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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. 1.

EDUCATIONAL.

OUTLINE OF THIS DEPARTMENT.

There are two aspects in which almost every subject may be regarded, the theoretical and the practical; and these are the aspects in which, in the subsequent pages of this Journal, it is proposed to consider the vastly important work of the Education of the young. And surely, we need scarcely remark, that in using the term *theory* we do not mean it to be understood in the bad sense in which it is sometimes taken, as if we were dealing in the visionary phantoms of a feverish imagination, or in the speculative dreams of the closet; but simply as pointing out the *science* of education, as distinguished from the *art*,—the principle, from the practice. Neither, we trust, need we say, that in thus allotting a separate heading to these terms, and discussing them accordingly, they can or ought to be divorced. On the contrary, we hold that they mutually illustrate one another, and stand in the same relationship to each other as the stream of water does to the fountain, or the branch of a tree to the trunk. Our main object in considering them apart is, if possible, to rid them of all ambiguity, and to impart greater clearness and definiteness to our thoughts.

Under the *theory* then, we shall embrace all that appertains to the nature, the philosophy, the essence of education; what, over, in short, falls under the legitimate answer to the ques-

tion, What is Education? This will naturally lead us into a wide field of observation, and involve the consideration of animal physiology, of intellectual and moral philosophy, as constituting alike the basis and the *rationale* of the education of the body, intellect and conscience, in all their intrinsic worth, reciprocal dependence, and mutual relationship.—This too may occasionally conduct us to controversial ground; and whilst we shall not shrink from a candid avowal of our views and sentiments, we shall, we trust, be enabled to do so in the spirit of moderation, equally removed from selfish dogmatism on the one hand, and from bitter acrimony on the other, and desiring to bring all to the bar of enlightened reason, of sound principle, and of tested practical experience.

Under the latter head—the *practice*, we shall have an equally broad field to travel over. Here we shall have occasion to discuss all that belongs to the *modus operandi* of education, the *How*, the *Who*, and the *What*. Under the *How*, or the *Mode*, we shall consider such subjects as these;—school premises, the organization and the government of schools, the various systems of education, in so far as their inner-life is concerned, the branches of learning in the more elementary and in the more advanced schools, and their practical application, so that the system adopted shall, in its essential features, characterize and pervade the whole, from the Alphabet up to the highest departments in Classics and Mathematics. Under the *Who*, will fall all that belongs to

living Agent, the Schoolmaster—his office, his qualifications, and the means of obtaining them; his duties—to himself, to his scholars and to their parents, to his profession, or his fellow Teachers, to the Trustees or Committee of Management; his difficulties and his rewards. Under the *Wherewithal*, will come the whole matter of the support of public education, the erection and preservation of school houses, the providing of the requisite Furniture, Text Books and Apparatus, as well as the competent remuneration of the Teacher. And here two distinct questions will present themselves to our notice, first, Who is the party on whom should devolve the responsibility of providing this support? Is it the parents in their associated capacity, or is it the different denominations of professing Christians, as such, or is it the Province, or State, or Nation, as such? And after this question has been decided, another will naturally arise,—How is the adequate means to be raised? Is it by voluntary contributions, or by direct or indirect taxation or by a combination of both? These are deeply important questions, and constitute, in some respect at least, that department of Education that more properly belongs to the Statesman and Legislator. The other subjects adverted to more directly appertain to the educationist in his professional capacity. Would that this line of demarcation were more snugly eyed by the one and the other! Then would there be less confusion, less clashing of views in the discussion of this vastly extensive subject. And whilst each preserved his legitimate sphere, the advancement of the whole would be largely subserved.

Such is a brief summary of this department. It is one of our rudimental rules in education, to present first of all a mere outline of the subject; and it shall be our aim at least, whatever may be our attainment, to practise as we preach.

I.—THEORY OF EDUCATION.

WHAT IS EDUCATION?

This is one of the most momentous questions, whether we regard it in itself or in its results. It involves the whole philosophy of our being. It deeply affects the future destiny of man, the whole of his eternal weal or woe. The Church and the State are alike dependent on its issue. Talk of prodigies! To us, one of the greatest is the comparatively small amount of attention and interest which this question receives; and, still more, that, in this the 19th Century of the Christian era, there should obtain such an immense diversity of opinion regarding it, that the principles and laws, the nature and design, the aim and end of the subject-matter of education should still remain so unsettled and so ill-defined.

