canadian Department were most flattering, and although often published, may with propriety at the present period be again brought under the notice of our readers.

“Of all the British Colonies, Canada is that whose exhibition is the most interesting and the most complete, and one may even say that it is superior, so far as the mineral kingdom is concerned, to all countries that have forwarded their products to the Exhibition. This arises from the fact that the collection has been made in a systematic manner, and it results that the study of it furnishes the means of appreciating at once the geological structure and the mineral resources of Canada. It is to Mr. W. E. Logan, one of the members of the Jury, who fills the office of Geological Surveyor of Canada, that we are indebted for this collection; and its value arises from the fact, that he has selected on the spot most of the specimens that have been sent to the Exhibition, and has arranged them since their arrival in London. The arrangement that he has adopted, which is entirely technical, includes eight divisions, viz:—Metaliferous minerals, and metals obtained from them; Minerals which require complicated operations to render them fit for use; Lithographic limestones and minerals employed in Jewellery, and in the manufacture of glass of various kinds; Various kinds of clays and refractory sandstones; Rocks furnishing whetstones, hones, and polishing stones; Rocks and minerals in use for improving soils; Materials used in construction, and rocks serving for architectural decoration; Combustible materials. All these classes include materials, of great interest, for industrial purposes, and we think it useful to mention some more specially. The ores of iron require notice first of all for their abundance and excellent quality, as the magnetic oxide is worked in upwards of ten different localities. The mines of Marmora, the most important of all, are situated in the west of Canada, and are worked in a mass of ore more than 100 feet thick. The magnetic ores obtained from them are accompanied by pig iron from the works established on the spot, and belonging to the Marmora Iron Company. The Jury has recognized the good quality of their products by making honourable mention of this Company; and the same is awarded to Dr. J. Wilson who has exhibited magnetic iron ores from South Sherbrooke, and phosphate of

lime from Burgess. Ordinary mention has also been made of Mr. Lancaster of Vaudreuil, Captain Morin of St. Vallier, Messrs L. Seer of Eustache, E. Caron of St. Ann, Montmorency, G. Duberger of Murray Bay, and R. W. Kelly of Gaspé, who have exhibited ores of iron and iron ochres of different kinds. Massive hydrous oxide of iron is an important mineral amongst the iron ores of Canada, and is workable in large masses in several localities. We may mention, particularly, that of St. Maurice, which for more than half a century has supplied the iron works and founderies of that name. The Honourable J. Ferrier, the proprietor of the mines, whose products are exhibited in No 5, has added to the ores, specimens of pig and other iron, besides slags and ashes obtained during the working of the ores. The iron from St. Maurice is of good quality and the products exhibited show that the establishment proceeds with regularity, in a metallurgical point of view; these considerations have induced the Jury to award a Prize Medal to the proprietor. The exhibition of Canada includes the ores of zinc, lead and copper, from several localities. The ores of copper from Lake Superior and Lake Huron are remarkable for their richness, and that called "Bruce Mine" on Lake Huron has been worked for some years. The Mining Company of Montreal (the proprietors of this mine,) have erected an establishment for working the ores on the spot, according to the methods adopted at Swansea, and the objects sent by this Company exhibit by the side of the ores the various products of smelting, besides the specimens of black and refined copper. Specimens of copper and native silver, from the Island of St. Ignatius, on Lake Superior, are added to these, and the Jury has awarded to the Company a Prize Medal for these various objects. The existence of spangles and pepites of Gold have been proved by actual investigation, in several rivers in the East of Canada, and honourable mention is made of the Chaudière Mining Company who exhibit pepites of native gold collected in the washing of those streams. Messrs. Bodin & Lebert are also rewarded with a mention for the white quartzose sands which they exhibit, which are used with advantage in the manufacture of flint and crown glass. The last award that we have to mention in the case of Canada is the honourable mention adjudged to Mr. Logan who has exhibited iron ores, lithographic stones, minerals, and various rocks. Our colleague has not thought it right to add to these the geological map he has made of Canada, a matter which the Jury greatly regret, not because they would then have been able to adjudge a reward for this beautiful work,—for the position of Mr. Logan, as member of the Jury, would render this impossible,—but because of the great interest it would have added to the Canada Exhibition. The lithographic stones exhibited by Mr. Logan belong to a paleozoic rock, occurring at Marmora, where the magnetic iron ore has been mentioned as forming a deposit of enormous thickness. These stones are remarkably homogeneous, and fine grained; the degree of finish of the

drawings that Mr. Logan has caused to be made upon them giving every promise of the quality being good. The geological position of the stones is interesting, and the reporter is not aware of such material having been previously found in the old rocks, since up to the present time those who practice lithography seek for stones from rocks of the oolitic series. The discovery of Mr. Logan proving that the palæozoic rocks may also furnish good lithographic stones, increases the resources available for this important branch of engraving and drawing."

It is very gratifying to be able to state upon excellent authority that Sir William Logan's Geological Map of Canada will be published in time for the Exhibition at London, and also that a description of the Geology of Canada will accompany this long expected, long looked for map.

EXHIBITION OF 1855.

The following table contains the names of Exhibitors who obtained Prizes and Honourable Mention at the Paris Exhibition in 1855.

FIRST CLASS

Mining and metallurgy, comprising general statistics, the modes of working mines, the modes of preparing metals, coals and combustible minerals, iron, common metals, precious metals, coins and medals, non-metallic mineral productions.

GRAND MEDAL OF HONOUR.

The Grand Medal of Honour was awarded to Sir William Logan, for his Geological Map of Canada, and as exhibitor of the greater part of the collection of minerals.

SECOND CLASS.

Everything relating to the management of trees, or to sporting fishing and hunting, and products obtained without cultivation, comprising statistics and general documents, management of the trees, hunting of terrestrial and amphibious animals, fishing, products obtained without cultivation, destruction of vermin, means used for acclimatizing animals and plants.

A Medal of Honour was awarded to the Government of Canada for all the collection of the class, and of the following class which belongs to the same group.

A first class Medal to the Hudson Bay Company for a collection of furs.

A first class Medal to Mr. Andrew Dickson, of Kingston, for a collection of timber.

A second class Medal to Messrs. Farmer and DeBlaquiere, of Woodstock, exhibitors of a collection of timber.

A second class Medal to Mr. Sharples, of Quebec, for exhibiting a collection of timber.

THIRD CLASS.

Agriculture, comprising Statistics and General Documents, Farming, Agricultural Tools and Implements, General Produce, Special Produce, Rearing of Useful

Animals, Industries immediately connected with Agriculture.

FIRST CLASS MEDALS.

Mr. Cross of Montreal, for cheese.
Canada Company, Toronto, for wheat.
Lyman & Co., Montreal, for seeds.
Mr. Shaw, Toronto, for chicory.
Mr. Perry, Montreal, mechanic.

SECOND CLASS MEDALS.

Mr. Fisher, of Montreal, for seeds.
Mr. Fleming, of Toronto, for seeds.
Mr. Laurent, of Varennes, for oats.
Mr. Morse, of Milton, for a plough.
Mr. Shaw, of Toronto, for seeds.
Mr. Sheppard, of Montreal, for a collection of seeds.
Mr. Wade, of Cobourg, for seeds.

HONOURABLE MENTION.

Mr. Coffin, of Gaspé, for wheat.
Mr. Evans, of Montreal, for seeds.
Mr. Kempton, of Ste. Therese, for seeds.
Mr. Jarvis, Toronto, for hops.
Rev. Mr. Villeneuve, Montreal, for wheat and peas.

FOURTH CLASS.

Machinery in general, as applied to industry, apparatus for weighing and gauging, instruments used for conveying power and detailed portions of machinery, horse gins, windmills, hydraulic machines, steam engines and air engines, machines used in moving heavy weights, hydraulic engines for lifting, ventilators and bellows.

FIRST CLASS MEDAL.

Mr. George Perry, of Montreal, for a fire engine.

HONOURABLE MENTION.

Mr. Lemoine, of Quebec, for a fire engine.

FIFTH CLASS.

Special machinery and apparatus for railways and other modes of transport, comprising apparatus for carrying burdens on the arm, the back, or the head, specimens of harness and saddlery, materials and apparatus for wheelwright's work and carriage making, carriages, railway apparatus for water conveyance, air balloons.

HONOURABLE MENTION.

Mr. Barrington, of Montreal, for a harness.

SIXTH CLASS.

Special machinery and apparatus for workshops, comprising separate pieces of machinery and apparatus for workshops, machines used in mining operations, machinery used in building, machines for working non-metallic minerals, metallurgic machines, apparatus and mechanical contrivances used in workshops, machines used in the manufacture of small articles in metal, machines used in the felling of trees and in their after treatment, machinery used in agriculture and in the preparation of alimentary substances, machines used in the chemical arts, machines used in connection with dyeing and printing, machines used only in certain trades.

FIRST CLASS MEDAL.

Mr. Rodden, of Montreal, for a machine for carpenters' work.

SECOND CLASS MEDAL.

Mr. Munro, of Montreal, for a planing and grooving machine.

Mr. Paige, of Montreal, for a large threshing machine.

HONOURABLE MENTION.

Mr. Dunn, of Montreal, a nail making machine.

Mr. Rice, of Montreal, a sifting machine.

Messrs. Dion & Lepage, Rimouski, a model of a threshing machine.

SEVENTH CLASS.

