

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

SEPTEMBER, 1861.

DECORATIVE PAINTING.

Mural decoration is a subject not yet well understood by our modern house painters. There is evidently a growing desire in the public mind that our principal edifices should exhibit internally a fair proportion of the embellishment hitherto lavished on the exterior. Public buildings of the first class, including our Law Courts, Universities, and Civic Halls, while rivalling in exterior grandeur many similar buildings in Europe, are woefully destitute of internal beauty, and differ but little in this respect from our commonest buildings. The solution of this anomaly is no doubt to be found in the want of skill in the art of decorative painting, the legitimate and most appropriate species of embellishment for walls and ceilings.

Some laudable attempts have, it is true, been made to supply this defect by a species of mural painting, introduced by some German painters, commonly, but falsely, called fresco painting. The specimens we have seen executed in Toronto, and elsewhere are not such as would lead us to believe would be adopted by the originators of our really good buildings, since the art aims at nothing higher than an imitation of architectural details.

Fresco painting, as practised by the ancients, and still followed by many eminent artists, consists in colouring the plaster while fresh, that is, before it becomes dry on the wall. The paintings thus produced are of a more permanent, and durable nature than ordinary paintings on other substances. The remains of ancient frescoes are found to retain their brilliancy of colour after the lapse of many centuries.

The so-called fresco painting, which has been practised to some extent in many of the public buildings in the province, has neither durability or good taste to commend it, and therefore the former is not so much to be regretted. But it is deplorable that, with the talent for drawing evinced by the perpetrators of this species of disfiguration, there should be so little taste in the choice of subject. The true aim of painting is to copy nature, and the truer it is to its object, the more pleasing it is to its admirers. Thus natural objects, whether animal or vegetable, will always be more interesting in a picture than representations of architectural, or similar productions of art. The decoration of walls and ceilings with architraves, pillars, and mouldings is not the

legitimate work of the painter, but of the sculptor, whether he works in plaster, wood, or stone. If we require to supplement the poverty of the architecture in the interior of our buildings by painted shams, may we not apply the same rule to the exterior of our plainer edifices, and paint imitation colonnades and rich entablatures, where we cannot afford a more substantial material. Is not the idea absurd, but wherein consists the difference? Can we endure within what would not be tolerated without? Yet how few we find give themselves the trouble, for it requires no great education of the taste, to discriminate in a subject of this nature what is really good, or even barely tolerable, from what is absolutely worthless.

The subject of decorative painting has not yet received that degree of attention which its importance merits. It has not kept pace with the other branches of art which the recent revival of architecture has so fully developed. The reason probably is that we have so few ancient examples, compared with the more enduring remains of its sister arts. The destruction throughout Europe, and particularly in England, at the Reformation, of almost every kind of work in Christian art in fresco, in wood, or in missals, has doubtless deprived us of many valuable examples of a species of decoration well adapted for our present wants. Unfortunately, too, the few relics of this art have been until recently almost inaccessible to any but the antiquarian, or are published in books so rare and expensive as to be beyond the means of the humble artist, while greater facilities have obtained in procuring the examples in the obsolete pagan styles of Greece and Rome. Consequently we have had no choice between the external graining of the house painter, and the heathen gods and goddesses of the decorative artist, except the drab coloured columns, capitals, and architraves of the Germans.

The attention which is now directed to this subject in England, and throughout Europe, by such artists as Digby Wyatt and others, and the facilities afforded by the improved process of chromolithography, have brought the study of the art within the reach of the poorest mechanic who may possess the faculty of drawing. If the method of illuminating were once understood by our common house-painters, by no greater exercise of talent than is now required to imitate the graining of wood, and the veining of marble, they could produce beautiful effects by the judicious combination of a few colours in simple patterns, at much less cost than that of graining, and in endless variety.

The illuminated style of decoration is not only applicable to plastered walls or ceilings, but to every kind of woodwork, and also to furniture. Mr. W says: "To woodwork illumination may be m

most fitting embellishment; and the application of a very little art will speedily be found to raise the varnished deal cabinet or book-case far above the majority of our standard 'institutions' in the way of heavy and expensive mahogany ones—in interest at least, if not in money value."

If our ordinary house-painters could be induced, through the Mechanics' Institutes or other means, to educate themselves in the art of illuminating, by beginning at first to copy from examples of ancient manuscripts or similar works, which can now be got at trifling cost, and having studied the true principles of polychromatic effects, we should soon see a vast improvement in the style of our house decoration.

What is the present style of the art? Suppose we should wish to spend a few dollars in the extra embellishment of our drawing-room, we send for the painter and ask his advice. "Have the walls grained oak," is the ready suggestion; and he adds, "If you wish a first-rate job, have it twice varnished." "But we are tired of oak; is there no other way?" "Oh, yes; there is satin wood and maple, but there is nothing stands like oak." So, if we should follow the advice of the painter, we are absolutely tied down to a base imitation of what we could as easily, and as cheaply obtain in its genuine state. Nor would we succeed much better with the architect. He would perhaps tell us, if he should happen to know, that there is a description of wall decoration, much admired in England, by which we could avoid the objectionable sham of graining; but that it would be impossible to attempt it in this country, unless we imported the workmen. Any attempt to introduce a superior style of decoration to that in use, we are fully assured, would result in failure, unless our painters, well qualified to execute the painting usually required, gave their attention to the subject.

INTERNATIONAL EXHIBITION OF 1862.

We had hoped to have been in a position to have announced in this number of the Journal, the appointment by His Excellency the Governor General, of a Provincial Commission to act on behalf of contributors to the International Exhibition of 1862.

Our readers are doubtless aware that the Boards of Arts and Manufactures for both Upper and Lower Canada, as well as the Boards of Agriculture, memorialized the Governor-in-Council during the last Session of Parliament to appoint such a Commission, and to make a grant of money for the purpose of aiding in securing a proper representation of the Arts, Manufactures, and Natural Products of Canada.

The Government did not see fit to recommend to Parliament any appropriation for this purpose, nor

did the prayer of the memorialists for the appointment of a Commission meet with any better success; the consequence is, that Canada will be entirely unrepresented, unless this error on the part of the government is at once remedied by the appointment of a Commission, through whom alone private contributors can hold communication with Her Majesty's Commissioners, or enter articles for exhibition. This position of affairs is much to be regretted, as we are confident that an appropriation of money for this object would have met with the cordial approval of all parties; and as the Provincial Exhibitions are now about to be held, excellent opportunities would have been afforded for making suitable selections of articles for transmission home.

Memorials have again been presented by the above named Boards, with a view to induce the government to reconsider the matter of appointing a Provincial Commission.

The decisions of Her Majesty's Commissioners on the reception, classification, and charge of the goods sent for exhibition, appeared in the April No. of the Journal, but as the Commissioners have since made several amendments and additions thereto, we now publish them in full as amended.

AMENDED AND ADDITIONAL DECISIONS OF HER MAJESTY'S COMMISSIONERS ON POINTS RELATING TO THE EXHIBITION.

1. Her Majesty's Commissioners have fixed upon Thursday, the 1st day of May, 1862, for opening the Exhibition.

2. The exhibition building will be erected on a site adjoining the gardens of the Royal Horticultural Society, and in the immediate neighborhood of the ground occupied in 1851, on the occasion of the first International Exhibition.

3. The portion of the building to be devoted to the exhibition of Pictures will be erected in brick, and will occupy the entire front towards Cromwell-road; the portion in which machinery will be exhibited will extend along Prince Albert's-road, on the west side of the gardens.

4. All works of industry to be exhibited should have been produced since 1850. The decision whether goods, proposed to be exhibited, are admissible or not, must, in each case, eventually rest with Her Majesty's Commissioners.

5. Subject to the necessary limitation of space, all persons, whether designers, inventors, manufacturers, or producers of articles, will be allowed to exhibit; but they must state the character in which they do so.

6. Her Majesty's Commissioners will communicate with Foreign and Colonial exhibitors only through the Commission which the Government of each Foreign Country or Colony may appoint for that purpose; and no article will be admitted from any Foreign Country or Colony without the sanction of such Commission.

7. No rent will be charged to exhibitors.

8. Every article produced or obtained by human industry, whether of

Raw materials, machinery, manufactures or fine arts, will be admitted to the Exhibition, with the exception of

1. Living animals and plants.

2. Fresh vegetable and animal substances, liable to spoil by keeping.

3. Detonating or dangerous substances.

Copper caps, or other articles of a similar nature, may be exhibited, provided the detonating powder be not inserted; also Lucifer Matches, with imitation tops.

9. Spirits or alcohols, oils, acids, corrosive salts, and substances of a highly inflammable nature, will only be admitted by special written permission, and in well secured glass vessels.

10. The articles exhibited will be divided into the following classes:—

SECTION I.

- Class 1. Mining, Metallurgy, and Mineral products.
- “ 2. Chemical Substances and Products, and Pharmaceutical Processes.
- “ 3. Substances used for food, including Wines.
- “ 4. Animal and Vegetable Substances used in Manufactures.

SECTION II.

- Class 5. Railway Plant, including Locomotive Engines and Carriages.
- “ 6. Carriages not connected with Rail or Tram Roads.
- “ 7. Manufacturing Machines and Tools.
- “ 8. Machinery in general.
- “ 9. Agricultural and Horticultural Machines and Implements.
- “ 10. Civil Engineering, Architectural, and Building Contrivances.
- “ 11. Military Engineering, Armour and Accoutrements, Ordnance, and Small Arms.
- “ 12. Naval Architecture, Ship's Tackle.
- “ 13. Philosophical Instruments and Processes depending upon their use.
- “ 14. Photographic Apparatus and Photography.
- “ 15. Horological Instruments.
- “ 16. Musical Instruments.
- “ 17. Surgical Instruments and Appliances.

SECTION III.

- Class 18. Cotton.
- “ 19. Flax and Hemp.
- “ 20. Silk and Velvet.
- “ 21. Woollen and Worsted, including Mixed Fabrics generally.
- “ 22. Carpets.
- “ 23. Woven, Spun, Felted, and Laid Fabrics, when shown as specimens of Printing or Dyeing.
- “ 24. Tapestry, Lace, and Embroidery.
- “ 25. Skins, Fur, Feathers, and Hair.
- “ 26. Leather, including Saddlery and Harness.
- “ 27. Articles of Clothing.
- “ 28. Paper, Stationery, Printing, and Bookbinding.
- “ 29. Educational Works and Appliances.
- “ 30. Furniture and Upholstery, including Paper-hangings, and Papier-mache.
- “ 31. Iron and General Hardware.
- “ 32. Steel and Cutlery.
- “ 33. Works in Precious Metals, and their imitations, and Jewellery.
- “ 34. Glass.
- “ 35. Pottery.
- “ 36. Manufactures not included in previous classes.

SECTION IV.—MODERN FINE ARTS.

(See Decisions 111-123.)

- Class 37. Architecture.
- “ 38. Paintings in Oil and Water Colors, and Drawings.
- “ 39. Sculpture, Models, Die-sinking, and Intaglios.
- “ 40. Etchings and Engravings.
- 11. Prizes, or rewards for merit, in the form of medals, will be given in Sections I. II. III.
- 12. Prizes may be affixed to the articles exhibited in Sections I. II. III.

13. Her Majesty's Commissioners will be prepared to receive all articles which may be sent to them, on or after Wednesday the 12th of February, and will continue to receive goods until Monday, the 31st of March, 1862, inclusive.

14. Articles of great size or weight, the placing of which will require considerable labor, must be sent before Saturday, the 1st of March, 1862; and manufacturers wishing to exhibit machinery, or other objects, that will require foundations or special constructions, must make a declaration to that effect on their demands for space.

15. Any exhibitor whose goods can be properly placed together, will be allowed to arrange such goods in his own way, provided his arrangement is compatible with the general scheme of the Exhibition and the convenience of other exhibitors.

16. Where it is desired to exhibit processes of manufacture, a sufficient number of articles, however dissimilar, will be admitted for the purpose of illustrating the process; but they must not exceed the number actually required. (17-25.)*

26. Exhibitors will be required to deliver their goods at such part of the building as shall be indicated to them, with the freight, carriage, portorage, and all charges and dues upon them paid.

27. The vans will be unloaded, and the articles and packages taken to the places appointed in the building, by the officers of Her Majesty's Commissioners.

28. Upon receipt of notice from Her Majesty's Commissioners, that the articles are deposited in the building, exhibitors, or their representatives, or agents, must themselves unpack, put together, and arrange their goods.

29. Packing cases must be removed at the cost of the exhibitors or their agents, as soon as their goods are examined and deposited in charge of the Commissioners. If not removed within three days of notice being given, they will be disposed of, and the proceeds, if any, applied to the funds of the Exhibition. (30-34.)*

35. No counters, or fittings, will be provided by Her Majesty's Commissioners. Exhibitors will be permitted subject only to the necessary general regulations, to erect, according to their own taste, all the counters, stands, glass frames, brackets, awnings, hangings, or similar contrivances which they may consider best calculated for the display of their goods.

36. Exhibitors, or their representatives, should provide whatever light temporary covering may be requisite (such as sheets of oiled calico,) to protect their goods from dust; and, in the case of machinery, and polished goods, should make the requisite arrangements for keeping the articles free from rust during the time of the Exhibition. (37-42.)*

43. Exhibitors must be at the charge of insuring their own goods, should they desire this security. Every precaution will be taken to prevent fire, theft, or other losses, and Her Majesty's Commissioners will give all the aid in their power for the legal prosecution of any persons guilty of robbery, or wilful injury in the Exhibition, but they will not be responsible for losses or damages of any kind which may be occasioned by fire or theft, or in any other manner.

44. Exhibitors may employ assistants (male or female) to keep in order the articles they exhibit, or to explain them to visitors, after obtaining written permission from Her Majesty's Commissioners; but such assistants will be forbidden to invite visitors to purchase the goods of their employers. (45-49.)*

50. Articles once deposited in the Building will not be permitted to be removed without written permission from Her Majesty's Commissioners. (51-54.)*

* Several numbers marked thus (*) in this and the following page are left blank, with the view of incorporating future decisions.

55. Her Majesty's Commissioners will provide shafting, steam (not exceeding 30 lbs. per inch), and water, at high pressure, for machines in motion.

56. Persons who may wish to exhibit Machines, or trains of Machinery, in motion, will be allowed to have them worked, as far as practicable, under their own superintendence, and by their own men. (57—70.*

70. Intending exhibitors, in the United Kingdom, are requested to apply, without delay, to the Secretary of Her Majesty's Commissioners, for a *Form of Demand for Space*, stating at the same time in which of the four Sections they wish to exhibit.