Much of this diversity of view, of this vague indefiniteness of opinion, as well as many of the evils that have flowed therefrom might, in our apprehension, have been obviated and averted, had those who engaged in its discussion given more heed to the primary signification of the term itself. Now every tyro in Latin knows that the word *education* has for its root the verb *duco*, to lead or draw, for its prefix *e* out of, and for its affix *ion* the act of doing. Thus, according to its derivation, it signifies the act of leading or drawing out. Of what? Of all the organs, the faculties and sensibilities of our nature. That nature is compound, made up of a body, an intellect, and a conscience; and the term education, then, when applied to the young and taken in its primary acceptation just means the

drawing out, the unfolding, the developing, the strengthening, by the appliance of legitimate means, of all the parts of their compound nature, of their physical, intellectual, and moral constitution. We say *all* the parts, for we hold it to be utterly beyond the power of the most skillful and painstaking Teacher to do justice to the education of the one of these, without embracing the others; to improve and strengthen the intellectual, if the physical or moral is neglected; to purify and elevate the moral, if both the physical and intellectual are unattended to. These component parts of our nature are all inseparably united by the Author of our being. They stand in indissoluble relationship, in entire subserviency the one to the other; and if man is to be exhibited in all the symmetrical beauty and in all the perfection and glory of his nature, they must all be cultivated and educated according to their intrinsic and relative importance. We rise a step higher and maintain, that such is the sympathy pervading these parts that, in order to give full development to one and all, they must be called into exercise at one and the same time;—*the body*, that the intellect may be aroused and interested and whetted, and the conscience strengthened and assisted in its training;—*the intellect*, that a buoyancy and elasticity may be imparted to the body, and an enlightenment, elevation, and direction to the moral sense;—and *the conscience*, that an expansion and enlargement be given to all the faculties of the intellect and its powerful, invigorating impulse to all the organs of the body. Single out any one of these and cultivate it to the highest possible degree, and you do so at the expense and to the enfeeblement of all the others. Cultivate the one and then the other, at certain intervals, and you thereby do what you can to pervert the arrangements of the infinitely wise and gracious Creator, you mar and tarnish the beauty of these arrangements, and so far at least unfit these powers, both in their individual and collective capacity, for the accomplishment of their high and ennobling destination.

But again each of these parts of our compound nature has its appropriate ingredients. The body has its organs, or systems of organs,—the nutritive, supporting, cutaneous, muscular and nervous. The intellect too, though one and indivisible, has several ways of manifesting itself, that is, it possesses certain powers of acting, which are hence designated faculties. These, according to the classification of Dr Wayland, are the faculties of Perception, Consciousness, Original Suggestion, Abstraction, Memory, Reasoning, Imagination, and, as belonging to the whole, Taste. The conscience in like manner has its own ingredients or modes of acting, viz.—the discriminative, the impulsive, and the emotional.

These all exist in the young, though in a state of embryo, and in greatest possible diversity. In some, the body is more healthful and vigorous, in others, the intellect, and in others the conscience. In some, one set or class of bodily organs is more robust and more capable of endurance, or some features of the countenance are more prominent, or one intellectual faculty or class of faculties is more fully developed, or one ingredient of conscience is vastly more sensitive and tender, than in others. But notwithstanding this great diversity of natural gifts and endowments, they all, generally, exist in the young, whether in a state of germination, or in more or less sensible development; and whilst it is the duty of the teacher to labor for the improvement of all, it is equally his duty to adapt his instrumentality to this very diversity, that the design of

the Creator in this arrangement, in so far as human agency is concerned, may be fully accomplished.