Special machinery and apparatus for the manufacture of woven fabrics, comprising instruments used in spinning and weaving, machines used in the preparation and spinning of cotton, machines used in the preparation and spinning of flax and hemp, machines used in the preparation and spinning of wool, machines used in the preparation and spinning of silk, rope making, lace making and special machines, weaving of the low warp and high warp, looms for making hosiery, apparatus and machinery for bleaching, dyeing, dressing, and the folding of fabrics.

No Prizes to Canada in this Class.

EIGHTH CLASS.

Arts relating to the exact sciences and to instruction, comprising standard weights and measures, documents of all kinds relating to the different weights and measures used in each country, clock work, optical instruments and apparatus of all kinds used in measuring space, instruments employed in the study of physics, chemistry and meteorology, maps, models and documents relating to astronomy, geography, topography and statistics, apparatus used in the study of the sciences, materials for elementary instruction.

No Prizes to Canada in this Class.

NINTH CLASS.

Manufactures relating to the economical production and employment of heat, light and electricity, comprising processes having for their object the employment of heat, cold, light and electricity derived from natural sources, processes having for their object the production of fire and light, combustibles to be used as cheap fuel, warming and ventilation of houses, production and employment of heat and cold in domestic economy, production and use of heat and cold in the arts, lighting, lighthouses, signals and aerial telegraphs, production and employment of electricity.

SECOND CLASS MEDAL.

Mr. Rodden, of Montreal, for a cooking stove.

TENTH CLASS.

Chemical manufactures, dyeing and printing, paper, leather, skins, india rubber, comprising chemical products, fatty substances, rosins, scents, soaps, varnishes and all kinds of coatings, india rubber and gutta percha, paper and paste-board, bleaching, dyeing, printing,

colors, inks and pencils, tobacco, opiums and various narcotics.

No Prizes to Canada in this Class.

ELEVENTH CLASS.

Preparation and preservation of alimentary substances comprising flour, fecula and their extracts, sugar and sweet substances, fermented drinks, preserves and condiments, preparations from cocoa, coffee, tea, &c., confectionary and products of distillation, apparatus and processes for the preparation of food.

SECOND CLASS MEDALS.

Government of Canada for the Canadian collection.
Mr. Clark Fitts, of Montreal for biscuits.

HONOURABLE MENTION.

Mr. Gamble, of Etobicoke, for flour.
Mr. Lawson, of Montreal, for flour.
Mr. McDougal, of Montreal, for flour.
Mr. Nasmith, of Toronto, for biscuit.
Mr. Proctor, of Montreal, for flour and Indian corn.
Mr. Robb, of Montreal, for biscuit.

TWELFTH CLASS.

Hygiene, Pharmacy, Surgery, Medicine, comprising Hygiene and Public Health, Hygiene in Private Life, use of Water, Vapour and Gas, Anatomy of man, and comparative Anatomy, Veterinary Medicine and care of Horses.

SECOND CLASS MEDAL.

Mrs. McCulloch, of Montreal, for a collection of stuffed birds from Canada.

HONOURABLE MENTION.

Prof. Croft, of Toronto, for official preparations.
Mr. Lyman, of Montreal, for official preparations.

THIRTEENTH CLASS.

Naval and military arts, comprising the principal elements of the materials used in Ship-building, and of the art of navigation, swimming apparatus, life-boats and diving-bells, drawings and models of ships, boats, &c., used on rivers, canals and lakes, and commerce and deep sea fishing, drawings and models of vessels of war and military engineering, materials of war and military equipage, equipment of troops, arms and projectiles, pyrotechnics.

FIRST CLASS MEDAL.

Mr. Lee, of Quebec, for models of steam and sailing vessels.

SECOND CLASS MEDAL.

Mr. Cantin, of Montreal, for boat oars.

HONOURABLE MENTION.

Captain Thomas, of Toronto, for a model of a life-boat.

FOURTEENTH CLASS.

Civil Engineering comprising building materials, the divers branches of work connected with building, foundations, works in connection with marine navigation, roads and railways, bridges, distribution of water and gas, special buildings.

FIRST CLASS MEDALS.

Public Works Office, for models and materials.
Geological Commission, for building materials.
Mr. Ostell, of Montreal, for wooden doors and window sashes.

SECOND CLASS MEDAL.

Mr. Brown of St. Catherines, for building materials.

HONOURABLE MENTION.

Shipton Slate Company, for slates.
Hamilton International Company, for asphalt.
Mr. Gauvreau, of Quebec, for Quebec hydraulic cement.

FIFTEENTH CLASS.

Steel and its products, comprising the manufacture of steel for the market, manufacture of special kinds of steel, springs, cutlery, steel tools, various steel manufactures.

SECOND CLASS MEDALS.

Mr. Scott, of Montreal, for tools.
Mr. Higgins, of Montreal, for axes.
Mr. Parkyn, of Montreal, iron shovels.

HONOURABLE MENTION.

Mr. Date, of Galt, for tools.
Mr. Dawson, of Montreal, for planes.
Mr. Wallace, of Montreal, for planes.

SIXTEENTH CLASS.

General metal work, comprising elaboration of metals and alloys, wires, large tubes, copper ware, sheet iron, tin ware, metal wire work, ironmongery and nail-making, locksmith's work and hardware, zinc work, lead work, tin work, and various white alloys, precious metals.

HONOURABLE MENTION.

Mr. Peck, of Montreal, for nails.
Mr. Jones, of Gananoque, for iron instruments.
Mr. Parkyn, of Montreal, for iron instruments.
Mr. Rice, of Montreal, for tin.

SEVENTEENTH CLASS.

Goldsmith's and Silversmith's work, jewellery, bronzes, comprising processes used in goldsmith's work, cutting and engraving of stones used in jewellery, manufacturers of precious metals, plated goods, jewellery, imitation jewellery, jewellery made of various metals, statues, bronzes.

No prizes to Canada.

EIGHTEENTH CLASS.

Glass and pottery, comprising general processes used in making glass and pottery, window glass and mirror glass, bottle glass, crystal glass, crystal, &c., for optical instruments, ornaments, common pottery, and terra cotta, faience, stone ware, porcelain, artistical objects.

No prizes to Canada.

The NINETEENTH, TWENTIETH, TWENTY-FIRST, and TWENTY-SECOND CLASSES were devoted to cotton, woolen, silk, and flax manufactures, in which departments no prizes were awarded to Canada.

TWENTY-THIRD CLASS.

Hosiery, carpets, embroidery, lace of every kind, gold and silver fringes, comprising all articles of these

different classes manufactured of silk, floss silk, wool, horse hair, thread and cotton.

SECOND CLASS MEDAL.

Government of Canada for their collection.

HONOURABLE MENTION.

Mrs. Jones, of Montreal, for a screen worked in wool.
Miss Parthenais, of L'Industrie, for embroidery in wool and silk.

TWENTY-FOURTH CLASS.

Furniture and decoration, comprising decorative furniture made of stone, stony substances or in metal, cabinet work for daily use, fancy furniture and decorative articles characterized by the use of costly woods, ivory, shell, by sculpture and inlaid work, furniture of moulded substances, gilt, lacquered, &c., furniture made of reeds, cane, straw, &c., household utensils, upholsterers' work, stained paper, stuffs and leather prepared for hangings, blinds, book-binding, &c., decorative painting, fittings for theatres, public ceremonies, &c., church furniture, ornaments and decorations.

SECOND CLASS MEDALS.

Mr. Drum, of Quebec, for a chair of waved maple.
Mr. Hilton, of Montreal, for a collection of furniture.

HONOURABLE MENTION.

M. Bevis, of Hamilton, for a mosaic table.
Mrs. Widder, of Toronto, for a drawing room chair.
Mr. MacGarvey, of Montreal, for rocking chairs.

TWENTY-FIFTH CLASS.

Articles of clothing, objects of fashion and fancy, comprising materials used in making clothes, buttons, linen drapery, stays, braces and garters, coats and clothes, boots and shoes, gaiters and gloves, hats and caps, hair work, feather and bead head dresses, ornaments, artificial flowers, needle work, fans, screens, parasols, umbrellas, sticks, articles of hardware in wood, ivory and shell, &c. Dressing-cases, inkstands, fancy articles ornamented with ivory, &c., sheaths and manufactures in morocco leather and cardboard, basket work, &c., toys, dolls, wax figures, games of all kinds.

SECOND CLASS MEDAL.

Mr. Barbeau, of Quebec, for hunting and riding boots.
Mr. Henderson, of Quebec, for a beaver pelisse.
Mr. Mercier, of Quebec, for Indian work.
The Montreal India Rubber Company.
Mr. Smith, of Montreal, for a collection of boots and shoes.

TWENTY-SIXTH CLASS.

Drawing and modelling applied to industry, letter press and copper-plate printing; photography, comprising writing, drawing, and painting; lithograph, autograph, and stone engraving, engraving on metal or wood, stereotyping, moulds and stamps, printing.

HONOURABLE MENTION.

Miss Cochran, of Quebec, for fruit in wax work.
Mr. Doane, of Montreal, for photographs.
Mr. Miller, of Montreal, specimens of book-binding.
Mr. Palmer, of Toronto, specimens of daguerreotypes.

The Sisters of Providence of Montreal, fruits in wax work.

Mr. Young, of Montreal, specimens of book-binding.

TWENTY-SEVENTH CLASS.

Manufacture of musical instruments, comprising wind instruments in wood, horn, ivory, bone, shell, leather and metal; wind instruments with key-boards, stringed instruments without key-boards, pulsatile instruments, automaton instruments, manufactured articles and accessories.