71. The following is the form which has to be filled up:—

1. Name and Christian name of applicant (or name of firm)
2. Nature of business carried on.
3. Address } No. of street or square, &c.
and
Name of Town
4. Nature of articles to be exhibited
5. Number of class in which they are to be exhibited.
Floor Space.

6. Probable Space that will be required for articles or case in which they will be shown	Length.....	feet
	Breadth.....	feet
	Height.....	feet
	Hanging or Wall Space.	
	Height.....	feet
	Width.....	feet

100. Foreign and Colonial exhibitors should apply to the Commission, or other Central Authority appointed by the Foreign or Colonial Government, as soon as notice has been given of its appointment.

101. Her Majesty's Commissioners will consider that to be the Central Authority in each case which is stated to be so by the Government of its country, and will only communicate with Exhibitors through such Central Body.

102. No articles of foreign manufacture, to whomsoever they may belong, or wheresoever they may be, can be admitted for exhibition, *except with the sanction of the Central Authority of the country of which they are the produce*. Her Majesty's Commissioners will communicate to such Central Authority the Amount of space which can be allowed to the productions of the country for which it acts, and will also state the further conditions and limitations which may from time to time be decided on with respect to the admission of articles. All articles forwarded by such Central Authority will be admitted, provided they do not require a greater aggregate amount of space than that assigned to the country from which they come; and, provided also, that they do not violate the general conditions and limitations. It will rest with the Central Authority in each country to decide upon the merits of the several articles presented for exhibition, and to take care that those which are sent are such as fairly represent the industry of their fellow-countrymen.

103 Separate space will be allotted to each foreign country, within which the Commissioners for that country will be at liberty to arrange the productions entrusted to them in such manner as they think best, subject to the condition that all machinery shall be exhibited in the portion of the building specially devoted to that purpose, and all pictures in the fine art galleries, and to the observance of any general rules that may be laid down by her Majesty's Commissioners for public convenience.

104. By arrangements made with Her Majesty's Government, all Foreign or Colonial goods intended for exhibition, sent and addressed in accordance with regulations hereafter to be issued, will be admitted into the country, and transmitted to the Exhibition building without being previously opened, and without payment of any duty; but all goods which shall not be re-exported at the termination of the Exhibition will be

charged with the proper duties, under the ordinary Custom's Regulations. (105—108.)*

109. It is not the intention of her Majesty's Commissioners to take any steps in reference to the protection of inventions or designs, by patent or registration, the law on these points having been materially simplified since 1851.

DECISIONS SPECIALLY APPLICABLE TO SECTION IV.— MODERN FINE ARTS.

Class 37. Architecture.

“ 38. Paintings in Oil and Water Colours and Drawings.

“ 39. Sculpture Models, Die-sinking and Intaglios.

“ 40. Engravings and Etchings.

110. The object of the Exhibition being to illustrate the progress and present condition of *Modern Art*, each country will decide the period of Art which in its own case will best attain that end.

111. The Exhibition of British Art in this Section will include the works of artists alive on or subsequent to the 1st of May, 1762.

112. It is not proposed to award Prizes in this Section.

113. PRICES will be not allowed to be affixed to any Work of Art exhibited in this Section.

114. One-half of the space to be allotted to Section IV. will be given to Foreign Countries, and one-half will be reserved for the works of British and Colonial Artists.

115. The subdivision of the space allotted to Foreign Countries will be made, after consideration of the demands received from the Commission, or other Central Authority of each Foreign Country. It is, therefore, important that these demands should be transmitted to Her Majesty's Commissioners at the earliest possible date.

116. The arrangement of the Works of Art within the space allotted to each Foreign Country will be entirely, under the control of the accredited representatives of that country, subject only to the necessary general regulations.

117. For the purposes of the Catalogue, it will be necessary that the Central Authority of each Foreign Country should furnish Her Majesty's Commissioners, on or before the 1st of January, 1862, with a description of the several Works of Art which will be sent for exhibition, specifying in each case, the name of the artist, the title of the work, and (when possible) the date of its production.

118. The space at the disposal of Her Majesty's Commissioners for the display of British Art being limited, and it being at the same time desirable to bring together as careful and perfect an illustration as possible, a selection of the works to be exhibited will be indispensable.

119. The selection of Exhibitors, the space and number of works to be allowed to each, and the arrangement of them, will be entrusted to Committees to be nominated by Her Majesty's Commissioners.

120. In the case of living artists, her Majesty's Commissioners would desire to consult the wishes of the artists themselves as to the particular works by which they would prefer to be represented. The selection of works so made by the artists will not necessarily be binding on her Majesty's Commissioners, but in no case will any work by a living artist be exhibited against his wish, if expressed in writing, and delivered to the Commissioners on or before the 31st of March, 1862.

121. Her Majesty's Commissioners will avail themselves of the following eight Art Institutions of this country in communicating with artists who are members of those institutions, viz.:—

The Royal Academy.
 The Royal Scottish Academy.
 The Royal Hibernian Academy.
 The Society of Painters in Water Colours.
 The Society of British Artists.
 The New Society of Painters in Water Colours.
 The Institute of British Artists.
 The Institute of British Architects.

122. Intending Exhibitors in the British Division of Section IV., who are not members of any of the preceding Institutions, may at once receive Forms of Demand for Space, by applying to the Secretary to Her Majesty's Commissioners. These Forms must be filled up and returned before the 1st of June, 1861.

By Order. F. R. SANDFORD,
Secretary.

Offices of Her Majesty's Commissioners,
 454, West Strand, London, W.C.

THE PROVINCIAL EXHIBITION OF 1861.

It is unnecessary to expatiate upon the growing importance of our Annual Provincial Exhibitions. The results to which they have led speak for themselves, and everywhere in the older parts of the country afford ample proof of the advantages they are capable of conferring, especially in the part of Canada where they may be held.

This is shown better in Agriculture than in Manufactures, and in the Agricultural rather than in the Manufacturing departments of our Exhibitions, because from the force of circumstances the field more than the workshop has hitherto been the scene of industry. Since, however, we became an established and prosperous country, this proportional difference has diminished; Arts and Manufactures have grown into great importance, pressing themselves upon the attention of the public and seeking encouragement by invoking a patriotic feeling in favour of home manufactures and home industry of every description, until their growth and development have become matters of national interest.

Compare the map of settled Canada ten years ago with what it is now; glance at the new townships which have sprung up in the West, North-west, and far East, and it will be seen that a tract of country equal in area to a moderate sized European Kingdom has been in part won from the wilderness and settled—an area nearly as large as the whole peopled part of Canada previously to the last census.

There is the Valley of the Saugeen and part of the Valley of the Maitland on Lake Huron; the Valley of the Nottawasaga on Georgian Bay; the back country stretching from Lake Simcoe to the Rideau; the Valley of the Upper Ottawa, of the St. Maurice and other rivers in Lower Canada, and of various tributaries to the Great St. Lawrence on both the North and South side as far as Gaspé.

The natural productions of the country, utilized by industry and Art are increasing in number and quantity. One of the most recent is the Petroleum

of the West, which promises, as recent discoveries show, to become a very important product. The mines of Copper in Lower Canada have only been heard of within the last two years, and are already both valuable and promising. Different varieties of timber, that great natural staple of the country, formerly allowed to rot on the ground or burned to get them out of the way, are now articles of export. Apart from all these considerations is the fact that the population of the country has assumed a stability and steadiness of increase which is astonishing when we survey the condition of the country during and since the memorable year 1857.

In no way, however, may an impartial observer note the true progress of the country than by witnessing and comparing our Annual Provincial Exhibitions. This is particularly observable in the Agricultural Department, not on account of greater energy, skill or enterprise having been given to this branch of our industry, but because it has hitherto occupied much of the capital and attention of the great mass of the people. But the time is rapidly approaching, if it has not already arrived, in which we shall see a similar progress in Arts and Manufactures throughout the older settled parts of the country. It would be absurd to look for equal results as far as quantity and variety is concerned, as we are essentially an agricultural people—particularly in the West where the next Exhibition is to be held—confining ourselves in the field of Manufacturing Industry to those articles which are most in demand and susceptible of practical application to every day uses, and which cannot be so cheaply produced in other countries. There are numberless items, however, which come, so to speak, from abroad, but which ought to be manufactured at home. No one requires to be told that the more home industry is encouraged in all its branches, the more prosperous and the more independent is the country likely to become under ordinary circumstances, and many are convinced that it is only necessary to bring our manufactures before the public in a prominent and attractive form, in order to secure, first, attention, and then very general patronage.

At the best it is a fleeting and very imperfect impression of our works of skill, or industry and art, which a crowd of excited observers rapidly streaming past, is capable of obtaining at our Annual Exhibitions. There is neither time nor space for a careful examination or even for a favourable display. All Canadian Manufactures in a Canadian Exhibition should be represented and exposed to view, when they will admit of it, in such a manner as to show their qualities and character, besides affording information respecting their cost and the facilities for supply. A Provincial Exhibition, lasting only four days, does not afford the facilities which are sought,

but for the present they are the best at our command and should be embraced to the utmost extent of which they are susceptible.

It was one of the lessons taught by the magnificent displays at London and Paris, that selection and arrangement are the mainsprings of success in displaying the products, natural or artificial, of any district. It has been hoped by many who have turned their attention to this subject that the approaching Exhibition at London, Canada, would afford an opportunity for commencing a collection of articles fitted to represent Canadian Industry at London, England, in 1862. We still indulge the hope that this may yet be the case, although more than an usual dependence on individual zeal and patriotism may be involved.

It is only during the past year that the Board of Arts and Manufactures have been in a position to fulfill a portion of the duties imposed on them by law; but having made a beginning, it is probable that more extended and practical efforts will soon be made. Our readers are already aware of the efforts of the Boards for Upper and Lower Canada to procure government assistance in securing a complete representation of Canadian Industry at London next year. The result has been most unfortunate, and we are left to rely on private resources and energy in collecting and contributing materials for exhibition. This is not the time or place to discuss the wisdom of so much self-reliance in an arena where all are so strong, and many infinitely stronger than Canada; nevertheless, it has one obviously good effect, namely, if it does not stimulate a fictitious and temporary industry as many think it would, it will show what Canadians can accomplish by individual and unassisted efforts. Our first field for display is at home, it will then be time to form a judgment whether we shall be able to retain laurels already won, or add another wreath to those we continue to call our own.

The approach of the next Exhibition suggests a few reflections which may yet assume a tangible form. Our mineral wealth, for instance, is so distributed and is of such a character, that the position of Canada as a mineral producing country, is already known, and our main hope lies in the application we may make at home of the mineral wealth of the country. At future Provincial Exhibitions would it not be well to have a mineral department, under the supervision of the Board of Arts and Manufactures, in order to familiarize the people with the more common forms in which the crude products of the country occur. Most of our new townships and newer settlements are made and indeed must be made, on rocks whose mineral character is pretty well known, and it is time that those who occupy them should have an opportunity of becoming familiar with the ordinary aspects of the

minerals of the country. This could be easily accomplished by encouraging the exhibitions of specimens of the more important minerals, the name, locality, and probable distribution being faithfully given.

It was remarked in Europe when the forest trees were collected from all parts of the world and displayed at Paris and London, that many species common in North America were admirably adapted for different manufacturing purposes, and would command high prices if brought into market. Why not carry out the idea in Canada, and by having an annual display of our forest productions accustom the people to them and acquaint them with their properties and uses. By adopting a strict culling process and by paying the cost of each contribution, a Museum of natural products, both mineral, vegetable, and even animal, might rapidly be formed at each permanent Exhibition Building, from which a selection for the central Museum of the Board of Arts and Manufactures could be made as opportunity offered.

PROVINCIAL EXHIBITION BUILDINGS AND GROUNDS.

While on a visit to the pleasant little City of London during the past month, in company with some members of the Board of Agriculture, we proceeded to the Exhibition Grounds, and took a run through the Building just erected by the energetic local committee of that city, for the purposes of the Provincial Exhibition, which is to commence on Tuesday, the 24th instant.

The grounds are enclosed by a close board fence, 8 feet high. On the north side of the grounds, and within the enclosure, is a small Lake, covering an area of about 5 acres, which will be very convenient for the watering of cattle, and for other purposes.

The extent of the Sheds now being erected for the accommodation of Cattle, Machinery, &c., will be upwards of 3,000 feet in length.

The building is erected in the immediate vicinity of the Barracks, and within half a mile of the centre of the city, on a beautiful piece of ground of about 26 acres, a portion of which has been purchased from the Government by the Corporation, for this purpose.

The ground plan of the building is a regular octagon, its dimensions from opposite angles being 186 feet. The space offered by the ground area is upwards of 24,000 feet, while the galleries give an additional space of 4,000 feet more. The external wall is built of white brick, on a foundation of rubble masonry and concrete, and is twenty-one feet in height. The entrance to the building is through eight doorways, each eight feet wide and fourteen feet high, one at each angle. In the brick wall, on

each side of the octagon and between the doorways, are five spacious windows, making on the ground floor forty windows. The roof of this portion of the structure is covered with felting, gravel, &c. The arrangement of the doors will afford ready ingress and egress to the building, besides securing a thorough draft for the purposes of ventilation. The second tier of the building, containing the gallery, rises to the height of thirty-two feet above the ground line, and is 114 feet in diameter from opposite angles, giving a wall accommodation of more than 300 feet, lighted with forty-eight windows, every alternate one being hung on a pivot to admit of ventilation. The ascent and descent to the upper portion of the building is provided for by two stairways, one being intended for the entrance and the other for the exit of the public, and leading in opposite directions, so as to divide the crowd. The third tier of the building is a continuation of the inside gallery wall, and runs to the height of forty feet above the ground line. This tier supports the cupola, and is covered with a shingle roof. The interior view is clear, and not interrupted by any timbers to the height of eighty-seven feet. The full height of the building, to the top of the flag-staff, is 114 feet; the dimensions of the cupola, twenty feet diameter by thirty-one in height; area of the ground floor and gallery 28,000 feet, being about the same area as the Hamilton Exhibition Building and 4,000 feet less than the Toronto Building. The sheeting of the roof is painted a blue colour, the timbers a drab. Provision is made for a band of music in a suitable situation. The building is designed and constructed with a view to the purposes for which it is erected, and also with a due regard to economy. The architect, a citizen of London, has been happy in designing and completing a building well adapted for the purposes of the Exhibition, and that, too, at a cost under \$9,000. The building is of the most permanent character, the best stone, brick and lumber, being used in its construction; while the workmanship is of a superior order. Mr. Alexander Campbell was the contractor, and by his exertions has succeeded in having it finished several weeks before the contract time. On the whole, it may be said that the London Exhibition Building is a credit to the architect, the contractor, and the local committee who have shown so much energy in pushing it to its early completion.

