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

OCTOBER, 1865.

THE AGRICULTURAL ASSOCIATION—1865.

The Twentieth Exhibition of the Agricultural Association of Upper Canada, held at London, has just terminated, having, as usual, extended over the week, commencing Monday, the 18th, and ending Friday, the 22nd September. The limits of a monthly journal will not permit of more than a general notice of the prominent features of interest; and beyond this, with the exception of the Arts and Manufactures, which are the special considerations of our publication, we cannot venture. Not having been able to procure in time those statistics which would enable comparison to be made between this and last year's Exhibition, as to the number of entries, the number of tickets sold as the test of attendance, the amount received and paid, &c. &c., we can only record our own impressions, derived from a tolerably close inspection of the various classes (thirty-nine in number), as to the character and effect of the Exhibition.

Providence favored the occasion with the finest possible weather: heavy rain fell on the previous Sunday, which completely laid the dust, cooled the air (heated by many days of high temperature), and refreshed the face of nature, parched by the long drought. The number of entries was larger than the number of articles exhibited, chiefly, we believe, in the classes of grain, roots, fruits, vegetables and flowers; arising, no doubt, from the extremely dry weather having marred the growth of these articles. The attendance of visitors, especially from the rural districts, was enormous. From an early hour on Tuesday and each succeeding day, the railroads delivered their thousands of men, women and children, bent upon sight-seeing; and the teams, freighted to excess, which rattled into town were past counting: and from the best means at our disposal we are justified in saying that, taking into account all classes, there must have been not less than sixty thousand people who visited the Exhibition grounds during the week! But, in addition to the ordinary visitors, the Exhibition of 1865 is memorable as having been attended by the Delegates (some fifty or sixty) from the maritime Provinces, and by Sir Morton Peto, M.P. for Bristol, and other English capitalists, who are making an inspection of the productions and resources of Canada. As regards attendance, therefore, the Exhibition of this year has been a most decided success, and the result to Canada West cannot fail to be of the utmost benefit at home, in the sister Provinces, and in the mother country.

The show of Cereals, Roots, Fruits, Vegetables and Flowers, was not as extensive as could have been wished for. The want of rain has sadly retarded all kinds of root crops, as well as deteriorated the quality of most kinds of fruits and vegetables; so that in these articles some allowance may be fairly made. But as regards Wheat and other grains, which form the great staple of Canadian agriculture, and of which there has been an abundant harvest, the show was small in quantity, and, with one or two exceptions, we think not very superior in quality.

The exhibition of Horses was numerous and good. To be sure, the thorough-bred or blood horse was not strongly represented, which is to be regretted, because a strain of blood is an improvement in a cart horse, and ought to pervade more than it does our carriage and farm horses, giving neatness and activity to the breed, and thus rendering their services more useful. But the heavy draught horses were worthy of Barclay & Perkins, and would have been admired anywhere. The carriage horses were handsome, serviceable looking animals, and so evenly were their merits balanced, that no wonder the judges were so long in deciding which was entitled to the first prize. In saddle horses the show was meagre, and would seem to indicate that the "pig skin" is not so much favored as it used to be, and in fact ought to be; for what exercise in the world is more graceful, or more healthy, than a good gallop on a well-bitted steed?

In Cattle the entries, if not large in number, were remarkably good in quality; and it may be asserted, without fear of contradiction, that in the various classes of cattle exhibited, there were some as fine specimens as could be desired. In Durhams, the Hon. David Christie, of Glenmorris, shone conspicuously, his imported bull "Oxford Lad" having carried off the Prince of Wales' prize; his imported cow won the first prize in her division; and both were splendid animals indeed. The Devons, that genteel class, were pretty and neat as a picture, but it may be doubted whether the climate of Canada is as suitable to them as to other breeds of cattle. The useful Ayrshires, famous for their butter-yielding milk, are evidently increasing in favor with our farmers, and those exhibited were very fine samples of the breed.

Black cattle, both Angus and Galloway, are destined to "increase and multiply" among us: they are hardy, healthy, and more easily fed than most other breeds: they are famous for beef, and by no means bad milkers; and each returning Exhibition shows them to be largely on the increase among our farmers, which we are glad to notice. For many years Hereford cattle have not found favor in the sight of Canadian breeders, although why not it is hard to determine, as they are highly fancied in the English market; and we were glad to notice several very good specimens shown by Mr. Stone, of Guelph, who seems to value the breed, his first-prize Hereford cow being equal to anything on the ground. As the natural consequence of the encouragement given to pure-bred cattle, the grade or half-bred cattle have surprisingly improved, and it required a good judge to tell some of the prize "grades" from the "pure-bred" heifers.

The Sheep were as numerous in quantity as they were excellent in quality, and finer animals were never exhibited in Canada. The Leicesters were particularly good, and we were shown a yearling ram for which the large sum of two hundred dollars had been offered and refused. The Merinos, famous alike for their ugliness and their wool, were in moderate quantities, but of superior quality. The large Cotswolds and Cheviots were fully represented. But the pick of the Exhibition were the Southdowns, so justly celebrated for their excellent quality of mutton and neat figure. Mr. Stone, of Guelph, was the principal exhibitor, and he showed two pens of shearling lambs, rams and ewes, superior to anything heretofore submitted to public competition, and which, as they merited, were greatly admired.

Any one who remembers the breed of Pigs some twenty years or more since, must wonder at the vast improvement which has been made in this direction. Then, the "critter" was long in the leg, flat-sided, rampant with bristles, and fit almost for a "quarter-race;" now, the animal is short, thick in figure, and his skin fine and thin of hair. All the known breeds were represented. The large breeds, such as Yorkshires and Berkshires, showed some huge masses of pig's flesh, put together in symmetrical shape; while the small breeds, such as Suffolks and "improved Berkshires," were really models of piggish beauty, and fine specimens of what cultivation can do in the way of improvement in an animal by nature so ungainly and so dirty as the pig. And to supplement this department, it may be mentioned that Mr. J. Symonds, of London, exhibited some very fine cured hams and bacon (to which a first prize was awarded), thus practically utilising the live animal's good qualities.

The Dairy produce was good enough in quality, though very short in quantity; but small as was the supply, the exhibition room was still smaller, and the inconvenience experienced by visitors was so great, that next year better arrangements will have to be made. It was as hard to get forward as it was to get out, and it was next to impossible to see the articles to advantage, as they were as much crowded as the people. The monster cheese, weighing 4,000 lbs., was not on the ground, but exhibited separately as a "ten-cent" speculation. Mr. Parsons, of Guelph, was, as usual, highly successful with his Canadian Stiltons, which, prejudice apart, are really almost, if not quite, as good as those imported from England. The other cheeses were also very good of their kind, and the time, it is to be hoped, is not far distant when Canada shall be able to supply "bread and cheese" for her own people. A variety of other articles were exhibited, such as honey, maple sugar, as well as some capital hams and bacon, already referred to.

The Wheat exhibited was good enough in quality, although but a small fraction of the late harvest was shown, and the kernel did not appear to us as large and well filled as on some former occasions. The Canada Company's prize of $100 for the best twenty-five bushels of fall wheat, was carried off by Mr. J. O'Sullivan, of Seymour; that of the Association, $40, by Mr. J. T. McEvers, of Cobourg; and the third, $20, by Mr. T.T. Turnbull, of Glenmorris. The Barley was good, and this article is now extensively grown in Canada, as it finds a large sale at good prices for the American market; Mr. J. O'Sullivan, of Seymour, and H. Kennedy, of London township, exhibiting the finest specimens. The Oats, both black and white, were only middling; but the Peas were very fine, and largely represented, through a large number of exhibitors. As a whole, the Grain show must be considered inferior to that of former years, but the smallness and inconvenience of the show-room (like that for dairy produce) did not allow fair play for the samples exhibited. The agricultural roots proper were nothing as compared with previous years; and it cannot be denied that in quantity as well as in quality, many mere township shows have surpassed what was to be seen in this class at London. But, making all reasonable allowance for the drought, this department, with the exception of potatoes, was anything but creditable to our agricultural efforts in the way of root crops, without which a Canada farm can never be properly cultivated.

The Horticultural department is always one which attracts much public attention, and although in general supplied most bountifully, was not so much so this Exhibition. There were very fine specimens of different fruit certainly, and perhaps there were some single instances of as fine grapes, pears and apples, as could be wished for; but in their collective capacity the Fruit show can hardly be said to have been a success. Of white grapes (under glass), Mr. John Grey, jun., of Toronto, and Bruce & Co., of Hamilton, divided the first honors; for black grapes (under glass), Mr. J. C. Small, Toronto, C. Merton, Hamilton, and Mr. Herschfelder, Toronto, carried off the first prize; and for the best collection generally (under glass), Mr. G. Buchanan, gardener to W. P. McLaren, Esq., Hamilton, distanced all competitors. For grapes grown in the open air, Mr. Arnold, Paris, Bruce & Co., Hamilton, and James Taylor, St. Catharines, were the most successful. Grape culture is fast becoming a valuable element in our productive interests, and large experiments are being made, and will be still more extensively made, in this direction, for making Canadian wine. Some specimens of this article were exhibited; but it is to be hoped that the vintage was only in its infancy, for, to say the truth, the home-made currant wine from London and Toronto was a more fruity drink, with better body and flavour. In apples, as well as in pears, Mr. Geo. Leslie, Toronto, carried off first prizes for the best thirty varieties, some of them very fine. The cooking apples were of great size and good substance, but it would be impossible to particularize the different exhibitors who took prizes. The same may be said of the table apples and pears, some of which were both handsome and well flavoured. Of the peaches there is little to say; the same remark applies to the melons exhibited; but with melons *not* exhibited, the grounds were abundantly supplied by waggon-loads, and hundreds of country folk might be seen burying their faces in the juicy section of a thumping water melon. The plums were good, but not many of them; and among the finest specimens was a collection of some dozen varieties grown at Goderich, which, for size, colour and flavour, are entitled to special praise. The garden vegetables, like the farm roots, were neither abundant nor very fine, most likely for the same reason, want of rain. There were a few lots of good onions, red and white; but with the exception of the potatoes, which were very fine, there was but little room for comment. The flowers were not much better than the vegetables. It is true, there were some illustrations of the beautiful in dahlias, pansies, verbenas, and so forth, but they were few and far between; and the most noticeable feature of the floral hall was the collection of greenhouse plants exhibited by Mr. Mitchell, of London, and Mr. Hirschfelder, of Toronto, with a floral ornament arranged with good taste and in the shape of a cornucopia, exhibited by Mr. Thomas Partridge, of London.

The Poultry show was admitted to be the best which has yet been seen, both as to numbers, variety and quality. From the lanky Cochin China to the tight little bantam, every class had its representative. There were Polands, black, white, golden and silver; Hamburghs, black, pencilled, spangled, golden and silvered; black Spanish, many and very fine; and our own favorite Dorkings, white and coloured. There were turkeys, white, coloured and black; and in ignominious captivity was a wild turkey, cooped in a pen where he could not stand upright, his bronze wings and captive look telling of the wild woods of his early life; and Aylesbury ducks (suggestive of green peas), peacocks and guinea-fowls, all of handsome form and plumage; while the noise made by such a gathering of prisoned birds, and the shrill, defiant crowing of a hundred cocks, made up a music more demonstrative than agreeable.

The Ploughing Match was a success, the "bone and sinew" of the country being well represented, not less than some eighty men and twenty-one boys competing for the prizes. The ploughing was considered to be remarkably good, the furrows being straight, sharply defined and clean. The shiny coats of the well-conditioned horses, the neat harness, and, though last certainly not least, the manly and intelligent appearance of the "lads between the stilts," was a right pleasant spectacle, which spoke volumes for the substantial character of our Canadian farmers. The contest was witnessed by thousands of admiring spectators, and may be said to have been almost *the* feature of the London gathering. The first prize, for men (a clover machine, valued at $300, given by Mr. Hall, Oshawa), was won by Mr. Courtis, Pickering; the second ($75), by Mr. D. McLean, York township; the third ($50), by Mr. S. Rennie, Scarboro'; all from the neighbourhood of Toronto. The first prize ($100), for boys, was won by John Weeks, Glanworth; but we have not space to do more than commend the others generally.

The Agricultural Implements were exceedingly numerous, of great variety, and of most excellent workmanship; all, we believe, of home manufacture, and showing that Canada needs no "foreign aid" in these departments. There were portable steam engines for farm purposes, for which Waterous & Co., Brantford, took the first prize; a

large collection of handsome iron ploughs, all very good and well finished, but the judges awarded the first prize to Mr. McWhinnie, St. Davids; other ploughs, of various kinds and uses; iron harrows, of excellent form and make; cultivators, assorted, which, if industriously employed, ought not to leave a weed, or, what is worse, a thistle, to be seen in our fields; threshers and separators; combined mowers and reapers; grain and turnip drills; straw cutters, root cutters, grain crackers, corn crushers, cider mills, market waggons and carts, farm rollers, and a host of other aids to a thorough cultivation of the fertile soil of Canada; all constructed with much mechanical ingenuity, and manufactured of the best materials, combined with good workmanship. The agricultural implements, chiefly for hand use, were also numerous and excellent, bearing favorable comparison with their seniors intended for horse and other power. There were fanning mills, straw and root cutters, churns (which promised butter almost without cream), pumps, fencing (of wire and wood), rakes, stall forks, scythes, hoes (of most beautiful workmanship, from Whitney & Co., Oshawa), drain tiles, machine for making the same, horse shoes, and axe-handles; and, what merits special commendation, just at the time the new "anti-thistle" law has come into effect, a thistle extractor: would that a thistle *extirpator* could be invented, to exterminate, now and forever, that abominable pest to our farms and gardens. Nor should we omit to notice the exhibition of specimens of oil cake, artificial food for horses and cattle, super-phosphates, ground gypsum, and other artificial manures, which, sooner or later, Canadian farmers must resort to, if they desire to keep their lands productive and in good heart.

From the foregoing comments, our readers, we hope, will have derived a tolerably good *general* opinion of the stock, dairy, poultry, horticultural and agricultural products and implements exhibited at London in 1865. To go into full particulars, and to mention the names of all those who took prizes, would be impossible, as to do so would fill a whole number of the *Journal;* and in those classes extending from No. 1 to No. 39, it must suffice that we condense our remarks, as above expressed, and take leave of these departments by recording our conviction that, some short-comings to be indulgently considered as the exception, this highly important division of the twentieth Exhibition was a decided success, well worthy of the agricultural reputation Canada has so well won for herself wherever her products have been seen and examined.

The departments which more especially belong to the *Journal of Arts and Manufactures*, extend from class 40 to class 56, and comprise mechanical industrial skill, the fine arts, printing and binding, ladies work, and various other branches of skilled labour pertaining to domestic life. Commencing in the first instance with the useful rather than the ornamental, the cabinet ware and other like manufactures was respectable, if not actually superior, the exhibitors being nearly all local workmen. As regards the Cabinet Work, it is no reproach to say that the every-day ware-rooms of Messrs. Jacques & Hay, Toronto, exhibit a hundred better specimens of handicraft, than what took first prizes at London. Thomas Bryan, jun., London, was deservedly successful in tool handles, made of capital wood and of neat workmanship. Mr. W. Craig, Toronto, showed good specimens of turning in wood, and the undressed, as well as dressed and polished veneers, from Canadian woods, reflected great credit on Mr. Clement, and Purdy & Co., both of Newbury.

