

NOTICE.

We shall be pleased to receive some of interest pertaining to Trade Societies from all parts of the Dominion or publication. Officers of Trades Unions, Secretaries of Leagues, etc., are invited to send us news relating to organizations, condition of trade, etc.

TERMS OF SUBSCRIPTIONS.

(INVARIABLY IN ADVANCE.)

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ADVERTISEMENTS.

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All communications should be addressed to the Editor, 124 Bay Street or Post Office Box 1025.

We wish it to be distinctly understood that we do not hold ourselves responsible for the opinions of correspondents.

Our columns are open for the discussion of all questions affecting the working classes. All communications must be accompanied by the names of the writers, not necessarily for publication, but as a guarantee of good faith.

WILLIAMS, SLEETH & MACMILLAN,
124 BAY STREET.

Trades Assembly Hall.

Meetings are held in the following order:—
Machinists and Blacksmiths, 1st and 3rd Monday.

Painters, 1st and 3rd Monday.
Coachmakers, 2nd and 4th Monday.
Carpenters, (159), 1st and 3rd Tuesday.
K.O.S.C. Lodge 356, 2nd and 4th Tuesday.
Tinsmiths, 2nd and 4th Tuesday.
Cigar Makers, 2nd and 4th Wednesday.
Iron Moulders, every Thursday.
Plasterers, 1st and 3rd Thursday.
Trades Assembly, 1st and 3rd Friday.
Bricklayers, 1st and 3rd Friday.
Coopers, 2nd and 4th Friday.
Printers, 1st Saturday.
Bakers, every 2nd Saturday.

Messrs. LANCEFIELD, BROS.,
Newsdealers, No. 6 Market Square, Hamilton,
are Agents for the WORKMAN in that vicinity, who will deliver papers to all parts of the city.

MR. J. PRYKE, "Workingman's Boot Store," will also continue to supply papers.

TO CITY SUBSCRIBERS.

City subscribers not receiving their papers regularly, will oblige the proprietors by giving notice of such irregularity at the Office, 124 Bay Street.

The Ontario Workman.

TORONTO, THURSDAY, JUNE 19, 1873.

NOTICE.

We would request such of our subscribers who have not yet forwarded their subscriptions to do so at an early date. Those of our city readers who will receive their bills during the present and coming week will oblige us by remitting the amounts forthwith.

TO SUBSCRIBERS.

We have received several complaints from our subscribers in Ottawa as to irregularity in receiving their papers. We beg to assure them that THE WORKMAN is punctually mailed from the office, and the fault must rest with the post office officials. We trust the Postmaster at Ottawa will see to it that the irregularity complained of will be remedied.

EDUCATION.

Under our admirable Common School system, the facilities for education in our young country have steadily improved, until at the present day as good a general education can be obtained in Canada as in any country. In addition to our common schools, our colleges and universities, law schools and theological seminaries are scattered almost in profusion over the land; numerous schools of medicine supply us with enough medical graduates to cure all the ills that "flesh is heir to," there are Academies of Design, and schools of painting, and conservatories of music,—but may we be pardoned for suggesting that perhaps the one most important field of education is still vacant,—we have no school for

the instruction of youth in the mechanical arts.

It is palpably impossible for all young men to become professionals—nor are we of opinion that is at all desirable that even a large proportion of them should become such. But whatever their future occupation is to be, it is highly desirable that their education should be defined and marked out by the proposed occupation to a very great extent. If a young man aspires to professional honor and preferment, he must acquire a thorough classical and practical education, in addition to the study of the technicalities of law, or medicine, or theology; should he aspire to authorship and a literary career the broadest possible range of reading, constant thought and unwearying labor, in addition to the groundwork of a liberal education, are requisite. But if a young man of limited means desires to render himself above want and comparatively independent by becoming a skilled artisan, a subordinate position, with little or no instruction in practical matters connected immediately with his labor, and absolutely none in anything beyond that, is deemed quite sufficient.