No prizes to Canada.

MISCELLANEOUS.

SECOND CLASS MEDAL.

Mr. Idler, of Montreal, for preserved meats.
Mr. Smith, of Montreal, for boots and shoes.

HONOURABLE MENTION.

Mr. Cross, of Montreal, for cheese.

The total number of prizes awarded at the Exhibitions of London, New York, and Paris, were as follows:—

At London, 67 medals and honorable mentions.			
At New York, 63 “ “ “	“	“	“
At Paris, 93 “ “ “	“	“	“

In the report of J. C. Taché, Esq', M.D., one of the Canadian commissioners to Paris in 1855, and one of the commissioners for Canada at the approaching International Exhibition of 1862, the following opinions of competent authorities on the success of Canada at Paris are enumerated.

The chapter under the title Canada, in the history of the Universal Exhibition, by Mr. Charles Robin, begins with these words: "The efforts made by Canada, that old French colony, to make a suitable appearance at the Great Exhibition of 1855, efforts which have resulted, moreover, in the most complete success, coupled with the undoubted importance of that fine country, whose future cannot be otherwise than brilliant, render it a duty on our part to devote to it a distinct chapter."

"Now we can form an estimate of the value of these few arpents of snow ceded to England with such culpable carelessness by the Government of Louis XV.," says Count Jaubert at the word CANADA, in his work entitled *La Botanique à l'Exposition Universelle de 1855*.

Baron Wedekin, Chief Ranger of the Duchy of Hesse, and compiler of the records of the German forests, writing to Dr. Taché, states: "In conclusion I congratulate you upon your Canada. Although the feeling in favor of emigration has very much diminished in Germany, I would recommend Canada to the emigrant in preference to any other country."

The standing acquired by Canada, in competing with other nations and colonies, may be inferred from the fact that the prizes received at the Great

Exhibition of London, in 1851, were 67 medals and honorable mentions; at New York, in 1853, 63 similar distinctions; and at Paris this number was increased to 93; Canada being the only instance of a Colony having obtained a grand medal of honour, a distinction won but not exceeded by the nationalities of Sweden, Denmark, Lombardy, Piedmont, and Bavaria.*

The Board of Arts and Manufactures

FOR UPPER CANADA.

CIRCULAR.

BOARD ROOMS,
TORONTO, November 30th, 1861.

The Executive Committee of the Board of Arts and Manufactures for Upper Canada, beg to direct attention to the Circular on the first page of this number of the Journal, which has just been issued by the Commissioners appointed by the Provincial Government to secure a proper representation of Canada at the International Exhibition, to be held in London in 1862.

For the purpose of promoting this national object, the Commissioners have applied to this Board for its advice and co-operation, which has been cheerfully accorded; the Committee therefore respectfully call upon the manufacturers and producers of Canada, promptly to respond to the Circular of the Commissioners, and put forth their utmost exertions towards securing such a representation of Canadian Art and Industry, as shall be creditable to us as a people, and enable the Province to maintain, at the third Great Exhibition of all Nations, the position so honorably attained at London in 1851, and at Paris in 1855.

The Committee regret that the time for preparation is so limited, owing to the delay on the part of the Government in appointing the Commissioners, through whom alone exhibitors are in a position to communicate with Her Majesty's Commissioners in London—so limited indeed, that in many departments in which it would have been highly desirable to have contributed articles of Canadian origin, any efforts would now be of no avail.

In the special report of this committee on this subject, adopted by the Board and published in the

* See article on "Canada at the International Exhibition of 1862," page 67 of this Journal.

April No. of its Journal, the several departments in which the Province should be represented were indicated in the following classification, namely:—

I.—Agricultural Productions.

(This department will be attended to by the Board of Agriculture.)

II.—Productions of the Forest.

Timber.
Gums and Resins.
Oils.
Dye Stuffs.
Tanning Materials.
Miscellaneous.

III.—Productions of the Mine.

1. Metals and their ores.
2. Minerals requiring more complicated chemical treatment to fit them for use.
3. Mineral paints.
4. Materials applicable to the fine arts.
5. Materials applicable to jewellery.
6. Materials for glass-making.
7. Refractory materials.
8. Grinding and polishing materials.
9. Materials applicable to the purposes of common and decorative construction.
10. Miscellaneous materials.

IV.—Animal Productions.

1. Glue.
2. Isinglass, from the Sturgeon.
3. Neat's foot Oil.
4. Bees' Wax.
5. Lard Oil.
6. Moose, Cariboo, Bear, &c., Skin.
7. Furs.
8. Porpoise Leather.
9. Whale Leather.
10. Seal-skin Leather.

V.—Productions of the Fisheries.

1. Seal Oil.
2. Cod liver oil.
3. Porpoise oil (*Delphinus Minor*).

[This oil is particularly valuable on account of its retaining its fluidity at extremely low temperatures.]

4. Porpoise leather.
5. Whale oil.
6. Capelin oil.
7. Shark Oil.
8. Fish manure.

All of the oils should be sent in the raw state and also clarified.

VI.—Manufactures, &c.

I.—MACHINERY.

1. Machines for direct use, including Carriages, Railway and Marine Mechanism.
2. Manufacturing Machines and Tools.

3. Civil Engineering, Architectural and Building Con-
trivances.
4. Philosophical, Musical, Horological, and Surgical
Instruments.

II.—MANUFACTURES.

1. Woolen and Worsted.
2. Flax, Hemp and Cotton.
3. Leather, Saddlery, Boots and Shoes.
4. Skins and Hair.
5. Paper, Printing and Bookbinding.
6. Woven, Felted and Laid Fabrics.
7. Dyed and Printed Goods.
8. Carpets, Oil Cloths, &c.
9. Articles of Clothing.
10. Cutlery, Edge and Hand Tools.
11. General Hardware.
12. Gold and Silversmith's Work.
13. Furniture, Upholstery, &c.
14. Manufactures in Mineral substances, for Building
or Decoration.
15. Manufactures from Animal and Vegetable substances
not woven or felted.
16. Miscellaneous Manufactures and Small Wares.

In the Circular above referred to, parties intend-
ing to exhibit are requested to notify the Commis-
sioners of their intention, through B. Chamberlin,
Esq., Commissioner, Secretary, in Montreal, on or
before the fourth of December next.

Intending exhibitors in Upper Canada, who may
not have been able to give the requisite notice
within the time specified, are nevertheless requested
to communicate their wishes to the Secretary of this
Board, at the earliest possible moment, and their
application will be submitted to the Commissioners
without delay.

W. EDWARDS, *Secretary.*

CIRCULAR NOTICE TO BOARDS OF DIRECTORS
OF MECHANICS' INSTITUTES.

The Board of Arts and Manufactures has been
requested by the Provincial Commissioners, ap-
pointed in connection with the International Exhi-
bition of 1862, to render such advice and assistance
to the Commissioners as may be within their power,
in securing a proper representation of the Arts and
Industry of Canada; the Board therefore requests
that you will communicate, as a special Committee,
with the Manufacturers and Artizans of your locality,
for the purpose of obtaining suitable contributions,
to be submitted to the Commissioners, for their
approval.

Mr. George E. Pell has been appointed Agent for
this Board, for the Western Section of U. C., and
Mr. E. A. McNaughton for the Eastern Section, for
the purpose of Canvassing for Subscribers for the
Journal; for information relating to Manufactures;
and for specimens of Native Manufactures for the
Museum of the Board.

The Agent for your Section will also avail him-
self of any opportunity you may afford him of meet-
ing your Committee, in relation to the International
Exhibition, and other matters.

The Board respectfully solicits for these gentle-
men, your active coöperation and assistance.

W. EDWARDS,
Secretary.

November 30th, 1861.

CANADIAN PATENTS,

BUREAU OF AGRICULTURE AND STATISTICS, Quebec,
29th November, 1861:—

Chester Chattuck, of the City of Toronto, County of
York, Tanner, for "A new Composition of Matter for
tanning leather."—(Dated 7th January, 1861.)

Cyrus Kinuey, of the Township of Dereham, County
of Oxford, Yeoman, Assignee of Israel Kinney, of the
Town of Simcoe, County of Norfolk, Waggon Maker,
for "A new mode of applying power to any machinery
by combining rotary motion with the inclined plane."
—(Dated 10th January, 1861.)

Ferdinand D. Lloyd, of the City of Toronto, County
of York, Tinsmith, for "Lloyd's Patent Broadcast Seed
Sower."—(Dated 12th January, 1861.)

Jehiel Churchill, of the Township of Pickering, County
of Ontario, Yeoman, for "A Stump Extractor."—(Dated
16th January, 1861.)

Samuel D. Shorts, of the Township of Richmond,
County of Lennox, Yeoman, for "A machine for the
manufacture of Cheese and Butter, termed the Dairy
Maid."—(Dated 16th January, 1861.)

Frederick Rodgers, of the City of Hamilton, County
of Wentworth, Manufacturer of Sewing Machines, for
"An improved Cam for working the under needle or
catch-pin of Sewing Machines."—(Dated 16th January,
1861.)

James Armstrong, of the Township of Bathurst,
County of Lanark, Blacksmith, for "A new and im-
proved Churn, termed The Jenny Lind Churn."—(Dated
16th January, 1861.)

David Fell, of the Town of Cornwall, County of Stor-
mont, Saloon Keeper, for "A new and improved Rotary
Lever Churn."—(Dated 16th January, 1861.)

