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THE JOURNAL OF EDUCATION AND AGRICULTURE,



PROVINCIAL NORMAL, AND MODEL SCHOOLS, TRURO, N. S.

FOR THE PROVINCE OF NOVA SCOTIA.

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No. 7.

EDUCATIONAL.

SERIES OF ARTICLES ON THE EXTERNALS OF EDUCATION.

UPON WHAT PARTY DOES THE RESPONSIBILITY OF A NATION'S EDUCATION DEVOLVE?

THERE are two aspects in which we may regard the vastly important subject of the education of the young—externally and internally. When we look at it in the latter acceptation, we embrace everything arising from the relationship of teacher and taught;—the whole management of the school, the inner life of education, clear and accurate views of the grand end of the education of the young, and a practical acquaintance with the best means of reaching it. When, on the other hand, we view the subject in its external bearings, we comprehend everything appertaining to the support of Education—such as the erection of commodious school premises, the providing of suitable and convenient furniture, apparatus, text-books, &c.—and, especially, the competent remuneration of the teacher;—in short, a complete external machine in nicest adaptation to, and for the most efficient carrying out of, the inner work. It is the province of the Minister of Public Instruction to care and to provide for the former of

these departments, and, through his subordinates or lieutenants,—the Teachers, to carry it into thorough operation. It is the province of the philanthropist, or the statesman, to devise and to see carried into execution the best scheme for the latter. Would that the line of demarcation between these two grand departments of the subject of Education were less frequently encroached upon, were more jealously guarded. This would obviate an immense amount of misapprehension and confusion, too often mingled up with discussions on the whole matter. It would advance largely the grand end contemplated by both, even the development of all the organs and powers and sensibilities of our compound nature. In the pages of our Journal we may, perchance, have given too great prominence to the inner life of Education, alike in its theory and practice—being chiefly desirous to benefit the teacher, and to elevate the whole standard of teaching qualification throughout the Province. Having now, we trust, been of some service in this cause, it is our intention to devote more of our space to the externals of Education. And here a question meets us at the very outset. Who is the party, in any community or nation, on whom devolves the responsibility of attending to this branch of the public service? Is it to be done by corporations of individuals sociated together for the furtherance of purely educational purposes, or by the different denominations of the Christian Church, either supplemented or not by the general revenues of the country, or by the

Province, or State, or Nation, as such? We have no hesitation in avowing our calm and deliberate conviction on this point, and declaring that it is the special function of the Province or State, as such, to discharge this duty, this high privilege; that it is its first business to see that every school-going child within its border is actually receiving education; and that not merely on the ground of high principle or of even-handed justice, or even of self-interest, but on the ground of sheer necessity; that is, that nothing short of a National System, broad and deep, can cope with the difficulties of the case, can meet the demands for a universal, popular education, can provide for the thorough education of all the young within its borders. Societies, whose object is the improvement of Education, both in point of quantity and quality, have unquestionably done much for the accomplishment of the one and the other of these objects. And there are not, perhaps, any sources to which the British Colonies are more indebted for the furtherance of their educational interests than the British and Foreign School Society, and the Church and School Colonial Society. But to suppose that the efforts of these, and many similarly organized and well directed Educational Societies, can supply the adequate means for pervading any country with a thoroughly sound and universal education, is altogether utopian. But why may not the different sections of the Christian Church overtake the work? Whilst we are free to admit that the interest which the Christian Church has all along taken in the cause of the education of the rising generation, constitutes one of the brightest jewels in her crown, it is altogether another question, Has she in any one instance done the work? Have we, then, any touchstone to enable us to judge of her capabilities in this respect, have we any criterion to conduct us to a fair and honest decision in the matter, as to whether the Church, with all her high born energies, with all her unquenchable zeal, and with all her vast resources and appliances, can really meet a nation's wants in educational matters? We think we have, and that in no less a case than England itself. England, as may be known to many of our readers, never possessed a National System of Education. Scotland, at this moment, has one, though it is very partial and limited in its extent, because it is destitute of any self-propagating power. Ireland, too, has had for the last thirty years a National System. But there is no such thing in England. During the last twenty years, however, the various denominations of the Christian Church, largely supplemented by Grants from the Public Treasury, have unitedly put forth a tremendous and vigorously sustained effort with the view of providing a National Education. It would take volumes even to present a bare enumeration of the results of this effort. Let the merest compend suffice. The Congregationalist body,—a considerable portion of which body repudiates all Governmental aid—has erected a large Training Institution at Homerton at the cost of £12,000, whose yearly outlay for training pupil-teachers is £1000. The number of teachers sent out by its Educational Board is about 300. The Roman Catholics have three Normal Institutions, one at Hammersmith, having accommodation for 50 students and built at a cost of £13,530, of which sum Government paid £3,900; the remainder, £9,630, was raised by subscription. One at St Leonard's-on-Sea, having accommodation for 50 students, and another at Liverpool, for 80 students, were erected by the generosity of an educational community belonging to that body. Besides these Normal In-

stitutions, the Roman Catholics have about 400 schools in England and Scotland under Government inspection, about 82 male and 88 female certificated teachers, 8 male and 3 female assistants, 207 male and 390 female pupil-teachers, and 2 Roman Catholic Inspectors. The educational organization of the Wesleyans is complete. They have a princely Normal Institution in the very centre of Westminster, London, covering an area of about three acres and erected at the expense of £40,000. They supply board and education to 100 students yearly—sixty males and forty females—and find employment for all. They have undertaken to build 700 schools in seven years, and they are doing it. "By last report," says Frazer on the State of our Educational Resources, "they have created, during last year alone, additional accommodation for 6,453 scholars; and have erected, besides extensions and improvements, no fewer than nineteen new school buildings, and sixteen teachers' houses, at a cost of upwards of £29,000.—Their schools are constructed with a liberal regard to the health of the children, and are usually surrounded by playgrounds, intended not more for physical exercise than for the development of mental tendencies and for moral culture.—They are turning most advantageously to account the assistance given through Privy Council Grants; and are setting before the country a specimen of vigorous and completely organized denominational action." But all these efforts, however great and praiseworthy, are never for one moment to be compared with those put forth by the Church of England, with all her influence and resources. "Under the cognizance and direction of the Church of England," we again quote from Frazer's pamphlet, "there are many Societies at work, representing, in their fragmentary and conflicting sections, manifold ecclesiastical and other opinions, but all having one aim—the education of the neglected in some shape or other—and all at the same time under the close and directive control of the Committee of Council of Education."

"The general outline of the educational work of the Church of England, through Normal Schools alone, is comprehensive and imposing. There are no fewer than 25 Training Colleges in active operation—14 for males and 11 for females.—In the colleges for males, at last inspection, there were 632; of these, 377 were in the first year of residence, 221 in their second, and 34 in their third; 428 obtained places in the class list at Christmas, 1856. In the colleges for female teachers, having accommodation for 783, there were in attendance about 600. Of these, 447 had completed their first year at last examination. In the competition 236 obtained class places, 137 were placed on the schedule, and 74 failed. When the Institutions are full, and the students remain generally two years, the annual supply will be 400. Last year 355 were sent forth.

The expenditure for all the male Training Colleges was £32,714, and the total income about £35,468; of which, £16,481 was paid in Privy Council Grants; £2,824 by the students, and £15,163 by the managers and subscribers.—The total current expenditure for 716 students in the female colleges was £22,812. To meet this, last year, there was paid in Privy Council Grants, £9,518; by students or private patrons, £7,289; and by subscriptions, grants from boards, &c., £6,346. The whole outlay in the maintenance of the Normal Colleges, apart from Government assistance, was met by £11,113 on the part of the students and their patrons, and by £21,509 on the part of subscribers. This outlay, it must

be borne in mind, is for Normal Schools alone, and distinct from the expenditure necessary for the maintenance of Common Schools.

During the last twenty years the Church of England has raised, for Normal Colleges, £148,817 13s. 2½d., and obtained from Privy Council, for the same object, £69,062 10s. 3d.; for ordinary schools, £1,285,511 8s. 11½d.; and from Privy Council, for the same object, £476,880 12s. 5½d. The British and Foreign School Society raised, for Normal Colleges, £16,433 7s. 9d.; and from Privy Council, for the same object, £5,000; for ordinary schools, £87,804 6s. 5½d.; and from Privy Council, for the same object, £13,762 12s. 5½d."

The following statement will show the result of the combined exertions of these sections of the Christian Church, with the supplements from the Public Treasury which they have respectively received, since 1839, that is, during the last twenty years:—Schools built, 2,587; enlarged or improved, 982; Teachers' residences built, 1,377; Scholars for whom additional accommodation have been provided, 459,754.

We have before us the Report of the Committee of Council on Education in Great Britain for the past year. We extract from it the following summary, which presents an overwhelming view of the work done through this machinery in the course of one brief year:—"Fifty-four inspectors, including 20 assistant-inspectors, were employed in visiting schools, and in holding examinations during the past year. They visited during that period 9,364 daily schools, or departments of such schools, under separate teachers. They found present in them 821,744 scholars; 6,495 certificated teachers; and 13,281 apprentice teachers. They also visited 38 separate Training Colleges, occupied by 2,709 students in preparation for the office of school-master or school-mistress. In December last these students and 2,087 other candidates were simultaneously examined for the end of the first, second, or third years of their training, or for admission, or for certificates as acting teachers. The inspectors also visited 539 schools for pauper children, containing 47,527 inmates, and 118 reformatory, ragged or industrial schools, containing 7,793 inmates."

Such is a brief sketch of the huge educational machinery now at work through the combined exertions of the different denominations, aided and supplemented by largely increasing Grants from the Public Treasury. For the last twenty years England has been passing through an experimental crucible with the view of meeting the educational wants of its young. And never, perhaps, was an experiment made under more propitious auspices. There is not, perhaps, one section of the Christian Church possessed of the same amount of resources as that of the Church of England, in any other land,—and no doubt her mightiest voluntary energies have been put forth to meet the necessities of the case—the providing of adequate means for the education of all her young. And all these efforts have received every possible encouragement by large and munificent Grants out of the general revenues of the country—rising gradually, and at a very rapid ratio, from about £11,000 in 1839, to upwards of £832,000 in 1859.—Surely, if the voluntary principle, in providing an adequate education for the rising generation, ever had an advantageous and honorable arena on which to display itself, that has been England during the last quarter of a century. And what is the result? It presents to us the astounding and appalling fact that in England alone—the mart of the commerce of the world, the fountainhead of civilization and refinement, the

seat of science and of the arts, the treasury-house of nations—there are no less than 2,262,019 children capable of receiving education attending no school at all.—Surely, ah! surely, this ought to satisfy every reasonable mind that the voluntary system of supporting Education, through denominational action, is utterly incompetent for the undertaking The Separate School System, which is neither more nor less than the denominational, has thus been weighed in the balance and found wanting. After such a practical demonstration of its utter inadequacy to meet the wants of any country, all argumentation fails to be of any avail. If all enlightened patriots, and philanthropists, and Christians, advocate the indispensable necessity of a nation's universal and popular education, for a nation's preservation and prosperity; that is, that no child within its borders capable of receiving education should be without it, they must try some other plan than the Separate School or Denominational System, if they would see their wishes gratified and their views substantiated. Nothing but the Province as a Province, or the State as a State, or the Empire as an Empire, can achieve an end so benevolent, so patriotic, and so divine.