In Carriages and Sleighs, there was much to admire in the neat workmanship and light draft of the various vehicles exhibited; but we did not admire the style of the carriages, ("buggies" as they are termed) and there was more varnish and shining black leather, than comported with our perhaps, old-fashioned opinions—in fact there was more of show than of utility all through the room; but there were some good samples of plain work in the shape of machine made hubs, rims, felloes, and spokes, exhibited by several parties. In the Decorative and Useful Arts, there was not much above mediocrity, nor was the supply at all equal to what has been exhibited heretofore. The carving in wood was respectable, as was the wood engraving, but no more. The marble mantlepiece and the head stone, by Mr. Smith, London, were also respectable, but no more. The picture frame, ornamented gilt, by Mr. A. J. Pell, now of Montreal, formerly of Toronto, was the best article in class 43.

The specimens of Home-made Paper, Printing, and Bookbinding, were eminently creditable to Canadian skill, and it is doubtful whether better work could have been exhibited anywhere. Among the articles shown was a folio volume of Tasso, beautifully illustrated, printed and bound by Mr. Desbarats, of Quebec, which would do honour to any publishing house in "the Row." It would have been desirable to have had a larger competition in this department; we should have liked to have seen a specimen sent from every practical typographer in Western Canada, not so much for the mere money prize, but as displaying the extent and ability of a free "Press" in a new country.

The exhibition of Chemical Manufactures was creditable and encouraging to Provincial enterprise, as supplying from *home* resources, what heretofore has been imported from abroad. The linseed and other expressed oils shown by the Toronto Company, were of excellent quality and merit public support. Of petroleum there was an abundance, to say nothing of the pungent odour. Painter's colours assorted in oil, pulp and powder, all of good quality, were shown by the Toronto Linseed Oil Company, and these home-made products will soon deservedly find their way into general use. There were good specimens of pitch, resin, tar, and turpentine: and there was an interesting exhibition of medical herbs and roots from London and Norwich. In Groceries and Provisions the supply, though small, was good, and the samples of pearl and pot barley, buckwheat flour, corn meal, chickory, starch and soap, are worthy of notice, as being good evidences of home manufacture. There were also numerous samples of preserved meats in jars; preserved fruits of various kinds; and a collection of good looking Canadian pickles, which we are glad to see becoming also an extensive element in home manufactures, as no sufficient reasons exist why Canadians should pay charges and duties on an imported article. And in the miscellaneous class some good useful brushes were shown, although only one person exhibited in this branch of domestic industry; there was a large and good collection of pottery by Mr. W. R. Campbell, of Hamilton, also a good collection of bricks, well made and well burnt; a large assortment of sewerage pipes and stone ware of substantial manufacture, also from Mr. W. R. Campbell, Hamilton; and a consider able display of Indian bead-work, very neat and pretty. And in foreign manufactures, diplomas were awarded to a church organ from New York, to Wheeler & Wilson's sewing machines, and to Mr. A. W. Russell's fine collection of London made chronometer watches.

In Machinery Castings, Tools, Stoves, and other articles in metal, the exhibition was very large and equally good. The Great Western Railway Company exhibited a fine assortment of really splendid machinery, substantial, and highly finished. In stoves, our Toronto firm of J. G. Beard & Sons, made as usual a grand display, carrying off several first prizes; and their display of copper and tinsmith's work was very good indeed. Mr. A. Copp, of Hamilton, also exhibited stoves of excellent quality, which took several first and second prizes. There were good samples of carding machines, improved spinning wheels, and other articles too numerous to mention, and we can only say that these useful classes were fully up to the mark in quantity and quality as compared with former years, and may be fairly counted a success.

In Saddlery and Harness the exhibition was scarcely up to the desired standard, either in quantity or quality. Some few good harness were, however, exhibited; and the assortment of saddles by Mr. W. Thompson, Whitby, were of excellent quality and workmanship. Toronto, we regretted to notice, was not represented in this class. Mr. W. Marks, Toronto, showed the only sample of engine hose copper-rivetted, and which as might be expected, was first rate. The leather was good, neatly finished and much noticed. Kingston monopolized all the prizes for boots and shoes, (why is Toronto so apathetic in these matters?) and the show was in fact limited, and by no means up to the mark as such a branch of industry ought certainly to be; and there was the usual supply of lasts and trees, prepared skins of some very superior quality, sole leather, &c.; but as a whole, classes 53 and 54 disappointed us.

But if those classes did not fulfil expectation, class 55, Woollen and Flax goods, Furs and Wearing Apparel, exhibited a display of articles in the raw material and made-up, such as a Canadian Industrial Exhibition has just reason to be proud of; and we are not at all exceeding bounds when we rank the display of goods in this most valuable and useful department as second to none in the whole exhibition. Bearing in mind the high tariff imposed upon imported "dry goods," as well as the advantages to be further derived from the encouragement of home industry and Canadian manufactures, it is quite encouraging to see the enterprise and skill brought to bear in regard to supplying our own domestic wants from amongst our own farmers and mechanics, instead of depending upon and paying higher prices to others. It would be out of the question to even attempt noticing in detail the great variety of excellent home-made articles exhibited on this occasion. The class (55) comprised not less than 47 sections, and the entries were very numerous, almost constituting an exhibition of themselves; and the judges must have had some trouble, where all was so good, in determining the best. There were bags made from hemp grown in Canada; blankets of excellent quality; winter and summer tweeds; shawls, stockings, drawers, undershirts (hardly to be told from imported goods), all manufactured at home from Canadian wools; hats, sleigh-robes, suits of clothes—all of home growth and manufacture. But what most gratified us was the linen goods, manufactured in Canada from Canadian-grown flax, in pieces of not less than 12 yards,

remarkably fine samples of home skill and industry, for which Mr. John Pearce (Tyrconnell) was awarded the first prize, and Mr. Wm. Pearce (Dunwich) the second prize, most deservedly. It would have given us pleasure to extend these remarks, but really we have not room; and all that is left for us to do, is to regret that Toronto and neighbourhood does not shine in the prize-list for this especially practical branch of Canadian industry, and to give our most hearty commendation to those enterprising exhibitors who have won honours in this particular.

The specimens in the Natural History class, both Canadian and foreign, were very good, and deservedly admired. In the birds, much taste and skill were shown in the attitude and character of the specimens, which in some instances were exhibited in a life-like manner; and it is to be regretted that the omission of technical names in decidedly the best collection shown should have lost what it so well merited—the first prize. The Canadian insects classified, were a very handsome and skilfully-mounted collection; and the collection of native plants in families was well deserving of commendation. The foreign and English insects were collections worthy of any museum; and the samples of Canadian woods, oak planks, and other forest productions, were in every way creditable illustrations of our resources.

In Musical Instruments, the display was extremely gratifying. The articles were not only handsome in appearance, fit for any drawing-room, but very fine in tone. During the time the exhition was open, music was in the ascendant, so that the public had a thorough opportunity of appreciating the merits of the various instruments, and thus endorsing the fiat of the judges, who awarded prizes to Toronto, London, and Hamilton manufacturers.

The Ladies' department was literally laden with beautiful specimens of those neat-handed productions of the needle, which female taste so much delights in. There was no end of bead-work, braiding (the stamping being extemporised by visitors), crotchet-work, embroidery, flowers, hair, lace, and moss-work; quilts in patchwork, like Joseph's coat, "of many colours;" shirts and the other article, socks, and a score of other lady-like articles beyond our description. It was mentioned in our hearing, that the show of ladies' work was not as good as in 1864; but to our mind it seemed quite as good, if not better; and certainly if admiration be any test of merit, the crowds which poured into the gallery was a striking evidence of the success of the show; and the difficulty experienced by the charming judges how to award the prizes, proves that there was more than an average supply of good needlework.

It would be quite beyond the capacity of our pages to enter into a lengthened criticism on the Fine Arts exhibited. There was not a little to admire and praise, much that was no more than mediocrity, and some that had better have been kept at home. This class (44) comprised the large number of 49 sections, under the general headings of Professional and Amateur, Oil and Water-colours, Crayon and Pencil, Portraits, Landscapes, Flowers, Fruit, Photographs, and Sundries. The entries were more or less numerous in every section, amounting to some three, or perhaps four hundred altogether. To judge these satisfactorily would have been a task quite difficult enough under the most favourable circumstances; but when even at the last moment no classification had been made, and when the judges had to hurry from one end of the gallery to the other to find one picture to compare with another, and all this in the midst of numbers of lookers-on fast gathering into a crowd, it is evident, as stated in their report, that it was impossible to perform the duty assigned to them with satisfaction to the society, the exhibitors, or themselves. It may seem invidious to criticise under such circumstances, but in truth the collection was sadly deficient in originality: very many were old acquaintances; some were coloured copies of at least moderate or doubtful originals; others were merely fancy articles, as wide from nature as exaggerated colour, and false drawing could make them; and of those which professed to be originals, portraits were all that looked like taken from nature. Of course there were some honourable exceptions, which space alone precludes being noticed; but the gem of the exhibition was the large collection of original watercolour drawings from nature of the wild flowers of Canada, by Mrs. Fitzgibbon (Toronto), which for genius, taste, and skill merits especial commendation.

The articles exhibited under the head of "Extras" were legion in number, and cannot be noticed otherwise than in general terms. In most instances they possessed considerable merit, and deserved the distinctions awarded to them: and if we do not specify articles or individuals, we must stand excused for the omission: but it is due to Messrs. Hurd & Leigh (Toronto) to notice and commend their display of painted crockery and china of home manufacture.

Taking the exhibition of 1865 as a whole, it is entitled to be considered a success; but on the next occasion it is to be hoped that some of the

mistakes and shortcomings at London will be rectified, and a better system of management matured. For instance, the crowding in the main building at London was frightful, and the manner in which women were hustled and mobbed by impatient men was disgraceful. Again, there *must* be a radical change as regards the time when all articles (except stock or things of a perishable nature) shall be on the premises. At London, some of the articles either did not arrive at all, or were received after the judges had commenced their duties. In several of the classes, but especially in that numerous one, the Fine Arts, no proper system of classification can be possibly carried out unless all the articles are at hand in good time, so as to allow of their being arranged carefully and thus correctly. There can be no reason why articles, not in their nature likely to deteriorate by keep ing, could not be sent in at the very latest say the Friday previous to the exhibition week. This would enable the parties in charge to complete the work of arrangement and classification in that deliberate manner without which so important an auxiliary to success can not be done properly. By such an improved regulation confusion would be prevented and mistakes avoided: the judges would have leisure to make their awards without being disturbed by the presence of others, and the prize tickets could then be attached before the Press or the public were admitted, and thus obviate the plea which, in 1864 and 1865, justified naming the exhibitors beforehand.

It is gratifying to know that the Delegates from the Maritime Provinces, as well as the English Capitalists, have left Canada abundantly satisfied with what they have seen of our breed of horses, cattle, sheep, and pigs; with our grains, roots, and dairy products; our home manufactures and our horticulture;—and more especially with the character of our people, worthy representatives of our productive soil and healthful climate.

Having endeavoured to do the best we possibly could to condense into limited form a general abstract rather than a report of the exhibition of 1865; and asking indulgence if we have, through oversight—certainly not from intention—omitted anything of consequence which merited notice, it only remains to say that next year the exhibition will be held at Toronto, and that Mr. McGillivray, of Glengarry, has been elected President of the Association for 1866.

We propose to publish a correct list of the prizes awarded in the Arts and Manufactures department, in the next number of the *Journal*.

LECTURES, AND THEIR INFLUENCE.

The wanderer returns from his peregrinations in foreign lands to his native village. Eager friends crowd to his fireside; and with eyes all expressive of wonder, they listen with intense interest to his narrative. Soon the tale of the adventurer becomes the topic of village gossip, and without the tax of study, the good people of the place acquire much instructive as well as interesting knowledge of their fellows belonging to other climes.

Encouraged by the interest excited amongst a few, he publishes his adventures by lectures to many; and if he be a shrewd observer, a well-educated man and an attractive speaker, wherever he goes he cannot fail to both please and teach, especially if he illustrates the theme by curiosities of nature and art, collected from the countries he visited.

Another inhabitant of this supposed villa has memorized the annals of time from the dawn to the present mid-day splendour of the world's history. The hours pass unheeded in the parlour, as he talks in a free and easy style, of the human oddities that ever and anon convulsed the serious deliberations of nations; or, as in the public hall, he portrays the life and character of heroes long since passed from off the stage of action, but, who wielded during their lives, and have ever since continued to wield,—a great influence. Amongst other noted worthies of the past, he introduces to his hearers Sir Isaac Newton, of cute perception and conclusive reason, who, from the falling of an apple discovered the law of gravitation.

The popular mind by a few such lectures would be prepared to understand the philosophical causes for the differences existing between countries and their several peoples. They would also be prepared to be instructed somewhat in those abstruse sciences, the study of which employed the gigantic intellect of Newton a lifetime.

So far, we have engaged a traveller, an historian and one who, philosophizing himself, is also acquainted with the various systems of philosophy, therefore one who has ability to explain to us the causes of things, and aid us to investigate their phenomena. But then, there is moral philosophy, intellectual, natural and many other classes, each of which is a science of itself, differing materially from its fellows, and requiring an exclusive talent for its service. It, therefore, would not be wise to give a metaphysician the subject matter of a botanist upon which to lecture. Let every man talk about matters he feels the most interested in, and therefore the better understands. However, as subjects of discourse are so numerous, the most

approved plan would be that, which is not too comprehensive. One or two subjects thoroughly sifted by men of but moderate talent would prove of greater benefit, than five or six partially examined by men of genius. If a course of lectures for the profit of mechanics be proposed, chemistry and mineralogy should be leading topics, with occasional biographical sketches, analysis of mind and geographical description to prevent monotony. Also we would urge, that the instruction of the people about health, the habits and conditions necessary to its enjoyments, be not neglected.

Having suggested instructive subjects, it would be well to say that to impart information in any branch of knowledge, it is not required of the lecturer to be dry and technical in the treatment of his text. Cheerfulness and hope are very necessary aids to the study of the sciences. The public teacher, then, should not seek to make his subject as abstruse and unintelligible as possible, but should endeavour to render it in pleasing illustrations, interspersing experiments and definitions with appropriate anecdotes, clothing all in the most consistent language attainable from vocabularies, not disdaining to employ flowery epithets and glowing figures of speech when they are admissible.

Clothing the facts of science in the most elegant attire, that is consistent with this matter-of-fact world, need not interfere with system, which by the way, is one of the chief requisites to instruction. To conclude our hints to the lecturer, we would add—He should commence nothing but what he can finish; especially should he refer to and explain such causes and effects as more particularly concern common life; and should feel, also show that he feels, a warm interest in the subject with which he is dealing; if he does not, it cannot be expected that his example will incite the hearer to the pursuit of knowledge.

Notwithstanding, however, the confessed duty—the avowed office of Mechanics' Institutes—to instruct, animate, invigorate, energize, and arm with knowledge their members, and not to beguile into enchanted slumber, from which the sleeper awakes enervated, stupefied, dissatisfied, and wholly unfit to encounter the difficulties of life—it is to be feared that these institutions are too servile in their obedience to the commands of vitiated taste. Neither do they generally fulfil their duty, nor answer the end for which established, as they should. Look to their catalogues and see which class of literature is the most voluminous. Not biography, not history, not science, not poetry—no, none of these; but the light and airy phantoms that, shaped as ideas, are unreal—that are pretended pictures of real life, but mere transparent deceptions.