But we think a vast improvement on this system might be made, and undoubtedly will in some future day; and the improvement will be in the establishment of schools for the instruction of young men in all the branches of skilled labor; perhaps combining sufficient work to be self-sustaining, with lectures, libraries, and all the modern appliances of education. Such schools, embracing instruction of both mind and hand, would afford education in its truest sense; and they would offer golden opportunities for young men of limited means to thoroughly prepare themselves for positions of usefulness. Then artisans would in a great measure cease to be mere machines without an idea beyond their routine of daily toil. Those who desired it might become educated and fully versed in practical matters connected with their various callings; and there are many who do desire it, but who are compelled to relinquish further study and enter with but comparatively scanty preparation upon their manual labor, for want of necessary means. To all such, the introduction of this system of instruction would be an inestimable advantage. Is this a Utopian chimera? Is it not rather what has long been needed—and should have been supplied long ago? Such a system would prove not only an individual but a national benefit,—for the strength of a nation materially consists in the intellectual advancement of its people.

THE NINE HOURS' MOVEMENT.

The movement in England for shortening the hours of labor in factories for women and children looks in a healthy state. Those agitating the subject are active, hopeful, well supported, and what is not the least gratifying feature, evince their steadfastness of purpose by a moderation and intelligence which augurs well for the success of the movement. The Dundee People's Journal notices, as not the least satisfactory of the incidents of the movement in favor of Mr. Mundella's Bill, a crowded meeting held recently in Kinnaird Hall. It says:—

"The tone of the meeting was excellent, the speeches models of good sense and taste, and the whole proceedings a striking contrast to the bitter feelings which were excited when, a quarter of a century ago, the Ten Hours' Bill was fought through Parliament in the face of the determined opposition of the whole employing class and their friends. Should Mr. Mundella succeed in carrying his Bill, a Session which seems destined to be otherwise barren will have produced at least one important measure."

At the meeting allusion was made to the reports of such capable and disinterested observers as the Messrs. Redgrave—men thoroughly informed as to the condition of the factory workers at home, and furnished with special opportunities for gaining reliable information abroad—which reports show how little formidable the competition of the foreigner is, real as it may be. Factory owners, half ashamed of their former fears, and yet half afraid of further

changes, appear to offer little or no opposition to Mr. Mundella's Bill; and the report of the Commission appointed to inquire into the subject, is favorable to its object.

LIFE AND LIFE FORMS.

[No. 2.]

BY R. R. Y.

The conditions to which the life-property is attached are sometimes exceedingly simple; and in the sense of knowing the simplest life-form we may be said to have arrived at the extreme limit of life, although we are possibly far from having discovered the extent of living organisms of a little higher grade. This lowest life-form is a single cell, or almost infinitesimal globule, perfectly structureless, and only containing a little fluid not seemingly unlike that in which it exists.

But if we find in these cells the simplest forms of life, it is now known also that in combination, similar cells form the highest and most complicated. All animal and vegetable structures are entirely composed of such. The hardest bone does not in this respect differ from the most delicate tissue, and the same is true of every other description of organized matter.

It is in these cells, the animal and vegetable kingdoms, so widely different in their higher developments, almost meet. Even under a very close scrutiny, animal and vegetable cells are precisely alike, and it is only by the utmost discrimination, aided by the most careful chemical analysis, that the difference can sometimes be detected; and in fact, so closely do the two kingdoms approach in the lower forms that it is yet a matter of dispute to which certain organisms truly belong.

Both the animal and vegetable cell multiplies in the same way, viz., by sub-division, and this at an almost incredible rate. Each cell gradually assimilates more and more fluid, and then sub-divides into two, perfectly alike. These then divide into four, eight, sixteen, and so on, until there is a filament of cells, each independent and capable of separate existence, but each attached to the other by its cell wall.