The interior fittings, which have also been contracted for by Mr. Campbell, will be ready some time before the Exhibition commences.

Messrs. J. & S. Blackburn, proprietors of the London *Daily Free Press*, have at considerable expense published a large woodcut illustration of the building, from designs by the Architect, W. Robinson, Esq., of which we have secured a sufficient number

of copies for presentation with this number of the Journal.

BRITISH AMERICA AND THE INTERNATIONAL EXHIBITION OF 1862.

The New Brunswick Provincial Board of Agriculture has applied for the large area of 20,000 feet to be allotted for the use of the Province, as the probable space required for the exhibition of its Arts, Manufactures, and Natural Products, together with a wall surface of 300 feet.

Nova Scotia intends to make a good display of her Manufactures and Natural Products; amongst the latter will be specimens of her recent gold discoveries, and some beautiful specimens of Jewellery made therefrom for Lady Mulgrave. His Excellency, in a recent dispatch, informs the Duke of Newcastle that "No exertion will be wanting on his part for furthering this important object" of having Nova Scotia duly represented.

Prince Edward Island is making every exertion to secure a good representation of her products at the Exhibition; and intends to furnish not only the Staple Produce of the Island, but specimens of the best Woollen Manufactures, and Furniture made in the Colony from the native woods, &c., &c.

In the Island of Vancouver,

"At a meeting of the General Committee appointed to take steps to have the resources of the British Colonies of the Pacific represented at the Great Exhibition of 1862, the following resolutions were adopted unanimously:—

"That every member of the committee should pay the sum of \$1 per month subscription.

"The sum of \$250 to be appropriated for the best pamphlet to be written on the resources of British Columbia and Vancouver Island.

"A further sum of \$750 was voted for the expense of printing the said pamphlet.

"\$5,000 was granted to defray the expenses of the committee for collecting specimens, &c.

"The Executive Committee of the Industrial Exhibition invite attention to the subjoined list of articles, crude and manufactured, specimens of which they deem desirable for transmission to England, to represent the industrial resources of these colonies at the Great Industrial Exhibition in 1862. The committee trust to see specimens of Colonial Produce, which, with care in their preparation, may enter into competition with similar articles of European or other colonial production, with a fair chance of winning, if not a premium, at all events that commendation from the gathering of all nations at the Great International Exhibition, which would tend more than any other means to direct the attention of emigrants towards these colonies.

"Two methods of obtaining collections will be adopted:—

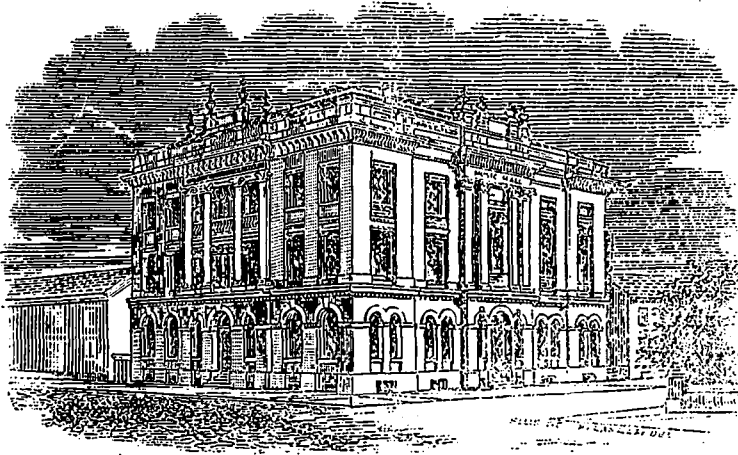
"1st. Specimens contributed to or purchased by the association.

"2nd. Specimens lent to the association, of which due care will be taken, and which will be returned to the owner or disposed of to the best advantage in England. All articles will be labelled with the name and address of the donor or lender, and will be conveyed to England in the same state as sent to the association here, who will bear the expense of their transmission."

Lists of articles that may be contributed from Vancouver Island, and British Columbia, are suggested, under the following heads, viz:—Agriculture, Fish, Wood, Stone, Minerals, Fabrics, Miscellaneous, and articles illustrating Indian handicraft.

The Hudson Bay Company will no doubt see that the Skins and Furs of Animals are duly represented. Canada, the wealthiest, and best able of all the

American Colonies to make a creditable show, is doing nothing; the Farmers, Mechanics & Artizans are not only willing but anxious to have an opportunity of exhibiting their various productions, but as the Provincial Government has not yet appointed any Central Authority, through whom alone intending Exhibitors can communicate with Her Majesty's Commissioners, their efforts to do so would be useless.



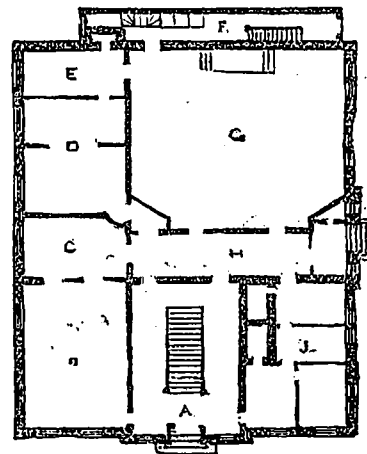
THE TORONTO MECHANICS' INSTITUTE.

The above woodcut is a south-west view of the New Hall of the Toronto Mechanics' Institute, in which the Board of Arts and Manufactures have lately established their Rooms. It stands on the south-east corner of Church and Adelaide streets, and is a large, commodious, and really imposing building, 104 feet by 80 feet, designed in the Italian style by Messrs. Cumberland & Storm, architects; and will cost, when fully completed, with the ground it stands on, about \$48,000.

At the time of its enclosure, it was leased to the Government for Departmental offices, and used as such until their removal to Quebec; the Institute meanwhile occupying their old quarters. Nothing was done to the new building in the way of fitting it up for its original purposes, until the beginning of the present year, owing to protracted negotiation with the Government.

The extensive alterations necessary to adapt it to its present uses are nearly finished, and for completeness and accommodation it is not equalled by any building of the kind in Canada.

The basement contains four class-rooms, house-keeper's apartments, water closets, &c., and three very large fuel and storage vaults, and kitchen for the use of the supper room.

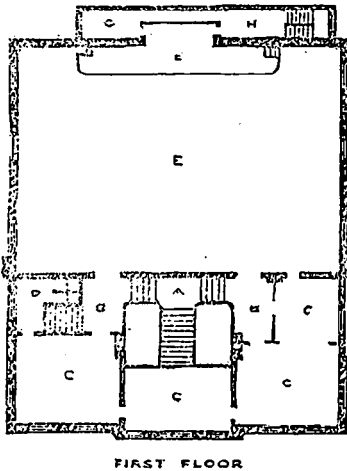


GROUND PLAN.

The ground floor, as will be seen by a reference to the plan, has two large entrances. The entrance hall from Church-street is 36 feet by 25 feet, and contains the principal staircase to the Music Hall and upper floor. The walls are finished with pannelled dado, pilaster columns, and rich modillion cornice, in the Corinthian order. The stairs are wide and bold, a centre $\frac{1}{2}$ flight, with niche for figure at head,

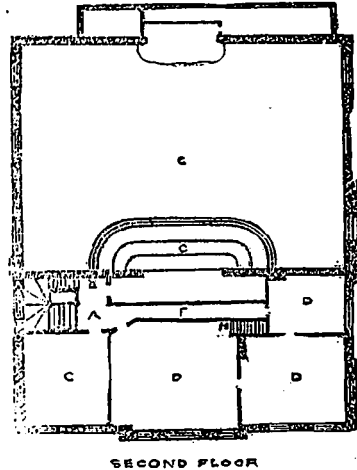
and branching off at either side to entrance of Music Hall.

To the left are the Reading Rooms (B and C), each 35+24 feet and 24+15 feet, fitted up in the most comfortable and convenient manner, and well supplied with newspapers and other publications. The Library (D), 28+24 feet, contains about five thousand volumes. Both Library and Reading Rooms are expensively fitted up with oak. Completing this suite of rooms is the Board Room, containing also a collection of valuable philosophical apparatus. The Lecture Room (G) is 51+42 feet, and is intended for the ordinary lectures of the Institute, and to be used as a supper room in connection with the Music Hall, and will also be open for rental for other purposes. The rooms marked J are leased at present to Messrs. Roaf and Davis, as law offices.



By a reference to plan No. 2, it will be seen that the Music Hall (E) occupies the greater portion of this floor, and also the whole height of this and the upper story. Its total dimensions are 76+53 feet; height of ceiling, 36 feet. In the centre of the east side is an arched organ recess, under an enriched entablature, supported by 3 Corinthian columns of imitation Sienna marble. The soffits and imposts of the arch are highly ornamented in plaster. In front of this recess stands the performers' platform, 40 feet long by 10 feet wide. On the opposite side of the room a very rich gallery projects from the wall, supported on ornamented iron columns. The room is lighted by three large windows at each end. The ceiling springs from a modillion cornice, and is coved with a large domical centre panel, and rich, handsome centre ornaments. The walls and ceiling of this room, together with main entrance hall, are being decorated at a cost of \$1,200, and it is expected when finished to present an exceedingly rich and

chaste appearance. Behind the platform is a performers' retiring room, to which access is obtained by a private entrance from Adelaide-street (F). The rest of this floor is occupied by a suite of dressing and refreshment rooms (C C C C), fitted with suitable conveniences.



A stair, 6 feet wide, leads to the second floor, three rooms of which (D D D) are occupied by the Board of Arts and Manufactures as Model Room, Board Room and Free Library of Reference, and Secretary's Office. Room C is intended for a Chess Club, and also for use as a gentlemen's hat and cloak room in connection with the Music Hall. The entrance to the gallery of the Music Hall (G) is from this floor.

Over the passage (F), and extending the whole width of the building, is a Model Gallery, 76+14 feet, also occupied by the Board of Arts and Manufactures, and approached by a stair from the Model Room, and lighted by two large skylights from the roof.

The subject of heating the building (a very important one, and a subject on which much difference of opinion exists), whether by steam or heated air, is now under consideration, and will be proceeded with as early as possible.

The membership of the Institute is daily increasing, and no wonder that it should be so, considering that the whole of its advantages may be secured for the trifling sum of \$2 per annum, and to ladies \$1.50.

EDITORIAL NOTICES.

In consequence of unexpected delays in procuring some of the woodcuts, the present number is issued a few days behind time. We will endeavour to prevent a similar occurrence for the future.

BOARD OF ARTS AND MANUFACTURES FOR
UPPER CANADA.

Notice.

The regular Quarterly Meeting of the Board will be held on Tuesday the 1st of October, at the Board Rooms, Mechanics' Institute, Toronto, at two o'clock P. M.

WM. EDWARDS,
Secretary.

PRIZE ESSAY.

Owing to the absence from the City of two of the gentlemen appointed as Judges of "Essays on the Manufactures of Canada," no Report has yet been received on the Essays competing for the Prizes offered by the Board; it will however be prepared in time for publication in the next number of the Journal.

CLASSIFIED CATALOGUE OF THE FREE LIBRARY OF REFERENCE.

I N D E X .

- | | |
|--|---|
| 1. Alphabets, Writing, &c. | 12. Geology, Metallurgy, Mines and Mining. |
| 2. Antiquities. | 13. Horticulture, Agriculture and Rural Affairs. |
| 3. Architecture and Building. | 14. Manufactures, Trades, and Industrial Arts in General. |
| 4. Biography of Artists, Engineers, Inventors, Manufacturers, &c. | 15. Miscellaneous, and Works treating on subjects in more than one department of the Library. |
| 5. Catalogues of Books, Apparatus, Manufactures, &c. | 16. Natural History, General. |
| 6. Decoration and Ornament, and Designing not embraced in Class 3. | 17. Naval Architecture. |
| 7. Dictionaries, Directories, Encyclopedias, &c. | 18. Patents of Inventions and Designs. |
| 8. Drawing and Geometry. | 19. Parliamentary and Municipal Publications. |
| 9. Engineering and Mechanics. | 20. Periodicals. |
| 10. Fine Arts. | 21. Science, General. |
| 11. Geography, Topography and Statistics. | 22. Transactions of Societies. |

CATALOGUE.

1.—ALPHABETS, WRITING, &c.

- Ornamental Alphabets, 24 sheets.....
 " " 6 "
 Penman's Manual; a New Theory and System of Practical Penmanship; 4to; 1861.....
 Universal Decorator; 3 vols., 4to; 1858-'59-'60 *Thompson.*

2.—ANTIQUITIES.

- Archæology and Prehistoric Annals of Scotland; 8vo; 1851 *Daniel Wilson.*
 Antique Vases, Altars, Candelabras, &c.; 170 plates; 4to; 1814 *Moses.*
 Costume of the Ancients; 321 plates; 2 vols., 8vo; 1841..... *Hope.*
 History of Ancient Pottery, Egyptian, Assyrian and Greek; numerous colored plates and engravings; 2 vols., 8vo; 1858..... *Birch.*
 History of Pottery and Porcelain, Mediæval and Modern; colored plates; 8vo; 1857..... *Marryat.*
 Vases from the Collection of Sir H. Englefield; 51 plates; 4to; 1848..... *Moses.*

3.—ARCHITECTURE AND BUILDING.

- Architectural History of Canterbury Cathedral; 8vo; 1845..... *Willis.*
 Application of Cast and Wrought Iron to Building Purposes; 8vo; 1854..... *Fairbairn.*
 Beauties of Modern Architecture; numerous plates; 8vo; 1839..... *Lafever.*
 Constructive Architecture: a Guide to the Builder and Mechanic, with a series of Designs and choice Examples of the five Orders of Architecture; folio; 1859..... *Sloan.*
 Carpenter and Joiner's Assistant, with an illustrated Glossary of Terms used in Architecture and Building; fol.; 1860..... *Newlands.*
 Church, Parsonage and School Architecture; 8vo; 1856..... *Dwyer.*
 Church of Great Haseley, Oxfordshire; 8vo; 1848.....
 Carpenter's New Guide, a complete book of Lines for Carpentry and Joinery; 8vo; 1856... *Sloan.*
 Domestic Architecture; being a series of Designs for Mansions, Villas, Parsonages, Lodges, &c. &c.; 2 vols., fol.; 1850..... *Goodwin.*
 Encyclopedia of Architecture, Nicholson's; 2 vols., 4to..... *Lomax & Gunyon.*
 Encyclopedia of Cottage, Farm and Villa Architecture, and Furniture; 2000 illustrations; 8vo; 1853..... *Loudon.*
 Gothic Architecture applied to Modern Residences, with elaborate Drawings and copious details; 4to; 1851..... *Arnot.*

7.—DICTIONARIES, DIRECTORIES AND ENCYCLOPEDIAS.