We are not cognizant with the proceedings of all these institutions; but the principal portion of those that come under our notice must plead guilty to the charge. Can things be changed? The prospect is not very promising. Too many managers of public libraries seem blind to the mournful results so often the consequences of novel-reading. So many talented young men and women hastened along by the current of sensation to the whirlpool of delirium. The frequent occurrence of this sad consummation to the excessive exercise of the imagination, should stimulate wise people to come to the relief of the foolish. No doubt it is a difficult task to save such as will passively yield to the temptation; but there are those who read light and trashy literature, because they have imbibed a false idea, which considers all other writings dry, heavy, and uninteresting. Now it is not impossible to lead these last mentioned from error to truth. Indeed, very possible— an undertaking much easier at trial than at glance. Lectures of the character recommended in this article, cannot fail to foster an appetite for useful reading, which appetite the library should satisfy. Should an institution thus amend the intellectual tastes of its members, less money would be expended in purchasing unprofitable books, and more dedicated to the instruction of the popular mind. No better plan then could be adopted than this—buying one half less novels than are now bought, and a larger proportion of useful works; make the lecture room more attractive, and constitute the attendance on lectures a privilege of membership, and charge the general public such low rate of admission as the case may demand. Of course there will be difficulties to surmount, but the object of the organisation of these institutions is to overcome difficulties. If Napoleon had been discouraged at the obstacles to his ambition, we would never have heard of Bonaparte. Had Wellington been afraid of the legions of France because of their previous unbroken chain of victories, the probability is that the usurper of France would have become the usurper of all Europe. Are Mechanics' Institutes afraid of public opinion? Then is it prognosticated, that they will become its slaves; while there is no tyrant, but only one who aspires to be such, let every precaution be taken to prevent his success and to preserve the liberty of intellect, that, untrammelled, she may traverse the domain of science, and ever and anon by exploration discover some new truth. Let the people be taught to perceive, reflect and conclude. If this cannot be accomplished through the medium of much

learning and high sounding titles, let the clergyman, physician, surgeon, barrister, school-teacher, and any others who are qualified by education, be pressed into the service. Frequently gratuitous lectures thus delivered, and when occasion requires it illustrated by means of apparatus made by resident mechanics, are as instructive as paid discourses, and, at the same time, more suited to the finances of many institutions.

It is urged however by many, that the only recreation absolutely needed by the working classes, is periodical change of subjects. Let them work all day physically, then mentally from supper till they retire in the studying of some useful book. All very well if human beings were made to wear forever. They are not, however, but are subject to daily wear and tear, which necessitates cessation from work, not action, at least four hours out of twenty-four, exclusive of sleep. The drudgery of mental work must be removed before it becomes a pleasing diversion. With many, learning is wearisome, if it must be obtained in entire solitude. As the school room is to the child so is the lecture room to the adult. The subject has been thought over, it may have been investigated by each, and now, they assemble together, listen to the reasoning of a superior mind, and add to their little stock new facts from the well stored memory of the speaker, thereby correcting or corroborating their own preconceived views. Yet, further, a numerous class are so burdened with business and family anxiety, that they cannot in the lulls of turmoil, set the mind to the solving of perplexing problems, or the analysis of intricate questions. To learn with pleasure or even with profit, they must inhale the social element of the lecture room.

To no part of the community are these entertainments of so great advantage as to the youth. When the school days are over, the spare hours are too apt to be squandered away by the apprentice and clerk. More or less, this evil Mechanics' Institutes can mitigate. The lecture room is well calculated to beget a lively interest in, and intense curiosity to understand the phenomena of nature. And, although, not itself a complete system of teaching, it leads to more thorough instruction. It is customary for some Institutions to initiate their evening classes by one or more addresses, which are intended to show the advantages of the different studies proposed. How much better this object would be accomplished by a course of lectures, so arranged as to be of special help and interest to the students of these classes.

Few more laudable undertakings than the education of our working classes do exist. Health, happiness, and usefulness are all augmented. Perception of danger and of safety increased. The secret of physical strength, and of mental power revealed. Wonders appear to the astonished mind and become common-place. The vapours of superstition are cleared up, the light of knowledge illuminates the poor man's path through life; where he before stumbled he stumbles not, and treasures never known before though passed by, are now polished from the ruggedness of nature and made subservient to his welfare. Do wounds gall, do pains cramp, does fever burn—philosophy has made known the causes of morbid actions, while for experimental science is claimed the credit of supplying antidotes to disease; others saying, that the same philosophy which discovers the origin of sickness will, instructing how to remove the cause, kill the effect. Above all, the mind by enquiring into the depths of science, and memorizing the lesson of history, does expand in comprehension, and increase in common sense. The intelligent man is the one who reasons most logically. The ignorant, as a class, are illiberal in their views rash in their judgments, and blind in their beliefs

Knowledge! mayest thou widely be diffused over the surface of our globe. Wherever man erects his hut or statelier mansion mayest thou there be found his welcome guest. In whatsoever community books shall occupy the library shelves, mayest thy facts be printed on each page. Whatever Institution will entertain the public with lectures, may their motive be, to give thee wider publicity.

WANT OF CAPITAL FOR INDUSTRIAL PURPOSES.

Undoubtedly the great *want* in our industrial operations in Canada is money capital, which can only be obtained now through exceptionable sources, and even then in insufficient quantity. What we mean, is this: but a very small proportion of those who possess the requisite capital will themselves engage in either farming or manufacturing pursuits; knowing that they can loan their money out to others, so as to realize a much larger amount of interest, than they would obtain by themselves engaging in any branch of industrial business. Hence we see not only the men who have inherited money from others, and the fortunate speculator, but the prosperous farmer and mechanic also, forsaking the callings by which their capital has been made, engaging in the money lending business.

Advise the man who has money capital to engage in farming, to take stock in some new manufacturing concern, or to start in some manufacturing business, and he will most probably

laugh in your face; and well he may, if he merely looks upon the money he possesses as a means of producing him the largest possible return; for he knows that as a money-lender he has no difficulty in realizing 10 per cent. on good mortgage security; or from 2 to 2½ per cent. per month, for short dates, in shaving good commercial endorsed paper. So far the capitalists act perhaps wisely, but the effect upon the borrower, and upon the prosperity of the country, is any thing but good.

We have no desire here to discuss the questions whether or not the rate of interest on loans should be restricted by Legislative enactments, or what the effect of such restrictions, if honestly carried out—which is the difficult point to secure—would have in making capital more available for industrial purposes; but we do know that for farming, mechanical, manufacturing or commercial operations, the borrower cannot generally afford to pay even 7 per cent. for his capital. The truth of this is evident, from the large proportion of our business men who fail in business.

We look upon the man who starts in any kind of business on borrowed capital, no matter how moderate the rate of interest he pays, as a slave; he has to "rise up early and sit up late," and not only to "eat the bread of carefulness," but to toil as no other class of men amongst us have to toil, and generally for the sole benefit of the capitalist whose money he uses—his reward being, in seven cases out of ten, that after years more or less of wearying anxiety, he finds himself quite as poor as when he commenced business; and in too many cases even poorer, as he has probably sacrificed what little capital he himself possessed, in his efforts to succeed.

These are constantly recurring facts from which we see no means of relief, until persons shall refuse to engage in business on borrowed capital, or on stocks obtained principally on credit. Then those who have made money in business will remain in it, and extend their operations as their means increase; and others who have capital will engage in agricultural or manufacturing pursuits, when they can no longer find investment for their money at exorbant rates of interest.

CULTIVATION OF STRAWBERRIES.

Our farmers cannot be too strongly urged to resort, in part, to the cultivation of other crops then those they have been so long accustomed to raise; such as orchard fruits, grapes, strawberries, &c. &c. At the New York Farmers' Club,

"The President said that Mr. Chambers, the Secretary, had been making a visit to Connecticut, and had gone over the grounds of the Community, at Wallingford They showed him a field of five acres cultivated in strawberries, and told him that they sold the crop this year for $5,000. The plants are cultivated in rows three feet apart.

Solon Robinson explained, in answer to an inquiry, that the runners are cut off, during the season of cultivation, by a sharp vertical knife attached to a plow, and the rows are kept narrow —some four inches wide.

Mr. Fuller remarked that he was gratified to hear these statistics, as when he made a statement in the Club a few years ago that he had raised strawberries at the rate of 600 bushels to the acre, and that a bushel of strawberries could be produced more cheaply and easily than a bushel of potatoes, his statement was discredited. He had no doubt that, by proper cultivation, $2,000 worth of strawberries can be grown on a single acre."

We believe that something nearly approaching this sum was realised per acre, somewhere in the neighborhood of Oakville, during the past summer. The aggregate amount of money sent to the United States each season, for ripe fruits, is enormous; and also encouraging to those who may put forth efforts to supply our fruit markets with home productions.

Board of Arts and Manufactures
FOR UPPER CANADA.

Ten days' absence on official duties, at the late Provincial Exhibition, at London, C. W., has unavoidably caused the issue of the present number of the *Journal* to be nearly a week behind its proper time, for which we ask the indulgence of our readers.

TRADE MARKS.

(*Continued from page* 302.)

Trade Marks registered in the Department of the Bureau of Agriculture and Statistics, Quebec; and open for inspection at the Library of the Board:

S. J. Ross & Co., Sherbrooke, C. E., "Dr. Colby's Pills." Vol. A, folio 82, No. 332. Dated Sept. 9, 1865.

P. E. L. Snow, Montreal. "Canadian Super-Phosphate." Vol. A, folio 80, No. 342. Dated Sept. 7, 1865.

J. J. Higgins, Montreal, "Edge Tools and Axes." Vol. A, folio 84, No. 377. Dated 26th Sept., 1865.

SUBSCRIPTIONS TO THE "JOURNAL."

The annual subscription to the *Journal* is invariably 75 cents per annum, except to members of Mechanics' Institutes and Agricultural and Literary Societies, and remitted through the Secretaries and other officers of these institutions.

Correspondence.

TORONTO MECHANICS' INSTITUTE EVENING CLASSES.

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

SIR,—With your permission I beg to lay before your readers the arrangements made by the Directors of the Toronto Mechanics' Institute for conducting their evening classes, during the ensuing season. In doing so I feel that I cannot do them a greater service than to request their re-perusal of your excellent remarks on the "Education of our young mechanics" in the September number of your Journal. Too much prominence cannot be given to this all important subject. Neither can too much attention be devoted to it by the Directors of the various Mechanics' Institutes of the Province. If the men of the next generation are to fill their respective positions better than their fathers did before them; if they would be more intelligent citizens, and rise higher in the scale of merit, they *must* devote their time, their energies, and their means to the acquisition of knowledge now. And they will be all the more censurable if, having the means within their reach, they fail to make use of them.

I have *known* instances, of pupils connected with our evening classes, after one session of diligent study, improving their position materially; and I have reason to believe that many more have done so, the facts of which have not come to my knowledge. It is proposed to open the following classes for the ensuing season:—

1. Book-keeping and Penmanship.
2. English Grammar and Composition.
3. Arithmetic and Mathematics.
4. Architectural and Mechanical Drawing.
5. Ornamental Drawing.
6. French.
7. Elocution.
8. Phonography.

and in all probability a Telegraphy class will also be formed, and another for the practice of Dr. Dio Lewis' light gymnastics. No's 1, 2, 3, 4, 5, 6, will meet two nights per week for twenty weeks, commencing at 8 will close punctually at 10 o'clock. The charge for admission to each class will be as follows. No's 1-2-3 and 4 to members of the Institute, $2, to non-members $3. No. 5 to members $3, non-members $4. No. 6 to members $3, to non-members $5. No. 7 and 8 will be taught by Mr. Richard Lewis, the former will receive fifteen lessons, admission to all $4. Class No. 8 will receive ten lessons, the charge $1. This class Mr. Lewis proposes to make a large and popular one, and his method of teaching it will be such, that in ten lessons diligent students may acquire sufficient knowledge of Phonography to be able to write it. There can be no question as to the value of Phonography to persons of studious habits in every walk in life; and, in order to induce the pupils of other classes to study it, Mr. Lewis has authorized me to say that he will reduce the fee to them one half; they therefore have an opportunity of learning this useful system for the small sum of fifty cents.

I submit Mr. Editor that the several branches taught in this series of classes commend themselves to all who would possess what is called a good English education. The terms moreover are such as to bring them within the reach of all classes of the community, and the hours are peculiarly favourable to those who are otherwise engaged during the day. Parents having children of either sex, whose education has been in any respect neglected, ought to hail with pleasure the opportunity here offered, and should see to it that it is not neglected; and young men and women beyond parental concontrol, need not feel themselves too old to learn, nor allow any false delicacy to prevent them from improving themselves, by devoting a few hours of the week to systematic study. To attempt this however in their own privacy is (as a general thing) to fail, I know of no better course than to manfully enter one of these classes.

The Directors of the Institute will secure a good staff of Teachers, and see to it that order and decorum is preserved in each class; and every pains will be taken to make the studies pleasant and successful.

In order to induce a spirit of emulation and of industry, a number of prizes will be offered for competition at the close of the session; the sum to be presented at a public meeting to be held for that purpose after the examinations.

As the number of pupils must necessarily be limited, I would urge upon those most anxious to enter them, to enroll themselves forthwith.

GEORGE LONGMAN,
Secretary.

Toronto Mechanics' Institute,
September 14th, 1865.

AGRICULTURAL PRODUCTS OF CANADA.

GRAND TRUNK RAILWAY OF CANADA,
Managing Director's Office, Montreal, Sept. 6, 1865.

SIR,—Some weeks ago I gave directions to the different Station Masters on the line of the Grand Trunk Railway to make me a report as to the condition of the crops in the neighbourhood of their

Stations. They were told to make very particular enquiries from the farmers and business men in their vicinity as to the crops, and their replies having now been received, I have had an Abstract made of them and enclose you a copy in order that if you think it of sufficient public importance, you may let the readers of your paper see the statements which have been prepared.

Yours truly,

C. J. BRYDGES, *Managing Director.*

To the Editor of the Journal of the Board of Arts and Manufactures, U. C.

[The above circular was received in the early part of September, with the Abstract referred too. The latter is a lengthy document, and moreover has already been published in a large number of the daily and weekly papers, so that although we deem it all important in itself, it would serve no particular object in now publishing it in the Journal.

The Report has been got up, apparently, to inform the Company as to the probable amount of grain and other agricultural products that is likely to pass over the Grand Trunk Railway during the year, and for which the Company will have to provide car accommodation; but at the same time the document is of public importance, and entitles the Company to the thanks of the country for giving it publicity. ED. JL.]

CAUSE OF HYDROPHOBIA.

To the Editor of the Board of Arts Journal.

Sir,—Having seen described in the August number of the Journal, the different symptoms of approaching madness in dogs—in all of which I agree—and having at different times seen numbers of similar articles, none of which have ever attempted to point out the true cause of hydrophobia, I am led to address you on the subject. I have in my time known several cases of dogs going mad, without any apparent cause—no mad dogs having been known to have been in the neighbourhood previously; but invariably these dogs were in the habit of worrying cats and killing them. I therefore firmly believe that when a cat is worried up to a state of frenzy madness, and bites so as to instil some of the saliva into the wound, it is the true cause of hydrophobia. I was mentioning my belief to a gentleman of this city, a few days since, and he entirely coincided in my opinion, and related that he had known a case in this city, where a cat had been worried to a state of madness by a number of boys, and ran into a house; and the woman attempting to put the cat out, was bitten, and afterwards died of hydrophobia. Of course the cat was put down as mad—what caused that madness?—I say the boys.

Another case in point, which I have no doubt numbers in Toronto remember, was that of a cat running into Trinity Church during divine service, which I have no doubt had been worried by dogs or boys, or perhaps both, and ran in there to get out of the way; but finding there new assailants, and taking every new assailant for an enemy, was the cause of its biting Miss G. and the sexton who took hold of it to put it out. I think I heard that the sexton died from the effects.

J. T.

[Our correspondent's opinion appears to be, that hydrophobia originates entirely from the bite of the cat, while in a state of frenzied madness, to which it has been driven by the persecution either of dogs or bipeds, or perhaps both; and that if the cats were not thus persecuted, there would be no hydrophobia. We must say that we are somewhat sceptical as to the correctness of his theory, but, in view of the dreadful nature of the disease referred to, it may be worthy of consideration.—ED. JOURNAL.]

Selected Articles.

OIL, AND OIL CAKE FACTORY, DUBLIN.