Henry Palmer, of the City of London, County of
Middlesex, Gentleman, for "A new Electro Voltaic
Pocket Battery."—(Dated 16th January, 1861.)

Francis Ervin and William Beemer, both of the
Township of Brantford, County of Brant, Carpenters,
for "A Horizontal Lever Washing Machine."—(Dated
24th January, 1861.)

Edward G. Maxwell, of the City of Montreal, Carpen-
ter, for "A Spring Latch, to be called Maxwell's Spring
Latch."—(Dated 25th January, 1861.)

PROCEEDINGS OF INSTITUTES.

Toronto Mechanics' Institute.

The Quarterly Meeting of the Members of this Institution was held on Monday, the 18th of November; the President, Rice Lewis, Esq., in the chair.

The board of Directors, in their report submitted to the Meeting, congratulated the Members on meeting them in their New Hall, undoubtedly one of the most complete of its kind on the continent.

The report alluded to the great expense incurred in decorating the Music Hall; and in finishing and furnishing the numerous rooms in the building, (31 in number besides passages) which, with the steam heating apparatus now nearly completed, will exceed the amount at the credit of the Board by about one thousand dollars. To raise this large sum of money it is proposed to hold a Bazaar, or EXHIBITION SALE, in connection with the Inauguration of the Building, on the 23rd and 24th of December (instant); and the Directors rely on the Active Cooperation of the Members in Making, and obtaining from their friends, contributions of Ladies' Work, Mechanical Specimens, and Articles of Utility and Ornament. Several valuable specimens have already been presented, and a Committee of Ladies have announced their determination to do their utmost in furtherance of this object.

The hope previously entertained respecting the increased prosperity of the Institute, when it should remove to its new premises, has been fully realised in the increase to the number of its members; and should the increase continue for the next six months, in the same ratio as in the past the Membership will have doubled itself within the year. The Library has also been increased during the same period by nearly 1,000 volumes; and the Reading Room has received many important additions.

The report also stated that arrangements have been made for establishing classes in Free hand Drawing and Painting, Architectural and Mechanical Drawing, Elocution, and the Theory and Practice of Music; and invites the support of the members to this important department of the Institute.

The Board has made no arrangements for a regular course of Lectures during the coming season, but will embrace any opportunities that may occur for securing the services of Lecturers on appropriate subjects, without interfering with ground already occupied.

The Report was unanimously adopted.

The Members generally expressed themselves as well satisfied with the Management of the Board of Directors, in the several departments of the Institute, and gratified at the progress the Institute is making, when the Meeting adjourned.

THE SECOND VOLUME OF THE

Journal of the Board of Arts & Manufactures

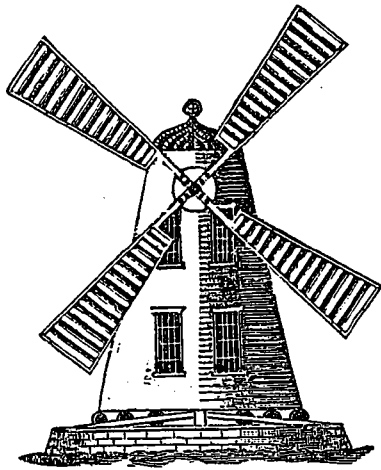
FOR UPPER CANADA.

ENLARGEMENT OF THE JOURNAL.

This number will close the First Volume of the Journal of the Board of Arts and Manufactures for Upper Canada. When the Board for Upper Canada issued their prospectus in December, 1860, they did not look upon the proposed issue of a monthly periodical devoted to the encouragement of Arts and Manufactures in the light of an experiment, which might fall to the ground through neglect or indifference, they considered it to be their duty to embrace and secure by every means at their disposal, opportunities of affording encouragement and assistance to home industry. In no way could this object be better attained than by a medium through which its operations and those of kindred institutions could be made known in the Province, and many of the intellectual wants of a numerous class engaged in manufacturing industry throughout the country, supplied if made known.

In all respects, with the exception of correspondence, has the Journal met with the anticipations of its promoters. As it is impossible with the means at our disposal to obtain information respecting local progress or local wants, we again call attention to that paragraph in the prospectus which refers to the coöperation of others. "All who are engaged in industrial pursuits, capable of improvement or extension, can recognize the advantages which a journal of the character proposed is capable of conferring; and it is earnestly hoped that many will be willing to contribute information as to what is *now doing* in Canada, and suggestions as to *what may be done* with profit to individual enterprise and advantage to the Province." Such, however, has been the share of encouragement awarded to this Journal, that the Board has determined to enlarge it by four additional pages in each number, or 48 pages in the volume. The monthly issue will also be printed on a larger sheet, and supplied with a cover, stitched and cut. These improvements will, we trust, be met in a liberal and encouraging manner by Mechanics' Institutes, Reading Associations, and private individuals. The Journal is supplied at the following rates:—At \$1 per annum for single copies, or to Clubs of ten or more at 75 cents per copy; to members of Mechanics' Institutes, and of Literary, Scientific and Agricultural Societies, through their Secretary or other Officer, 50 cents per annum per copy.

Vol. I., neatly half bound in coloured sheep, will be supplied for \$1; and to Members of Mechanics' Institutes, &c., &c., at 75 cents per copy.



NEW WINDMILL POWER FOR GRINDING, &c.

Patented by R. H. Oates, Toronto, August 9th, 1861.

The principle of this invention is, that the Mill House revolves on a Circular Foundation, so as to keep the sails towards the wind; the sails being self-adjusting will cause the Machinery to run as steady in Squalls or a Storm, as in moderate wind. It is estimated that a Grist Mill on this plan can be built and completed for about \$2,000, with two run of Burr Stones, two Bolts, &c.

DESCRIPTION OF BUILDING.—"Build a circular stone foundation, say 32 feet diameter, two feet thick, two feet above, and as much below the ground as will keep it from being affected by frost. On the top of this, place a circular plate of timber 12 inches square, frame into this two cross braces same size, crossing each other exactly in the centre of the circle. Bolt this wooden circular plate secure by wrought iron bolts coming up through the stone foundation. On the top of this timber circle, bolt or spike on a circular cast iron plate, half an inch thick and four inches broad; on the centre of the cross formed by

the two braces, place a cast iron centre post 10 or 12 inches in diameter three feet high with a flange at the bottom two inches thick and 18 inches diameter with 8 bolt holes, 1½ inch diameter. This flange is sunk flush into the timber and bolted fast by 8 wrought iron bolts, 1½ inch diameter. Twelve inches above the flange, a collar is cast on, and 15 inches above the collar is a key hole with key and washer. The Mill House is 18 feet square at the base and 9 feet square at the top; the posts are from 25 to 30 feet high.

One corner of the Mill House is the weather corner out through this corner and as near the top as possible comes the wind shaft to carry the sails. This weather corner rests on the collar of the iron centre post. The main body of the Mill House from side corner to side corner with 9 cast iron wheels 12 inches diameter and 4 inches thick underneath, rest on the circular iron plate track. The lee corner overhanging the circular foundation about 8 feet. The iron centre post will come up through an iron ring in the lower floor just inside of the weather corner with washer and key above said floor."

ADVANTAGES OF THIS PLAN.—The Mill House swings on the circular base round the iron centre post as the wind changes, like a ship at anchor. This is an advantage over the old Post Mill which has to be shifted by hand. The Mill with a revolving top is self-acting in part by the help of a small fantail wheel to bring the sails to the wind when wrong, but at times, in sudden squalls, this fantail wheel does not operate quickly enough and the sails are blown off; in consequence the Miller has to be very watchful of the weather, or his Mill will meet with serious accidents. While a Miller in a Mill on my plan, need not trouble himself about the weather, let it come as it may, the Mill takes care of itself. Its advantage over Water Mills is, that you can build this Mill where you please, and its advantages over Steam being that the driving power costs nothing.

The patentee offers a free right and all the necessary information, to whoever builds the first Mill on this plan.

BRITISH PUBLICATIONS FOR OCTOBER.

	<i>Sig. prices.</i>	
Abercromby (Lieut.-Gen. Sir Ralph), A Memoir by his Son, James Lord Dunfermline, 8vo.....	£0 10 6	<i>Edmonston.</i>
Amateur Illuminator's Magazine, and Journal of Miniature Painting, No. 1, sm folio	0 2 6	<i>Dry & Son.</i>
Anderson (T. McCall) On the Parasitic Affections of the Skin, 8vo.....	0 5 0	<i>Churchill.</i>
Apel (Madame) Essentials of French Grammar, 18mo.....	0 0 9	<i>Cornish.</i>
Barlow (Geo. Hilaro) Manual of the Practice of Medicine, 2nd edit., fcap. 8vo.....	0 12 6	<i>Churchill.</i>
Bayley (W. H.) Handbook of Slide Rule, its Applicability to Arithmetic, &c., 12mo.	0 6 0	<i>Bell & Daldy.</i>
Beadle's American Biographies. Life of Pontiac, the Conspirator, by E. S. Ellis, fcap. 8vo.....	0 0 6	<i>Beadle.</i>
Beale (Lionel S.) On the Structure of the Simple Tissues of the Human Body, 8vo.	0 7 6	<i>Churchill.</i>
Beaumont (Rev. W. J.) Cairo to Sinai and Sinai to Cairo, in Nov. and Dec., 1860, fcap. 8vo.....	0 5 0	<i>Bell & Daldy.</i>
Beeton (Mrs. Isabella) Book of Garden Management, Part 1, 12mo.....	0 0 3	<i>Beeton.</i>
Household Management, with illustrations, post 8vo.	0 7 6	<i>Beeton.</i>
Bohn's Classical Library. Demosthenes' Orations against Timocrates, &c., trans. post 8vo.....	0 5 0	<i>Bohn.</i>
English Gentleman's Library. Walpole's Letters, Vol. 7, 8vo.....	0 9 0	<i>Bohn.</i>
Book of Familiar Quotations (The) from the Best Authors, 3rd edit. fcap. 8vo.....	0 5 0	<i>Whittaker.</i>