But over and above all this there are grand general epochs of development in the mental, even as there are in the physical constitution of the young; that is, their powers become developed consecutively. There is what may be called the perceptive epoch, or that period of their history when they are mainly dependent on their external senses and this may embrace the period of childhood till about 7 or 8. Then there is the recollective epoch, or that stage when they evince a greater susceptibility of memory, when this faculty takes as it were the lead, which may run from about 8 to 11. Then again there is the stage when the understanding becomes conspicuous, and this generally is from about 11 to 13 or 14,—and, last of all, there is the reflective or reasoning epoch—that highest stage of development, in which reason subjects to her laws all the other powers, from about 13 or 14 onwards. Of course under each of these epochs there are various modifications and subdivisions, and there are also, as in every general rule, exceptional cases, where the lines of demarcation are less broadly drawn, less conspicuously displayed. But be this as it may, there is no denying the fact, that there is an order in which certain powers or faculties acquire the ascendancy, just as there is an order in the bursting of the foliage on the different branches of a tree. And this state of things too, the Teacher must be prepared to meet,—to this he must adapt himself, whether he is carrying on his operations in a graded or non-graded school establishment.

And now it may be asked, How is this compound nature of man, with all its diversified powers and faculties, and epochs of development, to be drawn out, to be trained, to be educated? We unhesitatingly reply, by exercise—appropriate and persevering exercise. The knowledge, or the exemplification of what ought to be, however sound and correct, will not suffice; there must be the use, the personal and practical use of all the powers and faculties, and that continued till proficiency is attained. And here arises another question of infinitely greater moment,—What is to be done, what method pursued, what means resorted to, so as most extensively and efficiently to secure this exercise? This is the grand difficulty, emphatically the educational problem to be solved. This is the arena on which all enlightened educationists ought to meet and settle their differences. In so far as the exercise of the body or conscience is concerned, there is little or no difficulty. If a bone or muscle is to be strengthened, it must be used. If the conscience is to be rendered increasingly tender and sensitive, its dictates must be listened to, and its requirements obeyed; and this must be done, not once or twice, but continuously, aye, and until the end is accomplished. But it is otherwise, in so far as the intellectual faculties are concerned. If these are only strengthened by use—and this we know to be the case,—what are the employments or the pursuits required? what is to be done so as to secure their being exercised, both separately and conjointly? It will not do to say, in reply to this question, 'Teach the children the various branches of learning, and they cannot fail to be provided with ample materials for the exercise of all the intellectual faculties.' All this may be done, and much valuable information imparted, and yet the faculties themselves may remain in a state of dormancy, of utter inactivity. It is not the things taught, but the method of teaching them, that is to secure the exercise required. And what is that method? It consists of two things

—first, the food congenial to the faculty to be exercised must be administered, that is, the subject best fitted to the particular power must be presented. This is easily done. Without going into particulars, and just looking at the different epochs of intellectual development, it is clear that the food most congenial to the perceptive faculties, is the objects belonging to the five senses;—to the recollective faculties, language;—and to the reflective, Mathematics and the like. But, secondly, how is this food to be administered, so that it may be digested?—How is the subject to be presented, that the faculty itself may be exercised? By the Teacher's descending to a level with his scholars; by his borrowing images and illustrations from objects and things with which they are familiar; and by this means, leading them on from the easy to the difficult, from the simple to the complex, from the known to the unknown, from the visible to the invisible. And the mechanical process by which this important principle is to be wrought, is that of question and ellipsis,—the former being intended to ascertain the amount of knowledge possessed, or to guide the teacher in imparting the knowledge that may be required; and the latter, to allow the scholars to use their respective faculties, filling up, supplying what is wanting, aye and until the goal is reached, the principle or truth arrived at, and that too by the exercise of their own faculties, that they may be fully strengthened and developed, and rendered capable of yet higher and nobler achievements. And this process is carried on with the whole class or school simultaneously. The question is addressed to all engaged, and the scholar or scholars whose endowments or attainments may run in this channel, will give the reply, or supply the ellipsis. And what is done that all may receive the benefit of this diversity of natural gifts or of scholarly attainment? The answer given is converted into a question, and thrown back on the whole class or school, so that what was but a few moments before the property of one or a few becomes the property of all. And this method, whilst, by the sympathy of numbers, it excites and stimulates the thinking powers of all, meets in nicest adaptation the intellectual endowments and attainments of each.

And now it may be asked, How is this method to be applied to the different epochs of intellectual development? How is the same subject to be presented to the children of different ages, that the whole school may be exercised simultaneously? By the presentation of an outline. To the younger scholars the faintest outline, the mere skeleton is given. To the more advanced, this outline is comparatively filled up, and so onwards, just as the scholars progress in knowledge, in maturity of apprehension, and in strength of intellect, so do they receive more minuteness of detail, till at length the subject is presented to them in all its meet proportions, and in all its native magnitude.