Oil and wine, the two first discovered panaceas for a wounded spirit and wounded body, have lost none of their importance with the advance of civilization and the consequent discovery of new agents. Since the time when the rich juice was first trodden from the grape and the unctuous liquid first expressed from the olive, these two commodities have played an important part in the world's commerce. Yet the primitive uses of either have not been lost sight of. Our physician still "pours in" the one, if he does not the other, and oil is still an important agent of light, though not, as in earlier days, the only one.

Though oil and wine have almost ceased to be associated with each other, we do not consider the present subject unsuited to follow immediately after our last chapter, which took the reader through the interesting intricacies of the vaults belonging to one of the most extensive wine dealers in the kingdom.

In stepping across the Irish Channel to view the process adopted by grape and linseed oil crushers to obtain the natural oil from those seeds, we do not ignore the fact that oil mills of a like character are to be found at home. Desirous, however, of making "Our Business Houses" complete in descriptions of representative manufactories in every branch of our trade, we are also desirous of selecting the material from sources as widely as possible apart, so that individual examples of commercial enterprise may not be lost sight of, or indications of each country's manufacturing progress remain unnoticed. It was for these reasons we visited a

Cork biscuit factory, a Scotch coal oil distillery, and a Lancashire soap house; and for these reasons also we take the subject-matter of our present chapter from the Ashtown Oil Mills, Phœnix-park, Dublin.

As Ireland promises to become a renowned flax-growing country, there is a prospect for oil crushers in that country which has never hitherto been presented.

The Ashtown Mills were built by Messrs. McGarry and Sons, under the superintendence of Mr. Robert McGarry, the present manager of the works, in the year 1831. At that time the McGarry's owned 130 acres of the adjoining land, and probably cultivated the seed crushed at their mill. At any rate, they were well known for their endeavours to develope the natural resources of their country; for, in addition to their extensive farming operations, they established lead mines at Clontarf, which, for want of the immense capital required for such operations, were closed many years since. The Ashtown Oil Mills, after having been successfully worked for over thirty years by the founder and his sons, passed a short time since into the hands of the present owners—Messrs, McMaster and Hodgson, the old-established and well-known drysalters and general merchants, of Dublin.

On communicating our errand to that firm, we were at once handed over by the active partner, Mr. Hodgson, to the tender mercies of the manager of the mills. Having procured an "outside car,"—Ireland's own peculiar vehicular luxury—we at once set our faces towards the finest park in the world, for a long and pleasant drive past the Vice-Regal Lodge, Sir Robert Peel's and the Under-Secretary's snug residences, through groves of elms and herds of deer, and through all those lovely scenes which are calculated to make the most contented amongst cockneys long for a Lord Lieutenancy and a residence in Phœnix-park.

We remarked the fact that no delay occurred in the granting of our request, and "our card to view" was made use of the moment it was received. This we mention because there are many manufactories, the whole internal mysteries of which have never been laid bare to the world, and many there are the proprietors of which act strictly upon the terms of the gate sign—"No admittance except on business." Arrived at the mills, which adjoin the park on the north side, we take an external survey of the buildings, which are ordinary, good-sized, substantial affairs, with walls four feet thick, of stone so close grained and durable that it appears likely to serve the purposes of many succeeding McMasters and Hodgsons, even should the present ones hold it until they are as aged as the patriarchs. A water course has been cut from the Royal Canal with a pond and mill race, and a fall of 18 feet upon an immense wheel, 28 feet in diameter and 10 feet wide, which, without ceasing day or night, turns monotonously upon its axle for the good of the oil trade and consumers of oil, oil cake, and linseed and rape meal. The stream of water that supplies so much power to the machinery within having performed its important task, enters an arched channel and listlessly returns to its original source through a "tail race" about 1200 feet long.

We notice that the buildings are well arranged, and that in their erection economy of space and the comforts of the workpeople have been well studied. The present works cover three acres of land, and clearances are being made for additional buildings.

Entering a good sized room, we observe several men emptying sack after sack of linseed into an immense funnel-like wooden vessel that appears to engulph all with extraordinary rapidity, and gape for more. This, our obliging guide informs us, is the "hopper,"—why, we did not inquire, but proceeded to examine the means by which it disposed of so many sacks of seed in so short a space of time. We discovered that in this work the hopper had the assistance of an "elevator," consisting of an endless band of leather, supplied at intervals of one foot with buckets, which, as the belt revolves, dip into the mass of seed, and carry it aloft. The motion of the belt is so rapid that the little buckets, on reaching the top cylinder, pitch out their burden to a considerable distance from the shaft which, through a height of five extensive floors, protects the belt. It will be wondered how so much seed can be carried away in so short a time by vessels holding only about seven pounds each; but there are 200 of them, and they never cease to ascend and descend in rapid succession. This is the process adopted for storing the grain on the various lofts, which is considered a much easier method than hoisting sacks with a crane. For those who are fond of familiar comparisons, we may add that the belt and buckets are on the same principle as those used on board mud-barges to clear the beds of foul rivers. While watching the grain disappear from the hopper, we receive the information that, in the absence of home-grown linseed, Dutch and Bombay seeds are used, the two kinds being mixed together. The home-grown seed is, however, preferred, for it is brought to the mill in a fresh state, while that from abroad is chiefly what is left after sowing.

Immense quantities of seed having been stored on the various floors, it is conducted back again to the ground floor—as required for crushing—by means of wooden shoots. In the first process a small stream falls through the roof between two bright steel rollers placed within one eight of an inch apart, and revolving towards each other. In passing between these the seed is merely broken, displaying afterwards the rich yellow grain, but little indication of the stores of oil to be extracted from it by future operations. The stream of broken seeds descends upon the floor in one corner, and to this heap a man with a wooden malt shovel makes periodical visits, transferring about six bushels at a time to beneath two pairs of ponderous vertical grinding stones weighing four tons each, and chasing one another upon edge round the metal pan which contains the broken seeds. The grinding soon destroys what remains of the original form and colour of the seeds, for as it changes into a damp heavy flour the colour of the mass also undergoes alteration, by the equal mixture of the outer skin and inner germ of the grain. The heap of broken seed is of a brown colour when viewed at the distance of a few feet; but after the same has been submitted to the grinding stones it has a much lighter yellowish tinge. It

is one man's duty to attend to the devouring wants of these enormous stones, and when a "charge" has been sufficiently crushed he "draws" it, and supplies another, without for a moment arresting the progress of the machinery. To effect the first object, a trapdoor is taken from the metal pan upon which the stones travel, and a sweeper descends at the will of the attendant and brushes all the flour into the wake of the hole, while a wooden bar occasionally shifts the mass towards the hole, through which it falls to the floor.

The seed is not allowed much rest in its new condition, but is at once seized by a number of men and boys, who transfer it to the "kettles,"—a series of iron vessels holding about two bushels each, and surrounded by a hollow chamber filled with steam from an immense boiler in an adjoining building. Each vessel has a "stirrer," which being interpreted means an iron rod with radiating arms, placed in the centre. These rods, being connected with the water power, are kept in constant motion, by which means the contents of each vessel are constantly stirred and an equal amount of heat imparted to all portions of the meal. The object of this stage in the treatment is to liquify the oil previous to submitting the crushed seed to hydraulic pressure. When made quite hot it runs more freely from the grain than when pressed in a cold state. We keep our eye upon one particular Knight of the Kettle to ascertain by what means he shall repossess himself of the hot contents, and presently we observe him place upon the lips of five mouths opening at the base of the vessel as many long, stocking-like worsted bags. He then opens a trap-door, and out comes the charge and descends into the bags, which are instantly removed, and the door closed to make room for a repetition of the same programme.

We now come to the fourth and most important stage in the process, and not having yet tired our patient guide with our very minute examinations and inquiries, we stand with him before one of a number of oil presses, all similiar in construction and mode of action. One at a time the workman brings forward the worsted bags, and after manipulating them into an uniform shape—half round and half flat—by sundry vigorous applications of the fist, arm, and elbow, the five are placed between the five divisions of the hydraulic press, which no sooner receives them than it commences an affectionate hug, increasing its intensity by slow degrees until it culminates in the delightful squeeze of 250 tons power. It is said that the younger workmen use this simile in their moonlight conversations with the Irish lasses, but for the truth of the statement we cannot vouch, as it did not come from our guide.

Along the side of each division that contains a bag run small channels to receive the oil, and a series of pipes placed at the corner convey it to where we shall in due course arrive. The first pressure merely flattens the bags, but presently bright drops of oil appear here and there and fall into the channel; the drops now become more numerous, and after a time all join together and dribble rapidly into the pipes. As the pressure nears its utmost limits, we see the oil gush out in such quantity that we begin to wonder how the small dry-looking seeds we looked at in the hopper could have obtained so much oleaginous liquid. But we have been witnessing the performance of but only one half of the press, which is a double one with alternate action. Another series of five shelves, with oil channels and pipes, alternates in its operations with that just described, and while one is being filled the other is emptied. The bag full of meal having been rendered literally as "flat as a pancake," the press gradually relaxes its hold, and meanwhile the water power transfers its attention to the second series of bags, which is now ready for the squeeze. While this is taking place, we alter our position to the opposite side of the press and watch the men draw out the long cakes of flat, hard, dry, uninteresting-looking stuff. The bags are stripped off, and the soft edges of each cake planed on a knife fixed in the front of a wooden bench. The refuse thus accumulated goes through the press again. Upon each cake we find the brand "M. H.," which is impressed by placing a piece of leather inside each bag with the initials cut out with a knife. The usual plan adopted for branding oil cake is to work the design with worsted upon the bags, Mr. McGarry has, however, adopted the simple and much more effective plan, of placing the design cut in leather inside the bags.

We must now see what becomes of the oil after it leaves the several presses engaged in expressing it from the seed. Each little pipe from each division of each press communicates with one common channel, which conveys the oil to a monster underground reservoir capable of containing about two tons of oil. The liquid, however, does not remain here long. A force pump, from which numerous pipes proceed to all parts of the premises, conducts it to such places and in such quantities as are required. For the present we will follow those which carry the oil in its raw state to the stores. Here we find, in a building about 200 feet long, a series of immense tanks, ranging in capacity from 3500 to 10,000 gallons. From these cisterns the oil is drawn by means of taps into the barrels in which it is sent to our shops. Outside the stores stands an immense pair of scales, and in these the barrels are weighed, and the quantity painted upon them. One of the out-buildings is set apart as a cooperage, and all the barrels used at the mills are made and repaired on the premises.

We next follow the course of a four inch pipe leading from the force-pump to a distance of about thirty yards, and entering the roof of a separate building. This is the boiling house, where "drying" oil is boiled and fined for painters' use. An immense cauldron, holding 1000 gallons, is filled with the crude oil, which is boiled for about seven hours, and when cold transferred to a sheet iron tank, the necessary purifying agents being added. In this tank there are three taps at different elevations. The oil becoming clear near the surface first, is drawn off, and after a further settling down the second tap is used, and finally the sediment is taken away through a tap in the base of the tank. So much care is not taken with the oil sent out from some mills. Manufacturers are not blind to the fact that the less pure, the more weighty the oil, so that the fining down does not occupy much of their attention. During the boiling the oil is kept in constant agitation by means

of a shaft turned by a man, who takes up his position in a sort of a pigeon-house near the roof outside the building. The precaution is taken in order that the health of the worker may not be affected by the fumes from the oil. The building is also well ventilated from the roof, and is separated by a distance of about 120 feet from any portion of the building. In case of fire, the danger or loss would be confined to the boiling house.

Having traced the production of the oil cake through the various stages of manufacture to its final distribution to the dealer and consumer, we devote half an hour to a general survey of the storehouse for the oil cake and the lofts where the raw material is housed. But first we are invited to see the large kiln used for drying rapeseed. This is on the same principle as the malting floor at a brewery. Entering a long building of three stories, we are shown piles upon piles of cake ready for the market. The cakes are laid edgeways, and one row is piled above another to the ceiling. Each rank holds about 350 cakes, which are calculated to weigh together one ton. Twelve ranks can be accommodated one on the other, so that each complete pile contains say 12 tons. A clear space is left within a centre archway, into which the waggons and carts are backed for loading; and, as linseed cake is piled at one end and rapeseed cake at the other, both kinds are easily reached. The floors above are similarly occupied, with the exception of a portion set aside for miscellaneous purposes.

Crossing the courtyard once more, we ascend by steep and very greasy steps to the first floor of the main building; and this performance we find requires the powers of a mountebank to accomplish with good grace. Every particle of wood about the immediate neighbourhood of the machine-room is so thoroughly saturated with oil that neither the hands nor feet of an inexperienced traveller in these slippery regions will retain their hold. Some portions of the woodwork, such as the railings to the stairs, are dyed a rich, light, glossy mahogany colour with the oil, and the explorer must ascend several flights of stairs before he escapes the dangerously smooth and narrow passages. But our devotion to the task we have taken in hand carries us in safety from one floor to another, until we reach the summit of the building, and stand on the fifth loft, where we examine the ponderous wheels of the workmen's clock, with the pulleys and ropes that move a minute hand three feet long round a dial 6 feet in diameter. On each of the floors nothing is to be seen but enormous heaps of seed, some of them receiving additions from the untiring revolutions of the belt and buckets previously described, and others giving out, through well-contrived shoots, gradual supplies to the machinery below. On the first and principal floor a good-sized sifter, worked by the unseen agency that turns the machinery below, suffers the very extreme of nervous agitation. Through this sieve every grain of seed is made to pass before it enters the mill; and the miscellaneous collection of odds and ends it gathers from what previously appeared to us very clean seed indeed would astonish any one but those who have become accustomed to the sight. Rope ends, morsels of twine, scraps of correspondence in various languages, pieces of wood, small masses of damaged seed, and dust galore. Before commencing our perilous descent, we note down some figures respecting the capacity of the immense rooms we have passed through, and find that they are capable of storing six hundred tons of seed, an amount equal to 10,000 quarters, or 80,000 bushels. We ponder a while to reduce these figures to amounts representing the manufactured article, and the result of our calculation is 500 tons of oil and 1200 tons of cake. Of course, these store rooms are not always full; but at the time of our visit there was a very large stock, upon which the workmen were operating most actively.

As we again mount our car, and enter the Park, we pass a row of very neat cottages occupied exlusively by the workmen belonging to Ashtown Mills and their families. There is an air of comfort about the dwellings that tells of satisfied occupants, and the occasional remarks let fall by our guide confirm this opinion. Sons work by the side of their fathers, who, in their turn, buzzed about the heavy machinery with *their* fathers. Good air and plenty of it, with regular earnings and proper treatment, seems to chain them to the spot. There may be seen one hale and hearty fellow who has seen ninety-three summers—forty of which were spent in this very estate, and we are assured that he is more active than many average-lived workmen in their prime.

In conclusion, and for the information of dealers, we are glad to be able to remark that, after inspection of the Ashtown Mills, we are satisfied that the best description of raw material is employed—that both the brown and refined rape oil, as well as the linseed and boiled oil, are prepared with the greatest care, and without mixture or adulteration. It is as satisfactory to us, as it no doubt must be to the trade, to know that it is the intention of the new proprietors to sustain the well-earned reputation enjoyed by the founder of these mills. Mr. Hodgson—if we may judge from the present and past position of the firm of McMaster and Hodgson—is not content, like Pugwash, in the "Chronicles of Clovernook," to saunter through life with his hands in his pocket and a daisy in his mouth—dying with just enough in his house to pay the undertaker.—*Oil Trade Review, London.*

SMOKE CONSUMING FURNACES.

We extract the following from an article on "Smoke consumption," in a late number of the London "*Mechanics' Magazine.*"

The main principle of this invention appears to be the supplying of fresh coal in such a manner that the air, in entering the furnace, has to pass through it before coming in contact with the red heated coal; thus taking with it the solid parts, or carbon, of the smoke, which is consumed before reaching the draft of the chimney.