Bourne (John) The Cotton Crisis, and How to Meet it: a Letter, 8vo.....	0	1	0	Longman.
Briggs (H. George) The Nizam: his History, and Relations with Brit. Government, 2 vols. 8vo.....	2	2	0	Quaritch.
Bristow (Hen. Wm.) Glossary of Mineralogy, post 8vo.....	0	12	0	Longman.
Brookes (R.) General Gazetteer, in miniature, by A. G. Findlay, roy. 18mo. ad- vanced to.....	0	5	0	Tegg.
Bruce's Travels and Adventures in Abyssinia, illust., sup.-roy. 16mo. reduced to...	0	3	6	Black.
Burn (Robt. Scott) Illust. of Mechanical Movements and Agricultural Machines, 4to	0	3	0	Chambers.
Chain (A.) of History, Part 1.—From Nimrod to Charlemagne, 18mo.....	0	1	0	Simpkin.
Chalmers (James) The Channel Railway, connecting England and France, roy. 8vo.	0	3	6	Spon.
Chide (Rev. G. F.) Singular Proprieties of the Ellipsoid, &c., 8vo.....	0	10	6	Macmillan.
Circle of the Sciences (The), Vol. 8.—Mathematical Sciences, new edit., cr. 8vo.....	0	5	0	Griffin.
..... new edit.. Vol. 9.—Mechanical Philosophy, cr. 8vo.....	0	5	0	Griffin.
Collier (Wm. Francis) History of English Literature, sm. cr. 8vo.....	0	3	6	Nelson.
Cooper's Dictionary of practical Surgery, new edit., by S. A. Lane, Vol. 1, 8vo.....	1	5	0	Longman.
Craik (Geo. L.) History of English Literature and the English Language, 2 v. 8vo.	1	4	0	Griffin.
Delamotte (F. G.) Medieval Alphabets and Initials for Illuminators, fcap. 4to.....	0	6	0	Spon.
Dickes (W.) Studies from the Great Masters, Part 8, imp. 4to.....	0	2	0	Hamilton.
Dobell (Horace) Lectures on the Germs and Vestiges of Disease, 8vo.....	0	6	6	Churchill.
Drew (Samuel), the Self-taught Cornishman, a Life Lesson, 12mo.....	0	3	6	Ward & Co.
Dumas' Historical Library.—The Page of the Duke of Savoy, fcap. 8vo.....	0	2	0	C. H. Clarke.
Ellis (Edward S.) Life of Pontiac the Conspirator, fcap. 8vo.....	0	0	6	Beadle.
Elwes (Alfred) Richmonds' Tour in Europe, new edit., cr. 8vo.....	0	2	0	Routledge.
Exeter, History of the City of, by Rev. George Oliver, 8vo.....	0	12	6	Longman.
Gamgee (Jno.) and Law (Jas.) Anatomy of the Domestic Animals, illust., roy. 8vo..	0	12	0	Simpkin.
Ganot (A.) Elementary Physics, edit. by E. Atkinson, Part 1, post 8vo.....	0	1	0	Baillière.
Glenny (Geo.) Properties of Fruits and Vegetables, a Guide to Judges, &c., fp. 8vo.	0	1	0	Houlston.
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Selected Articles.

ON WASTE.

(Continued from page 302.)

A patent has been recently obtained for cutting up the clippings of leather, and introducing them into the soles of boots and shoes, rendering them easier to the wearer and quite as durable; thus saving new material. Leather cuttings are also employed in the manufacture of Prussian blue. I have recently had some paper presented me by the Messrs. Schlagentweits, the celebrated German travellers, made in Berlin, from the cuttings of leather. The paper is remarkably tough, and apparently adapted for serviceable purposes; but it has not yet been used in sufficient quantity to render it a profitable manufacture.

I have hitherto been speaking of the physical properties of waste substances; but waste matters are composed of chemical elements, which can be changed into other compounds by which we can get new substances; and some of our most extensive manufactures depend on this fact. All the substances of which I have spoken—the clippings of leather and the fibres of wool and silk,—whatever animal substances we may have, are composed of the four elements,—carbon, hydrogen, oxygen, and nitrogen. We find all these elements in carbonate of ammonia. Now the difference of these elements, as they exist in the carbonate of ammonia and as they exist in bones, or in hoofs, or in horns, or in wool, or in skin, is this—that the elements of the animal body are much more easily changed, and more readily made to assume combinations which are useful to man, than if he had to deal with mineral compounds. Hence it is that he prefers to work chemically at the gelatine or wool, or some other constituent, than to take carbonate of ammonia, which is cheap enough but not the easiest to work with.

With this view I will now speak of skin waste. The tanner has waste. While he is preparing his skins, he cuts off the fat and the portions which cover the legs and the ears. He sells all these. The oil and the fat are sold to those who boil down oils and fats of all kinds. You will recollect that the oils and fats can be made into soap; and it is no matter whether the oil or fat be obtained from skins or from other sources. Then again this oil and this fat, obtained from the tanners' waste is made to yield its stearic acid. Its glycerine may be obtained for all the purposes to which it can be applied, and its stearic acid may be manufactured into candles. The bits of skin are carefully collected and boiled down with various other odds and ends of animal substances. The various sources from which these pieces and scraps of skin are obtained are very numerous. They are bought by the manufacturer, and after some process of selection, they are placed in large vessels and boiled in water, and thus they are made to yield gelatine. The oil contained in those substances floats to the top. If the manufacturer wants a coarse and common tallow, it is employed as it is taken off; but if you are to have a better kind, it is afterwards prepared with great care. The water being evaporated, the gelatine is then procured. If the gelatine is to be used as size in the arts, it is less carefully prepared than if it is to be sent to your table as isinglass; and, let me tell you, whether you

get the isinglass from the sounds of the sturgeon or from these things, it is all the same to you; for they are boiled down and purified, and can do no harm. Perhaps, with regard to these materials which have the same composition, from whatever source they are derived, it is best to ask as few questions as possible. The manufacturer of gelatine asks no questions, and perhaps it is prudent that you should ask none. This gelatine is certainly a very interesting substance, on account of the great variety of forms it assumes. According as it is used for one purpose or another, it is prepared carefully or not. When it is used in the arts for adhesive purposes, as in the form of glue, it need not be so destitute of colour or so carefully prepared. On the continent it is now manufactured into all kinds of forms. Large sheets are made for the purpose of colouring glass, for cutting up and forming into artificial flowers. It is used for the internal decoration of rooms, and for the wrappings of sweat-meats. Those who are in the habit of cracking *bon-bons* at the supper-table will recollect that they are wrapped up in this coloured gelatine. This manufacture is entirely dependant upon the use of what was a few years ago regarded as waste material.

I now come to the waste in bones. I mentioned that buttons were made of bones, and handles of knives, and a variety of useful articles, are made of bones. The buttons are punched out of the bones, and the pieces that are left are not lost. The dust made in sawing bones is collected; and butcher's bones and household bones are all used. They are first boiled down, and the fat is taken off, as in the case of the skin, and then their gelatine is dissolved, and the gelatine is used for glue, or size, or isinglass. In the bone that is left, there is still useful material, which may be employed for various purposes. The refuse of the bone-boiler is now commonly introduced into a closed furnace, by which a peculiar kind of animal charcoal is produced. So you see that after they have made buttons they are used for making size, gelatine, jelly, soap, and candles, and then they are still available for making animal charcoal. This charcoal, for many things, is better than any other; and this raises the question why this is the best? There is another form of animal charcoal obtained from burning blood, and which may be considered the best animal charcoal, because it contains the largest quantity of carbon; but it is found that this bone charcoal is better for filtering purposes than the ordinary animal charcoal, and at this moment it is fetching a higher price in the market. It is used especially for filtering water and refining sugar. You know that sugar is brought into this country in a brown state. Here it is melted and purified by passing through animal charcoal. One filtration is not sufficient, but a second is; and the charcoal which is found to be most efficient is this charcoal which is made from the refuse of bones after all the gelatine and fat have been extracted. It is probably, then, not so much the carbon which strains and keeps out this organic matter, as the phosphate of lime. Now, I do not mean to say that any one would make a fortune by it, but it is worth consideration whether common vegetable charcoal mixed with phosphate of lime may not answer as well. Here, perhaps, we may inquire, how it is that these charcoals act as purifying agents. I may say that this purifying action is not confined to water and sugar, but that chemists use animal charcoal as a means of purification for a variety of processes. It would seem, with regard to the water, that the animal char-

coal has a power of absorbing and holding, and, as it were, introducing oxygen to the impure substances contained in the water, so that they become oxidized and converted into something else; for we find that the animal charcoal retains its power of purification for several years. If, instead of oxidizing these substances and passing them through, it acted as a strainer or sieve, straining out the impure materials, then you would have the charcoal blocked up; but it is not so. These impure substances in water are all composed of carbon, hydrogen, and nitrogen. The oxygen oxidizes the carbon, and forms carbonic acid gas, which makes the water sparkling and refreshing. It oxidizes hydrogen, and converts it into water; it oxidizes nitrogen, and converts it into nitric acid. One of the impure-smelling substances in water is sulphur, and the oxygen unites with it; and thus we get sulphuric acid, or sulphates. Thus the impurities of the water are converted into substances which may be consumed without any injury whatever.