1.—THEORY OF EDUCATION.

PHYSICAL EDUCATION.—NERVOUS SYSTEM OF ORGANS—CONDITIONS OF HEALTH OF THE BRAIN—LAWS OF MENTAL EXERCISE.

This is the highest and most important of all the systems of Organs. It is that which operates upon and influences all the others. It forms the grand medium of communication between the mind and all the other organs, between the mind and the external world. The brain, the centre of this system, is now universally admitted to be the seat of the mind—the organ by which it manifests its operations and executes its purposes, and by which too a knowledge of the world without, its existence, its qualities, is conveyed to the mind. As to the mode of this intercourse between matter and mind and mind and matter, we literally know nothing. We know the fact, and that certain links in the chain of connection are absolutely necessary to produce the fact, but this is all. The mind, by some mysterious power, conveys its volition to the brain, the brain operates upon the nerve, the nerve upon the muscle, and the muscle upon the bone, and so locomotion is effected. And so is it in the opposite direction. The object congenial to the nature of the sense (which is neither more nor less than finely attenuated nervous substance) when presented in favorable circumstances to that sense, produces an impression thereon; that impression is conveyed by the sense to the nerve, the nerve to the brain, and through the brain a sensation or perception is conveyed to the mind. Such is the chain of connection, every link of which is indispensably necessary to produce the effect; but as to the *modus operandi*, we are just as ignorant of as the child unborn; and so long as the present state of things lasts, the probability is that we shall continue to be. But be this as it may, it is perfectly clear that, from the intimate and indissoluble relationship subsisting between this system of organs and the human mind, it is invested with the deepest importance, and, in its connection with physical education, demands our calmest and most deliberate consideration.

The nervous system of organs is extremely complex both in structure and function; but it may be described in a general way as central masses and expansions of nervous matter linked together by connecting cords called nerves. The principal nervous centres are the brain and spinal cord. The brain in the widest signification of the word is that large organized mass which, along with its enveloping membranes,—the *dura mater*, the *arachnoid* and the *pia mater*, completely fills the cavity of the skull and is subdivided into the *cerebrum*, the *cerebellum*, the *medulla oblongata*, and the *cephalic ganglia*; all of which are composed of two distinct kinds of nervous substances, the gray and the white, the former being the generator and the latter the conductor of the nervous influence. The spinal cord, which is also composed of two kinds of nervous substance, is subdivided into two sets of fibres, the anterior and the posterior, the one containing exclusively *motor* and the latter *sensor* stimulus or influence. From the spinal column, including the *medulla oblongata* which is but the upper extremity of that column, emanate nerves, in all directions; some of which, in a finely attenuated form, constitute the senses and others discharge the office of sensation or locomotion.

And now as to the functions performed by these nervous centres of animal life. On this point physiologists differ in matters of detail, though in the main considerable harmony prevails. It is then universally admitted that the *cerebrum* or hemispheric lobes of the brain constitute or include the organs of the intellectual and moral powers. It is the seat of consciousness, volition and emotion; and when it is removed the body sinks into a mere machine, which acts in obedience to the inherent forces of the automatic brain or responds to physical stimuli according to the laws of reflex action.

The *cerebellum* is the organ through which we exercise voluntary control over the muscles as well as the organ of the lower and animal propensities of our nature.

The *medulla oblongata* is universally allowed to constitute the seat of sensation and of respiration. The *cerebrum* and *cerebellum* may be probed and punctured without the least degree of pain; but if the smallest degree of pressure be inflicted on the *medulla oblongata*, the most acute pain is perceptible, and, if this be continued for any lengthened period, death will inevitably ensue.

The *cephalic ganglia* are deposits of nervous matter in the head. These are to be found in the shape of secretions of nervous matter all over the body, and, in the absence of regular nervous centres, such as we have in all the *invertebrata* class of animals, constitute the real source of animal existence. In the head they are evidently intended to unite the whole together, so as to spread a general sympathy throughout this department.

The *spinal cord* performs the office of conveying the nervous stimulus all over the body. The illustrious Sir Charles Bell was the first Anatomist who discovered that the spinal cord is made up of two classes of nerves, the *motor* and the *sensor*, whose offices are perfectly distinct, that of the *motor* class being for the purpose of conveying the volitions of the mind to the Muscular System, and thereby rendering them subservient to the purposes for which they were given; that of the *sensor*, on the other hand, being for the purpose of conveying the impressions made on the different senses to the mind. The former, from the functions discharged, is sometimes called *efferens*, and the latter *afferens*.

Considered as a whole, the Nervous System falls into two great divisions—that of animal and conscious life, and that of organic and automatic life; the *cerebrum* and *cerebellum* constituting the former, and the *medulla oblongata*, the *cephalic ganglia*, and the *spinal cord*, the latter. The one forms the mechanism, which, so far as it can be safely allowed, is under the control or command of the other.

With this brief sketch of the Anatomy and Physiology of the Nervous System, we are now prepared to go on and make a few observations on those conditions on which the health and vigor of the brain depend, and by which the greatest amount of intellectual effort may with safety be secured.

We shall not here dwell on the many advantages arising from a naturally sound constitution of brain. There is no part of our physical frame, when diseased or disorganized, so liable to be perpetuated or propagated from father to son, from parent to child, as the brain or nervous system; and, it is a fact worthy of observation, that there is no way by which disease is generated so largely in this system of organs as by the violation of some plain and palpable moral precept, such, for example, as intermarriages amongst near relations or an over-indulgence in viands or alcoholic drinks. How often do we see exemption from this species of disease during one generation, whilst it bursts forth with redoubled virulence during the succeeding. Neither do we dwell here on the advantages arising from an adequate supply of duly vitalized or oxygenated blood. This point we have already considered in connection with the ventilation of school-houses, and to which we would refer our readers. It cannot, however, be too frequently insisted upon, that as the life is contained in the blood, and as about a tenth part of the blood is required for the nourishment of the brain and for its preservation in full vigor, so is it indispensably necessary, that the brain may accomplish its high destination, that not only a due quantity of this vital fluid be provided, but also that it be of the right sort. Two things are requisite for this purpose. There is, first, a supply of healthful food, adapted both in quantity and quality to the age, the condition and the varied circumstances of the recipients. Then there is the requisite portion of pure atmospheric air, for the purpose of converting the venous into arterial blood—that is, of effecting the assimilating process. This latter is even of vastly greater importance than the former, for what availeth the most delicious meats and drinks unless they undergo that change which alone renders them fit for vitalizing and invigorating the whole frame. Withhold the requisite supply of this element, and that instant will you not only affect the health of the body generally, but the health of the brain in particular, and with that the health of the mind. A mental listlessness and apathy will, in spite of all our resolutions, ensue, and, if consciousness remain, an utter inability to put forth one mental effort. Would that all patriots and philanthropists but realized as they ought the outstripping importance of ventilation in connection with all educational movements! Too many seem to imagine that, in contending so much as we do for large and commodious and properly ventilated school-houses, we have only a respect to the physical welfare of the young, a matter which more properly belongs to the Parent than to the Teacher. True, the bodily health is thereby largely promoted, and this ought to be held in view by every faithful teacher. But this were a very partial view to take of our strenuous efforts for the accomplishment of this object. It is a mean essential for se-

earing a very high and important end, and that is, the invigorating, the healthful exercise of all the powers and sensibilities of the mind. We plead for the thorough ventilation of our school-houses, just because we defy the most skilful and painstaking teacher to do justice either to himself, or his pupils, or his system, unless in possession of this indispensable prerequisite. Supposing that both these points—a sound hereditary brainy system and a due supply of properly oxygenated blood—have been secured, the question now arises, What are the means to be employed for the purpose of strengthening the nervous system, and thereby rendering it more capable of carrying out the purposes of the mind,—if not, of imparting to it greater vigour, more powerful energy.

If mind manifests itself, through the medium of the brain, it is clear that the operations of the mind must depend largely on its condition; and *vice versa*, for the influence is clearly reciprocal. Though we cannot comprehend the *modus operandi*, there is the most incontrovertible evidence that the one operates most extensively upon the other. What, then, ought to be done so as to strengthen the brainy system? We must just resort to our usual specific,—exercise. By exercising the various functional parts of the brain, the blood is made to flow throughout all the blood vessels of the brainy mass, nicely adjusted and delicately attenuated though they be. This exercise, in order to accomplish the end desired, must be steady and moderate, neither defective nor excessive. If the effect of too little exercise of any particular part of the muscular system be the enfeeblement, if not the entire paralysis, of that part, it is, in very proportion to its surpassing delicacy, much more so with the brain. If the excess of exercise deranges the whole system, as being a direct violation of that law of activity and repose which prevades the whole natural and moral world, it is infinitely more so with the brain—and that for the same reason as is mentioned above. And what is the inference deducible from all this? It is, plainly, that we are neither to use the brain too much nor too little. And how is this to be effected? By the moderate application of the mind to study. For this purpose, instead of giving ourselves to mental pursuits by fits and starts, by long seasons of rest or violent exertion, we ought to have steady and regularly fixed hours for study, and adhere to them most rigidly and punctually. This will operate upon the physical brain, and produce the most beneficial results for its enlargement and consolidation. "Periodicity, or the tendency to resume the same mode of action at stated times, is peculiarly the characteristic of the nervous system; and on this account regularity is of great consequence in exercising the moral and intellectual powers. All nervous diseases have a marked tendency to observe regular periods, and rational inclination to sleep at the approach of night, is but another instance of the same fact. It is this principle of our nature which promotes the formation of what are called habits. If we repeat any kind of mental effort every day, at the same hour, we at last, when the time approaches, find ourselves entering upon it without premeditation, and, in like manner, if we average our studies in accordance with this law, and take up each regularly in the same order, a natural aptitude is soon produced which renders application more easy than when the subjects are taken up as accident may direct. Nay, occasionally, the tendency to periodical and associated activity becomes, in the course of time, so great that the faculties seem to go through their operations almost without conscious effort, while their facility of action

becomes so prodigiously increased as to give increasing certainty, where at first great difficulty was experienced. In thus forming habits, and acquiring readiness, we merely turn to account that organic law which associates increased appetite, animation, and vigour, with regular exercise."