This principle, we should say, is as applicable to stoves and grates for ordinary heating purposes, as to furnaces, and should be generally adopted.

It not only ensures the almost entire consumption of the smoke, and consequent prevention of the "smoke nuisance," but it is much more economical than supplying coal to a fire so that the air has first to pass through the perfectly ignited fuel before reaching the fresh coal. A great many improvements, or new inventions, are being adapted to our coal stoves; some of our manufacturers should turn their attention to the subject here indicated:—

"The worst portion of smoke is the superfluous carbon which is left unburnt either from the want of sufficient atmospheric air, or of a higher temperature than that present, which is insufficient for the perfect combustion of the varieties of carburetted hydrogen and the vapour of coal tar which are disengaged from heated coal. In either case the hydrogen is fired, whilst the carbon is carried forward by the draught of the chimney to be disseminated through the atmosphere and over the ground. The object of every apparatus proposing to effect a cure for this evil, must necessarily be to perfect the combustion of the superfluous carbon. If there was nothing more to be said than has already appeared upon the present subject, it would scarcely be worth while opening it up again for the sake of mere argument. We shall therefore support our position as to the perfect practicability of smoke consumption by reference to an apparatus for effecting this, and at the same time economising fuel, to which our attention has recently been directed. The invention to which we refer has been designed by Mr. E. B. Wilson, and has for its main features improvements on furnace building. This system did not emanate perfect in all points from the brain of the inventor, as did Minerva from that of Jupiter, but its development was the work of time. By dint of perseverance and careful experiments the furnace has passed through various modifications to its present perfect condition. By the internal construction of the furnace the utmost intensity of heat can be obtained, and the heat can be concentrated within a limited space or diffused over a considerable area, as may be found necessary. Mr. Wilson proceeds upon the principle laid down by Cutler some years since, which consists in carrying on combustion inversely to the usual practice. He burns the fuel from the upper surface downwards instead of from the lower surface upwards. Cutler failed from his inability to effect the introduction of fresh fuel in an efficient manner, and his plan has since been revived at various times with modifications, but with uncertain results. In carrying out his idea, Mr. Wilson dispenses with furnace bars and the ordinary door, and feeds through an aperture in the top of the furnace, where air also is admitted. The coal, supplied in small pieces, falls on a curved inclined plane, on which it rests on a sloping bank until consumed. In front of the heap of coals is a mixing chamber formed by increasing the height of the furnace roof for a short distance in a slanting direction. The coal is supplied at short intervals at the top, and the whole mass slides down the slope as combustion proceeds.

From the above arrangement it will be seen that the following consequences ensue. Assuming the furnace to be in full operation, the door would remain partially open, and through this aperture the atmospheric air necessary for combustion would be supplied. The air on entering passes through a stratum of cold fuel, about a foot deep; below this point the coal commences to smoulder and to give off free carbon vapour and hydrogenous gas. A rapid combination of these gaseous products with oxygen takes place, an excess of oxygen being admitted to keep the solid carbon on the outside of the smouldering fuel in vigorous combustion. The result is that, before the gases emitted from the fuel can find their way into the body of the furnace, they must pass through the outer stratum of burning carbon. By this means the entire gaseous mixture is immediately raised to the highest heat obtainable from the solid fuel, to which it adds the heat obtained from its own perfect combustion. During this process the heating chamber is filled with a white flame of great intensity, and the whole of the hydrogenous compounds are effectually utilised. This is a great source of economy in the Wilson furnace, and contrasts favourably with the ordinary method of burning on fire-bars, in which the compounds and mixtures of hydrogen, as soon as formed, pass from the hottest part of the fuel through the cooler coal on the top, and thence to parts of the furnace of still lower temperature. The result is that the greater part of the most valuable element passes away into the chimney without doing its proper duty. As an instance of the completeness of combustion in the Wilson furnace, it is stated that, on a puddling furnace being drawn in which 41 cwt. of fuel had been used since the previous clearing out, the residue was found to weigh but a little more than 20lb. These furnaces have been working for some time past in Manchester, giving the best results as regards economy of fuel, perfect combustion, and entire absence of smoke. They are also in use at the works of the Gartness Iron Company, near Glosgow, where the weekly returns show a saving of one-third in fuel upon the old system. Several ordinary steam boiler furnaces in Glasgow are also being altered upon Mr. Wilson's principle, which certainly appears to fulfil the conditions of smoke consumption and economy so perfectly that the smoke nuisance really need no longer exist."

PATENT LAWS.

Lord Stanley's speech at the late half-yearly meeting of the Liverpool Chamber of Commerce opened up a very large and difficult question, which deserves, and will probably obtain before long, much more attention than it has yet received. A suggestion that the law of patents is altogether wrong and mischievous, and ought to be abolished, will strike many persons as an outrageous paradox; yet that is no reason why it should not be seriously considered, if it is sustained by serious argument. Lord Stanley is certainly a man who is entitled to be heard upon this subject, for he has just terminated a long and patient investigation into its practical bearings; and he tells us that the conclusion which is so opposed to most people's prepossessions—and, we must confess, to our own—was gradually forced upon him as the inquiry

proceeded. The commission of which he was chairman* was appointed, not to pronounce on the principle of the patent law—the justice and expediency of which were taken for granted—but to examine its working, with the view of introducing into it amendments of detail. He informs us that he went into the subject accepting the existing system as one which experience had sanctioned, and against which no grave objection could be urged. Even now he has nothing to say against the "abstract justice" of the principle on which the patent law rests. He merely takes the ground that the system, practically, does much more harm than good, and that no conceivable amendments within the range of legislative ingenuity can make it do more good than harm. Lord Stanley is, moreover, of opinion that in the great majority of cases the attempt to realize "abstract justice" involves grievous practical injustice, for which it is hopeless to devise any effectual remedy, except by renouncing the pursuit of this seductive but unattainable ideal. Few persons will be prepared to adopt Lord Stanley's view without a good deal of consideration and inquiry; but we do not think it is a view to be dismissed with a mere flourish of rhetoric. It may be reasonably presumed that there is much to be said for a conclusion to which a competent and impartial mind is unexpectedly led by evidence and investigation.

What Lord Stanley and those who agree with him maintain is, that our system of patent law does not accomplish even tolerably well the object at which it specially aims, and that it does produce a vast amount of undesigned mischief, which much more than counterbalances any possible good that results from it. In the first place, it is, we are told, the merest chance whether the reward which a patent confers on an inventor goes to the right man. "It hardly ever happens," says Lord Stanley, "that any invention in mechanical matters is solely and exclusively the work of one man; you generally find that there are half a dozen upon the same track, and that the priority of one is very slight in point of time, and very often accidental." What A finds out to-day is as likely as not to be found out by B to-morrow, or by C the day after to-morrow; so that the only effect of artificially rewarding A by a patent is to deprive B and C of the natural recompense of their equally meritorious sagacity and industry. The legal monopoly given to one man—whose priority was perhaps not a priority of discovery, but only a priority in taking out his patent—prevents other men from using inventions which they may have hit upon quite independently of him. And here let us observe the very material distinction between an inventor's patent and an author's copy-right—two things which are often inconsiderately treated as if they were exactly analogous. There is an analogy, but it is a most imperfect one; for it is simply impossible that two men should write the same book without one copying from the other, while it is common enough for two independent discoverers to light on the same scientific truth or mechanical invention. A further objection to a patent law is that we get an enormous multiplication of patents for petty and trifling inventions, which merely obstruct and hamper productive industry and enterprise. Most people will, we think, agree with Lord Stanley that it is out of the question to attempt to remedy this evil by seeking to discriminate beforehand between important and unimportant inventions; for no tribunal could be created which would be competent to exercise so immense a discretionary power. Then it is quite a mistake, he goes on to argue, to say that a patent law enables a poor inventor to make a profit out of the products of his brain. It is the great capitalist, not the workman, who really profits by these legal monopolies. Patent cases are, from their very nature, the most complicated and expensive of all forms of litigation, and the rich man always gets the better of the poor man, whether he be plaintiff or defendant. Experience is, we fear, on Lord Stanley's side, when he says that "a wealthy and powerful employer may infringe the patent of an inventor who is not a capitalist almost without remedy; while, on the other hand, a man of no great means, if he is sued for the infringment of a patent, can hardly defend himself without the risk of ruin." The mischief reaches its maximum when, as is the case in some businesses, a wealthy firm buys up a number of patents, and so makes it next to impossible for any competitor to start in the same line, and carry on the necessary processes of the trade, without the certainty of being caught in some mesh or other of the legal net. All things considered, Lord Stanley comes to the conclusion—and he informs us that it is shared by some of his fellow-commissioners—that we should get on better without any patent law at all, and that the only way of reforming the system is to abolish it root and branch.—*Liverpool Mercury.*

*Royal Commission appointed to enquire into the working of the present British Patent Laws. [Ed. Jl.]

Useful Receipts.

Composition used in welding Cast-Steel.

Borax, 10; sal ammoniac, 2; flour of sulphur, 1 part; grind or pound them roughly together; then fuse them in a metal pot over a clear fire, taking care to continue the heat until all spume had disappeared from the surface. When the liquid appears clear, the composition is ready to be poured out to cool and concrete; afterward being ground to a fine powder, it is ready for use.

To use this composition, the steel to be welded is raised to a heat, which may be expressed by "bright yellow;" it is then dipped among the welding powder, and again placed in the fire until it attains the same degree of heat as before, it is then ready to be placed under the hammer.

Rosewood and Walnut.

Dingler's Polytechnisches Journal describes a new method proposed by Dr. Wiederhold for treating the surfaces of certain woods so as to produce imitations of other woods more valuable.

A concentrated solution of hypermangate of potassa is spread on the surface of the wood, and allowed to act until the desired shade is obtained. Five minutes suffices ordinarily to give a deep

color. A few trials will indicate the proper proportions. The hypermangate of potassa is decomposed by the vegetable fibres with the precipitation of brown peroxide of manganese, with the influence of potassa, at the same time set free, fixes in a durable manner on the fibres. When the action is terminated the wood is carefully washed with water, dried, and then oiled and polished in the usual manner. *Dingler's Journal* remarks that the effect produced by this process on several woods is remarkable. On the cherry, especially, it gives a very beautiful red color. The color resists well the action of air and light, and the process is very short.

Bottle-Wax.

Rosin, 13 parts; wax, 1 part; melt and add any colour. Used to render corks and bungs air-tight by melting the wax over them.

To Color Straw Black.

The following is given to us as a black color for straw hats. The quantities of material are intended for 25 hats or bonnets. They are kept for two hours in a boiling decoction of 4 lbs. of logwood, 1 lb. of sumach, and of 5 oz. of fustic; afterwards they are dipped into a solution of nitrate of iron of 4 degrees Beaume, then well rinsed with water, and when dry, are painted over with a solution of gum of dextrine. The iron liquor, as well as the other ingredients, are kept by all dealers in dye-stuffs.

Yellow Liquid for Foils.

Heat hay saffron in five times its weight of distilled water; and when the desired colour is attained, decant the clear liquid, and mix with gum or isinglass. After applying, it should be varnished.

A Good Cement.

An excellent cement for uniting articles of wood with metals, glass, stone, etc., may be obtained by dissolving glue in boiling water and making it of the same consistence as that of cabinet-makers' glue; then add, while stirring, a sufficient quantity of wood ashes as to produce a varnish-like mixture. While hot, the surfaces to be united must be covered or coated with this glue compound, and pressed together. When cold, the surfaces will be found firmly united, and much force will be needed to separate them again.

Vehicle for Color.

By boiling shellac and borax in water you will obtain a solution of the lac, which may be used as a varnish or as a vehicle for colors; mixed with lamp-black, it has been used as an ink that will resist acids.

Chemical Cement.

A good cement for chemical and electrical apparatus may be prepared by mixing five pounds of resin, one pound of wax, one pound of red ochre, and two ounces of plaster of paris, and melting the whole with moderate heat.—*American Chemist and Druggist.*

Preservation from Insects.

The leaves of the elder, if strewed among corn or other grain, when it is put in the bin, will effectually preserve it from the ravages of the weevil. The juice will also kill bed-bugs and maggots. Insects never touch elder bushes. The leaves of elder scattered over cabbages, cucumbers, squashes, and other plants subject to the ravages of the insects, effectually shield them. The plum and other fruits may be saved by placing on the branches and among them bunches of leaves.—*American Artisan.*

Zincing.

Copper and brass may be zinced by boiling them in a solution of chloride of zinc, pure zinc turnings being added in excess. Or, use zinc and solution of caustic potash, or hydrochlorate of ammonia.

To Join Alabaster.

Ornaments of alabaster or plaster may be joined together by means of a little white of egg, thickened with finely-powdered quicklime, or by a mixture of newly-baked and finely-powdered plaster of paris, mixed up with the least possible quantity of water.

Machinery and Manufactures.

STEAM BOILER INCRUSTATION.

Mr. Davis Embree, of Dayton, Ohio, U. S., has transmitted the following memorandum to the office of the British Commissioners of patents:—

"Dayton, Ohio, U.S.A., April 21st, 1865.—The undersigned hereby transfers or relinquishes to the Government and people of the United Kingdom of Great Britain and Ireland all his right to take out a patent in that country for the invention or discovery described in the circular hereunto attached; and desires that notice of the same be filed in the Patent Office department, so that no improper person may be able to obtain a patent for the same discovery. Davis Embree."

Specification.

The groundwork of my invention, or rather application, I conceive to be founded on sound chemical principles. that lime is the basis of all incrustation in steam boilers. That it is generally found to be carbonate of lime or limestone. That it assumes the form of crystals. That it is insoluble in water. That particles of the same kind, in the formation of crystals, unite with each other, adding to the mass first formed or fixed. Incrustation of boilers may be dissolved by an acid which has stronger affinity to lime than carbonic acid has; the lime and such acid will unite, generally forming a compound that is soluble, and cannot coat a boiler, while the carbon passes off in form of carbonic acid gas. Incrustation can also be removed by an alkali that has a stronger affinity for carbonic acid than lime has; such alkali uniting with the carbonic acid leaves the lime in a pure state, which is soluble in a sufficient quantity of water, and cannot coat a boiler; the compound

of such alkali with carbon will also generally be found soluble. To prevent incrustation in steam boilers, one other mode may be resorted to—that of thoroughly boiling the water before it enters the steam boilers. These are the only means known to accomplish the object desired.

There are but few persons aware of the exact condition in which lime is held in solution in what is called hard water. It is not carbonate of lime, for that is insoluble, and the assuming of that form causes all the difficulty. We must, therefore, look to some other combinations, for every new combination of chemical atoms has different results, and these atoms, according to late authority, unite in definite proportions, and not otherwise; hence, one atom of lime united with one atom of carbonic acid will form carbonate of lime (insoluble). If one atom of lime unite with two atoms of carbonic acid, it will be supercarbonate of lime, a substance that is soluble, and which, we contend, is the true condition of lime in hard water.

Limestone is carbonate of lime. By being burned in a lime-kiln it is deprived of its carbon, and its water of crystallisation, and becomes quick-lime. It then seizes upon a certain quantity of water or carbonic acid wherever it may come in contact with them, or either of them. Now, take a small quantity of quicklime, either dissolved in water or otherwise, and put it in common hard water, and it will immediately seize upon the surplus carbon of the supercarbonate of lime, and reduce all the lime in the water to carbonate of lime, which will be insoluble, and will immediately fall to the bottom of the vessel, leaving the water as pure as water can be; hence the impossibility of its coating a boiler. It only requires two tanks or tubs for water, that one may be settled while the other is filled, or, if the engine be supplied from a well and worked only in the daytime, the lime may be put in the well itself of an evening, and it will be settled before morning. The quantity of lime proper to be used can be tested by litmus paper. If there be a small surplus quantity of lime it cannot injure the boiler.