Such is a brief sketch of our answer to the question at the head of this article,—an answer which we shall elaborate and illustrate in subsequent numbers. Our object has been to bring before our readers, in a connected form, a kind of synopsis of our views on this important subject, so that when we take up the points in detail, their relationship and dependence may be the more readily perceived. And now, need we say in conclusion, that if these views are sound and correct, then verily education is something more than teaching or instruction, something more ennobling than the mere preparation or qualification for any particular business, or trade, or profession, something more extensive than the cultivation of any one power or faculty, or

class of faculties. And furthermore, we think that it must be apparent to all, that the recipients of the education thus briefly delineated, have made an acquirement infinitely more valuable than the possession of all knowledge and of all riches, even the acquirement of educating themselves; and thereby not only fitted and prepared for the right discharge of the duties of time, but, by the blessing of the Most High, for the employments and exercises of a blessed immortality. And surely the inference from all this is plain and palpable, that all who are engaged in extending the boundaries of this education, whether occupying a more or less prominent position, are in reality the highest benefactors of the species, and amply entitled to all respect and honour.

II.—PRACTICE OF EDUCATION.

SCHOOL PREMISES.—CHOOSING A SITE.

No tradesman can do justice to himself or to his employers, without a commodious workshop, and suitable tools; and so is it with the schoolmaster. He may be duly qualified, both in point of scholarship and professional skill, and he may be bent on carrying out the most improved system of education, but if he possess neither proper school-room accommodation, nor the requisite furniture, apparatus, and text books, he labours under the most grievous disadvantages; he is not in a fair position to prove either his own competency, or the excellence of his system. It is on this account we introduce this subject thus early; that, in the practical department, we give it precedence to all discussions on matters of school organization, government, &c. It is much to be regretted, that in older countries, where national systems of education have existed for centuries, this subject has not yet received that measure of attention it ought. In the American Republic it is far otherwise. There is not perhaps at this moment, on the face of the earth, a country where the external machinery of education, meaning by this every thing appertaining to School-houses, Furniture, Apparatus, Salaries of Teachers, &c., is in a condition of greater perfection than in the United States. There may, in the view of not a few, be a want of thoroughness in the inner-work of the Educational operations of that nation, but there is no such thing in the outer; and it were well for Teacher and Scholars, did more copy after their example, in this latter respect. We feel persuaded that this will ere long be the case. And where may we expect this example to operate more powerfully than in the adjoining British provinces? Already is it beginning to exert no small amount of influence. In Canada, New Brunswick, and Nova Scotia there are several schools constructed and furnished after the American fashion. Let us then press on in this direction, assured that there is the closest and most indissoluble relationship, subsisting between the outer and inner movements of the educational machine.

Now the first thing to be attended to in the erection of a School-house, is the selection of a suitable site, and here, oftentimes, the most egregious blunders are committed. How often, for example, do we find the School-house located on the side of the Highway, or on an acute angle where two roads meet, or on a small triangle, bounded on all sides by public roads. How often, again, do we find it in a low, swampy, gloomy situation, with a sluggish stream of water close beside it, or completely shut in by the surrounding forest, or, it may

be, in the immediate neighbourhood of some blacksmith's shop, or of some saw mill. And in all these situations how often is the School-house without one inch of ground attached, so that the children in their amusements must either repair to the public roads or the adjoining fields; and all this may occur in localities where the land is not really worth more than a few dollars an acre. And in villages or towns matters, in this respect, are oftentimes little better, if not worse. How often do we see the most eligible sites in the suburbs, and yet the School-house planted in the very centre of the villages or towns, parallel with the street, with nought but the most public thoroughfare for a play ground. Disputes we do occasionally hear of on this point; but these, unfortunately, have no connection with the healthfulness or beauty of the site, but with its proximity to, or distance from, this or that dwelling or farm house. How different the policy pursued in locating a Church, or a Court House, or an Asylum, or a Jail! Here we find one vying with the other in the selection of the most suitable, the most commanding situation. And yet is not the eligibility of a site for a school of far greater importance than any of these public edifices.