This, I think you will say, is a most remarkable instance of the application of waste to important purposes. This has really arisen out of the necessities of the bone-boilers, who, when they had obtained the fat and gelatine out of the bones, left them to accumulate and engender and send forth a smell of sulphur and ammonia, and other compounds, which made people object to the annoyance of bone-boiling houses near to them; and now, instead of allowing these bones to lie and produce these ammoniacal compounds, they are once thrust into a furnace, and converted into charcoal. Now, these things encourage us to go on. Let us not be beaten by bad smells. All these substances which throw out disagreeable odours—all these may be conquered and made to serve our highest and best purposes in life. The very sewers' smells, which are so injurious in the summer season of the year in this metropolis, even these may be made to form compounds with other substances, which, being conveyed on to the land, actually fertilize it; and the compounds of carbon, oxygen, hydrogen, and nitrogen of the sewers become the compounds which feed us in "our daily bread."

Then, suppose you had used your animal charcoal, and that it had become blocked up, what are you now to do with it? You cannot reburn it; but although it will not bear that process, it still contains phosphate of lime; it still contains that precious constituent which forms part of our bones, and the bones of the lower creatures. We must have that in our system, and where are we to get it from? The bread which we eat from day to day must have it. And where is the bread to get it from? Why, from the land on which it grows. If the land will not grow wheat, and the meadows grass, they must be made to do so. The soil may become exhausted, and has again and again been exhausted. We have instances of farms which have ceased to grow wheat because they have no more phosphate of lime. There are meadows which fail to grow grass because of the want of this phosphate. Then how can the farmer remedy this? In no way but by applying the phosphate to the soil; and this he may do by applying to his land the refuse of our great cities. But we may throw away our phosphate, we may pour it into our sewers and rivers, and thus destroy it, whilst our crops are exhausting our fields;—and this is the history of the great empires of antiquity. Why have they ceased to exist? History will give

you a variety of reasons why they have sunk. Some will tell you that it was because of their immorality, and others because of their civilization. But you will find around the great cities of antiquity, of Africa, of Asia, and of Europe, that the soils have become exhausted of their phosphate of lime, and consequently their crops have failed. Man could not then bring his food from great distances, and he has been compelled to seek his food on exhausted soils. On this account the great cities of antiquity have been depopulated, and new colonies have sprung up in every part of the world. But modern chemistry has shown man how he can avoid this necessity. It has pointed out that we have in these decaying bones the material of future life: it has shown us that in the earth are the bones of extinct animals containing this precious phosphate of lime. Thus we now bring up these creatures of a pristine world, and throw their ashes on our land to fertilize our fields. In the form of coprolites and phosphatite, we now get this phosphate of lime from the green sand of Cambridge, the red crag of Suffolk, the lias of Gloucestershire, the weald of Sussex and the Isle of Wight. This phosphate, in a mineral form, has also been found in Estremadura, in Spain, that country of never-ending wealth. There it exists in thousands, tens of thousands, probably millions of tons; although Spain has not yet arrived at a knowledge of the importance of this substance, and sends little or none into the markets of Europe. We get it, however, from Sweden and Norway, and other parts of the world. And here we have an instance of the use of that which previously had no value, being made subservient to the highest purposes in the life of man.

The dust of bones and ivory is sold in the shops, and used for various purposes. Ivory filings are collected most carefully by the ivory-turner, and sold as ivory-dust. Jellies are made from ivory-dust, and they are supposed to be more nutritious than jellies made from other things. I have, however, told you, in previous lectures, that gelatine is not nutritious. However, we have in this ivory-dust phosphate of lime, and it may be that a portion of the phosphate is thus introduced into the system. Then, bone-shavings are used as a substitute for ivory-dust, and are employed for the purpose of making a jelly which is frequently administered to the sick. Ivory-dust and bone-shavings are also employed for making a size.

Passing the refuse of leather, skin, bone, and ivory manufactures, I come to a curious instance of the application of refuse to purposes in the arts. If you recollect what I said more particularly with regard to the preparation of cloth, you will remember that I stated that soap was frequently employed for the purpose of washing away the oil and other impurities in the wool. Now, this soap is used in such large quantities, that soap-suds have become a source of annoyance in the rivers in cloth-manufacturing towns; and it has occurred to chemists, that if the materials of the soap could be collected, they are of considerable value; and in some places there are arrangements made for arresting the suds, which contain both potash and oil in large quantities. When collected, sulphuric acid is added to the suds, and the soap is thus decomposed; the potash and the soda go to the sulphuric acid, whilst the fatty matter floats on the top; and in this way large quantities of useful matter are rescued from destruction in our manufactories. The fatty matter which rises to the

top of these soap-suds is skimmed off and made into soap again, or into candles, or converted into other products in which fat is used. I do not know whether in our domestic arrangements, it would be economical to keep a bottle of oil of vitriol, to enable us to skim off the fat from our soap-suds, but, at any rate, it is an interesting application of refuse, and ought not to be lost sight of.

Now, let me call your attention to another process. The fragments of woollen clothing, bone drillings, whalebone shavings, hoofs and horns, button-makers' refuse, horn-shavings, dried blood, woollen waste, all sorts of animal products, the sweepings of manufactories, the lost atoms, which could not be used or employed for anything else in the respective manufactories, are used for making crystalline salts, known by the name of *prussiates*. There are two of these prussiates generally known; one is a beautiful yellow salt,—the other is an equally beautiful red salt.

And what are these prussiates? It is just worth while studying them for a moment, to see what curious compounds result from animal chemistry. The word prussiate comes from prussic acid (which comes from Prussian blue,) which is also called hydrocyanic acid, and which is composed of hydrogen and cyanogen, and the latter is a compound of carbon and nitrogen. Old scraps of iron are collected together, and with potash and animal matter form these prussiates.

In order, then, to obtain these salts, we take three sets of substances:—1. Refuse of animal substances—blood, bones, hoofs, horns, &c., which yield nitrogen and carbon. 2. Old scraps of iron,—refuse iron, shoes from dead horses, rusty nails, and worn-out iron hoops. 3. Potashes, Montreal ashes, the refuse, if you like, of hewn trees; and these supply the potassium. Now, when these things are exposed to heat together, they arrange themselves in this way:—the iron unites with the carbon and nitrogen in the form of cyanogen, forming ferrocyanogen, and this compound unites with the potassium, forming the ferro-cyanide of potassium; and this is what these salts are—ferro-cyanides.

I will not go further into the history of these prussiates, but just say a few words about their use. I do not know that there is any use for this prussiate of potash alone; but let us see how it acts in combination with iron. There are two proportions of cyanogen, and two proportions of potassium, and one of iron. Now, if we take a solution of iron and add it to a solution of this yellow salt—this prussiate of potash—it will be converted into a beautiful blue substance. This is Prussian blue—Berlin blue; and it is the base of all the blues that are known by that name, and the base of many other colours also. What is this Prussian blue? Why, it is a ferro-cyanide of iron. We displace the potassium by the addition of the iron, and thus form this important dyeing material. This is obtained, then, from waste made up of the sweepings of our manufactories, the refuse of our slaughter-houses, and blood and filth of all kinds. Man comes in, you see, as creator, builds up the elements, and makes all these beautiful colours with which he dyes his silk, and makes blues for his calicoes and other materials. The Prussian blue is also mixed with flocks, and is used as a pigment, being extensively employed wherever a blue colour is an object.

Now, there are many other things which I might speak of in connection with this large subject. I might show you that some materials which look un-

likely to be employed in the arts for any useful purposes, have been employed in that way. Recently there has been an attempt to use the substance which we know by the name of guano. We bring it over to this country on account of the phosphates which it contains. A series of beautiful colours have been obtained from this guano. If we take a little of it and mix it with nitric acid, we shall find that it will produce the beautiful colour of murexide. In the South Kensington Museum there is a series of colours which have been manufactured from guano. A few years ago, the test of the action of nitric acid upon the substances contained in guano was merely an amusement or chemical test; nobody ever thought of using it in the arts. But now, these substances are manufactured in large quantities, and guano is used successfully in the arts.

These beautiful colours do not, however depend on the phosphates of the guano, but upon the lithate of ammonia. When we add nitric acid to this substance, the purpurate of ammonia, or murexide, is produced. According to the way in which the guano is heated, will be the variety of results obtained. This is just one of a hundred applications of chemical knowledge to substances having a similar nature to guano.

I was asked the other day whether I had ever seen the colouring matter produced from an insect (*Cimex lectularius*) uncommonly disliked in this country. Some one in Australia, it was stated, had taken out a patent for procuring a beautiful colouring substance from this little creature. And if this should be the case, there is no doubt that they would run the hazard of extermination. I do not know whether this process has succeeded, but it illustrates the fact that there are hundreds of common things around us which may be made useful by the application of industry and intelligence.