Crests of the Families of Great Britain and Ireland; 2 vols., 8vo.....	<i>Fairbairn.</i>
Chronological Tables, Blair's; 12mo; 1856.....	<i>J. W. Rosse.</i>
Cyclopedia of Physical Sciences; 8vo; 1857.....	<i>J. P. Nichol.</i>
Cyclopedia of Practical Receipts; 8vo; 1859.....	<i>A. J. Cooley.</i>
Canada Directory, Lovell's; 8vo; 1857.....	
Catalogue of the London Exhibition of 1851, descriptive and illustrative; 3 vols., folio.....	
Cyclopedia of Drawing, Appleton's; 8vo; 1857.....	<i>W. E. Worthen.</i>
Dictionary of Dates, Haydn's; 12mo; 1860.....	<i>Vincent.</i>
Dictionary of Arts, Manufactures and Mines, Ure's. 3 vols., 12mo; 1860.....	<i>R. Hunt.</i>
Dictionary of Science, Literature and Art; 8vo; 1852.....	<i>W. T. Brande.</i>
Dictionary of Painters, Pilkington's; 8vo; 1857.....	<i>Cunningham.</i>
Dictionary of the English Language; 4to; 1860.....	<i>Worcester.</i>
English Cyclopedia of Arts and Sciences; 8 vols., 4to; 1859 to '61.....	<i>C. Knight.</i>
Encyclopedia of Ornament; 4to; 1842.....	<i>H. Shaw.</i>
Encyclopedia of Heraldry of England, Scotland, and Ireland; comprising a Registry of all Armorial bearings from the earliest to the present time; 8vo.....	<i>Burke.</i>
Encyclopedia Britannica; a Dictionary of Arts, Sciences and General Literature; 22 vols., 4to; 1859 to '61.....	<i>Lomax & Gunyon.</i>
Encyclopedia of Architecture, Nicholson's; 2 vols., 4to.....	<i>J. C. Booth.</i>
Encyclopedia of Chemistry; 8vo; 1854.....	<i>Loudon.</i>
Encyclopedia of Cottage, Farm and Villa Architecture and Furniture; 8vo; 1853.....	
General Gazetteer: a Dictionary of Geography; Descriptive, Physical, Statistical and Historical; 8vo; 1852.....	<i>A. K. Johnston.</i>
Hand Book of Practical Receipts; 12mo; 1857.....	<i>Branston.</i>
Index of Dates; 12mo; 1858.....	<i>J. W. Rosse.</i>
Iron Manufacturer's Guide to the Furnaces and Rolling Mills of the United States; 8vo; 1859.....	<i>J. P. Lesley.</i>
Illustrated Catalogue of the Bernal Collection of Works of Art, with an Essay on Pottery and Porcelain, and engraved lists of Marks and Monograms; 12mo; 1857.....	<i>H. G. Bohn.</i>
London Post Office Directory; 8vo; 1860.....	
Literary and Educational Year Book; 12mo; 1860.....	
McKenzie's Five Thousand Receipts; 8vo.....	
Men and Women of the Time; 12mo; 1857.....	
Toronto Directory, Caverhill's; 12mo; 1859.....	
Toronto Directory, Brown's; 8vo; 1861.....	

8.—DRAWING AND GEOMETRY.

Cyclopedia of Drawing, comprising Geometrical Projection, Mechanical, Architectural and Topographical Drawing; Perspective and Isometry; 8vo; 1857.....	<i>Worthen.</i>
Engineer and Machinist's Drawing Book; folio; 1855.....	<i>Blackie.</i>
Elements of Perspective; 12mo; 1860.....	<i>Ruskin.</i>
Elements of Map Drawing; 8vo; 1859.....	<i>Carter.</i>
Geometrical and Mechanical Drawing; a Text Book; 8vo; 1859.....	<i>Minifie.</i>
General Problems from the Orthographic Projections of Descriptive Geometry, with their Applications, &c.; 8vo; 1860.....	<i>Warren.</i>
Instructions in Practical Geometry, Drawing, &c.; folio; 1860.....	<i>Newlands.</i>
Linear Perspective, a Manual of; 12mo; 1857.....	<i>R. S. Smith.</i>
Practical Draughtsman's Book of Design; 4to; 1857.....	<i>Armengaud.</i>
Practical Geometry, Linear Perspective, and Projection; with Descriptions of the Principal Instruments used in Geometrical Drawing, &c.; 8vo.....	<i>Bradley.</i>
Topographical Drawing, a Manual of; 8vo; 1859.....	<i>R. S. Smith.</i>

9.—ENGINEERING AND MECHANICS.

Construction of Wrought Iron Bridges, embracing the practical application of the principles of Mechanics to Wrought Iron Girder Work; 8vo; 1858.....	<i>Latham.</i>
Heat, in its relation to Water and Steam; embracing new views of Vaporisation, Condensation and Explosions; 8vo; 1861.....	<i>C. Wye Williams.</i>
Mechanical Principles of Engineering and Architecture; 8vo; 1856.....	<i>Moseley.</i>
Mechanics of Machinery and Engineering; 2 vols; 8vo; 1848.....	<i>Wiesbach.</i>
Mechanics for Practical Men; 8vo; 1850.....	<i>Jamieson.</i>
Mechanics and Mechanism: Essays and Examples; 12mo; 1853.....	<i>R. S. Burn.</i>
New Method of Calculating the Cubic Contents of Excavations and Embankments, by the aid of Diagrams; 8vo; 1853.....	<i>Trautwine.</i>
Strength of Materials used in Engineering Constructions; 12mo; 1860.....	<i>Whildin.</i>
Tables for facilitating the Calculation of Earth Work, in the cutting of Embankments, &c.; 8vo; 1846.....	<i>McNeill.</i>

10.—FINE ARTS.

Art Mythology, with 100 plates of illustrations, in outline; folio; 1856.....	<i>E. Braun.</i>
Ancient and Modern Sculpture; 60 plates of illustrations, in outline; 4to.....	

15. MISCELLANEOUS; AND WORKS TREATING ON SUBJECTS IN MORE THAN ONE DEPARTMENT OF THE LIBRARY.

Automatic Mechanism, as applied in the construction of Artificial Limbs; 12mo; 1857.....	<i>Gray.</i>
Canada at the Universal Exhibition of 1855; 8vo.	
Catalogue of the World's Exhibition, New York; folio; 1853.	
Catalogue of the International Exhibition of London, illustrated; 3 vols., folio; 1851.	
Narrative of the Canadian Red River, and Assiniboine and Sackatchewan Exploring Expedition, in 1857-8; 2 vols., 8vo.	<i>H. Y. Hind.</i>
Prize Essay on Canada.....	<i>Hogan.</i>
Remarkable Inventions of the present century; 12mo; 1859	<i>Bakewell.</i>
Triumphs of Invention and Discovery; 12mo; 1861.....	<i>J. H. Fyfe.</i>
Theory and Practice of International Trade; 12mo; 1858	<i>Barry.</i>

16.—NATURAL HISTORY—(GENERAL).

American Weeds and Useful Plants; 12mo; 1860	<i>Darlington.</i>
Botany, Manual of; 12mo; 1859	<i>Gray.</i>
Botany, First Lessons in, with 360 wood-cuts; 12mo; 1860.....	<i>Gray.</i>
Cuvier's Animal Kingdom, illustrated; 8vo; 1859	<i>Carpenter & Westwood.</i>
Entomology; or Elements of the Natural History of Insects: their Metamorphoses, Food, &c. &c.; 12mo; 1860	<i>Kirby and Spence.</i>
General view of the Animal Kingdom; a large map; 1858	<i>Redfield.</i>
Illustrated Natural History of the Animal Kingdom; 2 vols., 8vo; 1861.....	<i>Goodrich.</i>
Zoological Science, or Nature in Living Animals; 12mo; 1858	<i>Redfield,</i>

18.—PATENTS OF INVENTIONS AND DESIGNS.

Commissioner of Patents Journal; 6 vols., 8vo; 1854 to 1859	<i>British.</i>
Indexes:—	
Alphabetical Indexes of Patentees, 7 vols., 8vo; 1617 to 1858	“
Chronological Index of Patents, 8 “ “ “	“
Fire Arms and Projectiles Index, 1 “ 1718 to 1853	“
Reference Index of Patents, 2 “ 1617 to 1855	“
Subject Matter Indexes of Patents 9 “ 1617 to 1858	“
Library Catalogue of G. S. Patent Office; 2 vols., 8vo; 1858	“
Reaping Machines, Appendix to Specifications; 8vo; 1853	“
Specifications of Inventions; 168 vols., 8vo; 1852 to 1858	“
Specifications of Inventions; Plates; 202 vols., folio; 1852 to 1858.....	“
Specifications of Inventions; Protection for Inventions; Patent Rights in British Colonies and Foreign Countries; and lists of prices of printed specifications from 1617 to 1858; 1 vol., 8vo	“
Specifications of Inventions; Key of Term and Phrases in Titles, &c.....	“
Specifications of Inventions; 5 vols., 12mo; 1858	“
Vol. 1. Marine Propulsion.	
“ 2. Steam Culture; Aids to Locomotion.	
“ 3. Manufacture of Iron and Steel.	
“ 4. Food; Watches, Clocks, &c.; Synopsis of Patents.	
“ 5. Manure; Drain Tiles and Pipes; Sewing and Embroidery.	
Specifications and Plates of Patented Inventions in Canada; 1 vol., 8vo.; 1824 to 1849.	
Patent Laws of the United States; 1861.	
Rules and Directions for proceedings in the Patent Office of the United States; 1861.	

19.—PARLIAMENTARY AND MUNICIPAL PUBLICATIONS.

Consolidated Statutes of Canada; 8vo; 1859.	
“ “ Upper Canada; 8vo; 1859.	
Census of Canada; 2 vols., 8vo; 1851-2.	
Legislative Council, Journals of; 6vo.	
“ “ Sessional Papers; 31 vols.	
Legislative Assembly, Journals of, 7 vols.	
“ “ Appendixes to ditto; 41 vols.	
Maps, Reports, and Estimates for improving the navigation of the River St. Lawrence; and a proposed canal connecting the River St. Lawrence and Lake Champlain; folio; 1856.	
Report of Commissioner of Crown Lands of Canada: Maps of Canada; 4to; 1857.	
Standing Orders of the Legislative Council.	
Statutes of Canada; 2 vols.; 1857-8.	
Tables of the Trade and Navigation of Canada; 7 vols.; 1852 to 1858.	
Various Parliamentary Reports, Returns, &c., &c.; Pamphlets.	

20.—PERIODICALS.

American Publishers' Circular; weekly.....	<i>New York.</i>
Athenæum; weekly	<i>London.</i>

Artizan; monthly	“
Bookseller “	“
Builder; weekly.....	“
Civil Engineer and Architect's Journal; monthly	“
Commissioner of Patents Journal; semi-weekly	“
Canadian Journal; bi-monthly.....	Toronto.
Canadian Agriculturist; semi-monthly.....	“
Canada Gazette; weekly.....	Quebec.
Journal of Gas Lighting, Water Supply, and Sanitary Improvement; semi-monthly.....	London.
Journal of Education for Upper Canada	Toronto.
“ “ Lower Canada	Montreal.
Laxton's Examples of Building; monthly.....	London.
Lardner's Museum of Art; weekly	“
Mechanic's Magazine; weekly	“
Photographic Notes; semi-monthly.....	“
Society of Arts Journal; weekly	“
Scientific American; “	New York.
Willis & Sotheran's Price Current of New and Second Hand Books; monthly	London.

21.—SCIENCE (GENERAL.)

Bookkeeping by single and double entry; 8vo; 1860.....	Preston.
Chemical Recreations: a popular Manual of Experimental Chemistry; 12mo; 1854	Griffin.
Chemistry of the Non-Metallic Elements and their Compounds, including a comprehensive course of class experiments; 12mo; 1860.....	Griffin.
Chemical Technology; or Chemistry applied to the Arts and Manufactures; 2 vols., 8vo; 1848	Knapp.
Experimental Researches in Chemistry and Physics; 8vo; 1859.....	Faraday.
Heat in its relations to Water and Steam; 8vo; 1861.....	C. Wye Williams.
Introduction to Heraldry; 12mo; 1848.....	Barrington.
Illustrated London Astronomy; 12mo.....	J. R. Hind.
Manual of Elementary Chemistry; Theoretical and Practical; 12mo; 1861.....	Fownes.
Manual of Technical Analysis; 12mo; 1857.....	Bolley.
Mechanical Philosophy, Horology, and Astronomy; 12mo; 1857	Carpenter.
The Principles of Chemistry illustrated by simple Experiments; 12mo; 1859.....	Stockhardt.
The Steam Engine, its Origin and gradual Improvement; 8vo; 1840.....	Hodge.
The Steam Engine, Plates; folio.....	“

FREE LIBRARY OF REFERENCE, AND MODEL ROOMS.

The Library of Reference and Model Rooms of the Board of Arts and Manufactures for Upper Canada, are open to the public free, from 10 a.m. till noon, and from 1 to 4 o'clock, p.m., daily, in the New Hall of THE TORONTO MECHANICS' INSTITUTE.

The Library contains several hundred volumes of valuable books of Reference in Architecture, Decoration and Ornament, Designing, Encyclopedias, Engineering and Mechanics, Manufactures and Trades, General Science, Patents of Inventions of Great Britain and Canada, &c., &c., &c.

The Model Rooms contain several hundred models of Patented Canadian Inventions, and the commencement of a Museum of specimens of Foreign and Canadian Manufactures.

The Manufacturers of Canada are respectfully invited to furnish specimens of their various productions, or of any natural products capable of being used in Manufactures, for Exhibition in the Rooms.

Specimens of Machinery, or of other bulky manufactured articles, are requested to be furnished in model.

NOTICES OF BOOKS.

Lovell's General Geography, for the use of Schools; with numerous Maps, Illustrations, and Brief Tabular Views. By J. GEORGE HODGINS, LL. B., F. R. G. S. Toronto: R. & A. Miller, 62 King Street East.