As an instance of the rapidity with which this reproduction goes on, we take the *Protococcus nivalis*, or red snow. This in the course of a few hours will redden vast tracks of snow; and another, the *Bovista giganteum*, is estimated to produce, in one hour, no less than four thousand millions; while the infusorial *Paramecium*, according to the calculation of Ehrenberg, increased at the rate of upwards of 268 millions in a month.

We may notice also a most valuable and wonderful property of the vegetable cell, viz., its power of elaborating such an amazing variety of products. It receives or imbibes but few substances from the outer world—water, carbonic acid, ammonia, and some other soluble salts; but with these few it is able to bring forth from its secret laboratory, all that can gratify the eye, the smell, and the taste of man. The beautifully tinted juices to which the flowers owe their rainbow variety of colors, the sweet odors with which they perfume the air, the gums, the balsams, the sugar, the starch, the medicines, the poisons, in endless profusion, are all distilled or fabricated by the vegetable cell.

Let us now advance a step in the animal scale, and we come to a group of minute creatures, with most of which those who had the opportunity of observing a drop of stagnant or infused water, through a good microscope, must be familiar. There is the utmost diversity of form and structure, yet all exhibit great liveliness and activity. There is one which seems but one removed from the cell, but has the capacity to change its form, and of forming a temporary stomach by producing a small external cavity or indentation, wherever a nutritious particle is found. In another we observe an opening, which serves the purpose of a mouth, and the first trace of a canal for the circulation of the nutritive fluid, while in others, this opening or mouth is surrounded by

a number of cilia or hair-like arms, which by their incessant motion produce a circulation of the water, and thus bring within reach the particles of nutriment or prey.

A little higher, and we come to a group whose characteristic form is radiate. Of these, the beautiful coral, the medusa, and the starfish, may be taken as examples. The medusa is particularly worthy of notice. It can hardly fail to excite our admiration of these creatures to consider the various functions they perform while their gelatinous bodies are apparently little more than a mass of vivified sea water. "Let," says Professor Owen, "that fluid part of a large medusa which may weigh two pounds, when recently removed from the sea, drain from the solid parts of the body, and these when dried will be represented by a thin film of membrane, not exceeding 30 grains in weight."

The general appearance of the starfish is well known. From the centre, in which the mouth is situated, spring usually five long rays or arms, diverging on every side, and looking, as observed by one writer, like the tails of so many scaly lizards. These rays are of exquisite workmanship. They appear to be nearly solid columns with narrow tubular canals running through them, but they are in reality penetrated by various organs, with muscles for motion, with glands for secretion, with nerves for sensation, etc. Externally they seem built up of plates, which fit and partly overlap one another, so as to allow freedom of motion. Those on the upper side are triangular with blunt points, those beneath are square with the points cut off, and they are connected with ridges, bearing long slender spines in each side.

These spines, we are told, when examined by a microscope of high power, present very beautiful objects. "When the rays of sunlight are reflected from them, they resemble the most elegant taper columns or obelisks. Throughout the whole length, and as the whole is composed of a substance of brilliant transparency and exquisite polish, the points sparkle in the light as if the whole column were sculptured in crystal."

The simple mechanism by which the suckers—of which there are about 200, placed all along the rays—are put in motion, is also very wonderful. Each of these little organs is tubular, and connected with a round visicle, filled with a watery fluid, and contained within the body of the starfish, immediately beneath the hole from which the sucker issues. When the animal wishes to protrude its feet, each visicle forcibly contracts, and propelling the fluid into the corresponding sucker, causes its extension; and on the contrary, when it wishes to withdraw them, a contraction of the suckers draws back the fluid into the visicle.