Speaking of insects and their products, I must here remind you that to the insect tribe we are indebted for chloroform—one of the most powerful agents in alleviating human pain. The little ant contains a substance called formic acid, about which old John Ray and Martin Lister corresponded a century ago; and they found that it contained an acid; and so it got into books as formic acid. It was found to be composed of a compound radical, formyle, and three atoms of oxygen. Dumas substituted chlorine for the oxygen, and thus obtained terechloride of formyle, which is chloroform. Then the Americans found that ether was capable of taking away all sensation from the human body; and Dr. Simpson, of Edinburgh, found that terechloride of formyle was more thoroughly adapted for this purpose than even ether. All this has arisen from a study of the habits of insects. There is no telling but that every insect has some use in relation to man. Such facts are inducements to study. Be not dismayed by obtaining no immediate results. Surely it is some reward, even if we do not get money payment, to feel that we have not lived in vain; that we have exerted our brains to the utmost to fulfil the mission that God sent us to perform on this earth; and that we have left the world wiser and better for our work in it. But you may be assured some people will get the money. You and I are the better for rich men. These large capitalists are not keeping the money in their pockets: they are spending it in a variety of ways. It is the wildest of theories to think rich men are an injury to the poor: they better the poor man. Then let us help the men

to get rich seeing that they cannot deprive us of the blessings of intellectual research and exertion.

But here I must cease my illustrations from the insect kingdom. The subject is a large one, and I hope some day again to bring it before you. I have before said there is no part of an animal which is not of use. So when they are dead, they ought not to be buried or cast away. I wish here to illustrate the whole subject of the uses of dead animals by this diagram, drawn up by Dr. Playfair, which gives you the value and uses of a dead horse. The value is not a large

Value of a Dead Horse, from 20s. to 60s.: Average value, 40s.

Weight in pounds, from 672 to 1,138; Average weight in pounds, 950.

	WEIGHT	VALUE.	USES.
Hair	1lb. 1½	8d. to 1s. per lb.	Hair-cloth, mattresses, plumes, and bags for crushing seed in oil mills.
Hide.....	30	About 8s.	Leather.
Tendons	6	Glue and gelatine.
Flesh, boiled	224	1l. 8s.	Meat for men, dogs, and poultry.
Blood.....	60	Prussiate of potash, and manures.
Heart & Tongue.....	A mystery.
Intestines.....	80	Covering sausages and the like
Fat	20	3s. 4d.	Used for lamps after distillation.
Bones.....	100	4s. 6d. per cwt.	Knife handles, phosphorus, super-phosphate of lime, bone dust.
Hoofs.....	6	8s. to 10s. per cwt.	Buttons, gelatine, prussiates and snuff boxes.
Shoes	5	5s. to 10s. per cwt.	Shots and old iron.

sum,—from 20s. to 60s. on an average; but recollect that every application to art or science of this dead horse renders him of greater value; and it is for us, engaged in various ways in the arts of life, to see whether we cannot apply things that have hitherto been wasted. Five hundred horses die every week in London. The hair, you see, is worth from 8d. to 1s. per lb., and it is used for making hair-cloth, for stuffing mattresses, and making plumes, and bags for crushing seed in oil-mills. Then the hide, weighing 30 lbs., is worth 8s., which is perhaps not a great deal of money; but when you have from 300 to 500 a week dying within a radius of five miles from Charing Cross, it comes to some money. Then the skin is used for a variety of purposes; tendons you know may be made into gelatine, and glue, and jellies. I told you that you must not be particular about these jellies: when the poor old horse has drawn your carriage, served you in omnibus and cab, and died at last; even then you have not done with him, for his tendons may then serve you for your delicious jellies. Then again it is not an uncommon thing for man to eat horse-flesh. We do not eat it here knowingly, but they eat it on the continent of Europe. There is a story of a Frenchman, who thought we sold meat for almost nothing, for we sold it on skewers for a penny a skewer-full. Then there is the blood, which is carried to the prussiate of potash manufacturers. Then there are the internal tubes, which are used for the coverings of sausages; and, as I said of the jellies, we need not ask any questions about these coverings as long as they are sweet. The heart and tongue are evidently great "mysterics," for no one knows what is done with them. There is almost as much mystery about

them as about the manufacture of the cloth of your coat. The heart, however, can be chopped up and mixed with sausage meat, and the tongues may be sold for ox-tongues. On a recent occasion, when I stated this fact, a newspaper which reported my lecture added that it was all a mistake, and that the tongues were never sold for so inferior an article as ox-tongue: they were always sold as reindeer tongues. Now, passing over the fat, which is worth 3s. 4d., I need not tell you that horses' bones are as good as any other bones, and can be employed for the various purposes to which other bones are applied. The bones of a horse weigh about 160 lbs., and are worth 4s. 6d. per cwt. Then there are the hoofs, 6 lbs. of these, at 8s. to 10s. per cwt., which can be used for making buttons, prussiates, and snuff-boxes. I do not think that it is correct to say they are used in making glue. I think horses' hoofs are composed of the same material as hair. They are sold, it is true to the glue-maker, but he sells them to the prussiate manufacturer. Even the poor old shoes are worth from 5s. to 10s. per cwt.; and even with regard to all these substances employed, there is nothing which cannot be used again and again.

Miscellaneous.

The Adulteration of Butter.

In order to distinguish between pure butter and that adulterated with lard and other substances, proceed thus:—First satisfy yourself, by melting a portion of the suspected butter over a water-bath, and observing if there be any insoluble admixture of farinaceous matter, such as wheat-flour, potato-starch, arrow-root, or turmeric, (said to be sometimes used,) which the microscope and chemical tests will prove; then mix the melted butter in an evaporating dish with four or five times its bulk of hot water, and allow it to stand for two or three hours to collect on the surface and solidify. Detach the resulting cake of butter, and place it on a piece of blotting-paper to dry, by the absorption of all adhering aqueous matter. If a piece of this prepared butter be introduced into a wide-mouth stoppered bottle, and surrounded with ether, at the temperature of 65° Fah., it ought to entirely dissolve, forming a clear lemon-yellow coloured liquid.

On the other hand, the purest lard, which, on being melted, leaves no residue, is more or less insoluble in ether, at that temperature, as a thick milky fluid results, which, on standing, deposits to a considerable extent. The same may be said of other fats, such as dripping, mutton-suet, tallow, &c., the precipitates from which are of a much coarser and flocculent character than that from lard in ether. Hence we perceive there is a striking peculiarity about butter, which, if treated as above, enables us to readily determine its purity and the probable proportion of foreign fatty matters mixed with it. The solution of lard and other fats in ether is considerably influenced by temperature, for if the bottle containing them be held in the hand a short time, liquefaction takes place, but on a reduction of temperature they are again precipitated. The character also of the various precipitates is remarkable, and gives us some clue to their nature,—the precipitate from lard being very fine and smooth, whilst that of dripping is granular and crystalline, and that from tallow long and thread-like, laying piled up one above the other. A solution of butter in ether, exposed to a less temperature than stated, yields beautiful stellar-like tufts of very fine acicular crystals.—J. Horsley.

Burning Oil Wells.

An oil well on fire is thus described in the *Tittsville* (Pennsylvania) *Gazette*.—"A dense black cloud of smoke was distinctly to be seen as the hill-tops were reached on leaving town. That cloud increased as the well was neared, until seen from the top of the hills adjoining the valley where the well was located, when the black column of smoke appeared, up which angry and lurid flames could be seen constantly leaping and flapping about, as though endeavoring to lash themselves into greater fury. The flames rose sixty to eighty feet into the air, and the noise of the flame, and the oil, and gas rushing from the pipe, was distinctly heard three-fourths of a mile. The stream of oil, the full size of the pipe, (four inches in diameter,) was thrown fifteen to thirty feet high, and all on fire the instant it left the pipe. Drops of oil thrown off a lurid blaze, and drops of water, converted into steam, were flying in every direction. Spiral columns of flame, formed by currents of air, rose on every side, and in great fury, presenting a most unique spectacle. The scene was grand, and one long to be remembered."

The Electric Light in Paris.

The experiments with the electric light, which have now been made for a long time past at the Palais-Royal, Paris, are still continued every evening with increasing success. Lately, instead of two burners fed by divided currents from the magneto-electric machine, one burner, fed by a single current has been used. It is raised sixteen metres, and illuminates, as with the light of the full moon, the whole square in front of the Palais-Royal and the two entrances of Rue Saint Honoré. Two hyperbolic reflectors—one above the light, the other below—increase and diffuse the light. By certain improvements in the prisms or cylinders of artificial carbon, which are used in the production of the light, M. Curmer, is now able to make electric lamps which will burn five or six hours without requiring any attention. The lamp of M. Serrin, placed before the house of Prince Eugene, also burns brilliantly. M. Serrin has succeeded lately in causing his lamp to burn under water almost as well as in the atmosphere. Thus, we may now light the bottoms of rivers, or of the sea, or the bottoms of floating vessels, sunken wrecks, the foundations of piers, and other submarine structures. It is expected that we shall soon be able to apply this method of illumination in our lighthouses, ships, and generally on land in our cities and houses. At the Invalides lately, in the presence of Despretz, Babinet, Foucault, and others, a magneto-electric machine was worked by one of Lenoir's lately-invented gas-engines, of 3 horse-power. By this means, a strong electric current was generated, and M. Serrin's lamp gave a very brilliant light equal to two hundred Carcel burners.—*London Mechanics' Magazine*.

Properties of Flint or Silica.