Fixed regular times for mental application is thus of essential moment for strengthening the brain. And the question here arises, What is the best time for study? It is, certainly, not after a full meal of meat. It is a law of the animal economy, that two classes of functions cannot be called into vigorous action at the same time, without the one or the other, or both, sooner or later, sustaining injury. To go to study, then, immediately after the pleasures of the table have been indulged in, is to act right in the teeth of this law. In such circumstances, the stomach and brain will so react upon and disturb one another, till all the horrors of nervous disease make their unwelcome appearance and render life miserable. The tendency to inactivity and sleep, which besets most animals after a full meal, shows repose to be, in such circumstances, the evident intention of nature. The bad effects of violating this rule, although not in all cases immediately apparent, will most assuredly be manifest at a period more or less remote.

Nor should the time for study be late in the evening.—Persons who practice night study, if they be at all of an irritable habit of body, will be sleepless for hours after going to bed, and be tormented, perhaps, by unpleasant dreams, which will render their sleep unrefreshing. If this practice be long-continued, the want of refreshing repose will ultimately induce a state of morbid irritability of the nervous system bordering on insanity. Nature has allotted the darkness of the night for repose, and for the restoration by sleep of the exhausted energies both of mind and body. What, then, is the best time for study? Unquestionably, we reply, the early part of the day. The morning and forenoon ought to be spent in hard mental effort. Then the brain is free to perform its functions, and is necessarily strengthened. This, again, will operate upon the mind and render it more capable of vigorous exertion. In this case, the evenings ought to be spent in lighter reading, in music, or in cheerful and amusing conversation. The excitement induced in the brain by previous study will be soothed by these influences, and will more readily subside, and sound and refreshing sleep much more likely to follow. This rule is of the utmost importance to those who are obliged to perform a great amount of intellectual labour. It is only by conforming to it, and devoting their mornings to study and their evenings to relaxation, that many of our most prolific writers have been enabled to preserve their health.—By neglecting this rule, others of the fairest promise have been cut down in the midst of their usefulness.

But not only is *regularity* but *variety* of study necessary. Whether the science of phrenology,—that science which makes the protuberance in the convolutions of the brain, the organ of some mental faculty,—whether this science is founded on fact we do not take it upon us to decide. There are great names ranged on both sides; some as stout in maintaining, as others are stout in denying the truthfulness of the science. But without pretending to dogmatize on the subject, we believe it is all but universally admitted that the anterior part of the *cerebrum* constitutes the seat of the intellectual powers and that the middle and posterior parts, the emotional and moral. If so, then it is clear that our studies should neither be purely intellectual, nor moral, nor emotional, and that simply on the

ground of the law of contractility. The brain is liable to the very same law of contraction and relaxation that the muscles are; and, of course, if any one part is kept in a state of exclusive tension both it and all the others must suffer. The health of the whole consists in each receiving its due amount of exercise. And how is this to be done but by a variety of subjects for study—such a variety as will not only give employment to these three great classes of powers with their corresponding organs, but to these powers in all their minute shades or details. And hence the necessity not only of blending the intellectual and social and moral, but of blending them in all their energies and sensibilities for the preserving and invigorating of the whole;—and this can only be done by a variety of subjects of study, not keeping the mind too long fixed on any one subject, however interesting or engrossing. And if all this is of force in reference to those whose brain is consolidated and strengthened, it must be still more so in reference to those whose brainy substance is but in a state of growth and development, and thereby exposed to the greatest possible injury by continued over-tension. And, hence, the younger the children the greater the need for variety of study, and a limited period devoted to the prosecution of any one branch.

But not only is it necessary for the full health and vigor of the nervous system to have regularity and variety of mental pursuit, but also reiterated and judicious repetition. Practice is as necessary to induce facility of action in the organs of the mind as in those of motion. The idea or feeling must not only be communicated, but it must be represented and reproduced in different forms, till all the faculties concerned in understanding it come to work efficiently together in the conception of it, and until a sufficient impression is made on the organ of mind to enable the latter to retain it. We may understand a new subject by a single perusal, but we can fully master it only by dwelling upon it again and again. In order to make a durable impression on the mind, repetition is necessary; it follows hence, that in learning a language or science, six successive months of application will be more effectual in fixing it indelibly in the mind, and making it a part of the mental furniture, than double or even treble the time, if the lessons are interrupted by long intervals. The too common practice of beginning a study, and holding at it a little time, and then leaving it to be completed at a later period, is as unphilosophical as it is injudicious. The fatigue of study is thus doubled and the success greatly diminished. Studies should not as a general rule be entered upon until the mind is sufficiently matured to understand them thoroughly, and when begun they should not be discontinued until they are completely mastered. By this means the mind becomes accustomed to sound and healthy action, which alone can qualify the student for eminent usefulness in after life. By this means, too, the physical organization of the brain is strengthened and consolidated, so that they mutually aid one another in the accomplishment of the same grand object.

II.—PRACTICE OF EDUCATION.

SCHOOL GOVERNMENT—PRIZES.

IS THE SYSTEM OF PRIZES, AS USUALLY PURSUED, TRULY BENEFICIAL AS A STIMULUS OR INCITEMENT TO DILIGENCE IN STUDY?

This we hold to be a question of paramount importance both in an intellectual and moral point of view. Supposing that prizes offered in a school in such a way that all may compete for them and only two or three obtain them, were effectual in stimulating to diligence all the scholars, the moral aspects of the system require still to be canvassed, and if these will not bear the light and the touchstone of the only infallible standard, at all hazards the practice ought to be discontinued.

But there is no necessity of resorting to this alternative to bring us to a righteous decision regarding them. It is our decided conviction, after no small amount of experience in their use, that Prizes given in the usual way do not effectuate the end intended, do not create a healthy interest in the school; and the conclusion is therefore plain and palpable, that they ought to be discontinued. This, some will say, is a bold, if not a presumptuous position to assume. What! would you abandon a practice that has not only the countenance and support of a hoary antiquity, but the sanction of the wisest and most beneficent of mankind. This is all very true, but it does not in the least degree invalidate our position. It only demands from us a more careful investigation of the whole subject and a more sitting exhibition of the reasons that have brought us to this conclusion.

We are happy in being able to state that this is not merely the conviction of those who happen to be imbued with what is called the *training* system of education, many of the most enlightened and soundest educationists on this side the Atlantic have adopted the same view and have calmly and dispassionately assigned their reasons.

There is no book on education published on this side the Atlantic that we appreciate so highly as "*Pogo's Theory and Practice of Teaching*." That distinguished educationist, after the experience of giving prizes for many years, is compelled to draw the same conclusion with ourselves, and most unflinchingly does he assign his reasons. These reasons are so cogently expressed in the Book just referred to, that we cannot, we apprehend, do greater justice to the whole matter than in submitting them first of all to the calm and dispassionate consideration of our readers.

I. *The offer of a prize gives undue prominence to a comparatively unworthy object.* It practically teaches the child to undervalue the higher reward of a good conscience, and a love of learning for its own sake. The dazzling medal is placed in the foreground of his field of vision; and it is very likely to eclipse those less showy but more abiding rewards found in a sense of duty and a desire to be qualified for usefulness. In studying his lesson he thinks of the prize. He studies that he may merely recite well; for it is a good recitation that wins the prize. He thinks not of duty, or of future usefulness; the prize outshines all other objects.

II. *The pursuit of a prize engenders a spirit of rivalry among the pupils.* Rivalry in pursuit of an object which only one can attain, and which all others must lose, must end in exultation on the part of the winner, and disappointment and envy on the part of the losers. It may be said, this ought not to be so; but seldom can it be said, that it is not so. Such is human nature, and such it ever will be. Unpleasant feelings—sometimes concealed, to be sure—but generally expressed in unequivocal terms—grow out of the award of almost every school prize, and sometimes continue to exert their baleful influence through life. Now as long as human nature brings forth unlovely traits almost spontaneously, such direct efforts to cultivate them surely are not called for. It is the part of wisdom, then, to omit such culture and avoid such results, especially when safer means are so accessible.

III. *The hope of gaining the prize stimulates the few, while the many become indifferent.* This is admitted to be true even by the advocates of the prize system. Let a prize be offered in any class as a reward for the best scholarship, and in a very few days it becomes perfectly obvious to all who the two or three are that will be likely to outstrip all the others. These two or three will be stimulated to exertion; but the strife is left entirely to them. All others, despairing of success, resolve at once to "let their moderation be known to all men;" and since the prize has been made so prominent an object, they cannot be expected now to look at any thing above and beyond it. Feeling that they are not likely to participate in the honors of the class, they have but little disposition to share in its toils.

This to be sure is not always so. There are some, who, ceasing to strive for the prize, toil for the more substantial blessing—a good education,—and in the end come out the

best scholars. This is the way indeed most of our strong men are made; for it has long been remarked that the prize scholars in our schools, and even in our colleges, do not usually become the most distinguished men. On the other hand, many of them are never heard of after receiving their honors. But, though some of the slower scholars do thus hit upon the true path of eminence, it is not to be set to the credit of the system; they rise in spite of the system rather than by virtue of it; while the ultimate failure of the prize scholars is usually directly attributable to the defect of the system; for having been untuly stimulated to study solely with reference to recitation, and not with regard to future usefulness, their memories have been developed out of all proportion to the other faculties of their minds; and, though they may have been very good reciters, they have no power to become independent thinkers. Under different training they might have become strong men.

But to look no further than the school, the remark holds true in general, that prizes stimulate the few, and the many become indifferent not only to prizes, but to other and better motives. That system of incentives only can be approved, which reaches and influences successfully all the mind subjected to its operation.

Nor is this an unimportant consideration. It is not sufficient praise for a teacher that he has a few good scholars in his school. Almost any teacher can call out the talent of the active scholars and make them brilliant reciters. The highest merit, however, lies in reaching all the pupils, the dull as well as the active, and in making the most of them, or rather in leading them to make the most of themselves. It should be remembered of every child, that the present is his only opportunity of being a child, and of receiving the training appropriate to childhood; and that teacher who rests satisfied with a system that does not reach the many, while he amuses himself and his visitors with the precocity of a few of his most active scholars, is recreant to his responsible trust.

IV. *There is much difficulty in awarding the prize so as to do strict justice to all.* So many things are to be taken into the account in order to determine the excellence of a performance compared with others, that some particulars are very likely to be overlooked. Those who are called to judge of the results often disagree among themselves. The following anecdote will illustrate this. Three literary gentlemen were appointed to select the best from several compositions, presented by a class who had written them in competition for a gold medal. Each of the gentlemen carefully read the whole number in private, and conscientiously selected the best according to his judgment. When they came together to compare results, it was found that each man had selected the best, but that no two had selected the same! They carefully read and compared the three, and still each insisted that his original choice was the best. After much debate and considerable delay, one of the parties being obliged to go to his business, relieved himself from a painful detention, and his friends from a perplexing doubt, by saying he believed the composition he had selected was the best, but, as he could not stop to claim its rights, he would yield them in favor of the second best in the hands of one of his associates. This ended the dispute, and the action in favor of the successful one, was declared to be unanimous!