Those engaged in tuition in this country have long felt the want of a proper geographical text book, a want which we are glad to observe has at length been supplied by our enterprising publisher, Mr. Lovell. The expense of English Geographies, rendering an Atlas necessary, has precluded their introduction into our Common Schools, while they do not supply sufficient information concerning British America. From motives of economy therefore, “Morse's American Geography,” combining atlas with text, has been used in most of our educational institutions, but for many reasons this treatise is highly objectionable. Compiled for the use of schools in the American States, the greater part of the work is devoted to a description of that country, whereby young students are apt to form a false estimate of the importance of the States, while they are left in comparative ignorance of other parts of the world.

Mr. Lovell presents us with a Geography superior to Morse's, illustrated with coloured maps, diagrams, and numerous engravings, specially prepared and

admirably adapted for the use of schools in British America. Half of the work is occupied with a description of the American Continent, accurate maps and information being given of the British Provinces, while the States are treated of as fully as their importance deserves. Other portions of the globe are described at sufficient length, and throughout the whole work the author seems to have striven to convey to the student a just idea of every country. The information is derived from the best and most recent authorities, and is conveyed in a concise and easy style.

We would recommend it to those who intend to present themselves as candidates for certificates in geography at the Examinations of the Board of Arts and Manufactures for Upper Canada.

The Works of Francis Bacon, Baron of Verulam, Viscount St. Albans, and Lord High Chancellor of England. Collected and edited by JAMES SPEDDING, M.A., ROBERT LESLIE ELLIS, M.A., and DOUGLAS DENON HEATH. Vol. I.; being the first volume of the Philosophical Works. Boston: Brown & Taggard. Toronto: Rollo & Adam. 12mo. 1860. Pp. 539.

Of this new and beautiful edition of Bacon's Works, undertaken editorially by Mr. Spedding, assisted by Messrs. Ellis and Heath, all of Trinity College, Cambridge, England, six volumes have now been published. The one before us, though the sixth in the order of publication, is Vol. I. of the whole series, and the first volume of the Philosophical Works; the five previous ones (numbered from XI. to XV. consecutively), which contain Lord Bacon's Literary and Professional works, having first been made ready for the press. The remaining volumes will, we are informed, be published in regular order from Vol. I. to X. inclusive, and will contain the Philosophical and Occasional works.

The present volume opens with an interesting account of the history and plan of this edition, from the pen of Mr. Spedding. From it we learn that it was originally intended that each of the three divisions of Bacon's works should be undertaken by a separate editor, namely, the Philosophical works by Mr. Ellis, the Professional by Mr. Heath, and the Occasional and Literary by Mr. Spedding; each division to be made complete in itself, and each editor to be solely responsible for his own part of the work. Unfortunately, however, for this arrangement, Mr. Ellis was compelled by a severe illness to give up his share of the undertaking, though not before the greater portion of his task had been done. His part, therefore, has been filled up and completed, where necessary, as well as made ready for the press, by Mr. Spedding; who, however, has marked for the information of the reader all the additions or alterations for which he is responsible.

The volume proper begins with "The Life of the Honourable Author," by his Chaplain, Dr. Rawley, who, in his opening sentence, well describes his patron as "the glory of his age and nation, the adorer and ornament of learning." This memoir, written as it is

by one who speaks from intimate and familiar knowledge during many years, and who is the only one among Bacon's personal friends by whom any particulars of his life have been recorded, contains by far the most authentic and important evidence concerning him that we possess, though, as might be expected, it is at the same time very favourable and affectionate.

We next have an exceedingly valuable as well as interesting general Preface to Bacon's Philosophical Works, by Mr. Ellis. In this he gives a very lucid explanation of the various reforms in philosophy which Bacon designed to introduce; especially of his doctrine of "Forms," and theory of the formation of Conceptions, and also of his method of Inductive Reasoning, the distinguishing features of which are its absolute certainty, and its mechanical mode of operation, which is such that it renders all men equally capable, or nearly so, of employing it, and so of attaining to the truth. He concludes by summing up what he considers Bacon's chief merits to consist in, and these he justly declares belong rather to the spirit than to the positive precepts of his philosophy. They may be briefly enumerated in the following manner:—First, the good service he rendered when he declared with all his eloquence, and all the weight of his authority, that "the true end of knowledge is the glory of the Creator, and the relief of man's estate." Next, his clear view of the essential unity of science; his perpetual enforcement of the necessity of laying aside all preconceived opinions and learning, in order to become a true follower of nature; his rejection of syllogistic reasoning in the establishment of axioms, a method which had been unduly exalted during the middle ages. And lastly, the tone in which he spoke of the future destiny of mankind. From such causes as these it was, that the influence which Bacon has exerted has been greater, probably, than that of any other uninspired man; for, while his philosophy has been in some degree pernicious, it has also done a vast amount of good.

In addition to the General Preface to the Philosophical Works, we have a Preface to the *Novum Organum*, also by Mr. Ellis, with the exception of the last few pages, which were added by Mr. Spedding, who has also, in the form of an appendix, given us his own views on some disputed points in Mr. Ellis' argument. This preface, while it furnishes a general account of the *Novum Organum*, is chiefly valuable for the excellent analysis it gives of the first book.

We now come to what occupies the remainder, and greater portion of the volume—Bacon's *Instauratio Magna*, containing the *Distributio operis*, and the second part, or *Novum Organum*. Of the wonderful learning and ability displayed in this his most celebrated work, it is needless for us to speak; in the words of Macaulay, "all the peculiarities of his extraordinary mind are found there in the highest perfection. Every part of the book blazes with wit, but with wit which is employed only to illustrate and decorate truth. No book ever made so great a revolution in the mode of thinking, or

overthrew so many prejudices, introduced so many new opinions; yet no book was ever written in a less contentious spirit. But what we most admire is the vast capacity of that intellect which, without effort, takes in at once all the domains of science—all the past, the present, and the future—all the errors of two thousand years—all the encouraging signs of the passing times—all the bright hopes of the coming age." Such language, coming as it does from one who has probably done more than any other writer to detract from Lord Bacon's reputation, is assuredly an encomium of no ordinary value.

We have now but to add that this edition is one of the best specimens of typography that has yet been produced in America; in fact, in style and execution it is quite equal to anything brought out by the best publishing houses in England. We are pleased to learn from the publishers that the list of subscribers is constantly increasing, and that it now numbers nearly one thousand. In conclusion we cannot refrain from stating our opinion that this is a work that ought to have a place on the shelves of every Mechanics' Institute library throughout the country; indeed no library of any pretensions can be considered complete without it.

What Illuminating Was. A Manual of The History of the Art. Part I.

What Illuminating Should Be, and how it may be Practised. A Technical Manual. Part II. By M. DIGBY WYATT, V. P. R. I. B. A.; with Illustrations, by W. R. TYMMS. Condensed from "The Art of Illuminating" by the same Author and Illustrator. London: Day & Son, Lithographers to the Queen. Toronto: Rollo & Adam.

The first part of this Work is devoted to a history of Illuminating, or the art of adorning manuscripts with colour. The characteristics of the several existing manuscripts are described, and the history is made as perfect as the space devoted to it would permit. The author bears testimony to the industry and genius of the transcribers of the sacred and other volumes during the middle ages, and endeavours to impress on his readers the value and usefulness of their labours in an artistic, as well as a literary point of view.

The second part is divided into two portions. 1st. "What Illuminating Should Be," and 2nd. "How Illuminating may be Practised." In the first section the author advocates its use as a decoration in our buildings, and gives directions to the student how to proceed in copying the plates with which the volume is illustrated. In the second section instructions are given in the preparation of the several pigments and their application to various materials, and all necessary information is supplied for the practice of illuminating. The plates interspersed through both parts are twenty-four in number, and serve both as copies for the student, and as fac-similes of some of the famous illuminated writings. We have among them specimens of "Charles the Bald's Bible;" "The Bedford Missal;" "Charlemagne's

Bible;" and "The Missal of Ferdinand and Isabella o Spain." The price of the two parts is but 90 cents, and is therefore within the reach of all, and is useful not only to those who may be inclined to devote some of their leisure time to illuminating, but also to those who desire to know something of the history, and to possess a fac-simile of some of the Mediaeval Manuscripts.

The following extract from the second part of the work will shew its style, and the extent to which the author would desire to see the art applied.

"Illumination, in whatever form practised, can never be properly regarded as any other than one of the genera into which the art of Polychromatic decoration may be subdivided. What was originally termed illumination, was simply the application of minimum or red lead, as a colour or ink, to decorate, or draw marked attention to, any particular portion of a piece of writing, the general text of which was in black ink. The term was retained long after the original red lead was almost entirely superseded by the more brilliant cinnabar or vermilion. As ornaments of all kinds were gradually superadded to the primitive distinctions, marked in manuscripts by the use of different coloured inks, the term acquired a wider significance, and, from classical times to the present, has always been regarded as including the practice of every description of ornamental or ornamented writing.

"Because such embellishments were, during the early and middle ages, and, in fact, until long after the invention of printing, almost invariably executed on vellum, there is no reason whatever why illumination should be applied to that material, or to paper, which has taken its place, only; wood, metal, slate, stone, canvass, plaster, all may be made to receive it. Again; because ancient illumination was almost entirely executed in colours, in the use of which water and some glutinous medium were the only "vehicles," there is no reason why modern illumination should not be worked in oil, turpentine, encaustic, fresco, tempera, varnish, and by every process in which decorative painting is ever wrought in these days. It is in such an extension that the most valuable functions of the art are likely to consist in all time to come. The utilitarian application which it, originally and for so many centuries, found in the production of beautiful books, copies of which could be elaborated by no other means than hand labour, has been, to a great extent, superseded by chromolithography and chromotype. No doubt a wide field for useful and even productive labour, is still left to the practical illuminator on paper and vellum, in designing and preparing exquisite originals for reproduction by those processes, as well as in the rich and tasteful blazoning of pedigrees, addresses, family records and memorials, and in the illustration for presentation, or for private libraries, of transcripts from favourite authors; but, at the same time, an equally elegant and useful application of the art would be to enrich ceilings, walls, cornices, string-courses, panels, labels, round doors and windows, friezes, bands, chimney-pieces, and stained and painted furniture in churches, school-rooms, dwellings, and public buildings of all kinds, with beautiful and appropriate inscriptions, of graceful form and harmonious colouring. Such illumination would form not only an agreeable, but an eminently useful decoration. How many texts and sentences, worthy, in every sense, of being 'written in letters of gold,' might not be thus brought prominently under the eyes of youth, manhood and old age, for hope, admonition, and comfort. No more skill, energy, and taste are requisite for the production of this class of illumination, than are essential for satisfactory work upon vellum and paper; and

while in the one case the result of labour may be made an incessant employment for many, in the other it is seldom more than a nine days' wonder. shut up in a book or portfolio, and seen so seldom as scarcely to repay the amateur for the expense and trouble involved in its execution."

The Emigrant, and other Poems. By ALEX. McLACHLAN. Toronto: Rollo & Adam. 1 vol.; 16mo. 1861. pp.236.

Though this little work does not properly come within the limits we prescribed for ourselves in our literary notices, we cannot forbear transgressing our rule, and affording it a little space in our columns, especially as it is the production of one who has taken up his abode in our midst, and its publication is a Canadian enterprise.

The author has not inaptly taken as his motto the well known quotation, "*Caelum non animum mutant, qui trans mare currunt;*" for his mother country and native dialect shew themselves in every page. The Scottish element is plainly conspicuous also in the characteristic prejudices, the keen satires, and narrow doctrines, mingled with tender sympathies and joyous aspirations, which are visible throughout his poems. The opening piece, from which the book takes its title, would be far less interesting, were it not diversified by

a number of episodes in the shape of songs sung by several of the characters introduced, which are decidedly the best part of the poem. His minor pieces are, to our taste, by far the best; throughout them all there breathes an independent spirit, and most of them exhibit a knowledge of human nature which is the great characteristic of our author's productions. Our limited space forbids our introducing any extracts from those of his lays which please us most; we must therefore content ourselves with enumerating a few of them. Among the first we would mention "Charloch Ban," a piece adapted to an old Highland tune. The "Ode on the Prince of Wales' Visit," and "The Seer," will be admired by many. We ought not to conclude without observing that our bard might make some improvement in his rhymes, without detracting from the beauty and originality of his pieces: many of them are barely admissible, and, indeed, in a younger aspirant after poetical fame would not be tolerated at all.

With regard to the typographical execution and general appearance of the work, the publishers deserve great credit. It is indeed a very fair specimen of the manner in which books can be got up in this country. We heartily wish the enterprising publishers every success in their undertaking.

We intend to publish in each future No., a selected alphabetical list of Books issued in Great Britain and the United States, during the previous month; principally from that class of Works most suited to the Libraries of Mechanics' Institutes, and other similar Associations.

BRITISH PUBLICATIONS FOR JULY.

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Correspondence.

To the Editor of the Journal of the Board of Arts and Manufactures.

SIR,—I see by the August number of your Journal, that the Board of Arts and Manufactures offers a prize of \$10 to each Mechanics' Institute in Upper Canada who may establish a class of not less than six members and submit not less than two members of such class for examination in any of the subjects mentioned in the programme of examination just issued by the Board for 1862. The Board also offers in addition to the certificates to be awarded to successful competitors, silver medals in the proportion of one to every five of the competitors who shall pass their final examination.

I would respectfully suggest to the Managers of Institutes in which classes may be formed, that they appropriate the \$10 offered by the Board in prizes to be competed for within the respective classes, thus furnishing an additional inducement to their youthful members to engage in class instruction.

The annexed letter cut from the pages of the Journal of the Society of Arts, in England, I send for insertion in this Journal, believing that it contains suggestions that may be useful to the Managers and Members of Mechanics Institutes in this province who may be desirous to form discussion classes within their respective Institutes.

Such a class as is therein referred to has been in operation in the Toronto Mechanics' Institute for the past two seasons, and has been very successful. The members of the class, generally, have taken a great interest, and made very satisfactory progress, in its studies and exercises.

Yours respectfully,

A MEMBER, T. M. I.

Toronto, July 23, 1861.

MECHANICS' INSTITUTIONS AND DISCUSSION CLASSES.

SIR,—The knowledge of our own language is one of the first and most important ends of education, and should form the prominent feature of adult instruction in the classes of Mechanics' Institutions. This is not implied, nor will it be accomplished by a mere knowledge of the formal rules of grammar. The object to be obtained is the capability of speaking and writing correctly, which may be materially promoted by a class for the reading and discussion of essays. It is a means of promoting the practice of English composition, and the emulation excited by an animated discussion often proves to be one of the most attractive features of an institution. Care should be taken to exclude all subjects connected with theology or party-politics, or which are calculated to excite angry feelings; and if a list of questions suitable for discussion be prepared, the difficulty of choosing an appropriate subject, which to the unpractised member too often appears insurmountable, would be in a great measure obviated. In order to assist the committees of Institutes in the furtherance of this object, I subjoin a few brief rules which have been circulated by the Yorkshire Union amongst the 143 Mechanics' Institutes comprised in it.