It is well known that silica can, by appropriate means, be obtained in the form of a pure aqueous solution, and it was to this liquid that we accordingly directed our attention. This solution can be made in several ways:—

1. By dissolving sulphide of silicium in water, when sulphuretted hydrogen is given off, and the silica remains completely dissolved, and in such quantity that the liquid gelatinises when an attempt is made to evaporate it.

2. By precipitating silica in the gelatinous state from an alkaline silicate, by means of acetic or other weak acid, and, after well washing, heating it for some time under pressure, with a small quantity of water in a closed vessel. A liquid is thus obtained which gelatinises on addition of a saline solution.

3. By passing gaseous fluoride of silicium over crystallised boracic acid, and separating the hydrofluoric and

boracic acids by digestion with a large excess of ammonia, a hydrate of silica remains, which, when well washed from the above acids, is very soluble in water. This solution gives no precipitate when boiled but leaves silica as an insoluble powder on evaporation.

4. By the beautiful method recently pointed out by Professor Graham, in which advantage is taken of the new means of separating bodies by *dialysis*. A solution of silicate of soda, supersaturated with hydrochloric acid, is placed on one side of a parchment paper septum, pure water being on the other side; in a few days the hydrochloric acid and chloride of sodium will be found to have completely passed through the diaphragm, leaving the silica in aqueous solution, and so pure that acid nitrate of silver fails to detect chlorine in the liquid. This solution remains fluid for some days, but it ultimately gelatinises. We have generally adopted this last plan of preparing the aqueous solution of silica, although a stronger solution is obtained by the method first given.

When a pure aqueous solution of silicic acid prepared as above is allowed to soak into the pores of chalk or dolomite, a process of hardening rapidly occurs, which goes on increasing for several days, whilst, owing to its considerable depth of penetration, and to there being no soluble or efflorescent compounds to be removed, there is every probability that this hard silicious impregnation will afford permanent protection to the stone. We are now actively engaged in investigating the nature of the action which takes place, and already several curious and important results have been made out, from which we are led to anticipate that our experiments will ultimately be rewarded with complete success.—*Chemical News*.

Solder for Brass Instruments.

An alloy of 78.26 parts of brass, 17.41 of zinc, and 4.33 of silver, with the addition of a little chloride of potassium to the borax, is recommended by Mr. Appelbaum, as the best solder for brass tubes which have to undergo much hammering or drawing after joining.

Photo-Electric Apparatus.

A Trappist named Delalot-Sevin, of the abbaye de la Grèce-Dieu, has invented a new pile, much stronger, and at the same time much cheaper, than the pile of Bunsen. By means of his photo-electric apparatus he produces an electric light as cheap as gas, and with his thermo-electric pile he supplies caloric on economic terms hitherto unknown. Several of these apparatus have been constructed, and one is at full work in the abbaye of La Grèce-Dieu. Manufactories for the public are shortly to be established in Paris and at Lyons. The apparatus for producing gas will not be given to the public until after the Exhibition at London next year, but that for heating buildings will be made public on the 16th of December next. The inventor has been authorized to make public experiments with his system of lighting on the Place Saint Jacques in Paris, and on the Place Bellecourt at Lyons.

On the Natural Dissemination of Gold.

Mr. Eckfeldt, the principal assayist for the United States Mint at Philadelphia, has lately made several interesting examinations tending to show the very wide distribution of gold. Passing over the evidence respecting its presence in various galenas, in metallic lead, copper, silver, antimony, &c., we recite the following, perhaps the most curious result of all:—Underneath the paved city of Philadelphia there lies a deposit of clay, whose area, by a probable estimate, would measure over three miles square, enabling us to figure out the convenient sum of ten square miles. The average depth

is believed to be not less than fifteen feet. The inquiry was started whether gold was diffused in this earthy bed. From a central locality, which might afford a fair assay for the whole, the cellar of the new market house in Market Street, near Eleventh Street, we dug out some of the clay at a depth of fourteen feet, where it could not have been an artificial deposit. The weight of 180 grammes was dried and duly treated, and yielded one-eighth of a milligramme of gold; a very decided quantity on a fine assay balance. It was afterwards ascertained that the clay in its natural moisture loses about fifteen per cent. by drying. So that, as it lies in the ground, the clay contains one part gold in 1,224,000. This experiment was repeated upon clay taken from a brickyard in the suburbs of the city, with nearly the same result. In order to calculate with some accuracy the value of this body of wealth, we cut out blocks of clay, and found that, on an average, a cubic foot as it lies in the ground, weighs 120 pounds, as near as may be; making the specific gravity 1.92. The assay gives seven-tenths of a grain, say three cents' worth of gold to the cubic foot. Assuming the data already given, we get 4,180 millions of cubic feet of clay under our streets and houses, in which securely lies 126 millions of dollars. And if, as is pretty certain, the corporate limits of the city would afford eight times this bulk of clay; we have more gold than has yet been brought, according to the statistics, from California and Australia. It is also apparent that every time a cartload of clay is hauled out of a cellar, enough gold goes with it to pay for the carting. And if the bricks which front our houses could have brought to their surface, in the form of gold leaf, the amount of gold which they contain, we should have the glittering show of two square inches on every brick.

Microscopic Photography.

Professor Gerlach, of the University of Erlangen, has obtained some photographs of microscopic objects by a new method, which consists in taking the object itself as the negative image, and then taking a magnified positive of this image, and repeating the operation, alternately positive and negative until an image is obtained of such a size as to present details of structure far exceeding in magnitude those obtainable by the most powerful microscopes at present in use.

The Electricity of the Torpedo.

M. Armand Moreau has informed the French Academy that he has at length succeeded in collecting and condensing this electricity, by taking extreme care in insulating the body of the animal, and only bringing it in contact with the condenser at the moment when, the nerve being excited, the discharge takes place. Without these precautions the electricity is immediately conveyed to the earth. Thus it is that it is nearly impossible to collect spontaneous discharges, and that we can only succeed by provoking one.

TO INVENTORS AND PATENTEES IN CANADA.

Inventors and Patentees are requested to transmit to the Secretary of the Board short descriptive accounts of their respective inventions, with illustrative woodcuts, for insertion in this Journal. It is essential that the description should be concise and exact. Attention is invited to the continually increasing value which a descriptive public record of all Canadian inventions can scarcely fail to secure: but it must also be borne in mind, that the Editor will exercise his judgment in curtailing descriptions, if too long or not strictly appropriate; and such notices only will be inserted as are likely to be of value to the public.

TO CORRESPONDENTS.

Correspondents sending communications for insertion are particularly requested to write on one side only of half sheets or slips of paper. All communications relating to industry and Manufactures will receive careful attention and reply, and it is confidently hoped that this department will become one of the most valuable in the Journal.

TO MANUFACTURES & MECHANICS IN CANADA.

Statistics, hints, facts, and even theories are respectfully solicited. Manufacturers and Mechanics can afford useful coöperation by transmitting descriptive accounts of LOCAL INDUSTRY, and suggestions as to the introduction of new branches, or the improvement and extension of old, in the localities where they reside.

TO PUBLISHERS AND AUTHORS.

Short reviews and notices of books suitable to Mechanics' Institutes will always have a place in the Journal, and the attention of publishers and authors is called to the excellent advertising medium it presents for works suitable to Public Libraries. A copy of a work it is desired should be noticed can be sent to the Secretary of the Board.

INTERNATIONAL EXHIBITION, LONDON, 1862.

THE Commissioners for Canada of the International Exhibition of 1862, give notice to all parties desirous of exhibiting Canadian Products (whether application has been already made for the exhibition of the same or not), that such articles may be sent in for examination and approval to the following places, at any time between the TENTH DAY OF FEBRUARY next, and the under-mentioned dates, viz:—

IN CANADA WEST.—London, 18th February; Hamilton, 20th February; Toronto, 22nd February; Kingston, 25th February; and Ottawa, 28th February.

IN CANADA EAST.—Quebec, 14th February; Three Rivers, 18th February; St. Hyacinthe, 22nd February; Sherbrooke, 25th February next; and Montreal, 3rd and 4th March next.

Articles will be received and stored at the Depots of the Grand Trunk Railway Company at London, Toronto, Kingston, Quebec, (Point Levi), Sherbrooke, and St. Hyacinthe.

The Commissioners will begin their examination at 10 o'clock a.m. of each day named.

Intending exhibitors must deliver the articles for exhibition at the above named places free of charge. Should they not be approved, the Grand Trunk Railway will return them free of charge to any Depot on their line from which they have been sent.

Parties sending in Grains or Woods are requested in every case to transmit a certificate, stating the species, and varieties, and where grown. Woods should be sent of the usual dimensions for commerce; and Her Majesty's Commissioners have expressed a desire that they be shown in planks 4 inches thick, showing the sap on both sides, or in 4 inch scantling, and accompanied, wherever practicable, by twigs with leaves or flowers.

Parties desirous of further information may apply, concerning Minerals and Specimens of Economic Geology, to Sir W. E. Logan, Montreal; concerning Products of the Forest and Waters, to Dr. Tache, Quebec, or Dr. Hurlburt, Hamilton; concerning Agricultural Products, to Hon. L. V. Sicotte, St. Hyacinthe, and Col. Thompson, Toronto; concerning articles of Canadian Manufacture to Dr. Beatty, Cobourg; or to the Secretary, Montreal, to whom also, communications on all other business of the Commission are to be addressed.

B. CHAMBERLIN,
Commissioner, Secretary

Montreal, Dec. 12.