This only proves how difficult it is to decide; and in the case just cited, it might well be asked, why should one of these competitors be held up to the multitude to be applauded and admired, and the others sent back to their classes covered with the shame of a failure? What principle of justice sanctioned this decision?

Nor is this a solitary instance. It rarely happens that the case is perfectly clear. There is usually much perplexity about it; and hence one reason why the decision seldom satisfies the friends of parties either in the school or at home.

V. *The prize rewards success, not report; talent, not worth.* Every one knows that in estimating the value and virtue of an action, the motive which promoted it, and the effort it necessarily cost, should be taken into the account. Every one knows, too, that success in study is by no means a cri-

terion by which to judge of the merits of the scholar. Some learn their lessons with great facility and with but little effort; others study long and patiently without any brilliant results. One competitor for a prize may bring results which have cost him midnight toil and the most unremitting perseverance; another with brighter parts, and with but little labor, is able to surpass him, and takes the medal. Now the former deserves in a far higher degree the encouragement of the reward; yet it is given to him who has the talent but who lacks the industry. The rule of Scripture which announces that "to whom much is given, of him shall much be required," is violated, and he is rewarded for producing but little more than the one to whom little is given.

It is often urged by those who advocate a system of prizes and rewards, that *God rewards*; and therefore it is at least justifiable that we should imitate his example. I admit that God, in his government, does reward; but he rewards effort rather than success; he "looketh upon the heart" which a man cannot do, and rewards worth, not talent. We might, indeed, imitate his example, if we had less frailty, and were not so liable to be imposed upon by the outward appearance. God indeed rewards men; but he estimates the secret intention, seeing the inward springs of thought before they find expression in words or actions. He regards the motive, and holds out for the encouragement of the humblest child of earth, who does the best he can, as rich a crown of glory, as he does for those whose outward circumstances, in the eyes of mortals, are more auspicious. When man can as wisely and as righteously bestow his prizes and rewards, there will be far less objection to their use.

VI. *The pupil who studies for a prize as his chief motive, will seldom continue to study when the prize is withdrawn.* This is so obvious as scarcely to need illustration. If it be necessary to add any thing to the mere statement of the fact, an appeal to almost universal experience would confirm it. A teacher who has depended upon prizes in a school, finds it very difficult to awaken an interest there when he withdraws the prize. Hence many have, on trying the experiment of abandoning the prize system, become discouraged, and have returned again to the use of prizes, believing them essential to their success. Thus the very argument which shows most clearly their pernicious tendency, is made a reason for continuing them. As before hinted, the prize scholars in our academies, and even our colleges, are seldom distinguished men in after-life,—a fact that speaks conclusively on this point. But it can scarcely be necessary to spend words to prove a truth almost self-evident.

VII. *By the prize system, the influence of the good example of some of the best pupils, is lost upon the school.* All who have taught, know how important this influence is to the success of the school. It tells with resistless power upon the other scholars, wherever it exists, unless some unworthy motive can be assigned for it. But under the prize system, let a teacher appeal to the example of his best scholars, and the reply is, "Oh, yes, he behaves well, or he studies diligently, but he is trying to get the prize." With this understanding, his example becomes powerless, unless, indeed, there may be a disposition to be unlike him in every thing. It is believed this is a consideration of considerable importance.

I have thus assigned, at some length, the reasons why I should discountenance, among the incentives of the school, the use of Prizes. As to the use of "Rewards," when they are made so numerous that every one who is really deserving may receive one,—and when the basis of their distribution is not talent, not success merely, but good intention and praise-worthy effort,—I have much less to say. As expressions of the teacher's interest in the children, and of his approval of their well-doing, they may serve a good end. Perhaps there is no very strong objection to them in principle; though if the teacher subjects himself to the necessary outlay in the purchase of them, it may become burdensome to him. I may add, however, that I do not think rewards are necessary to the teacher's success. I should prefer to do without them. It is possible to produce such a feeling in the schoolroom, that the approving conscience of the child, and the commendatory smile of the

teacher, shall be the richest of all rewards. These come without money and without price, and may always be freely and safely bestowed, wherever there is a good intention exhibited by the child. That is the most healthy state of things where these are most prized. As children whose parents begin early to hire them to do their duty, are seldom ready afterwards to render their cheerful service as an act of filial obligation, whenever the pay is withheld,—so children at school, who have been accustomed to expect a reward, seldom pursue their studies as cheerfully when that expectation is cut off.

MENTAL ARITHMETIC—INTEREST.

This is the only remaining branch of Mental Arithmetic of sufficient practical importance to require discussion in these pages.

In the following remarks, we have no design of entering upon any elucidation of the general principles upon which this rule depends;—these are too well known to render it necessary to occupy space with them. It may not, however, be improper to state that proportion is the basis of every calculation in Interest, and that an explanation of its principles has been given in our last number.

It is always advisable to make pupils acquainted with proportion, before turning their attention to Interest.

In mental calculations this rule is generally a favorite with the young, the operations are so simple and so uniform that children prefer it to most other mental exercises; nor is it inferior in practical utility, to any other rule,—practice expected.

For the benefit of beginners, and those not already familiar with the subject, we will attempt an *éclaircissement* of some of the terms in general use.

The *Interest* is the sum of money paid as hire,—for the use of money lent.

As the object of every calculation in this rule is to discover the *Interest*, this term has given its name to the rule.

The *Principal* is the sum of money lent, on which Interest is to be paid. The *Amount* is the sum of the principal and the interest.

Per Cent. contracted from *per centum*, means, for a hundred pounds. For convenience, Interest is generally calculated at a certain *Rate per hundred pounds*; hence the general use of the phrase *Rate per cent.*

Per annum means for one year. When no time is mentioned, it is presumed that the money is lent *per annum*.

In Great Britain, and some other countries, parliament has fixed a standard rate, at which all monies are to be hired, but in teaching, we are accustomed to suppose a variety of rates by way of illustration.

In England the standard Rate per cent. is £5, per annum in Nova Scotia, it is £6.

RULE 1.

To find the Interest of any sum at £5 per cent. per annum.

Call £1, 1 shilling; 10s., 6 pence; 5s., 3 pence; 2s. 6d. 1½ pence; 1s. 3d., ¾ pence; 7½d., ¾ pence.

Explanation of Rule.—In this case the interest of one hundred pounds is five pounds or one twentieth part of itself, hence the interest of any other sum at the same rate will be the one twentieth part of itself.

Examples.

1. Find the Interest of £275 10s., at 5 per cent. per annum?

By the Rule.

275s. 6d., or £13 15s. 6d. *Ans.*

2. Find the Interest of £916 7s. 6d., at 5 per cent. per annum?

By the Rule.

916s. 4½d.; 916s. 4½d., or £45 16s. 4½d. *Ans.*

3. Find the Interest of £37 1s. 3d., at 5 per cent. per annum?

By the Rule.

37s. and 3d.; 37s. 0¾d., or £1 17s. 0¾d. *Ans.*

4. Find the Interest of £468 11s. 9d. at 5 per cent. per annum?

By the Rule.

468s.; 10s. are 6d.; 1s. 3d. are ¾d.; 6d. are ½d., nearly; therefore the whole Interest is 468s. 7½d. or £23 7s. 7½d. *Ans.*

It is unnecessary for practical calculations to descend to minute fractions.

RULE 2.

To find the Interest of any sum at any other rate per cent.

Find the Interest at 5 per cent. and add or subtract as occasion may require.

Examples.

1. Find the Interest of £96 10s. at 6 per cent. per annum?

By Rule 1.

The interest of £96 10s. at 5 per cent. is 96s. 6d. or £4 16s. 6d.; 6 per cent. is one fifth greater than 5 per cent. therefore add one fifth of £4 16s. 6d. to itself; £4 16s. 6d. ÷ 5 = 19s. 3 3-5d., and £4 16s. 6d. + 19s. 3 3-5d. = £5 15s. 9 3-5d. *Ans.*

2. Find the Interest of £169 17s. 6d. at 4 per cent. per annum?

By Rule 1.

At 5 per cent. £8 9s. 10½d. subtract one fifth—or £1 13s. 11¾d. nearly; £8 9s. 10½d. — £1 13s. 11¾d. is £6 15s. 10¾d. *Ans.*

3. Find the Interest of £98 11s. 3d. at 4½ per cent. per annum?

By Rule 1.

The Interest of £98 11s. 3d. at 5 per cent. is £4 18s. 6¾d.; now 4½ per cent. is ½ less than 5; and ½ is one tenth part of 5; therefore subtract one tenth part of £4 18s. 6¾d. from itself; £4 18s. 6¾d. ÷ 10 is £0 9s. 10¾d. nearly; and £4 18s. 6¾d. — £0 9s. 10¾d. is £4 8s. 8¾d. *Ans.*

To find the *Amount* add the principal and interest together.

4. Find the Amount of £150 at 6 per cent. per annum?

By Rule 1.

The interest at 5 per cent. is £7 10s.

By Rule 2.

The interest at 6 per cent. is £9 0s.; and £150 + £9 is £159 Amount. *Ans.*

To find the Interest of any sum of money for one month, one half month, or one week, at 5 per cent.

RULE 3.

For 1 month, call every pound, one penny.

For 1 half month, call every pound one half penny.

For 1 week, call every pound one farthing.

Examples

1. Find the Interest of £64 10s. for *six* months, at 5 per cent ?

By the Rule.

£64 10s. will be 64½ pence or £0 5s 4½d. *Ans.*

2. Find the Interest of £156 12s. 6d. for ten years and six months at 5 per cent.

By Rule 1.

For 1 year, £7 16s. 7½; For ten years; £78 6s. 8d; For 1 month, 156½d. or 13s. 0½d.; For six months, £3 18s. 3½d. + £78 6s. 8d. = £82 4s. 6½d. *Ans.*

It is unnecessary to multiply examples,—we have indicated the path to be pursued, and the intelligent teacher will find no difficulty in elaborating for himself, the principles here enunciated, and applying them to every calculation in Interest.

We may further remark that the foregoing may be applied with equal facility in Profit and Loss.

III.—OFFICIAL NOTICES.

A goodly number of the Annual Returns of the Boards of School Commissioners is still awaiting, and more of the Grammar School Returns. Dr Forrester especially requests the Clerks of those Boards, who have not yet forwarded them, to do so with the least possible delay. Four or five awaiting, is just as material to the Superintendent in making up his Report as if there were twenty.

