

as its basis the number and character of its wings, has superior recommendations, and is now generally recognised. Thus we have one order including all insects with only two wings, known as *Diptera*, belonging to which is for instance, the green-gold fly, the beautiful blue and red spotted fly, &c. Then there is the order *Hymenoptera*, literally, membrane winged, or those insects which have four slightly nerved wings, as in the case of the *Ichneumon*, bees, wasps, ants, &c. The order of *Coleoptera*, or sheath winged, as in beetles. The *Lepidoptera*, or scale winged, as in butterflies. The *Aphaniptera*, or hidden winged, as fleas, &c.

The study of these various descriptions is very interesting and curious, especially, as they form, perhaps, the most striking characteristic of the class under consideration, but space will only admit of two or three brief observations. Of all the invertebrate animals, insects alone enjoy the power of flight, and by no class in the whole animal kingdom are they surpassed, or even equalled in the perfection of the apparatus for this purpose. The rapidity with which, in consequence of this, some insects can travel is almost incredible. Take, for example, the dragon fly, which may be observed skimming over rivers and ponds, and very noticeable from the beautiful colors of blue, green, and gold. The wings of this little creature have a texture like the finest gauze, and yet to such good purpose can they be used that the swiftest bird is outstripped. The scale wings of which those of butterflies and moths are examples, are in many cases very rich and splendid. They are found to be covered with minute scales, which, when rubbed, looks like fine dust, but, which, when viewed through the microscope, present a great variety of form and coloring. In beetles, we have an instance of the sheath wings. In this case, there are two pairs of wings, but the upper ones being of a horny texture, are useless for the purpose of flight, and simply serve as protection, cases for the real wings. These are leathery or membranous, and although they are frequently of considerable size, are so neatly folded that they are entirely hidden from view by the elytra or wing cases. The senses of insects show a considerable advance towards perfection, compared with those of the previous orders. The eyes are especially worthy of attention, as they are of the very exceptional kind known as compound, that is, the apparently simple eyes are made up of an immense number of facets, or lenses, each one of which is equal to a single eye of the ordinary kind. Let us take the common house fly, which at this season is unpleasantly familiar. To all appearances, it is possessed with two immoveable eyes, but when properly examined, it has been found that instead of this, the two little raised points are covered with minute globes or lenses, disposed with the utmost regularity, to the number, it has been calculated, of not less than eight thousand, and each one of which is capable of conveying a distinct and perfect image of any object in view. This applies equally to the eyes of some other insects, such as those of the beetle, the silkworm, butterfly, and dragon fly, &c., except as regards the number, which varies considerably, thus the latter has at least 12,000 eyes, while some species of the beetle is in the enjoyment of more than twice as many. In other cases, as in the bee, we have a still more wonderful apparatus of vision. This industrious little creature is provided with three large eyes, and three thousand five hundred smaller ones, so grouped together as to give a perfect picture of all surrounding objects, and economising to the utmost every feeble ray of light, when the bee is at work on its cells.

The statement that each of the thousands of lenses can convey a distinct image may appear an extraordinary one to some, but the fact has been placed beyond doubt by the curious experiments of the able and indefatigable Leuwenhoek. Having prepared the eye of a fly, he placed it in a particular position before a powerful microscope, and then pointing the instrument towards a church steeple, after the manner of a telescope, looked through it. This steeple was about 300 feet high, and distance about 750 feet, and yet could be seen through every one of the minute lenses in all its entirety, although the image could not have been longer than the point of the finest needle. Next the microscope was directed towards a house with an equally satisfactory result. Not only could it be distinctly visible, but the observer could clearly see which windows were open, and which were closed.

The food of insects consists to a large extent of the juices of animals and plants, but large numbers also feed upon flesh, and a variety of hard substances, and it is very noticeable how exquisitely the character of the mouth and the digestive apparatus is adapted to meet each case. When the food

is liquid, there is attached to the mouth in most instances, a long hollow tube which can be thrust out and withdrawn as occasion may require, and in some, as that of the butterfly, can be rolled up in a spiral form. In many cases, also, where there is difficulty in extracting the juices, this tube or proboscis becomes very complicated, and is even provided with sharp lancets, and other instruments for making the necessary incisions and borings, or as in one species there is a long slender tongue enclosed in a hard sheath, and so arranged that as soon as a wound has been made by the point of the sheath, the tongue is protruded, and opening out inside, is enabled to suck up the juices. Those insects which subsist on solid food, have mouths of very varied forms of construction, but showing equal adaptation to those just mentioned. Some are suited for grinding, and in these such is the power which can be exerted than even the hardest substances are speedily reduced to powder, others are formed for tearing flesh, others for cutting like scissors, &c.