To remove incrustations in a steam boiler, I have chosen still-slop, an article not heretofore used. It costs but little, and contains a large quantity of vegetable acid, which is not severe on iron. I do not claim the discovery of any new chemical principle. I have long been aware that vegetable acids would decompose carbonate of lime. I am also aware that quicklime has been used to break what is called hard water; but I do claim the right to use or employ known materials for a purpose which is new and useful, when such appliance has never been authorised, patented, known, or published, What, therefore, I desire to secure by letters patent is the use of still-slop to prevent or remove incrustation by lime in steam boilers, and the use of quicklime in the manner herein substantially set forth to prevent such incrustation.

Polishing Metals.

Mr. George Printy Wheeler, of Abinghall, Gloucester, engineer, and Mr. John Fox Gloyn, of Manchester, have patented an invention for improvements in the preparation and application of certain materials for the purpose of cleaning and polishing the surfaces of metals, which are also applicable to other purposes. In carrying out this invention the patentees take the slag, dross, or cinder produced from the smelting of iron, copper and silver, and subject it to a suitable action of crushing, grinding, or pulverising by machinery, and when it is sufficiently crushed or pulverised, it is sifted into suitable degrees of fineness to suit the various purposes to which it is to be applied. The material thus produced is suitable for cleaning and polishing metals, sharpening knives, razors and other cutting instruments, and may be used in the same manner as sand, emery, and similar materials are now used for the said purposes, and will be found very superior and more economical than sand, emery, or similar articles. This material is also applicable to filtering machines as it makes an excellent filtering medium, and will supersede the use of charcoal, felt, and similar articles used for filtering water and other liquids. It also makes an excellent cement for covering the outsides of buildings, covering the surfaces of roads or streets, either used alone or mixed with other cements. As a cement for the foundations of houses or other buildings, roads, walks, or similar purposes, the powder is mixed with lime or other suitable material. It may also be used alone or otherwise as a tooth powder. This powder mixed with soap makes an excellent material for scouring floors, decks of ships, or other places; and it also makes an excellent hand soap, which may be used as a substitute for the ordinary sand soap.—*Mech. Mag.*

Manufacture of Iron and Steel.

The object of this invention [by S. C. Kreeft, of London] is to impart homogenity and a compact molecular arrangement to cast-iron, cast-steel, and to Bessemer metal, and thereby to give increased strength to the articles manufactured therefrom. To attain this end, a powerful current of electricity is applied to the metal while in a state of fusion, the current being obtained either from a voltaic battery or an induction apparatus. The electric current is applied by means of carbon points connected with the wires of the voltaic battery or induction apparatus, the points being brought into contact with the metal while it is being run off. The metal is thus caused to assume (while in a state of fluidity) the desired homogeneous and compact molecular arrangement, which arrangement it retains after cooling. By applying the electric current during the running-off of the fused metal—and more especially the metal obtained by Bessemer's process, and the cast-steel produced in furnaces with saggars—the occurrence of flaws or bubbles is prevented, as the molecular movement set up by the electricity prevents their formation. The metals thus treated acquire a tenacity superior to that of iron and steel manufactured and cast under ordinary circumstances. The effect of this treatment is also to give to the metals thus acted upon a perfect magnetization, which renders possible the economical construction of magnets. The patentee claims, "subjecting manufactured iron and steel, while in a state of fusion, to the action of electric currents, for the production in cast-iron,

cast-steel, and Bessemer metal of a homogeneous and compact molecular arrangement, as described."—*Newton's London Journal of Arts.*

Matches without Phosphorus.

We had occasion, some months ago, to draw attention to the terrible effect upon the health of the workmen engaged in the manufacture of the phosphorus which enters into the composition of the lucifer matches at present in use, and to mention that Dr. Hierpe. of Stockholm, was engaged in an earnest endeavor to discover some means of producing effective friction matches without the aid of a substance the whole of our supply of which ought to be devoted to the fertilization of the soil, and which, when employed in the arts in the free state, is so frightfully injurious to those who are unfortunate enough to have to manipulate it.

Dr, Hierpe has since patented, both in Sweden and some other continential countries, a composition for the tips of friction matches, consisting of a mixture of four to six parts of chlorate of potash with two parts of bicarbonate of potash, two parts of either peroxide of iron, protoxide of lead, or deutoxide of manganese, and three parts of glue or other cement. Matches tipped with this composition will only ignite when rubbed upon a surface specially prepared. For this igniting surface Dr. Hierpe uses a mixture of twenty parts of sulphide of antimony with two to four parts of bicarbonate of potash, four to six parts of either oxide of iron or oxide of lead, and from two to three parts of glue. The new matches are no more costly than the old ones, and, besides having the advantage of their manufacture being innoxious, and not involving the consumption of any substance which ought not to be spared from other purposes, are immensly *safer* then our ordinary matches, since they will not ignite except when rubbed upon a composition prepared expressly for the purpose—*Mechanics' Magazine.*

Practical Memoranda.

Weights of Pipes of various Metals, and Diameters.

Thickness in parts of an inch.	Wrought Iron.	Copper.		Lead.	
		lbs.	plate.	lbs.	lead.
1/32	·326	11½	·38	2	·483
1/16	·653	23½	·76	4	·967
3/32	·976	35	1·14	5½	1·45
1/8	1·3	46½	1·52	8	1·933
5/32	1·627	58	1·9	9¼	2·417
3/16	1·95	70	2·28	11	2·9
7/32	2·277	80½	2·66	13	3·383
¼	2·6	93	3·04	15	3·867

Rule. To the interior diameter of the pipe, in inches, add the thickness of the metal; multiply the sum by the decimal numbers opposite the required thickness, and under the metal's name; also, by the length of the pipe in feet; and the product is the weight of the pipe in lbs.

1. Required the weight of a copper pipe whose interior diameter is 7½ inches, its length 6¼ feet, and the metal ⅛ of an inch in thickness.

$$7{\cdot}5 + {\cdot}125 = 7{\cdot}625 \times 1{\cdot}52 \times 6{\cdot}25 = 72{\cdot}4 \text{ lbs.}$$

2. What is the weight of a leaden pipe 18½ feet in length, 3 inches interior diameter, and the metal ¼ of an inch in thickness?

$$3 + {\cdot}25 = 3{\cdot}25 \times 3{\cdot}867 \times 18{\cdot}5 = 232{\cdot}5 \text{ lbs.}$$

NOTE.—Weight of a cubic inch of

Lead	equal	·4103	lb.
Copper, sheet,	"	·3225	"
Brass, "	"	·3037	"
Iron, "	"	·279	"
Iron, cast,	"	·263	"
Tin, "	"	·2636	"
Zinc, "	"	·26	"
Water,	"	·03617	"

Heating Power of Various Combustible Substances.

Species of Combustible.	Pounds of water which a pound can heat, from 0° to 212°.	Pounds of Boiling water evaporated by 1 Pound.	Weight of Aimospheric air at 32° to burn 1 Pound.
Wood, in its ordinary state..	26	4·72	4·47
Wood charcoal	73	13·37	11·46
Pit coal.....	60	10·90	9·26
Coke..	65	11·81	11·46
Turf	30	5·45	4·60
Turf charcoal..	64	11·63	9·86
Carburetted hydrogen.....	76	13·81	14·58
Oil	78	14.18	15·00
Wax.....			
Tallow.....			
Alcohol of commerce	52	9.56	11·60

To Estimate Distance.

Observe how many seconds elapse between a flash of lightning and the thunder, and multiply them by 1142, the number of feet sound travels in a second, the product will be the distance in feet. The same process may be applied to the flash and report of a gun, or any other sound, provided we can ascertain the time at which it is produced, and the interval that elapses before it reaches the ear.

Illustration. Saw a flash of lightning five seconds before I heard the thunder: required the distance.

$$\frac{5 \times 1142}{3 \times 1760} = 1\tfrac{42}{528} \text{ mile distant.}$$

In the absense of a watch, the pulsations at the wrist may be counted as seconds, by deducting one from every seven or eight.

PRECISION.—Precision is a good trait of character. A writer in a late number of an agricultural contemporary says that 24 days, 12 hours, 43 minutes, and about 62 seconds is the turkey's natural time to sit.

Statistical Information.

OUR EXPORTS.

The Commissioner of Customs, Mr. Bouchette, has just issued a summary statement, showing the value of the principal articles of Canadian produce and manufacture exported for the fiscal year ending 30th June last. Documents of this kind are generally of a "dry" character, and although having a large circulation, are seldom or never read by the great majority of the people. The present report, however, is worthy of attention. It derives its chief interest at the present time from the fact that it contains a list of our Exports to the United States, with their values; and in view of the anticipated abrogation of the Reciprocity Treaty, the figures cannot fail to be interesting.

From this statement we learn that the produce of our Mines exported for the year ending 30th June last amounted, in round numbers, to $575,000. Of this there were exported to—

Great Britain	$387,000
British Colonies	661
United States	186,649
Germany	5,790
Other foreign countries	13,168

This shows a falling off of $183,000 in the produce of the Mines in '65 as compared with '64.

There is also a slight decrease in the products of our Fisheries—the amount for this year being $766,000, as compared with $770,500 in '64. This year's products were divided among the different countries in the following proportions:—

Great Britain	$ 95,000
British Colonies	107,000
United States	89,000
Other countries	474,000

The most important items of our Exports are, this year, Lumber and Timber. The total amount exported represented in value the sum of fourteen and a quarter million dollars, showing a slight increase on the previous year—the value of these articles exported in '64 being a little less than fourteen millions. Of the quantities exported this year—

Great Britain had	$9,000,000
British Colonies	32,000
United States	5,000,000
France	99,000
Germany	1,600
Other countries	145,000

The Exports of Animals and their Products has considerably increased. The total amount of this class of Export in '64 was six and a half million dollars, while in '65 it is eight and a half—showing an increase of two millions and a half, or nearly twenty-five per cent., as compared with last year.

The figures for this year are—

To Great Britain	$1,255,000
" British Colonies	146,000
" United States	7,053 000
" Other countries	32,000

The item next in importance this year is the "Agricultural." The total amount exported for the year is in round numbers ten and a half million dollars.

To Great Britain	$1,525,000
" British Colonies	662,000
" United States	8,247,000
" Other countries	18,000
	$10,455,000

These figures show a falling off of over three million dollars, as compared with last year.

We are pleased to notice an increase, though slight, in the Exports of Canadian Manufactures, the amount for '64 being $932,000, while in '65 it sums up to $1,095,000. We export Coin in Bullion to the United States and Great Britain only. The total amount to Britain is $89,000, and to the United States $1,600,000. Of these valuable commodities we exported a few thousand less in '65 than '64.

The entire value of our exports for the year ending 30th June last is $42,481,151. The exports of the previous year amounted to $43,718,191, shewing a decrease this year of $1,237,040. Out of the forty-two and a half millions this year, twenty-three millions, about half our entire exports, were to the United States. The following figures will show the amounts:—

Mine products	$575,000
Fishery do	89,000
Timber and lumber	5,000,000
Animals and their products	7,000,000
Agricultural products	8,300,000
Coin in bullion	1,600,000
Other articles	300,000
Total Exports to U. S.	$22,864,000

It appears to us that the largest part of this comes under the conditions of the Reciprocity Treaty, though Mr. Galt states that only about ten millions is directly affected by its operations.—*Trade Review.*

PUBLIC LIBRARIES.

There are 104 public libraries in the country, which number not less than 10,000 bound volumes each. The aggregate of the whole is 2,403,477. Of these libraries only 8 with an aggregate of 152,000 volumes, are in the territory lately under rebel control. The largest public library in the country is that of Harvard University 140,000 volumes. The Astor Library has 120,000. The Boston public library, the youngest on the list ranks third, having 110,563 volumes. Yale College has 42,000. Brown University (one of the choicest libraries in the country) 31,000. Dartmouth College 15,679. The Portsmouth Athenæum, established in 1817, closes the list with 10,000 volumes. Massachusetts has 20 libraries, or nearly one-fifth of the entire list, and 514,415 volumes—four times as many as the late Southern confederacy. New York has 16 libraries with 488,838 volumes. California, Michigan, Tennessee, Georgia and Vermont rank below New Hampshire. According to the latest returns, Great Britain has only 43 libraries, which exceed 10,000 volumes, and France only 38. It estimated that all the public and educational libraries of the United States contain 1,250,000 volumes.—*Maine Farmer.*

UNITED STATES IMPORT DUTIES.

The duties which prevail in the United States upon articles of produce which we export, are not perhaps very generally known; and, in the event of a repeal of the Reciprocity Treaty, it would be interesting to see what they really are. We have compiled the following for the information of our readers:—

Wheat	20	cents per bushel.
Corn	12	" "
Oats	12	" "
Rye	15	" "
Barley	15	" "
Beans and peas	10	per cent ad val.
Flour	20	" "
Ashes	15	" "
Lumber	20	" "
Staves	10	" "

The duty on wool is as follows:—

When costing 12 cents or less per pound	3 cents per lb.
When costing over 12 cents, and not over 24 pounds	6 " "
When costing over 24 cents, and not over 32 pounds	10 " " and 10 per ct. ad. val.
When costing over 32 cents	12 cents per lb. and 12 per ct. ad. val.

On the Skin 20 per cent ad valorem.

Hence on wool bought in Canada, which has of late years been worth over 32 cents per pound, the duty would be 12 cents per pound, and 12 per cent ad val., or nearly 16c., which, taken off the price (31c.,) reduces wool to 16 cents per pound! —*Ibid.*

THE PROGRESS OF CANADA AND THE UNITED STATES.

For some time past we have been in search of statistics by which our readers could see the real progress of Canada and her rival, the American Union, are making in wealth and population. The official publication of the last census of the United States supplies the want. From the *Globe*, we gather full extracts from it, which we can compare with results of our own advancement, and so strike the balance between the progress of the rivals. First, then we learn that the census tables show that the population of Upper Canada is increasing at a far greater rate than the population of the United States. In 1850 the population of the United States and Territories was 23,191,876. In 1860 it numbered 31,433,322—an increase of 38,58 per cent. in ten years. In January, 1852, the population of Upper Canada numbered 952,004. In January 1862, it increased to 1,456,681—an increase of 53,01 per cent. In other words, says the *Globe*—"while the United States have added, in ten years, in round numbers, thirty-five persons to every hundred of her population, Upper Canada had added fifty-three to every hundred of hers.

So much for Upper Canada. The comparison does not, of course, hold so well as regards Lower Canada; but even there the States have not so much to boast of. In 1852 the population of Lower Canada was 890,261. In 1862 it may be stated to have been 1,138,430—an increase in ten years of 27,88 per cent, against the 35,50 per centage increase of the United States. But taking the increase of Upper and Lower Canada together against the increase of the States, for the two periods of ten years mentioned, we find that the increase in population in Canada has been five per cent. greater than that in the States! This is a great result, considering the gigantic efforts made by the States to monopolise the emigration of the world. These figures, it will be seen, are so far at fault, that they compare the progress of the States from 1850 to 1860 against the progress of Canada from 1852 to 1862. But, then, it must be borne in mind that the emigration to Canada in the few years preceding 1850 was very small, while the emigration to the United States for the few years preceding 1862 was large—a state of things which renders total increased rate of population on the part of Canada all the more remarkable.