It has come to our knowledge that there are still two or three of the Boards of School Commissioners that demur at paying the travelling expenses of the Pupils, to and from the Normal School, even when they give them a recommendation for admission to that Institution. We had occasion to advert to this subject a year ago, when we stated the law upon the point; and we regret to learn that there are still two or three Boards holding out against this—the only encouragement given to students attending the Normal School. How differently are they treated in the neighbouring colonies, and indeed all over the world, receiving as they do not only a gratuitous education, but at some, partially, and at others, entirely, supported during their attendance. We would again refer these Boards to the Normal School Bill, which will be found in the New Series of the Revised Statutes, and we earnestly trust that when application is again made, they will state their reasons for non-compliance with the requirements of the law.

Little more than two month will bring us to the close of another Session of the Normal School. Never, we believe, has there gone forth from the walls of this Institution a greater number of well-qualified Teachers than will do on that occasion. Dr Forrester begs to call the special attention of Parents, Trustees, and others, to this fact, and to request on the part of those School Districts, desiring to be supplied with such Teachers for the Summer, an immediate application. Male Teachers holding a First Class Diploma ought to have guaranteed them from every source at the rate of £75 per annum, and Female, of the same Class, at the rate of £60. The former, with the Government allowance, could be easily raised by 30 scholars at the average fee of two dollars a quarter—and the latter by 25 scholars. And this could be very easily accomplished by the great proportion of School

Districts of the Province, with the exception of a few of the more recently settled. Of course, in either case, whatever amount additional may arise from an increase of scholars should be understood as placed to the credit of the Teacher, in reward of his efficiency and success. This would form a powerful stimulus to the Teacher.

Enquiries have frequently been made by teachers and others, as to the length of time a school should be in session daily, and whether any teaching should be given on Saturday. In reply to these enquiries, we have to state that at present there is no law upon these points, and that everything appertaining thereto must be referred to the agreement entered into by the Teachers and the legally appointed Trustees of the District. We may, however, say generally, in reference to this matter, that we know not a greater delusion than to suppose that the scholars longest in school every day must necessarily make the greatest progress in their studies. This is to judge of mental labor by the very same standard that people generally judge of manual or mechanical labor—but before this can be legitimately done it would require to be established that the laws of matter and of mind are one and the same. We suspect comparatively few are prepared to take and to defend such a position, though it is much to be feared that the low and degraded notions that obtain relative to the whole matter of the education of the young, as well as the miserable estimate that is too frequently entertained of the services of the devoted and painstaking teacher, are all to be traced to this very root. But, to return from this digression, we believe the general time that schools throughout this Province are in session is five or six hours every week day, and on Saturday about one half that time; and yet we hesitate not to aver that there are few scholars, even in the more advanced classes, and at the best conducted seminaries in this or any land, that devote more than half that time to real intense mental application. Indeed, if they did, it would, from the very nature of mind, be productive of the most disastrous consequences to many of the most promising of our youths. The mind could not stand continuously such over-tension, and would lend either to its derangement or to the sowing of the seeds of disease in some other region. We are aware that not a few, parents among others, will look amazed at this strain of observation. But we should like to ask such individuals, how long a period in each hour they imagine themselves capable of directing the whole energy of their mind to any particular subject, to the utter exclusion of any foreign element? If they manage to keep their mind intently fixed on that subject for one half the time they profess to be engaged in its contemplation, they must be considered as possessed of well trained, well-disciplined minds, and will not fail to achieve wonders. And yet these very individuals seem to expect that little children, from six to twelve years of age, must be busily at work every moment of the six hours they are within the walls of the school-room; and, therefore, to use any means for the purpose of directing and controlling the laws of the muscular and nervous system of organs, by physical exercises, music, or outdoor recesses, and thereby to render themselves subservient to the accomplishment of a larger amount of intellectual labor, is considered by them as tantamount to a perfect waste of time, and is begrudged and lamented by them as a poor return for their expenditure of means on behalf of their education. Fortunately for the health of the scholars, physical and mental, they will, despite of all the ignorance of teachers or parents, obey these physiological laws of their being. Surely, ah surely, it were infinitely wiser to seize upon these laws and to render them subservient to the grand end of all education.—But we must drop the subject for the present, and beg to refer our readers to the discussion of the Brainy System of Organs as contained in the pages of this same number of our Journal.

IV.—EDUCATIONAL INTELLIGENCE.

CANADA.

We have much pleasure in giving insertion to the following official replies of the Chief Superintendent of Education to local School authorities in Upper Canada regarding School Trustees. Our readers will perceive how admirably constructed the laws of Upper Canada are on this point to secure the thorough working of this part of the Educational machinery, unquestionably the mainspring of the working out of any system of public education:—

ELECTION OF COMMON SCHOOL TRUSTEES.

The law relating to Annual School Meetings.—The law provides, that the annual meetings for the election of School Trustees shall be held in all the Cities, Towns, Villages, and Townships of Upper Canada, on the second Wednesday in January in each year, commencing at the hour of Ten of the clock in the forenoon.

Time of School Meeting.—The law prescribes the time of an annual school meeting, and if it be held at that time it is lawful, though no notice whatever of it was given; but the Trustees are liable to a fine if no such meeting be held for want of notice. Of all special school meetings, six days notice must be given in three public places of the School Section.

*Proceedings of the annual School Section meetings.**—At every annual school section meeting it shall be the duty of the freeholders or householders of such section present at such meeting, or a majority of them. *Firstly.* To select a Chairman and Secretary. *Secondly.* To receive and decide upon the report of the Trustees. † *Thirdly.* To elect one or more persons as Trustee or Trustees, ‡ to fill up the vacancy or vacancies in the Trustee Corporation, according to law; Provided always that no teacher or Local Superintendent shall hold the office of School Trustee. § *Fourthly.* To decide upon the manner [as defined below §], in which the salary of the Teacher or Teachers, and all the expenses

* Trustees are not required to state the ordinary business of an annual meeting in their notices, as the law expressly specifies it; but if the trustees have other business to bring forward, they must distinctly state it in their notice, otherwise it cannot be lawfully considered at the meeting. A special school meeting can, however, be called at any time.

† The Trustees are required to present their yearly school accounts to the Annual meeting for audit. For neglect of this duty they are personally responsible. Should no exception be taken to the accounts they must be held to be correct. The meeting should see that the vouchers agree with the sums reported to have been paid by the Trustees on behalf of the Section. If not satisfactory arbitration should be resorted to.

‡ Local Superintendents are authorized to investigate school Election complaints within twenty days after the Election.

§ Supporters of separate schools are ineligible as Trustees of public common schools.

§ It belongs to the office of Trustees to estimate and determine the amount of the Teacher's salary and all expenses connected with the school; but it appertains to the majority of the Freeholders and Householdors of each School Section, at a public meeting called for the purpose, to decide as to the manner in which such expenses shall be provided for, whether (1) by voluntary subscription; (2) rate bill in advance, of twenty-five cents (or less) per month on children attending the school; or (3) rate on property.

But the Trustees alone determine the amount required for the support of the school, which they are required to keep open at least six months of the year, and they are authorized to provide the balance in such a manner as they may think proper. They are also authorized to provide for deficiencies, by a rate upon the property of the section, should the vote of the annual meeting not cover all expenses; or for all expenses of the school, (over and above the checks of the Local Superintendent) should the annual meeting omit or refuse to decide as above. But for all the money received and expended by them, the Trustees must account annually to their constituents.

connected with the operations of the School or Schools shall be provided for during the years.

Election of Chairman.—The Electors present at a school section meeting have the right to elect whom they please as Chairman, whether such Chairman be a freeholder or householder or not. None but householders and freeholders have a right to vote at a school meeting (except the Chairman in giving a casting vote), but they can elect whom they please to preside at their annual meeting.

Challenging Voters at School Meetings.—If any person offering to vote at an annual or other school meeting, shall be challenged as unqualified, by any legal voter in such section, the Chairman presiding at such meeting shall require the person so offering, to make a declaration.* In the Revised Statutes, which have been proclaimed, and which came into force on the 5th of December, the Commissioners for Consolidating the Statutes recommend that this declaration read as follows:

"I do declare and affirm that I have been rated on the assessment roll of this Section as a freeholder or householder [as the case may be], and that I have paid a public school-tax within the last twelve months, and that I am legally qualified to vote."

The vote of any person refusing to make this declaration shall be rejected; but any person convicted of making a false declaration of his right to vote, is liable to fine and imprisonment for misdemeanour; and should any illegal votes be allowed by a chairman of a school-meeting, a complaint can be made to the Local Superintendent within twenty days, who can set aside the election, as empowered by law.

Right of Trustees and Teachers to Vote.—Trustees and Teachers, if freeholders or householders in School Sections, have the same right to vote at the annual or any other school meeting as have any other freeholders or householders in their section. A person's being a Trustee or Teacher does not deprive him, if a rate-payer, of his rights as a freeholder or householder, any more than it deprives him of his elective franchise.

Annual election of one Trustee.—In all School Sections (except in Cities, Towns, and Incorporated Villages, and new School Sections,) one Trustee shall be elected to office at each annual school meeting, in place of the one who shall have been three years in office. The same individual, if willing, may be re-elected, but no School Trustee shall be re-elected, except by his own consent, during the four years next after his going out of office.

Penalty for refusing to Act as Trustee.—If any person chosen as Trustee, shall refuse to serve, he shall forfeit the sum of five dollars; and every person so chosen, and not having refused to accept, who shall at any time refuse or neglect to perform the duties of his office, shall forfeit the sum of twenty dollars; which sum or sums may be sued for and recovered by Justice of the Peace; but any person chosen as Trustee may resign with the consent of his colleagues in office and of the Local Superintendent, expressed in writing.

Choice of Trustees.—The householders or freeholders in a School Section can elect whom they please as Trustee, whether he be a householder or freeholder in the section or not; and any person thus elected has a right to act as Trustee, whether he be an elector or not.

Legality of Trustees' Election.—The legality of the proceedings of an annual school meeting cannot be called in question if deferred until twenty days after their occurrence, any more than the election of a member of Parliament can be called in question unless the protest be made within the period authorized by law.

Investigation by a Magistrate.—A Magistrate has no right to dismiss a Trustee from office, or decide whether a Trustee is lawfully elected or not. The law directs a Local Superintendent, but not a Magistrate, to investigate such mat-

* Supporters of separate schools have no votes at public common school elections.

ters. The fining of a Trustee does not in the least degree disqualify him for office or lessen his obligations or powers.

Reconsideration of Proceedings.—The Trustees can call a special meeting to reconsider the proceedings of the annual meeting, as to the mode of providing for the support of the School. Should a *rate-bill* be adopted, and only a few children attend the School, the Trustees can levy and collect from the assessed property of the Section, all that is necessary to pay the salary of the Teacher and the expenses of the School, over and above the small amount of the rate-bill.