In the nervous system of insects, as well as those for the circulation of the blood and respiration, we observe a distinct and important advance in organization. The nervous system shows a greater concentration, and more systematic distribution. The apparatus of circulation makes a nearer approach to the perfect type, particularly in the fact that here we find for the first time a central organ, simple perhaps in structure, but still representing, and to a certain extent performing, the functions of the heart in higher animals. It is, however, in the apparatus of respiration that we see the greatest development. The activity and power of insects demand a very free communication of air to the various tissues of the body, and the means employed to this end are admirably adapted for the purpose. Two large canals run along the sides of the body, just beneath the surface, and from these a great number of minute tubes ramify through every part of the animal.

But although the insect form exhibits in its perfect state such a high degree of organization, and in many cases, as in the ant, so much intelligence, it is in the earlier stages of its existence of a very low and simple structure, not ranking above the common earthworm, and would, together with others of a similar description, be so classed, were their subsequent history unknown. There is, perhaps, no more wonderful fact in the animal kingdom, than the curious transformation which, beginning with say an humble caterpillar, which hides among the leaves of the cabbage plant, and which is regarded with so little favor, ends in the production of a beautiful butterfly.

### Communications.

#### ST. CATHARINES.

##### OUR MANUFACTURERS.

(From our own Correspondent.)

It is always a source of satisfaction to us to notice improvement in any of the departments of business, where labor finds a field for employment and profit, and capital a safe investment, by which the value of property in general is enhanced, and the progress of our country towards wealth and importance is promoted.

##### THE ST. CATHARINE'S SAW WORKS.

Our readers are, no doubt, aware that for several years the manufacture of saws, plastering trowels, straw knives, &c., by Mr. Joseph Flint, and now carried on by his successor, Mr. R. H. Smith, who was formerly a partner in the Rochester, N. Y. concern, has been one of the largest and most successful industries of our Province. So great has become the demand for the excellent products of this establishment, that the proprietor has determined to build a large and commodious factory especially adapted to meet the wants of his increasing business; he has therefore purchased a large lot, centrally located, and is now engaged in erecting thereon a splendid building three storeys high, the dimensions of which are one hundred and seventy-five feet long, and fifty-four feet wide. He has given Messrs. Goldie, McCulloch & Co., of Galt, orders for an engine and boiler, of seventy-five horse power, and will run entirely by steam. The present factory affords employment for about fifty men, but the new one will require many more. We believe it is the intention of Mr. Smith, to place in his new works the most improved machinery, thereby enabling him to turn out work second to none in the country. The various products of this establishment have been for many years exhibited at the Provincial Exhibitions, where they have never failed to carry off the first prizes. The Town of St. Catharines showed discretion when they exempted

Mr. Smith from taxation for five years. It is with pleasure, we wish Mr. Smith a continuation of his success.

##### NEW STOVE FACTORY.

A company has been formed in town for the purpose of making stoves. The capital invested is twenty thousand dollars. The company have very wisely, we think, selected Mr. John House, late of the city stove store, as manager. Mr. House is a quiet, unobtrusive man; but for sound judgment and thorough business habits, he is the right man in the right place. Twenty ton of the finest sand is being brought from Albany for the use of the company, who will, we believe commence operations in a few days. We wish them all success.

##### AXE FACTORY.

It gives us great pleasure to state to your numerous readers, that the Axe Factory will be set a going again on or about the first of August. It is under an entirely new company, Mr. Cowan being principal, a gentleman of good business habits and abundant means.

Trade is rather quiet at present; much more so than it was last year at the same time. We trust things will get better soon.

St. Catharines, July 12th, 1873.

#### THE LABOR MOVEMENT.

From the report of the Bureau of Statistics of Labor of Massachusetts we quote the following, and commend it to the careful study of our readers:

"The real advance of the labor movement means the promotion of peace and order, and the general welfare of all mankind; it does not mean that the ascendancy or tyranny of one class, or set of classes, is to be superseded by the ascendancy or tyranny of any other class hitherto held in subjection, but that in proportion as the labor movement advances, 'peace on earth and good-will to men' will increase with it, and that if its advance is temporarily checked by revolution and violence, it is not owing to the principle of the movement, but to the ignorance and error of those who, supposing themselves invincible, endeavor to oppose its progress."

"There is great ignorance of the vast amelioration of the individual, social, and political condition of the people, which the labor movement has effected in Europe. Trades Unionism has been an immense motive force in developing a higher order of civilization; and the capitalists and governing classes, in order to hold their own against it, have been forced to repeal unjust laws, and pass better ones."