We might also notice the form and structure of the beautiful Eocrinite, etc.; but we must now pass on to another and very different type of life-forms, viz., the jointed, or ringed form. This is always a long, soft, tapering body, made up of a great but varying number of rings or segments, and it is interesting to observe that we here find a distinct system for the circulation of the blood, as well as a nervous system, though they are of a rudimentary character. A familiar example of these creatures is the lowly earth-worm. Each of the rings in this case, is furnished with eight retractile bristles, by means of which it is enabled to burrow its way through the earth in all directions, subsisting on roots, woody fibre, and such other organized substances as come in its way. Although these worms are small and despised creatures, the part they perform in the operations of nature is highly important. Insinuating their pointed heads between the particles of earth, they succeed in making a passage, and thus by the united labor of myriads, the earth is lightened and vegetation wonderfully assisted. Besides this, in the Proceedings of the Geological Society, Mr. Charles Darwin has satisfactorily proved, that these earthworms are most valuable agents in fertilizing lands, es-

pecially in undisturbed pastures, gradually covering the surface with a layer of finely pulverized earth of the richest character.

But the earthworm is much surpassed by those which have their homes in the sea, and which are provided with all the means of leading a life of activity and enjoyment. Some of these consist of several thousands of rings, and thousands of muscles to direct their movements. Each segment has also delicately formed branches or gills, and with bristly feet, serving both for locomotion, and clasping their prey in a deadly embrace. Clothed in robes of metallic brilliancy, these beautiful worms of the ocean glide through the crevices of submarine rocks, or conceal themselves among the water plants, or in the sand at the bottom of the sea. Here they lie in wait for their prey, ready like the larger snakes of the dry land to dart forth suddenly upon the first unfortunate crustacean or naked mollusc that heedlessly swims by.

Belonging to the same class, is another worm, which neither burrows in the earth nor swims in the ocean, but hesitates not to make its home and prey in man himself. We refer to the tapeworm. This is truly an extraordinary and—we will say it—interesting creature, especially as regards its structure, if not in its operations. Let us examine it a little. It consists of a ribbon-like body, formed of square flattened segments, sometimes amounting to upwards of 500 in number, and attaining an aggregate length of 60 or even 100 feet. The points become much smaller at the fore part, diminishing at length so excessively as to form a very attenuated neck, at the top of which is placed a little round head. This is furnished with a mouth, two rows of hooks, and four suckers. A head like this, however, says Professor Jones, supported on a neck so slender, would be quite unable to ensure attachment for the enormous body it is destined to support; additional and firmer anchorage must, therefore, be provided. This provision has accordingly been made. Upon the margin of each segment has been placed a strong and prominent sucker, so constructed as to adhere with a firm grip to the smooth walls of the intestine, where the creature has established its abode; every joint is, therefore, fixed in situ, and it thus becomes no easy matter to dislodge a worm like this from its numerous anchorages." But what is extraordinary and altogether unparalleled in the economy of the tapeworm is that while as regards certain organs and functions, each segment is really a distinct independent animal. In other words, each tapeworm, so called, is a compound of hundreds of distinct animals, although there is but one mouth and one alimentary canal.

(To be continued.)

DEBT.

"Owe no man anything" was the advice or rather the command of the Apostle nearly two thousand years ago, but mankind has never paid much attention to the injunction, though we have suffered and do suffer severely for disregarding it. "Of what a hideous progeny of ill, is debt the father?" says Douglas Jerrold. It is indeed the parent of many ills, of many troubles, perplexities, wrongs, and crimes. When a recent philosopher claimed to have discovered a method of avoiding debt, everybody asked "how? how?" "Never run in debt" was the simple reply.

We know how extremely hard it is for workingmen to avoid debt. Men whose daily earnings are not sufficient to furnish their families with the absolute necessities of life, are sometimes forced into debt by the inexorable demands of the world. For men thus situated, debt is a curse, but it is a necessary evil. Men whose earnings are not sufficient to furnish their families with the absolute necessities of life, are sometimes forced into debt by the inexorable demands of the world. For men thus situated, debt is a curse, but it is a necessary evil. Men whose earnings are not sufficient to furnish their families with the absolute necessities of life, are sometimes forced into debt by the inexorable demands of the world. For men thus situated, debt is a curse, but it is a necessary evil.