NO. 2. RIGHTS AND DUTIES OF RURAL TRUSTEES.*

Non Resident Trustees.—A Trustee who may have removed a mile or two out of the limits of the School Section, is as much a Trustee as he ever was, and has a right to exercise all the powers of a Trustee until his successor is elected; and it is at the discretion of the other two Trustees whether or not they will call a meeting for the election of a Trustee in his place, or whether they will leave him to act until his legal period of office expires. The provision of the law enables the two remaining Trustees to call a special meeting for the election of a Trustee in place of one who has removed; but it does not require them to do so; and in very few cases is the vacancy filled up before the annual meeting. School electors can, at their discretion, elect a non-resident as a Trustee if they please.

Power of Trustees to erect School Houses.—In regard to the erection of a school-house, and everything appertaining to it, the power is vested in the elected Trustees, the same as the power of making laws is vested in the Legislature; and not in any public meeting in the one case any more than in the other. The Trustees may call a public meeting to consult on the subject, but the legal decision is with the Trustees. The only power of a public meeting in such a case is to decide upon the manner in which the sums requisite to purchase a school site, or pay for a school house, or support the school, shall be provided; but the amount required in all cases, the kind of school house to be erected, or kind of teacher to be employed, is with the Trustees; and if a public meeting does not provide for all the sums required, the Trustees can provide the balance by rate on the property of their section.

Obligations of Trustees in regard to keeping open a School.—Unless a school be kept open six months of the year it is not entitled to share in the School Fund at all; but if the Trustees close it six months of the year, they forfeit and lose to the School Section one-half the amount of the School Fund, which they would receive did they keep the school open the whole year, and they are personally liable to pay to the School Section (on the complaint of any resident in it) the amount they thus forfeit and lose by their neglect. The very object of the law on this subject is to compel reluctant Trustees to provide a school all the year round, for the youth of the section in which they have been elected School Trustee guardians of such youth.

Rights of Trustees as between themselves.—The law knows no difference between the Senior and Junior Trustees of a School Section. All the Trustees of a School Corporation ought to be notified of each corporate meeting; but any agreement made, or meeting called under the signature of a majority of the Trustees, and attested by the corporate seal, is legal and binding.

Official Acts of a Trustee de facto.—If a person is returned as elected Trustee, and his election is afterwards set aside, his acts before the decision on his case were as lawful acts as if his election had been confirmed instead of having been annulled. Thus a person may be elected member of Parliament, and his election may be protested against, and, after investigation, set aside, yet until his election is set aside, he has a right to vote in the Legislature, and the acts passed by his vote are lawful.

Appointment and change of Secretary-Treasurer.—The

Trustees can change and appoint a Trustee Secretary-Treasurer as often as they please; and if one who has been a Treasurer refuses to give up any papers, money, &c., which came into his hands as such, the other two Trustees can proceed against him as directed by law.

Using the School House for Public Meetings, &c.—If there be a provision in the deed of a site on which the school house is built, requiring the Trustees to open it for all kinds of public or religious meetings, then in case of refusal to do so, application can be made to the Superior Courts, if it be thought desirable, to compel the Trustees to give effect to that provision of the deed. But if there is no such clause in the deed, the Trustees have discretionary power to open or close the house to whom they please, and upon such conditions as they please. Whatever individuals *said* at the time of building the house as to the uses to which it might be applied, imposes no legal obligation upon the elected Trustees for the time being.

Strictly speaking, the Trustees have no legal power to permit their school house to be used for other than school purposes, but usage has invested them with a sort of discretion in that respect; but if they should abuse their trust, an application may be made by any dissatisfied party to the Court of Chancery for an injunction to compel the Trustees to confine the use of their school house to school purposes, though no mandamus from the Queen's Bench would likely be granted to compel the Trustees to allow it to be used for other than school purposes, unless provision be made to that effect in the deed.

NATIONAL EDUCATION IN SCOTLAND.

The deputation appointed by the Committee of the friends of a national system of education had an interview with the Lord Advocate yesterday forenoon. There were present—Mr Adam Black, M. P., Rev Dr Guthrie, Mr D. McLaren, Rev Dr Harper, Rev T. Finlayson, Mr W. Duncan, Mr J. Peddie, Rev Dr Begg, Rev Dr Johnstone, Mr W. McCrie, Dr George Bell.

Mr BLACK said, it would be unnecessary to state what was the object of the deputation, as his Lordship was so well acquainted with all the proceedings that had taken place with the view of improving the system of education in Scotland. The deputation were anxious that a bill should be introduced into Parliament for the Abolition of the test, which they considered an insuperable obstacle to the introduction of any improvement on the parochial system; and they were persuaded that till this obstacle was removed, the country would have to submit to the present sectarian and inefficient system. On the part of the deputation, he hoped his Lordship would take an early opportunity to introduce such a bill into Parliament, and he had no doubt that such a bill would receive the approval of a large majority of the House of Commons.

The LORD ADVOCATE said, he had not communicated with the Government on the subject, but he was quite prepared, if he obtained the concurrence of the Government, to bring in a measure on this matter. But the chances of success would entirely depend on the amount of public support which any movement of this kind might receive; and without very considerable interest in it being elicited from the people he had not any sanguine view of the result.

Mr DUNCAN M'LAREN, with reference to what had fallen from the Lord Advocate, expressed his opinion as to the importance of acting energetically in the matter, and said he thought the country generally would support such a plan as had been proposed. Meetings would no doubt be held in support of the bill as soon as it was published, and petitions would be got up in its favor. A deputation should also go to London to promote the bill in both houses of Parliament, and they might be sure of the support of the Liberation Society, who have great influence in these matters.

A conversation ensued on various points of detail, in the course of which

Dr GUTHRIE remarked, in answer to the objection which some had made to the abolition of tests, viz., that a Roman

* For rights of Trustees in Cities, Towns, and Villages, see No. 7, page 180.

Catholic proprietor might thus place a Popish teacher in a parish school, that no doubt the thing was possible, although very improbable—that there was no enactment or system which did not lie open to some objection—that at the worst such a thing could not occur in more than one case in five hundred—and that if any one of the very few Roman Catholic proprietors so dared to outrage public opinion, they would be completely defeated in their design to propagate Popery; because, in the first place, none of our people would send their children to such a school; the teacher's office would be a sinecure—he would be the master of a school without scholars. And secondly, the Churches of the country would, were such a case to occur, supply the locality, independent of patron or priest, with a sound teacher and a Protestant school. Dr Guthrie expressed his hope that many good and patriotic men connected with the Established Church would now look favourably on the abolition of tests, as the only way of securing a great, sound, safe system of National Education, without which thousands in our country must perish for lack of knowledge. He thought that the demands now making by Bishop Cullen and his Romish coadjutors in Ireland would open the eyes of many to the unsoundness of the present system of Privy Council grants. They had been a great instrument of extending Popery in the country, and they opened a door for a still greater and more formidable extension of it. By that system of grants, the public money, to an enormous amount, was used for the purpose of propagating the grossest errors; and it would be impossible to stop unless a national system of education were established on a broad basis: and no such system could be established till these tests were abolished. He remarked that it was of the utmost importance to connect the abolition of tests with such an extension of education as would embrace the thousands of children who were at present growing up in ignorance. Unless it was clearly shown that the abolition of tests was a means to an end,—a step towards this great and blessed end,—the people would take no interest in the matter, but would regard the whole affair with calm indifference, as a mere struggle between the Established and unendowed Churches for power,—a strife in which they had no stake, and would therefore take no part.

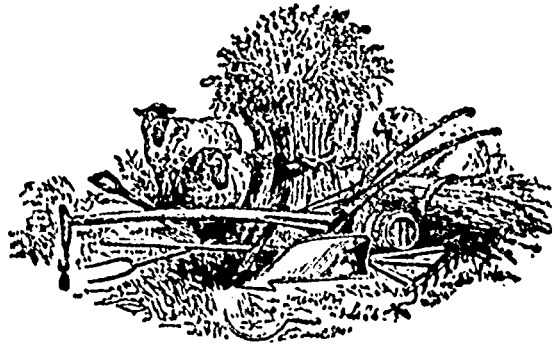
Dr HANPHER expressed the hope that the Lord Advocate would confine his bill to the abolition of the test, as he was satisfied that by doing so his Lordship would secure a much larger measure of support in the country than if he were to make the bill more comprehensive. Other matters would follow in due time.

Dr BEGG likewise urged this view of the subject. If a number of details were inserted in the bill it might not be easy to induce all sections of the friends of education to act unitedly and energetically. With respect to what Dr Guthrie had said on what some had represented as a Roman Catholic difficulty, he was quite ready to meet that difficulty should it ever arise. Any such possible evil as that supposed was as nothing compared to the enormous evils the present system of Privy Council grants was producing in the country by the spread of Popery.

Dr JOHNSTON, Mr DUNCAN, and others, concurred in the desirableness of the Lord Advocate limiting his bill to the abolition of the test—at all events, in the mean time.

After some further conversation, in which his Lordship took part, the deputation thanked him for the courtesy he had shown during the interview, and withdrew.

AGRICULTURAL.



II.—PRACTICE OF AGRICULTURE.

DEEPENING THE SOIL.

The depth of a cultivated soil is always a matter of importance. Lands on which the vegetable stratum is thin, are deficient in permanent productive power and require a much larger application of manure, and more thorough working, than those which have a greater depth. Digging two spits deep, as is practiced in Europe, or gradually going deeper with the plough, tends to obviate this difficulty, and will eventually render the soil productive, if the requisite care be exercised in cropping and manuring.

Where the vegetable stratum is thin, and reposing on a poor subsoil, a speedy change may be effected in the following manner, although from the great cost of labor in this country, it may not be advisable to adopt it except on a limited scale: Along the margin of the place to be improved, be it more or less, throw the soil, subsoil sods and all, into a winrow on one side, to the depth which is desired, say twelve or twenty-four inches. Then commence on the side in the direction the improvement is to proceed, and deposit all the mould and sods taken from the top in the bottom of the first trench, throwing that taken from the bottom of the second trench over on the top of the first, and in this manner, proceed till the work is done. Then cart on old, well decomposed compost, mixed with an equal volume of green unfermented stable manure, and work the whole thoroughly into the yellow earth until the virgin soil is approached. A liberal allowance of manure is requisite in order to hasten the decomposition of the soluble silicates contained in the fresh earth, as well as to ensure the more ready absorption of the fertilising gases from the atmosphere which are necessary to impart vigor and activity to its latent powers. A small quantity of fresh manure sprinkled in lightly as the filling goes on, will be of great service, and, indeed, any kind of vegetable matter, such as straw, forest leaves, or chip manure, will materially assist the process of enriching, and furnish food for the plants.