"Any one who knows of the degraded, ignorant, and sordid condition of the English working people under the old Combination Laws, when work, beer, and tobacco were practically all that was left them by the governing classes, can alone conceive how Trades Unionism lifted them up, step by step, to the present condition of Boards of Arbitration, Co-operation, the Franchise, etc. Before the Combination Laws were repealed, barn-burning and riots were common. After that, strikes were the first and rudest form of organization. Any form of organization, however rude, is always a sign, comparatively, of awakening intelligence. Trades Unionism is a still higher form of organization, the practical training school, which is slowly but surely disciplining and educating the workmen to Co-operation, industrial partnerships, and associative production. Children must crawl before they can walk. Trades Unionism provides legitimate channels through which the just discontent of the people can temperately and rationally express itself, and thus overthrow abuses by peaceful legislation; and if it were not for those channels, this discontent would have expressed itself by more violent measures."

"The papers constantly repeat the fallacy that Trades Unionism encourages bad workmen, when the fact is, that without some means of self-protection to the workmen, capital always tends to bring the wages of the good workmen to the level of the wages of the bad, and to reduce the wages of the bad still lower. Thus by crushing hope, more and more, out of the workmen's life, by steeping them more and more in poverty, the selfishness of capital tends to reduce them to mere machines, and to that poverty which produces ignorance, crime, and national death."

"Trades Unionism was thus forced, in self-defence, to fix a limit below which wages should not go, while it left the good workman free to make the best bargain he could. It also fixed a rough standard of workmanship, by providing that a man should not belong to a Union until he could do a 'day's work'; and as bad workmen are always a drag upon the funds, power, and independence of a union, it is the direct interest of every Trades Union to im-

prove the average workmanship of all its members. Trades Unions, however, by their very effort to improve the general body of the workmen, are bound to have a policy and system adapted to the average capacity and needs of their members, not allowing themselves to be unduly biased by considerations which can only effect the exceptionally good workman, on the one hand, or the exceptionally bad ones on the other; 'the greatest good of the greatest number,' is their motto."

"It is plain that before a man's moral and intellectual nature can develop or improve his body—his physical condition must be reasonably comfortable. This can not be, so long as he is overworked or under-fed, or half-crazed, or benumbed with pecuniary anxieties, connected with his wife and family, or himself."

"In this relation, it is well to add, that when the working classes are prosperous, the consumption of food, clothing, furniture, etc., is constantly increasing. This can be illustrated by pointing to the increase of revenue and the decrease of pauperism in England during the last few years."

### Advertisements.

#### ORGANETTES AND ORGANS.

W. BELL & CO.'S  
CELEBRATED PRIZE MEDAL

#### Cabinet Organs, Melodeons & Organettes

Every Instrument FULLY WARRANTED FOR FIVE YEARS. SATISFACTION GUARANTEED.

Prices from \$85 00 Upwards.

Sole Agent for Toronto,

THOMAS CLAXTON,  
197 YONGE STREET.

N.B.—Second-hand Melodeons and Organs taken in exchange.

#### CITY OF KINGSTON

#### ORDNANCE LANDS SALE.

Public Notice is hereby given, that on

Wednesday, the 9th day of July next,

at noon, will be sold by Mr. WILLIAM MURRAY, Auctioneer, of Kingston, a large number of

#### BUILDING LOTS,

Of divers sizes and dimensions, being subdivisions of the Ordnance property, known as Herchmer Farm as shown on a plan thereof by Nash, P.L.S., to be seen at the said Auctioneer's rooms.

#### Terms of Payment:

One-tenth of the purchase money to be paid down at the time of sale, and the remainder in nine equal annual instalments, with interest on the unpaid balance of the purchase money at the rate of six per cent.

Further conditions will be made known at the time of sale.

Copies of plan may be had on application to the Auctioneer.

E. PARENT,  
Under Sec. of State.

WILLIAM F. COFFIN,

Ordnance Lands Agent.

Department of Secretary of State,

Ordnance Lands Branch,

Ottawa, 11th June 1873.

#### POSTPONEMENT OF SALE.

The Sale of Lots on Herchmer's Farm, Kingston, ordered to take place on the 9th inst., is postponed to WEDNESDAY, the 13th AUGUST, at the hour and place advertised.

E. A. MEREDITH,

Dep. Min. of the Interior.

WILLIAM COFFIN,

Ordnance Lands Agent,

Department of the Interior, Ordnance Land Branch,

Ottawa, 4th July, 1873.

#### ICE CREAM! ICE CREAM!

THE BEST IN THE CITY.

#### A. RAFFIGNON

Begs leave to inform the public, and his customers generally, that he has refitted his place, No. 107 King Street West, with an elegant new Soda Water Fountain, with the latest improvements, made by Oliver Parker, Toronto, and which will be kept constantly running during the summer season. Also, an elegant Ice Cream Parlor, fitted up to suit the most fastidious taste.