RULES.—The class should meet on one evening in each week, and elect a chairman for the evening.

Each member should in turn read an essay on some subject, either of history, literature, science, &c., to occupy not more than twenty minutes. It should then be open to discussion by the members of the class, the time occupied by each speaker not to exceed five minutes.

All members of the Institute to have free admission, but only the members of the class to take part in the discussion.

At the conclusion of the discussion, the chairman should sum up the arguments and take the votes of the members on the question at issue.

Any member unable or unwilling to prepare an essay may provide a substitute.

At the close of the season a premium may be awarded for the best essay which has been read.

HINTS TO THE MEMBERS.—In the essay it is advisable that the affirmative of the question be maintained. Succeeding speakers should, as far as possible, confine themselves to the salient points of the preceding arguments.

All personalities and egotistical expressions should be carefully avoided.

In discussion, admit as much as possible of what has been advanced by an opponent:

It is important to check the slightest inclination to petulance or ill-temper.

Brevity is as valuable in speaking as in writing.

An opponent should never be accused of acting from wrong motives.

Each argument should be clearly stated, and honestly and calmly answered.

A respectful tone and gentlemanly demeanour should be preserved.

Let me hope that, the attention of those who have the management of Mechanics' Institutions being called to the above few suggestions, it may be the means of stimulating some of them to increased energy. They will not find much difficulty in preparing a list of suitable questions.

I am, &c.,

BARNETT BLAKE.

To the Editor of the Journal of the Board of Arts and Manufactures.

MR. EDITOR,—In the Report of the Board of Arts and Manufactures, published in your last No., the committee in referring to the failure of the projected class examinations last May, give it as their opinion that it was owing to the short notice given, and the neglect of Mechanics' Institutes in forming classes. Now, doubtless, this does explain the circumstance, but only in part. They would be very good reasons for the *scarcity* of candidates, but not for their *total* absence. The real reason, in my opinion, is, that the Board did not offer sufficient inducement to candidates, the only reward held out being certificates. Now, without seeking to underrate these certificates, I would ask, what possible value or benefit would they be to the competitors? Would their possessors enjoy any peculiar privilege; would they enable them to procure employment the readier, or even procure for them a higher standing in society? Would not only the result be, the solitary personal satisfaction of their possessing such a printed paper? A blacksmith would get no higher wages, or a better place, because he had passed an examination in Astronomy; nor a dry-goods clerk a situation the sooner

from his having passed a similar examination in Chemistry. To be sure, masters in both cases, should value these men more highly, not because their acquirements have any connection with their separate trades, but from the great probability that men who take delight in such subjects, would be more likely to be better workmen, and more steady and honest in their characters. But as masters do not look at it in this light, as no great degree of skill is valued or required in any trade in this country, or, I may fairly add, moral character either, I hold that it is but fair that the Board should offer some further inducement to submit to an examination than certificates.

It is no argument to say that certificates are offered, almost wholly, by the mother Institution at home. The case there is very different. The field and demand for superior skill and knowledge being there both large and great, the possessor of a certificate is pretty certain of bettering his position; and, as a natural consequence, the number of competitors is very large. Besides, if I am not mistaken, there are several branches of the government service there, open to candidates possessed of these certificates. While, more than all this, the home institution is well known and esteemed throughout the whole island, and the certificates are as much valued by the public as if they proceeded from an University.

How different the circumstances are in Canada I need not dwell upon. The institution here has yet to acquire a standing; the vast majority of the people of the Province being, I suppose, ignorant even of its very existence; nor are our government offices filled according to the acquirements of the candidates.

Taking all these circumstances into consideration, I am certain, Mr. Editor, you will agree with me when I say that it cannot be expected that candidates will come forward solely for certificates, and that if the Board wish to form annual examinations; they must offer something more substantial. It is but natural for a young man to expect something of real value as a reward for the labor required for qualifying for such an examination, and the trouble in attending it. The most convenient form for such a reward would, I suppose, be books, or small sums of money; and as it is not likely there would be many competitors for the first few years, \$30 would probably cover the annual expense—a small consideration for the valuable results which such examinations would lead to. If the Board adopted such a plan, and gave timely notice of their intention to hold an examination with such prizes, I feel certain it would not have to regret again a similar failure to that of the present year.

Yours, truly,

R. S.

Toronto, August 15, 1861.

[We cheerfully insert the above letter in the columns of the Journal, being satisfied that by keeping the subject before our readers, a spirit of enquiry will be fostered that will in the end result in the success of the proposed annual examinations of the Board.

Had our correspondent read the proceedings of the executive committee of the Board, published in the same number with the Report to which he refers in his letter, he would have noticed that what he considers the principal cause of failure for the present year, has been provided against for the future; the committee having offered a prize of ten dollars to each Institute establishing a class, of not less than six members, for the study of any of the subjects named in the programme for 1862, and submitting not less than two members of such class (who shall have passed a satisfactory previous examination by the local committee) for the final examination of the Board.

The managers of the several Institutes will no doubt award the ten dollars, appropriated by the Board, in prizes to the successful pupils of their respective classes; and as a further inducement to study, the Board will award silver medals at the final examinations, in addition to the certificates, in proportion of one to every five of the successful candidates.

While we cannot but believe that the prizes offered will tend to the success of the undertaking, we do not see that such should necessarily be the case. We believe that the certificates to be awarded by the Board will have a value in themselves which should be sufficient to induce the youth of our country to become competitors for them.

Our correspondent altogether underrates the advantages to the industrial classes of obtaining a knowledge of the subjects of examination, and asks if the possessors of these certificates will "enjoy any peculiar privileges."

Is it no advantage to the Mechanic that he is able to speak and write his native tongue correctly, or that he should have a knowledge of Arithmetic, Geometry, drawing, and the principles of Mechanics? to the Agriculturist or Gardener, that he be conversant with the science of his profession? to the Commercial clerk that he is a good penman, and thoroughly understands the principles of book-keeping? And to how many of the various callings of the Industrial classes, are a knowledge of one or more of the studies named in the programme of the utmost importance?

Where can the intelligent employer be found that will not appreciate an intelligent workman, or servant; and that will not pay more liberal wages to such as have their minds stored with knowledge, and whose characters for morality and industry have been established? We are satisfied that few such employers can be found.

The Board cannot look for that measure of success that has crowned the efforts of the London Society of Arts, nor can corresponding advantages be held out to the possessors of the certificates to be awarded; but a beginning must be made, and although the results may be small and not very satisfactory at first, yet, by perseverance, in the face of many discouragements, great benefits to the industrial classes may be confidently anticipated.—ED. JOURNAL.]

Selected Articles.

THE METALS IN CANADA.*

Lead.

The Geological Survey report the occurrence of lead in many localities in Canada. The following extracts from Sir William Logan's Reports of Progress will conclusively show to any one at all acquainted with the subject, that rich and persistent deposits of lead may be looked for in the townships of Bedford and Lansdowne, counties of Frontenac and Leeds.

In the Report for 1858, pp. 48-50, he says under the head:

"*Galena*.—This ore of lead is another of the minerals that are to be looked for in connection with the limestones of the Laurentian series, but it is not yet determined whether it specially characterises one or more of the bands. None of it was met with in the calcareous exposures in the district of the Rouge; but I have been informed that several veins holding galena have recently been discovered in the township of Bedford, not very far removed from those lodes which have already been discovered by Mr. Murray, in the twenty-first lot; and near the line between the eighteen and nineteen lots of the eight range of the township."

In the Report for 1851-52, Mr. Murray makes mention of the occurrence, in the second lot of the eighth range of Lansdowne, of a vein of heavy-spar and calc-spar cutting rocks of the Laurentian series, and holding disseminated crystals of galena, which had been unsuccessfully tried as a lead mine. Subsequently to his visit to the locality, a lode was discovered on the third lot of the same range, from which specimens were obtained in 1855 for the Paris Exhibition.

A trial shaft was sunk on it to the depth, it was said, of fifty feet, and a sufficient quantity of ore obtained to pay the expenses of sinking. The specimens showed a thickness of between two and three inches of pure galena, associated with calc-spar. It was said that other lodes existed in the neighbourhood, but their position was kept secret.

"The bearings given by Mr. Murray to the three lodes examined by him in Bedford are N. 15 W., N. 32 W., and N. 85 W., the last being the course of the lode traced and tested farthest. The distance between the Bedford and Lansdowne lodes is not much over twenty miles; and considering the differences that may be allowed for the gentle windings which usually exist in the courses of metalliferous veins, it appears not at all improbable that the lodes of the two localities may be identical or belong to one group, the bearing of the two positions being about N. 68 W. and S. 68 E. of one another. If a line from the Bedford to the Lansdowne lodes were continued twenty-five miles farther, it would cross the St. Lawrence and strike Rossie in Lawrence County, New York: where a group of well known veins of lead ore exists, some of which, though just now abandoned, are not supposed to be exhausted, and two of which are known at one period to have yielded a great quantity of ore.

"The rock cut by the lodes at Rossie is of the Laurentian series; but a line between Rossie and

Lansdowne would intersect the outcrop of the Potsdam sandstone, which lies between Rossie and the St. Lawrence. It has been ascertained that a vein of lead ore cuts through this sandstone at Redwood, which would not be far from the position of the line to Lansdowne. It is thus not improbable that there is a group of lead ores running from Rossie to Bedford, and this metalliferous line appears well worthy the attention of explorers in search of lead ores. The dislocations in which the lodes exist are of course thus proved to be of more recent age than the Potsdam sandstone, but this by no means establishes that the older rock may not be the source of the metal."

Ramsay Lead Mine.—In 1853, Mr. Richardson ascertained the existence of a vein of galena on the third lot of the sixth range of Ramsay, in the county of Lanark. The rock which the vein intersects is an arenaceous limestone, the fossils of which prove it to belong to that division of the Lower Silurian series known as the Calciferous sandrock. Mining operations have been prosecuted with some success, and have established beyond a doubt the important facts that the galena occurs in true veins which may be depended on for persistence in depth, and that its quality is most excellent, producing eighty per cent. of metallic lead. "There appear," says Sir William Logan, "to be indications of other lodes with nearly the same bearing as the one opened at Ramsay, not far removed from it, and it may belong to a group which, running parallel with the Bedford and Rossie group, would be about forty miles from it to the north-east."*

Sir William in 1848 discovered traces of galena at Bay St. Paul, on the north bank of the St. Lawrence, about 90 miles below Quebec. Although in unworkable quantity, the mode of occurrence of the ore gave unmistakable evidence of its being in a true vein; and, from the well known valuable characteristics of such deposits, this circumstance invests the discovery with some importance.

Galena of an excellent quality is known to exist at several points in the Quebec group of rocks, stretching from Lake Champlain to Gaspé but the facts have not yet been accurately ascertained by the compilers.

Gold.

Discoveries of gold have been made at several localities, and in fair quantity in Eastern Canada, chiefly in the valleys of the rivers Chaudiere and Du Loup, and their tributaries, and on the St. Francis, all in the Eastern Townships. In all cases it has been obtained by a laborious process of washing or *stream-work*, the material subjected to this process consisting of drift clay and gravel, the debris of the rocks, on which they repose. These rocks consist of clay-slates, and interstratified grey sandstones associated with conglomerates, talcose slate and serpentine, and with various ores of iron; and it seems probable from recent observations, that the gold producing regions will have the same geographical limits as those assigned to the Quebec group of rocks.* The gold has nowhere been found in place,

* Report of Progress for 1858, page 51.

* The Quebec group consisting of altered and highly dislocated and disturbed limestone and sandstone strata, belonging to the Lower Silurian system; and extends in a belt varying from twenty to sixty miles wide, from the borders of Lake Champlain eastward to nearly the extreme point of Gaspé. This band of rock is pronounced by Sir Wm. Logan, J. D. Whitney and other eminent geologists, to be a portion of the great metalliferous formation of North America; to

* From "The Metals in Canada," by Messrs Wilton and Robb, Montreal, 1861.

with the exception of a mere trace discovered in a quartz vein near Sherbrooke. The size of the largest nuggets varies from two to four ounces.

The result of the washings on the Du Loup and Chaudière in 1851-52, when the process was vigorously and systematically pursued during a whole season, was about 1900 dwts.; and the proceeds shewed a yield of about double wages. The quantity obtained was not so great, nor the results, as far as regards profitable working, so satisfactory as to give much encouragement to the gold seeker in Canada; but it is fair to infer that since the rocks of the country are now ascertained to be identical with those which, in the neighbouring States, have yielded a considerable amount of the precious metal, explorations will be undertaken and prosecuted with greater vigor and greater prospects of success. On the whole however, it may not be considered out of place to repeat the caution given by Sir William Logan, that in all probability, "*the deposit will not in general remunerate UNSKILLED labour, and that agriculturists and others engaged in the ordinary occupations of the country, would only lose their labour, by turning gold hunters.*"

Silver.

With reference to the occurrence of this metal in Canada, we are not aware of the existence of any silver ores proper; and the lead ores which have been hitherto discovered are for the most part exceedingly poor in silver. Mr. Hunt however, in the Report for 1853, page 370, gives details of assays made by him upon samples of galena from Meredith's location (Maimansee) on Lake Superior, and from the Rapids of the Chaudière in Lower Canada, the former yielding thirty ounces, and the latter twenty five ounces per ton of metallic lead. This result affords the strongest encouragement to the prosecution of the search for argentiferous lead ores in these districts, which, although widely separated geographically, have been lately ascertained to belong to the same geological epoch.

On the north shore of Lake Superior, and in Michipicoten Island, considerable amounts of native silver have been obtained associated with copper veins and native copper.

At Prince's location, towards the western extremity of the Lake, 15 miles west of Sturgeon bay, a bunch of four cwt. of ore containing about four per cent of silver, with traces of gold, has been found. On the south shore in Michigan, which is considered to be in the same geological formation, a considerable amount of native silver is frequently met with, in workings for copper; but in most instances it is stolen, or deemed a perquisite by the miners; one nugget is mentioned by Whitney which weighed 96.8 oz.

Copper.