A further comparision of statistics reveals the fact that Lower Canada, slow as she is, has in ten years increased her population at a greater rate than any single State in the Union, during a like period of ten years, with, we believe, one exception, Illinois.—And with regard to Upper Canada, the result is still more satisfactory. To make a single comparison—Upper Canada in ten years, increased her population from 952,004 to 1,456,680 —an increase of 53,01 per cent. New York during a like period increased its population from 3,097,494 to 3,880,735—an increase of only 25.29 per cent! Compared to the increase for ten years of the whole group of Western States, including Illinois, Michigan, Indiana, Ohio, Wisconsin, Minnesota, Iowa, Missouri, Kentucky, Kansas and the territory of Nebraska, the rate of increase in Upper Canada, for a like period, falls off. In 1850 the population of those States was 6,386,000. In 1860 it was 10,147,663—or an increase of 90.47 per cent; while, as we said before, the decimal increase of Upper Canada is 53.01 per cent. But manifestly the proper way to estimate the progress we are making is to compare the whole of the United States, Territories and all, with the whole of Canada, and according to this comparison, as has been already shown, Canada has increased her population, in ten years, five per cent greater than the United States. These figures are satisfactory so far. They show that, despite the assertions of the annexationists, Canada is increasing in population—and population in the western world means wealth—at a greater rate than the States. They also indicate a bright future for the country, when emigration developed by the government to its fullest extent, and when, as we hope will be the case, the fertile prairies of the North West are thrown open to Canada and old country settlers—*London Prototype.*

INDUSTRY OF THE UNITED STATES.

The arrangement of the census of 1860 in reference to labor details, exhibits our manufacturing industry as represented by 128,210 establishments, whose owners, on a capital of $1,049,800,022, produced, through the aid of machinery and 1,873,-

026 operatives, $1,900,000,000 worth of commodities. This extraordinary amount is equal to $60 61 to every man, woman, and child in the country, and after deducting the exports, $39,803,000, we have an aggregate for consumption amounting to $1,187,853,651. This, on a division *per capita*, gives $99 12 to each individual.

In the report it also appears we have 31,445,069 people, and have only 8,378,498 engaged in the various *industries* of the country. In the agricultural department we have 2,423,895 farmers, 795,979 farm laborers, 85,551 planters, making 3,305,136 able-bodied, industrious people who live by the sweat of their brow. Then commerce, which is the handmaid to agriculture, employs 123,878 merchants, 67,360 marines, 184,485 clerks, 3,546 ship-masters, 7,558 steamboat men, 2,850 sail-makers, 13,392 ship-carpenters, 2,546 ship-chandlers, 26,446 boat-builders and boatmen, making a total of 3,736,491 who aid in the distribution of the productive industry of the country.

Those classed as manufacturers by the census are 147,750 miners, 21,905 fishermen, 1,217,845 manufacturers, making a total of 1,387,100 men, women, and children, who act as producers of the raw material and fit it for consumption. Of the specialties the agriculturists amount to 35 per cent., and the mining, fishery, and manufacturing interests about 16 per cent.; the aggregate deducted from the entire number reported leaves 3,181,477 engaged in various professions, of whom there are 37,529 clergymen, 33,193 lawyers, and 34,543 physicians; making 124,275 who are non-producers, but active consumers, and tolerated "only from the moral or intellectual necessities of the producer."

The next important class comprises 38,633 laundresses, 35,165 mantau-makers, 270 midwives, 25,722 milliners, 8,132 nurses, 90,198 seamstresses, 375 shirt-makers, 101,808 tailoresses; making 298,106 who, if they do not contribute to the moral condition of society, at least give to the exterior appearance the attribute next to godliness that prevails in all well regulated communities. Following these we have 19,000 bakers, 11,000 barbers, 13,000 bar-keepers, 112,357 blacksmiths, 14,735 bricklayers, 142,968 carpenters, 21,640 carters, 27,437 civil engineers, 17,180 coach-makers, 43,624 coopers, 19,521 drivers, 11,031 druggists, 21,323 gardeners and nurserymen, 40,570 grocers, 12,728 harness-makers, 11,540 hatters, 22,899 housekeepers, 25,816 inn-keepers, 10,195 jewellers, 969,301 laborers, 15,929 lumbermen, 48,925 masons, 24,942 mechanics, 36,581 waiters, 177,077 molders, 24,693 public officers, 37,883 overseers, 51,695 painters and varnishers, 16,594 pedlers, 13,116 plasterers, 23,106 printers, 36,567 railroad men, 13,557 refectory men, 12,756 saddlers, 15,000 sawyers, 550,908 servants, 164,808 shoemakers, 18,823 stone-cutters, 49,993 students, 10,484 tanners and curriers, 119,469 teachers, 34,824 teamsters, 17,413 tinsmiths, 11,196 traders, 96,178 weavers, 32,693 wheelwrights, and 72,872 whose occupations are unknown; making near 2,000,000.

It is a most mortifying reflection to any man to consider what he has done compared with what he might have done.

THE RESOURCES OF CANADA.

In foreign countries a number of persons will be found whose custom it is to regard Canada as an inclement, unproductive region where the inhabitants for half the year are compelled to bundle themselves up in furs, and huddle closely together over roaring fires, denied of all the comforts and conveniences of life. Even in England, although of late our fellow subjects have become better informed about us, there are but few among them who have any idea of the vast resources of our country, or the energy and productive industry of the Canadian people; and we ourselves are not perhaps altogether aware of the many natural advantages we possess. A brief consideration of our resources will therefore not be uninteresting.

First the mineral wealth of Canada is immense, needing only capital to develop it and render it a great resource of national wealth. The Lake Superior copper has already become famous for its extent and value, and the Acton Copper Mine, in Lower Canada is one of the richest in the world. The iron deposits in the neighborhood of Lake Superior seem to be practically inexhaustible.

In the vicinity of the Gilbert and Chaudiere Rivers, in Lower Canada, have been found large deposits of gold, which seem likely to conduce largely to the wealth and prosperity of the Provinces.

With the Oil Wells of Upper Canada we are all more familiar, but probably few among us have any adequate idea of their importance. The section of country embraced by them is over ten thousand miles.

The quantity of grain produced by Canada annually seems almost fabulous.—Of Wheat last year over 25,000,000 bushels was grown; 12,000,000 bushels of peas; 40,000,000 bushels of oats; over 1,500,000 tons of hay; 13,000,000 bushels of buckwheat; 28,000,000 bushels of potatoes, and 10,000,000 bushels of turnips. We also produced 30,000,000 pounds of beef, sheared 5,500,000 pounds of wool, and made 45,000,000 pounds of butter. The number of milch cows, horses, sheep and pigs is considerably over two millions.

Turning to our manufactories we find them by no means insignificant. Lower Canada alone contains over 2,000 saw mills, and in one year cut nearly 800,000,000 feet of lumber.

Our coast line from the Gulf of St. Lawrence to Lake Superior is over 2,000 miles, and besides our magnificent system of water communication, we have over 2,000 miles of railroad traversing the country in all directions.

The population of Canada liable to military duty is about half a million, the embodied militia 90,000 men, the volunteers alone numbering some 30,000.

There are nearly 300 newspapers in the two Canadas, employing 2,000 persons; 8,000 schools educating 60,000 boys and girls.

Let us hope that the people of Canada will have sufficient energy of purpose and industry to benefit by the many advantages they possess, and by loyalty and patriotism strive to preserve to their children the blessings they themselves enjoy.—*Hamilton Spectator.*

THE PRECIOUS METALS.

The following interesting items are from M. Roswag's new work on the subject, entitled *Les Méatux Précieux.* From the year 1500 to 1848 America yielded 27,122 millions of francs in silver, and 10,028 millions of francs in gold. These numbers comprise 13,774 millions of silver drawn from Mexico, 43,059 from Peru and Bolivia, 230 from Chili, and 58 from New Granada. As to gold, the share of Brazil was 4,625 millions of francs; that of Granada, 1,952; of Mexico, 1,341; of Peru and Bolivia, 1,172; of Chili, 862; and of the United States, 76. Europe during the same period only produced 2,330 millions of francs in silver, and 1,600 ditto in gold. Africa yielded 2,500 millions from Guinea. Hence the total quantity of precious metals existing in 1848, including 1,000 millions supposed to exist before 1500 formed a total of 44,578 millions of francs—viz., silver, 30,152, and gold, 14,426. From 1848 to 1857 the stock of precious metals has been increased by 2,170 millions of francs of silver, and 6,004 of gold. Of the latter, California has produced 2,508 millions, and the rest of America 445. Australia has yielded 1,695, and Europe 743, including Russia for 678 millions. Asia has contributed 505 millions, and Africa 108. Of silver, Australia has yielded 9 millions; America, 1,827; Europe, 321; and Asia, 22; forming a total of 2,179 millions of francs. There consequently exist at present in the world 32,331 millions of francs of silver, and 20,430 of gold. The ratio of gold to silver, which before 1848 was as 1 to 2, is now as 2 to 3. In weight there existed before 1848 about 31 kilogrammes of silver for every kilogramme of gold; in 1856 this proportion had fallen to less than 24 kilogrammes of silver for one kilogramme of gold. Since 1856 the total annual increase of the precious metals may be stated at 240 millions of francs of silver, and 500 of gold, being more than double the former.

BRITISH POPULATION.

The growth of the population of the British Islands during the last one hundred and fifty years is prodigious. The surplus has furnished the great majority of the population of British America, Australia, and the United States. Great Britian and Ireland have furnished upwards of 30,000,000, of people to these countries, and yet the home population, which was in the year 1700, only 7,650,000, and in 1800, only, 15,800,000, is now upwards of 30,000,000. The British Islands have doubled their population twice in one hundred and sixty-five years. France in the year 1700 contained 19,669,000 inhabitants, in 1800, 27,349,000, and in 1860, 37,000,000—so that her population has not doubled once during the same one hundred and sixty years, although she has done but little in the way of colonization. The other European States show but a very slow rate of increase; in fact. we believe that one or two of them remain in *statu quo.*

POPULATION OF TEN BRITISH TOWNS.

From returns of the Registrar General, in the middle of the present year, the population of the following towns were:—London, 3,015,494; Liverpool, 476,368; Manchester, 354,930; Salford, 110,833; Birmingham, 327,842; Leeds, 224,025; Bristol, 161,809; Edinburgh, 174,180; Glasgow, 423,723; Dublin, 317,666.

Photography.

RECOVERY OF SILVER FROM OLD BATHS.

(*British Journal of Photography.*)

"From the frequency with which inquiries seem to be made respecting the recovery of silver from old baths and wasted solutions, it would seem that the methods generally prescribed, simple as they are to any one in possession of a laboratory, yet present difficulties to amateurs out of the reach of furnaces, and that a yet simpler method for obtaining reduced silver in a compact fused form (in which state alone can it be safely relied on for furnishing pure nitrate) is for such persons still a desideratum. The following method will, it is hoped, put the recovery of silver in a compact and pure state within the reach of all, even in the most ill-furnished positions.

"Precipitate old nitrate baths with chloride of sodium in excess, and old hypo baths with 'liver of sulphur' or sulphide of potassium, or, if this cannot be procured, with the yellow solution obtained by boiling lime and sulphur together for some time in water. The chloride and sulphide of silver thus obtaned, after washing and drying, are then to be mixed with two or three times their weight of powdered nitrate of potash or saltpeter. Select a solid piece of well-dried wood, of dimensions in the proportion of about eight inches cube to half a pound of the above mixture; place a small quantity, say half an ounce, on the upper surface, and thrust in the red-hot end of a burning stick. When deflagration has fairly commenced, and a cup-shaped cavity has begun to form, add the remainder of the mixture, in small quantities at a time (for fear of its overflowing) by means of a spatula or spoon. If this has been skilfully done the whole quantity may be added without loss; and after the combustion is completed, there will be a deep cavity in the block containing the reduced silver in a spongy form, in the midst of a cake of carbonate and sulphate of potash and chloride of potassium. The whole is to be scooped out and thrown into water, which dissolves the salts, leaving the silver sponge, which, after drying, is ready for the second operation.

"In the above process the niter, in contact with the burning wood, furnishes oxygen to it, thus blowing the fire, so to speak, and keeping up a vigorous combustion, and in so doing becomes reduced to carbonate of potash, which at a red heat readily decomposes chloride of silver. The final result of the two steps of the operation may be thus represented:—

$$KO\,NO_5 + Ag\,Cl + 3\cdot C = Ag + K\,Cl + N + 3\,CO_2.$$

For fusing the spongy silver into a compact mass, a mixture known as Baume's flux, with a reduced amount of sulphur, answers perfectly. Mix six parts of saltpeter, two parts of dry and fine sawdust, and one part of flower of sulphur. Take a

large iron ladle, put a layer of flux about an inch deep on the bottom, and above this alternate layers of silver and flux, using about two parts by weight of the latter to one of the former; press the whole tightly down. On setting this mixture alight it burns with great heat, and after the combustion is over the silver will be found in a single compact button at the bottom of the ladle, and after well washing in water it will be ready for solution in nitric acid. By this method, a lump of silver weighing many ounces can be obtained with great ease in a very short space of time.'"

"E. HADOW.

"King's College."

Photographs of Shadows in Water.

"Sir DAVID BREWSTER exhibited to the Photographic Society of Scotland, a photograph of Warwick Castle, taken several years ago by the late Mr. Buckle, of Leamington, in which the picture of the Castle seen by direct light has, in several parts, disappeared, while the same parts of the picture seen by reflection from water are as distinct as they ever were. In a few years therefore, when the direct picture of the Castle has disappeared, the picture of it as reflected from the still water will be perfectly distinct.

"Mr. W. D. CLARK suggested, as a probable explanation of the phenomena, that, as well known to all artists, shadows in water were always darker than the substance they represented, consequently this was the case in all photographs, and presuming that the view of Warwick Castle had all faded equally, the result would be that the Castle being originally more delicate than the shadow, would show greater symptoms of decay."

Photographs in Colours.

In the July number of the Journal, we published an article from the *Revue contemporaine*, giving an account of the success of M. Chambay. We notice in the *Photographic Journal* a correction from his pen, in which he says:—

"I am desirous to amend the very flattering article in question, for the sake of truth as well as of my character.

"I, in reality, do not 'fix the natural colours of the object photographed;' but I possess a process by which the ordinary proof is transformed to a coloured one, which is exactly the reproduction of what is seen in the 'camera obscura' on the ground glass.

"The second part of the aforesaid article states that the likeness obtained has all the delicate colouring of a pastel drawing and the minute accuracy of a miniature-painting.

"I am not conceited in adding that such a statement does underrate, if anything, the real value of my process."

He that cannot forgive others, breaks the bridge over which he must pass himself; for every man has need to be forgiven.—*Lord Herbert.*

Adversity overcome is the brightest glory, and willingly undergone the greatest virtue. Sufferings are but trials of gallant spirits.

Miscellaneous.

Canada at the Dublin Exhibition.

The *Journal of Education* for Upper Canada says:—

"A gentleman who recently returned to this city from the Dublin Exhibition speaks very highly of the Canadian collection and states that it is one of the finest and most imposing in the building. A large number of French gentlemen were prominent in their attendance on the collection, and appeared to view the productions of Louis XIV. with deep and regretful interest. The magnificent collection of minerals contributed by the Canada Geological Survey was especially admired and had no rival, the contributions in this department from other countries being few and far between. It attracted the special attention of many gentlemen from the British mining districts, and in several instances led to inquiries, which will probably be followed up by the introduction of British capital for their proper development. The grains made a good show and were pronounced by competent judges to be equal to anything on the ground. The clover seed was said to be the best ever seen in Ireland. Many of the carpenters' tools could not be procured in Dublin, and several were inquired for at any price. It was the general opinion that a good business in these articles could be done in Ireland, particularly in spoke shaves and other small tools. The agricultural implements were very superior, better than any shown. Furs were very good and attracted considerable attention. Many inquries were made for the skates and snow-shoes, every article of this description having been bought at the opening. The photographic department was deservedly one of the features of the collection, and far surpassed the specimens furnished by the British and French photographers. This was particularly the case of Mr. Henderson's views of the Eastern Townships, and Mr. Notman's splendid book of copies from engravings and paintings. The atmosphere of Canada is peculiarly favorable to the photographer; but apart from this, these gentlemen have brought great natural abilities to bear upon the development of the art; and, favoured by a correct artistic taste, have succeeded in utterly distancing their European rivals. Mr. Duncanson's two paintings, 'The Lotos Eaters,' and 'The Falls of the Chaudiere,' were also greatly admired. The latter composition was sold to an Irish nobleman soon after the opening of the exhibition, for $400. Much surprise was manifested at the beauty and solidity of the specimens of book binding contributed by Mr. George E. Desbarats of Quebec. A good many contributions had been sent into this department, but Mr. Desbarats' handiwork far exceeded them all. A host of works, well designed not only to show the elaborateness of the book binders' art, but also to illustrate the growing literature of the province. Mr. Lovell's collection of school books came in for its due share of praise in this connection, and for cheapness and high tone and character was pronounced by many dominies and learned professors to be equal to anything shown. A good many specimens of flax and oil were exhibited.