Remember the address—

57-oh

NO. 107 KING STREET.

Near the Royal Lyceum

#### EATON'S

#### NEW

#### DRESS GOODS!

We show to-day a choice lot of Dress Goods, in checked, plain, and striped material—all the newest shades and colors. A job line of Black Lustres, at 25c per yard—a bargain.

CORNER YONGE & QUEEN STREETS,

COME AND SEE THEM TO-DAY.



## CUSTOMS SALE.

The undernamed Goods, if not entered  
BEFORE THE 31st INSTANT,

Will be sold by

## PUBLIC AUCTION.

ON THE 31st INSTANT.

CONSIGNEES.	PACKAGES, &c.
Adams, E. P.	1 Small Rocker.
Boulton, H. J.	2 Castings.
Beard Bros.	2 Machine and Box.
Do.	1 Brl. Varnish.
Blackburn, Geo.	95 Castings.
Bryan, Ewart & Murray.	1 Bale Mds.
Burke, J.	2 Caddy Tea.
B. B.	8 Cases Hds.
Carruthers & Co.	1 Case 1,085.
Clevedon & Co.	2 Sacks Meal.
Do.	4 Brls Glassware.
Davis, W.	17 Pigs do.
Fuller, B. L.	1 Brl. Mds.
Flayler, W. H.	2 Beams Warp.
Griffith & Co.	1 Half Chest Tea.
Hamilton, W.	430 Car Springs.
Hunter, W.	3 Cases 1,012.
Holwell, John.	1 Sign.
Hudson, S. & Co.	2 Pigs 1,510.
Do.	5 Cases 14, 16, 17, 225, 250
Kelfeder, H.	2 Boxes Varnish.
Lewis, R. & Son.	2 Cases Mds.
Merrick Bros.	1 Caddy Wadding.
M. D.	1 Keg 5.
No Mark	1 Brl.
Machine Hat Co.	1 Case.
McPherson.	1 Pkg.
McMaster & Bro.	1 Truss 258.
Newton, Jhon.	1 Caddy Baggage.
Norton, L. (Sarnia).	1 Box H. H. Goods.
Order, F. B. T.	1 Box.
Plumier & S.	1 Keg.
Robb, F. or Roll (Sarnia).	1 Box Mds.
Routledge & Son.	1 Case 4,402.
Scoble, C.	2 Tugs and Rds.
Straw Works.	1 Case Hardware.
Sexton.	4 Pieces Stone.
Tombs, W.	1 Box Mds.
Taylor, W.	1 Box Mds.
Wingfield, A. H.	3 Cases 14.
Wicks, C. H.	1 Box Mds.
Wendigo, C. H.	2 Boxes Hardware.
Wallace & B.	1 Half Chest Tea.
Smith & K.	

JAMES E. SMITH,

Collector.

Custom House, Port of Toronto,

2nd July, 1873.

65-h



#### TO CONTRACTORS.

Tenders addressed to the undersigned, at this Department, will be received until noon on

Monday, 14th of July Next,

For the excavation of A CHANNEl at the "Pitch OT" in the Petite Nation River, in the township of North Plantagenet, county of Prescott.

Plans and specifications can be seen at this Department, and with Mr. John Ryan, at Plantagenet.

Printed forms of tender can be had on application at this Department, or at the places mentioned.

Each Tender must contain the bona fide signatures of the persons as sureties for the due fulfilment of the contract.

The lowest or any tender will not necessarily be accepted.

ARCH'D McKELLAR,

Commissioner.

Department of Public Works, Ontario,

Toronto, 23rd June, 1873.

65-t

#### To the Mechanics of Toronto

AND VICINITY.

#### W. J. GRAHAM & CO.,

157 KING STREET WEST,

Having opened the NEW FURNITURE WAREHOUSES, as above, beg to invite the attention of the Mechanics of Toronto and vicinity to their well-assorted stock of

BLACK WALNUT BED ROOM SUITS,

DRAWING ROOM SUITS,

DINING ROOM FURNITURE,

OFFICE FURNITURE,

Gornices, Curtains, Window Blinds,

Poles and Fringes, &c., &c.

CARPETS MADE AND LAID.

All kinds of Furniture Repaired.

65-1e

#### JOHN RAYMOND

Begs to inform the inhabitants of Toronto and its vicinity that he has purchased the business lately carried on by

Mr. JAMES WEEKES,

AT

247 and 249 Yonge Street!

And trusts by strict attention, combined with the low est possible charges, to merit a share of the patronage that has been so liberally bestowed upon his predecessor.

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