Although iron ores are most extensively distributed, and lead veins have been detected in the Laurentian rocks, we are not aware of any discoveries of copper in the region occupied by the great mass of this formation. This region has, however, been so little explored that it would be altogether premature to assert the absence of this metal. At various points along the lines of junction or contact

between the Laurentian and the next succeeding formations, namely the Huronian in the west and Zower Silurian in the east, important discoveries of copper have been made.

Lake Region.—In the lake region the disturbances are so great, and the amount of exploration hitherto accomplished so limited, that it is impossible to indicate accurately the geographical boundaries of the formations; but the recent observations of Mr. Murray seem to point to this geological horizon as a promising field. In his Report for 1856, he says, referring to districts overlying this point in the series, "The existence of the ores of copper and iron, which are known to be more or less characteristic of the Huronian series of rocks, invests the geographical distribution of the formation with much economic importance. These ores were repeatedly observed in the region explored last season, and although nowhere seen in large amount or to a great extent, the indications were sufficient to establish their pretty general distribution. Small specks and patches of the yellow sulphuret of copper was frequently found in the blackish and dark grey slates on the lower lakes of the Maskinongi; and at the southern turn of these lakes there is a quartz vein of from six to eight feet wide, with copper pyrites cutting slate conglomerates, and an intrusive mass of compact flesh-red feldspar. In the feldspathic dyke, small narrow veins of specular iron ore occur, which appear to run parallel with the dyke or slightly oblique to it, and the quartz veins and its subordinate *droppers* cut across both. Were this vein as conveniently situated as those of somewhat similar character on Lake Huron, it is fully as well worthy of trial as many that were selected by explorers there some years ago upon which to found claims for mining locations."

In the Report for 1857, he says, "Copper pyrites is very generally disseminated through masses of greenstone wherever they were examined, and it occasionally appears in quartz veins in sufficient abundance to constitute metalliferous lodes. The most favorable indication known of this description is the area on the south side of Echo Lake, and in the hills north of the mouth of Root River, both of which localities have been taken up for the purpose of mining, but have not hitherto been worked to advantage."

Again, in the Report for 1858, Mr. Murray gives, a list of all the localities where copper ores were found on the River Mississagui; and in reference to it states that "though the quantity of the ore does not in the case of any of the veins appear very encouraging, they may become the means leading to the discovery of veins of a more promising character in the neighbourhood." A useful hint to the explorer will be found embodied in a further statement made by Mr. Murray in reference to the same locality, "The examination of the area connected with the Mississagui has not yet been sufficiently extended to determine the relations between the copper-bearing veins of the Grand Portage and the physical form to which they are subordinate. The veins of the lower part of the river are evidently related to the anticlinal existing there. Those of the south part of Echo Lake also belong to an anticlinal; so do those of the Bruce and Wellington mines; and it would almost appear as if the importance of the metalliferous indications rose with the sharpness of the fold. But whatever be the cause of the dislocations in which

which belongs not only the rich ores of Lake Superior, but the gold, silver, lead, zinc, copper, cobalt, nickel, chrome and titanium, found along the Appalachian chain from Canada to Georgia, as also in Missouri and Tennessee.

metalliferous minerals are secreted, it would seem to be a probable supposition that in a metalliferous district the greater the dislocations, the greater the chances of valuable metalliferous lodes."

The Huronian system itself occupies the whole northern flank of Lake Huron and parts of Lake Superior, and constitutes the lower copper-bearing rocks of the Lake region,—consisting of white and often vitreous sandstone or quartzite, passing into a jasper conglomerate and interstratified with heavy masses of trap. The deposits exist in the form of true veins, although it is said that some of the lodes have become rather poor and thin on penetrating to a comparatively small depth. The ores are entirely sulphurets;—yellow, variegated and vitreous,—no native copper being found in this region. The Wallace, Bruce and Wellington mines have been worked in this formation for many years: of these the Bruce mines are the most important, and have been worked by the Montreal Mining Company with tolerable success; and had proper skill and discretion been exercised from the first in their management, they would undoubtedly have proved an excellent investment. These are truly valuable mines, and should produce largely.

The important copper deposits at Maimanse, Michipicoten Island, and the more Western localities of the north shore of Lake Superior, in all probability belong to the upper copper-bearing rocks; being the same as are exposed on the south shore, and have produced such extraordinary results.

The promontory of Maimanse consists of thick masses of quartzose sandstone and conglomerate, associated with amygdaloid trap and volcanic ash or tufa. The copper occurs in the amygdaloid trap both in the native state and as ore, the vein-stones being principally calc-spar and quartz; the deposits seem to partake of the character of segregated veins, and are both very thin and do not hold out in depth, though exceedingly rich in some places. In 1855, at the depth of eighteen feet, a mass of native copper weighing 630 lbs. was extracted, and the whole yield of a shaft twenty-seven feet deep and without galleries was about three tons of metallic copper.

On Michipicoten Island, where copper mining has been carried on for many years, the metal is deposited in the native state in beds of amygdaloid trap and volcanic ash, overlaid by compact trap and underlaid by a coarse red quartzose sandstone; the cupriferous bed proper being from one to two feet thick, and sufficiently rich to pay for working. The metal also pervades to some extent the rocks lying above and below the copper-bearing belt, being distributed through the former in bunches, and through the latter disseminated in grains. It occurs also in veins traversing the beds at nearly right angles. It seems that when a metalliferous belt has been broken up by the intrusion of igneous rocks and re-arranged under metamorphic action, rich deposits of ore may be expected.

At the western locations on Lake Superior, the rocks consist of argillaceous shales or slates overlaid by a flow of trap; both formations being cut by numerous parallel trap dykes, and by transverse veins of quartz, barytes and calc-spar, carrying ores of copper and native copper. We are not aware of the extent to which these veins have proved productive. The amazing development reached by the copper workings on the south shore, situated in corresponding positions, will be best judged by the

fact that in 1850 the aggregate value of exports was \$266,000, while in 1860 it had attained the sum of \$3,000,000. Masses of nearly pure native copper have been there discovered weighing from 300 to 400 tons.

Copper in Lower Canada.—We have already remarked that the Quebec group of rocks are the equivalents of the upper copper-bearing rocks of Lake Superior; and accordingly we find them characterised by similar features, as regards their metallic contents. Towards the line of junction between the Laurentian rocks and the Quebec group of the Lower Silurian system a few discoveries of copper ore have been made and recorded by the Provincial Geologists. In the Report for 1852-53, Sir William Logan states that in the seigniory of La-Norraye, in the county of Berthier, on the north side of the St. Lawrence, a point situated in the above geological horizon, a vein of calc-spar and pearl-spar occurs carrying copper pyrites, though in small quantity. He remarks that "though the vein does not appear by any means a promising one, it yet bears too many of the characteristics of a regular lode to be passed over without notice." Recently a report, which however wants confirmation, has been made of an important discovery of copper ore at St Irenée de Malbaie, which as will be seen by reference to the Report for 1849-50, is also situated at this point in the geological series.

In this connection also we have shortly to notice the discovery as related by Mr. Murray, (Report 1851-52, of a small quantity of copper pyrites occurring in a vein of calc spar which is found penetrating the Laurentian limestone and Potsdam sandstone, in the township of Bastard, county of Leeds. The vein was tried by sinking a shaft to the depth of twenty feet on it, but the amount of ore found was not sufficient to justify the expectation of a favorable result. The trial seems to have been made in consequence of the previous discovery, on Gananoque Lake near the same locality, of some loose masses of very fine and rich copper pyrites of considerable size, and containing upwards of thirty per cent of copper. The source of these masses has not yet been discovered.

In the same neighbourhood in the township of Escott, and still upon the borders of the Laurentian rocks, there occurs a bed of magnetic oxide of iron, holding a considerable quantity of copper pyrites so strongly resembling the detached masses found on Gananoque Lake as to induce the belief that they have originated in similar deposits.* The cupriferous portion of the bed varied from six to ten inches in thickness over a length of about twelve feet extending in the direction of the stratification. Sir William remarks: I understand that between eighteen and twenty tons of the copper ore were obtained, but after this bunch became exhausted I believe no excavation was made through the dead ground in search of a further quantity. On testing the iron pyrites, Mr. Hunt has detected in it traces of cobalt, and as cobalt and nickel very generally accompany one another, the latter may very reasonably be expected in this deposit."

Copper in the Eastern Townships.—But the copper region of Eastern Canada, *par excellence*, will be found to be on the south side of the St. Lawrence in the Quebec group of rocks. So far as hitherto dis-

* See Report of Progress for 1853, p. 52.

covered, the deposits occur most abundantly and in greatest richness, as might be expected, in the highly altered and disturbed strata constituting the mountainous and picturesque region of the Eastern Townships. Throughout this region and extending as far as the extremity of Gaspé, the rocks are distributed in long narrow synclinal forms, with many sharp plications or folds, and in some cases overturn dips. The ores, consisting of the pyritous and variegated sulphurets of copper, are found usually in the vicinity of certain bands of dolomite, serpentine, soapstone and other magnesian rocks; and the deposits, in every instance yet discovered, preserve a direction coinciding with the stratification.

Upton.—In a trial excavation in the township of Upton, Drummond county, the ore, consisting of pure pyrites, in a matrix of calc-spar, occurred in the form of reticulating veins of from a quarter of an inch to an inch in thickness, enclosed in a partially crystalline limestone, the veins constituting bunches, several of which could be traced in the strike of the limestone. Sir William Logan regards them as veins of segregation, filling up fissures which do not pass beyond the limits of the limestone.

The same calcareous band, is traceable through several townships in a north-easterly direction parallel with the mountain ranges; and transversely to this course, a series of ridges nearly parallel to the first, are produced by repeated folding of the strata into synclinal and anticlinal forms; at many points in this series copper ore has been found under the same circumstances as at Upton. "The ore is very irregularly distributed in bunches, some of which might produce five, and others two to three hundred weights of between twenty and thirty per cent. to a fathom of ground; but the irregularities appear to be so great as to make it questionable if the ore is capable of being profitably mined."

Acton.—A very remarkable exception however occurs in the rich deposit forming the well known "Acton Mine" in Bagot county, an admirable description of which will be found in Sir William Logan's Report for 1858, to which we must refer our readers; as well as to an interesting and lively sketch of the same locality in the "Canadian Naturalist and Geologist," Vol. V.

In this case the greater proportion of the ore is deposited in brecciated masses or conglomerate beds, the pebbles being limestone, partly angular and partly rounded, and the paste consisting of the variegated and vitreous sulphurets of copper; the beds in question being subordinate to the stratification of the limestone rocks of the country. Many examples of similar brecciated bunches occur in the true veins of Cornwall and Devonshire, in England, as related by De La Beche,* and Sir William Logan states that the whole conditions of the case bear a striking resemblance to those of the copper deposits of the Ural Mountains, as described by Sir Roderick Murchison.

Referring to the Acton deposits, Sir William Logan says: "There is no doubt the mass of ore is a very important one; already after but nine weeks working not far from 300 tons have been housed, supposed to contain about 30 per cent of pure metal. The value of this quantity would be about \$45,000; while inclusive of lordship, the mining expenses and those necessary to carry the ore to a market will be comparatively small. The quantity of ore excavated

seems to have produced but a moderate impression on the total mass in sight." Since the above was written additional masses of ore are said to have been discovered at the same locality, and the working has been equally successful.

Leeds, &c.—In the townships of Inverness and Leeds, Megantic county, copper ore has been discovered at several points, in a different form from any we have hitherto noticed, and mining operations are there carried on with much vigour and skill. The ore occurs in rocks of an aluminous and micaceous nature, most appropriately named by Mr. Hunt "nacreous" (or pearly) slates; it is of the same description as that found at Acton, but is distributed in a succession of slate bed coinciding with the stratification, and also in quartz courses or veins crossing the strata at various angles. "The mode" says Sir William Logan "in which the copper ore is distributed in the nacreous slates of Leeds precisely resemble that in which it occurs in the bituminous slates of Germany; and it is only the circumstance that the facts known in connection with the Canadian deposits are yet too few to give entire confidence in the persistence of similar conditions over a great area, which should moderate expectation of an important result."

Sir William estimates the average yield of metallic copper from the Leeds beds at about four per cent. The copper-bearing slates of Mansfeldt in Germany, above referred to, are profitably worked on a yield of only two per cent; and the following remarks by Mr. Whitney in reference to somewhat similar circumstances are deserving of attention. Speaking of one of the workings on Keewanaw Point, Lake Superior, he says, "Here a bed of sandstone has been lately examined, carrying enough copper to be excellent stamp-work. By some it is believed that it carries one per cent of copper, but by others it is thought to be richer. It is perfectly clear from what can now be seen of it that many thousand tons of mixed rock and copper will be taken up from it in opening the mines. It will require no calcining to stamp and wash easily, and can be cheaply excavated. So little has been done in testing the value of the bed in question that great caution should be observed in giving an opinion in regard to it; but metalliferous beds have been and are now mined in the Ontonagon districts with some success, and on Portage Lake with prospects decidedly flattering."

MANUFACTURE OF PAPIER MACHE.

The origin of the manufacture of useful and ornamental articles from paper, is still a matter of doubt, although it is generally believed that the Japanese were the first inventors. From the name given to it, we would naturally infer that it had been introduced by the French; a recent French writer, however, ascribes the merit of producing paper ornaments to the English.

When the art of moulding and casting in plaster was first introduced into England, the art of preparing the pulp of paper was improved and extended, and ultimately rendered practicable the adoption of papier maché in the formation of architectural decorations. The handsome ceilings of Chesterfield

* Report on the Geology of Cornwall, Devon, &c., page 323.

House, and many of the fine old ceilings in deep relief of the Elizabethan era, are of this material.

The London *Ironmonger* gives the following description of the various processes practised in the manufacture of papier maché, at the works of Messrs. Loveridge & Shoolbred, at Wolverhampton :

"There are at present five principal varieties of *papier maché* known in the trade, viz., 1, sheets of paper pasted together upon models; 2, thick sheets or boards produced by pressing ordinary paper pulp between dies; 3, *fibrous slab*, which is made of the coarse varieties of fibre only, mixed with some earthy matter, and certain chemical agents introduced for the purpose of rendering the mass incombustible (a cementing size is added, and the whole well kneaded together with the aid of steam. The kneaded mass is passed repeatedly through iron rollers, which squeeze it out to a perfectly uniform thickness; it is then dried at a proper temperature); 4, *Carton pierre*, which is made of pulp or paper mixed with whiting and glue, pressed into plaster piece-molds, baked with paper, and, when sufficiently set, hardened by drying in a hot room; 5, *Martin's Ceramic papier maché*, a new composition, patented in 1858, which consists of paper pulp, rosin, glue, drying oil and sugar of lead, mixed in certain fixed proportions, and kneaded together; this composition is extremely plastic, and may be worked, pressed or moulded into any required form. It may be preserved in this plastic condition for several months, by keeping the air away and occasionally kneading the mass.