Lands treated in this manner stand the drought much more successfully than untrenched grounds, and are always found to be more productive, with the *same amount* of manure, than the deepest soils in their natural and unimproved state.

On gardens we have seen it tried repeatedly. It is well known that the sand and coarse gravel excavated from wells and cellars, will when exposed to atmospheric influences, imbibed principles of fertility rapidly, where no manure is used, and become in a short time covered with verdure. We have known the common yellow sandy loam taken from the pit and spread upon upland mowing fields with the happiest results. This loam is full of fertilising salts, which upon being brought to the influence of the air and rains, impart them to the roots of the grass with surprising effect.

Plaster and charcoal each have a powerful tendency to absorb enriching principles from the air, and in all experiments like the one we have suggested, they can be profitably employed. The second year after digging, a very decided improvement will be apparent, and a single operation will have a decided influence for many years.

Those who have but little land should attend to this suggestion if they wish to make it highly productive. We have tried it on garden lands, accompanied with thorough draining, and think we have doubled the crop,—using no more manure than we did before the trenching—*N. E. Farmer.*

HOW TO KEEP CROPS GOOD.

“ Let this be held the farmer's creed—
For stock seek out the choicest breed ;
In peace and plenty let them feed ;
Your land, sow with the best of seed ;
Let it not dung nor dressing need ;
Incluse, plow, reap with care and speed,
And you will soon be rich indeed.”

Never keep a poor or malformed animal to breed from, and in selecting seed, strive always to procure the best. If you have a good animal, reserve it and sell your mean calves, lambs and pigs to the butcher: he can turn them to more advantage than you can, and your stock will escape contamination by having them taken away.

In the vegetable kingdom, the most healthy and vigorous plants are invariably those which spring from the most healthy and vigorous stocks. Corn, or indeed most other vegetables, may by selecting inferior seed for several consecutive seasons, be so deteriorated in quality as to be comparatively worthless, in the same manner, and with almost the same facility, we may destroy the cow or ox. By selecting our most valuable and symmetrical animals for the shambles, and reserving to ourselves as breeders only those that are worthless or deformed, we are certain to perpetuate the deformity and diseases which have been the curse of the breed; and which, acting by obvious and irresistible laws over which we can exercise no efficient control, produce a distinctive or family configuration as thoroughly inwrought and inalienable as the principle of life itself.

Every person who understands the principles of vegetable physiology, knows that it is one of the great fundamental laws of nature, that “like produces like,” and this law is equally as pervading a principle in animal, as in vegetable life, and presents us with an injunction for the regulation of our efforts at improvement; and this is eminently worthy of our regard.

In casting our eyes around us, we shall at least perceive that this law has not only been systematically developed by scientific breeders in foreign countries, but that it has everywhere received from the intelligent and reflecting portion of the community, the attention and encouragement it deserves.

Were we to go through our several field crops at the commencement of the seasons of maturation, and select the best and earliest ripe of the divers sorts, we should find the benefit of such a course, and our fields would present at harvest a very different appearance from that which now so frequently causes us to turn from them with dissatisfaction. It would cost but a mere trifle to select seed in this way, even in the case of the cereal grains.—*Id.*

HOW TO FATTEN CHICKENS.

We make the following extracts from an article on this subject in the *London Cottage Gardener*, and commend them to our readers:

“It is hopeless to attempt to fatten them while they are at liberty. They must be put in a proper coop; and this, like

most other poultry appurtenances, need not be expensive.—To fatten twelve fowls, a coop may be three feet long, eighteen inches deep, made entirely of bars. No part of it solid—neither top, sides, nor bottom. Discretion must be used according to the sizes of the chickens put up. They do not want room; indeed the closer they are, the better, provided they can all stand up at the same time. Care must be taken to put up such as have been accustomed to be together, or they may fight. If one is quarrelsome, it is better to remove it at once; as, like other bad examples, it soon finds imitators. A diseased chicken should not be put up.

“The food should be ground oats; and may be put in a trough, or on a flat board running along the front of the coop. It may be mixed with water or milk; the latter is better. It should be well slaked, forming a pulp as loose as can be, provided it does not run off the board. They must be well fed three or four times per day—the first time as soon after day-break as may be possible or convenient, and then at intervals of four hours. Each meal should be as much and more than they can eat up clean. When they have done feeding, the board should be wiped, and some gravel may be spread. It causes them to feed and thrive.

“After a fortnight of this treatment you will have good fat fowls. If, however, there are but four or six to be fattened, they must not have as much room as though there were twelve. Nothing is easier than to allot them the proper space, as it is only necessary to have two or three pieces of wood to pass between the bars and form a partition. This may also serve when fowls are put up at different degrees of fatness. This requires attention, or fowls will not keep fat, or healthy. As soon as the fowl is sufficiently fattened it must be killed; otherwise it will still get fat, but it will lose flesh. If fowls are intended for the market, of course they are, or may be all fattened at once; but if for home consumption, it is better to put them up at such intervals as will suit the time when they will be required for the table. When the time arrives for killing, whether they are meant for market or otherwise, they should be fasted, without food or water, for fifteen hours. This enables them to be kept for some time after being killed, even in hot weather.”

[From the New England Farmer.]

COAL ASHES AS A FERTILIZER.

FRIEND BROWN:—Your paper is taken at our office by A. H. Grosvenor, for the general instruction in agricultural gardening, &c., at our section of the Shaker Village at Harvard. Among the farmers' reading matter it contains, I have been pleased to observe, an occasional article upon the general uses of coal ashes as a fertilizer.

In your last issue, the editor of the *Commercial Bulletin* has presented to the public a good article on this subject, but in perusing it I was led to suppose that many disposed to be skeptical on this subject would argue that the editor's test of anthracite coal was not a clear one, because he incorporated with saul ashes equal parts of horse manure and loam in one general heap, as an auxiliary to his pleasant half-acre.

Such skeptical friends would be apt to contend that the horse manure and loam did all the work, while the ashes, like the white soft-handed gentleman farmer that simply rides through his plantation, received the honor, and made all the noise. But as we too think different, please allow us to state our reasons for endorsing his opinion.

We consume at our large dwelling-house a number of tons of coal each winter, and having added portions of it to our composts, with little calculation or observation, we determined to test it singly this past season, and closely observe its effects. On an old mowing field too much run down, we top dressed a square piece of ground fairly with clear coal ashes early in the spring. While the crop was growing, at all stages the difference was perceptible. When ready for the scythe, it was more in quantity; and as to quality, it produced about equal parts of herds grass and red clover. If the clover was not introduced by the agency of the ashes, we know not how it was introduced, for four years none was seen there before, or in any other part of the field, and this was the only clover seen in said

field the past season. Both grass and clover was more vigorous, green and lively within the top-dressed square, and just as visible all around was the exhausted crop, which said as audibly as grass could say, in its declining state, that it had received no such assistance from this individual fertilizer.

On a hill-side not at all renowned for its wealthy properties in soil, we planted the Davis Seedlings and Jenny Lind potatoes in clear coal ashes, half a shovel full in a hill. Below, on equally as good ground, we planted the same kinds of potatoes in compost manure, and the coal ashes, single handed, turned out the largest, best, fairest and most numerous quantity of potatoes. In reality, they were the best we raised on the farm. Almost side by side, in compost manure, our potatoes were somewhat infected with rot; in the ashes they were all healthy and sound almost to a potatoe.

In kindling fires, it is true, we use shavings and a little light wood, but the quantity I consider almost too insignificant to take into the account.

These experiments convince us that as a fertilizer, anthracite coal ashes possess the life and energy to produce the above effects on common crops. Hence, whatever theoretical lecturers or writers may present to undervalue the better qualities of the article, while it continues to improve quantities and qualities of grass, and give us sounder and larger crops of potatoes, we conclude to give it an honorable standing among the general agents which have long held undisputed station in the farmer's compost.

South Gorton, Oct., 1859.

WM. LEONARD.

OFFICIAL NOTICES.

Dr Forrester will be greatly obliged if the Secretaries of the different Agricultural Societies will forward to him all the information they can relative to the state of Agriculture within their respective bounds in addition to what they have already done, especially every thing appertaining to the crops of last year. Next year, it is hoped, that a regular series of queries on blank sheets will be issued, by which complete and accurate statistics on the Agriculture of the Province may be published every year, and by which our progressive advancement in this respect may be seen. This year a Report must be presented to the Legislature, and it is in every way desirable that that Report be as full as possible. Every effort ought to be made, that the original Agricultural Grant to the counties be restored. Were the different Agricultural Societies to take up this subject, and to forward petitions to the Legislature to this effect, we have little doubt that the object would be gained.

ARTICLES ON RETURNS TO CIRCULAR.

We return to our theme. The next query in the circular is this—"Is there anything like general attention paid to the Rotation of Crops?" There is no small diversity in the replies given to this query. Were we to go into details and attempt to classify the Returns, on this point, we would say, that out of about 40, there are 10 report that the rotation of crops is pretty generally attended to, 15 partially, and the other 15, that it is not attended to at all. This state of things does not take us by surprise. The want of a systematic rotation of crops in Nova Scotia, and indeed in Lower Canada as well as in all the Lower Provinces, lies at the root of all our defects in the matter of Agriculture. The long, severe winters present something like a plausible reason for taking crops of hay year after year in succession from the same field, and that oftentimes without any top-dressing. The uncertainty of the markets, too, sometimes presents temptations to our Farmers to grow some particular crop to an excess, to the all but total neglect of all others, such, for instance, as has taken place in King's county for the last few years in reference to the potato. The great demand for that esculent, and the high price it brought in the American market, have prompted not a few to plant the

same root in the same field for a succession of years—not without manuring, it is true, but rendering it altogether impossible for them to carry out anything like a systematic course in the management of their Farms. And, in addition to all these reasons, there is, perhaps, a majority of our Farmers who really know little or nothing about the immense advantages arising from an adherence to system in the rotation of crops. We blame them not for this. Their ancestors, the first colonists in the settlement, betook themselves to the clearing of the ground and the cultivation of the soil without any previous training, and ended without any scientific knowledge of Agriculture at all; and as their forefathers firmed so do they, their circumstances having in a great measure shut them out from those opportunities of information which have been opened to others in older settled districts. And, even when they have been favoured with such opportunities, there is a stereotyping in Agricultural pursuits, arising from a long continued practice, which nothing but the most palpable and sensible demonstration, which nothing but ocular observation, will supplant.