The flax was very favorably spoken of by Belfast and other Northern linen men, and compared very well in length and fineness of fibre with many of the specimens grown on Irish soil. The oils also came in for very favorable notice. The fine display was greatly admired. The Canadian tweeds exhibited attracted a great many inquirers, and persons interested in manufacture of Scotch tweeds admitted that they could not undersell us in our own market, while the qualities shown were very superior. An enormous stride has been taken by Canada in this respect of late, and we may soon be able to compete with the British manufacturer on equal terms, duty or not duty. The Canadian woods were a source of astonishment to many who had only previously seen our pines and other rough, cheap woods, and were the finest collection on the ground. An exposition of the solar system was looked upon as a very interesting and ingenious work, and was not the least attractive feature in the collection. Our informant had a good opportunity to note the effect the Canadian collection had on the visitors; and expressed as his belief that, apart from the collections of England, France, and other European countries, it proved the most impressive and complete in the building. He also states that Ireland is in a very prosperous condition; that many new manufactories were springing up in the northern towns, and that the country was evidently entering on a new area of wealth and contentment.

Processes of Disinfection.

The following memoranda on disinfection have just been issued by the Privy Council; and, considering the circumstances under which they are published, we feel bound to assist in giving them all publicity:—

"1. For purposes of artificial disinfection, the agents which most commonly prove useful are—chloride of lime, quicklime, and Condy's manganic compounds. Metallic salts—especially perchloride of iron, sulphate of iron, and chloride of zinc, are, under some circumstances, applicable. In certain cases chlorine gas or sulphurous acid gas may advantageously be used; and, in certain other cases, powdered charcoal or fresh earth.

"2. If perchloride of iron or chloride of zinc be used, the common concentrated solution may be diluted with eight or ten times its bulk of water. Sulphate of iron or chloride of lime may be used in the proportion of a pound to a gallon of water, taking care that the water completely dissolves the sulphate of iron, or has the chloride of lime thoroughly mixed with it. Condy's stronger fluid (red) may be diluted with fifty times its bulk of water; his weaker fluid (green) with thirty times its bulk of water. Where the matters requiring to be disinfected are matters having an offensive smell, the disinfectant should be used till this smell has entirely ceased.

"3. In the ordinary emptying of privies or cesspools, use may be made of perchloride of iron or chloride of zinc, or of sulphate of iron. But where disease is present, it is best to use chloride of lime or Condy's fluid. Where it is desirable to disinfect, before throwing away, the evacuations from the bowels of persons suffering from certain diseases, the disinfectant should be put into the night stool or bed-pan when about to be used by the patient.

"4. Heaps of manure or of other filth, if it be impossible or inexpedient to remove them, should be covered to the depth of two or three inches with a layer of freshly burnt vegetable charcoal in powder. Freshly burnt lime may be used in the same way, but is less effectual than charcoal. If neither charcoal nor lime be at hand, the filth should be covered with a layer some inches thick of clean earth.

"5. Earth, near dwellings, if it has become offensive or foul by the soakage of decaying animal or vegetable matter, should be treated on the same plan.

"6. Drains and ditches are best treated with chloride of lime, or with Condy's fluid, or with perchloride of iron. A pound of good chloride of lime will generally well suffice to disinfect 1,000 gallons of running sewage; but, of course, the quantity of disinfectant required will depend upon the amount of filth in the fluid to be disinfected.

"7. Linen and washing apparel requiring to be disinfected should without delay be set to soak in water containing per gallon about an ounce either of chloride of lime or of Condy's red fluid. The latter, as not being corrosive, is preferable. Or the articles in question may be plunged at once into boiling water, and afterwards when at wash be actually boiled in the washing water.

"8. Woollens, bedding, or clothing which cannot be washed, may be disinfected by exposure for two or more hours in chambers constructed for the purpose to a temperature of 210 to 250 degrees Fahrenheit.

"9. For the disinfection of interiors of houses, the ceilings and walls should be washed with quicklime water. The wood-work should be well cleansed with soap and water, and subsequently washed with a solution of chloride of lime, about two ounces to the gallon.

"10. A room, no longer occupied, may be disinfected by sulphurous acid gas or chlorine gas—the first—by burning in the room an ounce or two of flowers of sulphur in a pipkin; the second, by setting in the room a dish containing a quarter of a pound of finely-powdered black oxyd of manganese, over which is poured half-a-pint of muriatic acid, previously mixed with a quarter of a pint of water. In either case the doors, chimney, and windows of the room must be kept carefully closed during the process, which lasts for several hours."
—*Chemical News.*

New Combustible.

I see the mention of a new combustible, invented by a gentleman who very appropriately bears the name of Stoker. It appears to be very pure charcoal, finely ground and made into a paste with starch. The paste is molded into cakes or balls of different sizes, and then dried. When perfectly dry these may be lighted with a lucifer match, and will continue to burn steadily, like German tinder, without giving flame or smoke. The combustible is intended for heating urns, chafferettes, etc.—*Paris Correspondent of Chemical News.*

Peale's Wages Calculator.

The *Scientific American* of the 9th September, contains an illustration of a very ingenious calculator, the usefulness of which the following description will afford a pretty distinct idea to the reader:—

"By the use of the instrument herein illustrated the various causes of error heretofore existing, in the making up of pay-rolls, are entirely avoided. It consists of a cylinder, on the surface of which is arranged a calculated table; the left-hand column contains the number of days and fractions of days to be calculated, namely, 1, 1¼, 1½ days, and so on for any number of days, to suit, for weekly, semi-monthly and monthly payments. This cylinder is inclosed in a zinc case, and revolves therein on pins having a bearing in the ends of the case. It is easily moved by a milled head at the left end, and the whole is neatly mounted on a walnut base. Running nearly the entire length of the case is an opening sufficiently wide to expose but one row of figures at a time. Immediately below this opening is placed, on the outside of the case, a row of figures denoting the several rates of wages, from the lowest to the highest ordinarily paid. The operation of this instrument can be readily understood by presenting an example, as follows:—

To find the amount of wages necessary to be paid for 9¾ days at the rate of $12 75 per week, or $2 12½ per day. Turn the cylinder by means of the milled heads at the left end, until the figures 9¾, on the left hand column, appear to view; then above the figures $12 75, denoting the rate of wages, on the outside of the case, will be found $20 72—which is the amount to be paid.

They are also arranged for calculating by the hour and half hour. This is a very useful contrivance.

For further particulars address C. W. Peale, No. 2,600 Hamilton street, Philadelphia, who will furnish machines at $6 for weekly, $8. for semi-monthly, and $10 for monthly sizes."

Tyndall and the Climate of California.

The interior of California is occupied by a great valley, lying between the coast range of mountains and the Sierra Nevada, being some 60 miles in width, from east to west, and 300 in length from north to south. The climate of this valley is very peculiar; like the rest of California, it has no rain during the summer, but, unlike the coast district, the days are excessively hot, while the nights are remarkably cool. For months together the thermometer ranges in the afternoon from 100° to 109° in the shade, but after about five o'clock, it begins to grow cool, and the temperature continues to fall till sunrise. A bowl of butter at sunset will be liquid oil, and at sunrise as hard as if it were imbedded in ice. Another noticeable feature of the climate is the extreme dryness of the atmosphere; lumber is seasoned with wonderful rapidity, and clothes washed and hung upon a line are completely dried in a few minutes.

In a nice laboratory in England a philosopher is engaged in some very abstruse investigations of the nature and action of heat. His apparatus is of wonderful delicacy—his thermometer being so sensitive that the approach of the human hand within three feet of it will vary its indications. With this delicate apparatus, with large knowledge, and with patient labor, the eminent physicist has prosecuted his examination of the subtle and invisible force which was the subject of his investigations. Among other facts, he learned that while heat passes freely through atmospheric air, its course is seriously obstructed by minute quantities of the vapor of water.

What a miracle is civilization! Sitting in our office in New York, by the aid of books and mails, we are able to glance in one direction across the stormy ocean to the laboratory of the philosopher, and in the other across the broad continent to the parched valley of the Sacramento, and to perceive an interesting relation between the two. The discoveries of Tyndall have taught us why it is that the dryness of the California atmosphere causes the days to be hot and the nights cool. The absence of aqueous vapor from the air allows the sun's rays to pour down with undiminished force during the day, and during the night the same cause permits the radiation of heat from the earth to go on with greater rapidity than the moister air of other climes.—*Scientific American.*

A New Explosive Substance.

Glycerine as we all know, is the sweet principle of oil, and is extensively used for purposes of the toilet, but it has now received an application of rather an unexpected nature. *Galignani* states that in 1847, a pupil of M. Pelouze's, M. Sobrero, discovered that glycerine, when treated with nitric acid, was converted into a highly explosive substance, which he called nitro-glycerine. It is oily, heavier than water, soluble in alcohol and ether, and acts so powerfully on the nervous system that a single drop placed on the tip of the tongue will cause a violent headache that will last for several hours. This liquid seems to have been almost forgotten by chemists, and it is only now that Mr. Nable, a Swedish engineer, has succeeded in applying it to a very important branch of his art, viz., blasting. From a paper addressed by him to the Academy of Sciences, we learn that the chief advantage which this substance, composed of one part of glycerine and three of nitric acid, possesses, is that it requires a much smaller hole or chamber than gunpowder does, the strength of the latter being scarcely one-tenth of the former. Hence the miner's work, which according to the hardness of the rock, represents from 5 to 20 times the price of gunpowder used, is so short that the cost of blasting is often reduced by 50 per cent. The process is very easy. If the chamber of the mine present fissures it must first be lined with clay to make it water-tight; this done, the nitro-glycerine is poured in and water after it, which, being the lighter liquid, remains at the top. A slow match, with a well charged percusion cap at one end, is then introduced into the nitro-glycerine. The mine may then be sprung by lighting the match, there being no need of tamping. On the 7th of June last three experiments were made with this new compound in the open part of the tin mines of Altenburg, in Saxony. In one of these a chamber 34 millimetres in diameter was made perpendicularly in a dolomitic rock 60 ft. in length,

and at a distance of 14 ft. from its extremity, which was nearly vertical. At a depth of 8 ft. a vault filled with clay was found, in consequence of which the bottom of the hole was tamped, leaving a depth of 7 ft. One liter and a half of nitro-glycerine was then poured in—it occupied 5 ft.; a match and stopper were then applied as stated, and the mine sprung. The effect was so enormous as to produce a fissure 50 ft. in length and another of 20 ft.; the total effect has not yet been ascertained, because it will require several small blasts to break the blocks that have been partially detached by this.—*Mechanics' Magazine.*

The Steel Pen Disease.

The Boston *Journal* says:—"Some of our readers will probably recollect a notice which appeared in the *Journal* relative to a theory advanced by President Felton, of Harvard, that the debilitating and sometimes paralytic affections of the hand and arm, experienced by those accustomed to write much, were attributed to the use of steel pens. Since the appearance of the notice in question, there has been a good deal of speculating regarding the theory it described, and many practical tests of its reliability have been instituted. President Fulton has received a great many letters proving the efficiency of resorting to the old goose-quill in curing partial, and almost complete, paralysis of the hand and arm, caused by using steel pens. One instance is very remarkable. An eminent publisher in this city some years ago found himself unable to write. His hand and arm swelled so that he was forced to employ an amanuensis; and such was his necessity, only at brief intervals, until he happened to see a description of President Fulton's theory in the *Journal*. He adopted the goose-quill instead of the steel pen, and in a month thereafter was able to do his own writing, which he continues to do without any trouble. It may save parties the risk of annoying President Felton with inquiries relative to the basis of his theory, when we inform them that he has none to explain."

Rich Herbs.

"Time is money," is a sage saying. Thyme may be money, but the mint produces it. Shakespeare tells us of "a bank whereon the wild thyme grows." A sweet time a man would have had getting money out of that bank! Bah! Time is a very good thing to be allowed when a bill falls due; but after all we would rather have a mint of money, and we should then be sure of having a good time.

The Toad.

The toad is the most abused of reptiles, and yet nothing is more undeserving of such abuse. It lives on all manner of insects. At night it comes out of its hiding-place and goes in search of food. It seizes its prey with an astounding quickness of tongue. So quick is the motion it is absolutely invisible. This fact makes up for its otherwise slow movements. The toad is truly harmless and inoffensive—children may be permitted to play with it, and it will become enamored of their attention. True, it has a homely, even repulsive, look, but then its eye is all the brighter for it. May it never be trod upon, but multiply and replenish the night! Instruct the children to spare it, for it troubles no one, and only when night hides its ugliness does it come forth. In the spring its trill is among the sweetest of childhood sounds. —*Coleman's Rural World.*

Petroleum Residuum a Substitute for India Rubber.

A Mr. Hanscroft, of Cincinnati, writes to the *Scientific American*:—"Among the many applications of petroleum I notice one of a very strange character—I refer to the invention of our citizen, Mr. John Root. After a great deal of patience and skill he has really succeeded in making a composition that vies with vulcanized rubber for strength and usefulness, from the solid residuum that remains in the still after the more volatile vapors are driven off the well-oil or petroleum. I have seen some very beautiful picture frames and medallions, equal, in fact, to any manufactured from rubber. He also makes bottles and jars of the same composition. Truly we live in an age of improvement.

A New Plan for Preparing Bird Skins.

MESSRS. EDITORS:—In your last paper I saw an article about skinning and stuffing birds. I have found myself that it is a tedious and often difficult job so to stuff them that they look life-like, and I, therefore, tried another plan, which succeeds very well. I do not skin the birds at all, but make only an opening in the lower part of the body, remove all the intestines and insert in the empty space cotton, impregnated with a mixture of one part of creosote, three parts of alcohol, and one quarter part arsenic acid; a wire, wrapped in cotton, saturated as before goes through the neck. After sewing the opening up I lay the bird on its back for about two weeks, when it is fit to be set up. The flesh dries up like a ham, without any perceptible shrinking and the bird retains its original shape. The largest bird tried was a duck but I think it might do with any size. To drive the disagreeable smell of the creosote away, I put the birds, after drying, in a baking oven when it is not too hot. I hope some of your readers may try this method and let us know the result.

GUSTAVUS H. SCHMIDT.

Swatara, August 6, 1865

How to Dignify Agriculture.

The *N. Y. Tribune*, in an article on the present state of the country, says:—"We judge that the migration hence to the Western States has been less than formerly; but there is a steady relative gain of urban over rural population, which we observe with regret. Our youth prefer to swelter on pavements rather than enjoy the scope and freedom of the pure, free country air. They forsake their fathers' farms to pull teeth or measure tape, or chop logic in some fetid city. We must try to teach them better. Nay, we must ennoble and dignify agriculture by making it the intellectual, liberal pursuit it might and should be. Now the pettiness of its processes disgust and repel; it seems to most boys to be mere coarse, rude mindless drudgery. It can be quite other than this, and in time it shall be. More of this hereafter."