"The first mentioned variety of *papier maché* alone engages our attention here. A special kind of paper, of a porous texture, is manufactured for this purpose. An iron mould of somewhat smaller size than the object required, is greased with Russian tallow, a sheet of the paper is laid on to the greased surface of the mould, and covered over with a coat of paste made of the best biscuit flour and glue, which is spread evenly all over the sheet with the hands; another sheet is then laid on, and rubbed down evenly, so that the two sheets are closely pasted together at all points. After this the mould is taken to the drying chamber, where it is exposed to a temperature of about 120°; when quite dry, which it takes several hours to accomplish, it is carried back to the pasting-room, and another sheet laid on with another coat of paste, after which it is returned to the drying chamber, and the same operation is repeated over and over again until sufficient thickness is attained, which, for superior articles, such as are manufactured at these works, requires from thirty to forty sheets of paper, and of course as many coats of paste between. The shell is then removed from the mould, and planed to shape with a carpenter's plane, after which it is dipped in linseed oil and spirits of tar to harden it; this changes the color from gray to a dingy yellowish-brown tint. The article is then stoved, and seven or eight coats of varnish are laid on (with a stoving after each), which are cleared off each time, any inequalities of surface being finally removed with pumice-stone. The number of drying processes the articles have to go through consume so much time that it takes three or four weeks to fit them for ornamentation, which is applied in bronze-powder, gold or color, and for many articles also in mother-of-pearl. The ornamentation of these articles is sometimes effected in the highest style of the painter's art. It was in Wolverhampton that Bird, R. A., worked as a 'japaner,' the technical name given to an 'ornamentor;' and we believe some other of our great artists have sprung from the pursuit of this occupation.

"The gold-leaf is laid on with a solution of isinglass in water, the design then pencilled on with asphaltum, the superfluous gold removed with a dossil of cotton

dipped in water, which leaves intact the parts touched with asphaltum, and the latter finally removed with essence of turpentine. The cotton pledgets used are of course carefully collected, to recover the gold removed by them.

"After the application of every coat of color or varnish, the object so colored or varnished is dried in an oven or chamber, called a stove, and heated by flues to as high a temperature as can safely be employed without injuring the articles, or causing the varnish to blister. All articles so japanned, or, to use the technical term, 'stoved,' are more durable than they would be if simply left to dry in the air.

"For black grounds, drop ivory-black mixed with dark colored animé varnish is used; for colored grounds the ordinary painter's colors, ground with linseed oil or turpentine, and mixed with animé varnish. The colors most in use are white lead, cobalt blue, yellow, vermilion (used more particularly to imitate tortoise-shell), Indian red, verdigris, umber, and the intermediate tints produced by mixing two or several of them together. The varnishes most used are aminé and copal. The grounds and varnishes are generally laid on with painting brushes, or flat brushes, made of fine soft bristles. Tin-plate articles intended for japanning, are first thoroughly cleansed from every trace of grease that may adhere to them, with turpentine or spirits of tar, then rubbed with sand-paper. They are then ready to receive the first coat, after which they are thoroughly dried in the stove.

"For black japanned works, the ground is prepared with a coating of black made as just now stated, by mixing drop ivory-black with dark-colored animé varnish, which gives a blacker surface than would be produced by the japan alone; and the object is then dried in the stove; from three to six coats of japan are afterwards successively applied, the work being always thoroughly dried again in the stove ovens between the laying on of every fresh coat.

"For brown japanned works, umber is mixed with the japan, to give the required tint; the process in all other respects being the same as for black japanned works.

"The colors are protected against atmospheric influences, and made to shine with greater brilliancy, by two or three coats of copal or animé varnish. Superior articles receive as many as five or six coats of varnish, and are finally polished.

"The ornamentation of all such articles as come under the head of toilet wares, is effected by the ordinary mode of painting with a camel's hair pencil, or some fitting substitute; where imitations of woods or marble is intended, the ordinary grainer's tools are used. Many patterns are produced upon the various articles by 'transfer printing.'"

SUPERHEATING STEAM IN LOCOMOTIVES.

The *Toronto Daily Leader*, of Tuesday, Sept. 3rd, in an article on the working of the locomotives on the Grand Trunk Railway of Canada, speaks of Mr. Martin, the Locomotive Superintendent of the Western Division, and of his recently patented superheating apparatus, as follows :

"This gentleman, whose experience has extended over a period of eighteen years, has devoted a great deal of attention to the improvement of the locomotive, with especial reference to the saving of fuel; and a visit to the Toronto workshops enables us to state the shape and the result of his labors in this direction.

"Fully alive to the drawbacks to the highly expansive

working of the locomotive which arise from condensation, and the large quantity of water which is carried with the steam into the cylinders, causing loss of power by back pressure, Mr. Martin has brought into use a superheating apparatus, which, after severe and protracted trials, is found to work admirably. The value of the superheating process, as applied to marine engines, has long been known; but though the most eminent writers on this branch of engineering have repeatedly dwelt upon the desirableness of applying the process to the locomotive, the object aimed at has not hitherto been attained. Amongst those who have dwelt upon the subject most emphatically, is Mr. Kinnear Clarke, perhaps the ablest and most widely known writer on railway machinery, and who has just been appointed by the English Commissioners Superintendent of Machinery in the approaching Exhibition. For though superheaters have been tried in the smoke-box of the locomotive on other railways, they have virtually been failures; an inability to prevent the choking of the draft producing an aggravation of the very evil which engineers have desired to remedy. To Mr. Martin belongs the credit of having perfected an invention which realizes the great desideratum—a diminished consumption of fuel—and yet avoids the drawbacks which have baffled other inventors.

“An examination of the working returns of near a score of engines, running on the Grand Trunk Railway, shows that in no instance has Mr. Martin’s superheater failed to improve the engine, as well in actual hauling power as in steaming qualities. It is impossible, without diagrams, to illustrate the construction and working of the apparatus. We may nevertheless be understood by mechanics, when we say that inasmuch as the position of the bottom of the superheater acts as a vacuum-chamber, an equalization of the draft is secured, and there is consequently always an abundance of steam. The economical result is remarkable. In some engines, where the smoke-box was sufficiently capacious to admit of the largest superheater, a saving of thirty per cent. has been effected. Mr. Martin is modest, however, and contents himself with claiming on the average a saving of twenty per cent.; a reduction in the outlay upon fuel which railway managers will know how to appreciate. As a natural result, the quantity of water consumed is largely diminished. We may mention that the saving effected by the superheater is rendered all the more noticeable by the fact, that the engines furnished with the apparatus were originally fitted with the American Petticot pipe, which is admitted to be a good equalizer of the draft.

“The superheaters used on the Grand Trunk are usually made of cast iron, three-eighths of an inch in thickness, with wrought iron tubes of sixteen wire gauge. Some are of copper, with copper tubes. No ferules are employed. The steam pipes are joined with the loose brass ring used in ordinary practice; and although some of the engines, with the apparatus, have run two years, no trouble has been experienced from leaky joints or tubes, or in the working of the valves or pistons. The cost of the apparatus, when applied to a number of engines, is, we learn, \$75 per set. And to secure to himself the profit of his invention, Mr. Martin has taken out patents in this Province, in the United States, and in England and France.”

INKS.

Indestructible Ink.—1. Powdered copal 25 parts; oil of lavender 200 parts; lamp-black 2 parts; indigo 1 part. Dissolve.

2. Asphaltum 1 part; lamp-black $\frac{1}{2}$ part. Melt, then add oil prepared for printers’ ink, by boiling and burning until sufficiently stringy, $1\frac{1}{2}$ part. Mix

together, and add spirits of turpentine 3 or 4 parts. We would propose this ink, made with less turpentine, so as to be sufficiently thick for stamping, as the most perfect preventive of fraud, as when applied to the surface of an engraving, or letter-press, nothing will remove it that will not also discharge the ink of the stamp. It will stand the action of the alkalis, chlorine, acids, &c., even in a heated state, when they will at once destroy the texture of the paper.

Lithographic Ink.—1. Take Venice turpentine 1 part; lamp-black 2 parts; tallow 6 parts; hard tallow soap 6 parts; mastic in tears 8 parts; shell-lac 12 parts; wax 16 parts. Melt, and pour it out on a slab.

2. Take dry tallow soap 5 parts; mastic in tears 5 parts; Scotch soda 5 parts; shell-lac 25 parts; lamp-black 2 parts. Fuse the soap and lac, then add the remainder.

For use, this ink must be rubbed down with water in a saucer (warmed), until an emulsion is formed of a proper consistence to flow easily from a pen or pencil.

Blue Writing Fluid.—1. Ferrocyanide of iron, powdered, and strong hydrochloric acid, each 2 parts. Dissolve, and dilute with soft water.

2. *Indestructible.*—Shell-lac 4 parts; borax 2 parts; soft water 36 parts; boil in a close vessel till dissolved; then filter, and take of gum-arabic 2 parts; soft water 4 parts. Dissolve, and mix the two solutions together, and boil for five minutes as before, occasionally stirring to promote their union; when cold, add a sufficient quantity of finely powdered indigo and lamp-black to color; lastly, let it stand for two or three hours, until the coarser powder has subsided, and bottle for use. Use this fluid with a clean pen, and keep it in glass or earthen inkstands, as many substances will decompose it while in the liquid state. When dry, it will resist the action of water, oil, turpentine, alcohol, diluted sulphuric acid, diluted hydrochloric acid, oxalic acid, chlorine, and the caustic alkalis and alkaline earths.

Red Ink for writing.—Boil over a slow fire 4 ounces of Brazil wood, in small raspings or chips, in a quart of water, till a third part of the water is evaporated. Add during the boiling 2 drachms of alum in powder. When the ink is cold steam it through a fine cloth. Vinegar or stale urine is often used instead of water. In case of using water adding a very small quantity of sal-ammoniac would improve this ink.

Fine Black Writing Ink.—Take 2 gallons of a strong decoction of logwood, well strained, and then add $1\frac{1}{2}$ pounds blue galls in coarse powder; 6 ounces sulphate of iron; 1 ounce acetate of copper; 6 ounces of well ground sugar; and 12 ounces of gum arabic. Set the above on the fire until it begins to boil, then set it away until it has acquired the desired black.

Black Ink Improved.—To 1 pint of common black Ink add 1 drachm of impure carbonate of potassa, and in a few minutes it will be a jet black. Be careful that the ink does not run over, during the effervescence caused by the potassa.

Green Ink.—1. Cream of tartar 1 part; verdigris 2 parts; water 8 parts. Boil until reduced to a proper color.

2. Crystallized acetate of copper 1 ounce; soft water 1 pint. Mix.

Marking Ink.—Lunar caustic 2 parts; sap green and gum-arabic each 1 part; distilled water. Dissolve.

The preparation.—Soda 1 ounce; water 1 pint; sap green $\frac{1}{2}$ drachm. Dissolve, and wet the linen (where you intend to write) with this mordant, then well dry it.

Miscellaneous.

Ship Armor Plates.

The Sheffield and Rotherham Independent (English paper) describes the manufacture of armor plates for the war vessels of the British navy as conducted upon a large scale at one of the iron and steel establishments in Sheffield. The plates are made from slabs of bar iron, each $1\frac{1}{2}$ inches thick, and measuring 30 by 12 inches. Four of these are first laid upon one another and heated to a white heat in a furnace, then rolled into a plate about four feet square. Step by step several plates are now put together, heated and rolled until four plates measuring 10 feet by 4 feet 4 inches and $2\frac{3}{4}$ inches thick are made; then these four are heated, welded together and rolled, by one final operation making one massive armor plate 20 feet long, 4 feet and 4 inches broad, $4\frac{1}{2}$ inches thick and weighing 6 tons or 180 lbs. to the square foot. Formerly armor plates were forged by a huge steam hammer, but it has been found that by using iron of different fibres, and rolling it from slabs, so as to have about 132 layers, the plates are tougher than those formed by hammering.

When one of these huge plates are rolled finally it is quite crooked and has to be straightened. To do this it is placed on a long flat iron bed, and two immense rollers—each weighing nine tons—are passed over it, in the same manner as plate glass is made. This levels the plate perfectly, and it is now left to cool. The plates after this are each lifted by a crane into a huge planing table, where they are cut true on the edges to the exact width of four feet, then they are tongued and grooved like pine boards for flooring, and are ready to be bolted to the side of the vessel.

Electricity for Exploding Gunpowder.

In a recent lecture in London by Professor Abeel, F.R.S., and Director of the chemical establishment of the War Department, he stated that an extensive series of experiments had been made for ascertaining the different forms of electricity which were the most advantageous for exploding gunpowder. The Ruhmkorff coil, by which electricity of high tension is obtained, he considered was the best. What is called the "magnet fuse" has been used very successfully in firing gunpowder with electricity. It consists of two fine copper wires, each covered separately with gutta-percha, then both placed alongside, and bound together with an outer coating. It is then cut into short lengths, exposing the copper wires at the ends. Moistened gunpowder is placed upon the terminals or ends of these fuses when placed in the mine that is charged with powder to be exploded. A spark of inductive electricity sent from a Ruhmkorff coil fires the moist gunpowder at the end of the fuse, and explodes the charge with certainty. This moistened gunpowder is prepared by mixing the fine-grained quality with a dilute alcoholic solution of chloride of calcium. A large supply of such fuses, with prepared gunpowder and a large magnetic apparatus for generating electricity, furnished a portion of the equipment

of the British army during the late China war, and the obstructions to the expedition on the Peiho river were cleared away by electrical discharges.

An improvement in the magnet fuse has lately been made in rendering the priming composition more sensitive by using a mixture of phosphide and sulphide of copper and the chlorate of potash. This priming is put upon the terminals of the copper wire, and it is ignited with the smallest size of magneto-electric machines—such as the 6-inch horseshoe magnet and a rotating armature used in America for medical purposes.

The charges of powder which are used for blasting under water and in mines with electricity, are either inclosed in a tin case or a bag of india-rubber, with the magnetic fuse placed in the middle, and connected with the conducting wire to the magneto-electric machine which develops the sparks. For field and mining operations in military engineering, a magneto-electric machine is more convenient than a galvanic battery, and a very small apparatus, made with Beardslee's American cast iron radial magnets would, we think, answer admirably for such purposes.—*Scientific American.*

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 wood cuts, 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 MANUFACTURERS & 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.