Now there are two grand classes of reasons in favour of the rotation of cropping on which we would make a few remarks. The first is that different plants draw from the soil different sorts of food, so that one plant will grow freely in a soil in which another will scarcely grow, or, if it grow at all, will prove exceedingly unproductive and unprofitable. This is a great law or principle taught us by nature itself, and constitutes one of the main reasons for the geographical distribution of plants. Why does one species of grass grow in the meadow, another on the level plateau, and another on the Alpine summit? Simply because they find in these respective localities the food most congenial to their nature. You may plant the finest hardwood trees in the fields occupied for a century or more by those of the identical species—before the desolating scourge of the forest fire passed over them—and what will be the result? If they grow at all, they will be stunted and scraggy. And the reason plainly is, that the bygone trees have absorbed all the nutriment congenial to their nature. Plant other kinds of trees, such as are classed amongst softwood, and these will shoot forth with utmost luxuriance. And exactly so is it with ground and crops under cultivation. The turnip, for example, takes from the soil a large quantity of one kind of nutritious matter—wheat a large quantity of a different nutritious matter, and hay a large quantity of nutritious matter different from both turnips and wheat; therefore, though a field may give a sufficiency of that kind of nutriment which is principally required by one crop, yet, if another of the same kind immediately follows, there will be a deficiency for it; but, if a different crop succeeds, there will be found enough of all the materials it needs fully to manure it; and when a third crop of another description follows, which requires nourishment different from either which have preceded it, the soil may be in a condition to yield a good crop of the last also. But as every crop takes away more or less of all the nutrition which the soil contains, if a succession of crops (no matter how different the kinds which succeed each other may be) are gathered and carried off the land without the occasional addition of manures, they will be found gradually to diminish in quantity till they reach a point, when they will scarcely pay the expense of cultivation. And this is actually the state of matters, in too many instances, throughout this Province.

The other class of reasons which go to support the necessity of the adoption of a thorough system of the rotation of crops, is that from the variety of crops the occasional failure of one is not so much felt, seeing that the others furnish subsistence sufficiently without it. This other class of reasons might furnish abundant scope for illustration. Whatever be the science and the skill of the Farmer in the cultivation of the soil, and in the supplying of his various crops with suitable food, much of the success of his efforts depends upon the blessing of heaven. Changes in climate and other casualties often occur which blast the fairest prospects of the Farmer regarding certain crops. Over these, of course, he

has no control, and the only way by which he can defend himself against them is by the adoption of a rotation of crops. But on this topic we cannot at present enlarge.

The next point connected with this subject is the plan of rotation best adapted for this country. Instead of dilating on this point ourselves, we prefer to lay before our readers the experience of a Scottish Farmer in Lower Canada, and to express our thorough belief that were anything like the plan recommended pursued in this country, a complete revolution would be effected in the course of a few years on the whole of our external condition:—

PLAN OF THE ROTATION.

Divide the arable portion of the farm, whatever may be its size, into six parts, as equal as possible, with a direct communication from the barn yard to each field, and from one field to the other, so that the cattle may pass from one to the other when required. This division into six fields, may require on most farms new fencing, and it will be proper beforehand, to see how this can be done with the least possible expense. I shall now suppose the farm prepared to receive the application of this system, and that is the one which I have found the best for even the poorest settler.

1st. Root crops, such as potatoes, carrots, beets, parsnips, &c., [turnips and also flax,] and in cases where the land is not sufficiently open for a crop of this kind, the field must be left in fallow.

2d. Crop of Wheat or Barley.

3d. Crop of Hay.

4th. Pasture.

5th. Pasture.

6th. Crop of Oats or Peas.

In the beginning the application of this system, that field of the series which is in best condition for a Root crop, should be called Field

The best for Wheat or Barley,

That which is actually in Hay,

The Pasture Fields

That which is best for oats or Peas,

A
B
C
D & E
F

Each field for the first year ought to be appropriated to the crops above mentioned, and after the fashion now in use among the farmers of Lower Canada, except in the case of field A. By this plan, they will at all events still get as much from their five fields as they get at present.

The culture of field A and of crop No 1 come up together for the first year, and ought to be the object of special attention, as this is, in fact, the key to the whole system; for the good culture of this field has for its object, and ought to have for its effect, not only a good crop the first, but also to improve the land for the five other years of this Rotation of Crops.

In the following year the cultivation of the different crops will be according to the following order:—

Crop No. 2 in the field	A
Do " 3	B
Do " 4	C
Do " 5	D
Do " 6	E
Do " 1	F

and so on, changing each year until the seventh, when crop No 1 will come back to field A, and the whole will then be in a good state of fertility, and free from weeds. The above system has been proved to be capable of watering old land, and extirpating all weeds.

In order to render the thing more simple and easy of comprehension, I shall suppose myself to be again obliged to take a worn out farm in the autumn of 1849. The first thing that I should do, would be to divide the land into six fields, by proper fences, to prevent the cattle going from one field to the other; and I would then take for field A, that which appeared best for green crops or root crops; I would collect all the manure I could find in or out of the barns, I would take up the flooring of the cow-house, stable and piggery,

and I would take out as much of the soil underneath as I could get, for this soil is the essence of manure, one load of it being as good as four or five loads of common dung. The portion thus removed ought to be replaced by an equal quantity of ordinary soil, or, if it be possible, of bog earth, which might be removed when necessary afterwards.

The dung and other manure thus collected, should be placed on the field A, in September, or the beginning of October, spread with care (as far as it will go,) and covered up in a shallow furrow. Manure aids the decomposition of straw and the weeds of the soil, and frees it from these plants, which thus help to keep the soluble portion of the manure, until its juices become necessary for the crops of the succeeding years. The greater variety there is in the crops of this field, the better it will be, provided the soil is suitable for them. Thus, this field ought, as nearly as possible, to look like a kitchen garden.

CROP 1ST.—ROOT OR GREEN CROP.

Under the actual circumstances of the country, I would particularly call the attention of the farmers, to the cultivation of the Carrot as being one well adapted to our soil and climate.

The land which has been manured in the fall, as above described, ought to be ploughed at least twice in the spring, the one furrow across the other, and both as deep as possible. It is then to be harrowed until it is properly mellow. You then make with the plough two furrows, distant two feet, or two feet three inches from each other, taking care to raise the soil as much as possible between them. You pass the roller over this ploughed portion, and then with the corner of a hoe, make a small furrow or drill along the top of the rows; drop the seed into this furrow, and pass the roller over it again: this last operation will cover the seed sufficiently.

If you can get a seed sower, that will simplify matters considerably. A roller is essential in the culture of root crops which spring from small seeds, but it can be readily got by all farmers. A log of twenty inches diameter, and five feet long, with a pole fixed at each end, will do the business admirably.

Carrot seeds (and you may say the same of the other seeds,) ought to be soaked in rain, or soft water, until they are about to sprout, and then rolled in quick lime until the grains are dry enough not to stick to each other. When there is no lime, wood ashes will do as well. A pound of seed, if it be good (and you ought always to try it before sowing,) will be sufficient for one acre of land. By the above plan, the young plant will come up before the weeds, so that it will be easy to distinguish the rows of carrots before the weeds appear: this renders the cleaning comparatively easy, since it may be done (except the thinning) by means of a cultivator. This cultivator is an instrument which every settler ought to have, and which, like those already mentioned, is extremely simple in its construction. It is made of three bars of wood joined in front, and separated behind according to the width of the furrows which you wish to clean. This instrument, called the Horse-hoe or Drill-harrow, or Cultivator, is drawn by one horse, and has handles to it like a plough, or, ly lighter. A man or a boy may guide it, so as not to touch the rows of Carrots or other crops, but only to raise the soil to a greater or less depth, at pleasure. As soon as the weeds appear, you draw this harrow between the rows, so as to bring the soil as close as possible to the young carrots, but without touching or covering them. This process will keep the plants sufficiently clean until the time for thinning them and leaving them four or five inches apart from one another; soon afterwards you may plough between the rows thus harrowed and raised. These operations do good to the plant, by permitting air and moisture to have access, and by facilitating evaporation. My plan for gathering the carrots in autumn, is to pass the plough along the right side of the plants as close as possible, without injuring them; this frees

them on one side, and the stem is strong enough to allow us to haul up the roots by it afterwards.

This method of culture requires a good deal of labour, but the return is more than enough to recompense the farmer.

When we consider the large amount of nutritive matter contained in this root, and its general application to all the living things on a farm, its culture cannot be too strongly recommended, besides it is relished by all animals, especially by working horses, to whom it may be given instead of oats.

I have dwelt particularly on the culture of carrot, because the same method applies to the culture of all the root crops, which can be advantageously grown in this climate, such as Parsnips, Beets, Mangels and Turnips.

Parsnips will grow in a close soil, almost in clay, and do not require cellars since they remain uninjured all winter in the ground. In this case you will have them in the spring, affording a new and succulent food, at a time when it is most necessary. Every animal will eat parsnips with relish, and cows fed upon them yield a very rich milk.

Beets and Mangels have the same value as a crop, and as food for milk cattle, but I do not consider them to be so good for fattening cattle.

[In spring, all the manure made during the past winter should be carted to the field, placed in a heap, and twice turned, all bones should be gathered and broken up with a hammer, all coal and wood ashes, scrapings of sewers, the dung from the fowl house, and the contents of the privy, should be collected and made into a compost, with dry loam or bog earth.

The above manure may be used for that portion of the field devoted to cabbages, potatoes, and turnips. It should be put in the bottom of the drill on which the above are to be planted or sown.

When the ground is properly ploughed and harrowed, and a sufficient quantity of sound seed sown,—say, at least, four pounds to the acre,—the Turnip crop is as certain as any other.

The sowing of turnip seed should be commenced early in June, and may be continued up to 20th July. If the fly takes the first sowing, a second will be likely to succeed.

The turnips when well up, and getting strong, should be thinned out to a foot apart, and the hoe and cultivator passed through them at least twice before they meet in the drills.]

If the land is too heavy for root crops, beans and green peas will suit for No. 1, taking care to sow them in drills, and to prepare the land as above described for root crops.

If it be thought absolutely necessary to summer fallow,—that is, to plough without sowing,—which only happens when the soil is so hard and heavy that it cannot be pulverized in any other way, you ought not to spread the manure on the land in the preceding fall; but plough the land and ridge and furrow it with as much care as for a crop. You need not touch it again before the month of June: when you must plough it again, and harrow it, so as to render it even, and destroy the roots of the weeds. You may then draw the furrows in a straight line, giving them a uniform breadth, and so as to facilitate drainage. About the middle of July you must plough it again, and sow it with plenty of buckwheat. At the end of September, plough it again, having previously spread it with dung. In this case the buckwheat is ploughed under with the manure, and serves greatly to increase the latter. The land thus prepared, ought to be sown with wheat in the ensuing spring, and you may add a little timothy and clover. A bushel of timothy will suffice for four or five acres, and three or four pounds of clover to each acre.

By following the method above described, you will have in the end of the year 1851, quadrupled, or more than quadrupled, the fertility of the soil.

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