What then, it will be asked, ought to guide the inhabitants of a district in the selection of a site for a school? The first point to be determined, if it is in a purely rural district, is its centrality, that is, where the district is pretty regularly settled. In a country like this, no district should extend beyond three miles square, making the journey for the scholars not more than one and a half miles, or at most two miles. The next point is the locality itself, and this should be, if possible, on a small eminence, with southern aspect, a pleasant prospect, and, in every respect, healthful. And to every School-house in the country there ought to be attached, if possible, an acre of ground, or at all events half an acre, which ought to be well fenced round. This ground may be divided into three sections, one for the buildings, another for the play-ground, and another for shabby or small parterres. We doubt not that some may be inclined to smile at such a proposal, and especially at the idea of a play-ground, with an enclosure, when the children may roam at will throughout the whole surrounding forest. And so they might, with some feasibility, were there no other object contemplated, than the promotion of the physical health of the scholars. This end is no doubt served, and who will deny its importance, either in itself, or in its relationship to intellectual advancement. But its higher and nobler end is the providing of the scholars with a suitable arena for the display of their natural tempers and dispositions. So long as they are in the School-room they are under restraint. However abundant may be the opportunities afforded the Teacher of discovering the natural intellectual endowments of his scholars, in the School-room, they are comparatively rare in so far as their moral character is concerned. In the uncovered School-room, however, as the play-ground is sometimes designated, he sees them in their natural condition, unfettered and unembarrassed, in all their native elasticity and buoyancy, as they mingle in their sports with their fellows. The Teacher is supposed to be in their midst, sharing in their sports and directing them in their games, and all the while storing up those facts or occurrences, which days or weeks after he may turn to profitable account in their moral culture or training. He is thoroughly persuaded that the moral nature of the scholars requires to be trained as well as the intellectual, that, in fact, this is the very element which imparts life and force to the

whole educational process; and how is he to do this unless he knows something about their natural tempers, and characters, and habits. And where can he obtain this knowledge more satisfactorily than in the play-ground? Another portion of the enclosure might, as we have already stated, be appropriated for a shrubbery or garden, with its little beds and walks, and the children taught to keep and dress them. Such an exercise would be eminently instrumental in training the children to habits of order and neatness. Gooseberry and Currant Bushes, and other varieties of the smaller kinds of fruit, might be planted all around; abstinence from the fruit thereof might form an admirable mean for the producing and the strengthening of many virtues and graces, in the minds of the young.

And in the case of villages or towns, every exertion ought to be made to obtain grounds for school houses in the neighbourhood, in the most pleasant places of resort, within the boundaries of the district. And, in the case of large cities, every means should be used to secure sites in retired situations, as far removed as possible from the bustle and din of the more public streets. The situation of such school-houses renders a play-ground all the more necessary—a play-ground, at least, sufficient for the erection of a gymnastic apparatus.

The architecture of school-houses is the next subject, but this must be reserved for a subsequent number. We close these remarks with two quotations. "A school," says the distinguished statesman and philanthropist Cousin, "ought to be a noble asylum, to which children will come, and in which they will remain with pleasure; to which their parents will send them with good will." "If there is one house," says another equally celebrated writer, "in the district, more pleasantly located, more comfortably constructed, better warmed, more inviting in its general appearance, and more elevating in its influence than any other, that house should be the school house."

SCHOOL BOOKS.

THE saying of the Wise Man is surely specially applicable here, "Of making many books there is no end." Every country, we had almost said every district of the country, if not, in too many instances, every school of the district, has its own School books. The Schoolmaster who attains celebrity in teaching any one branch of learning, seems to imagine that there is imposed on him the necessity of publishing a treatise on his favourite subject. Then we have the advocates of some particular system of teaching—it may be, they are the originators of that system, or, at least, very directly concerned in its propagation—and they too set to work and compile a series of books in adaptation to that system. And then again there are some who entertain different views of the mode of teaching from the original compilers of some admirable series of books, and they issue a new edition of the same, with a few trifling additions, in the shape of explanations, or some preliminary observations, or the appendage of questions and answers at the end of every chapter, in all probability marring egregiously the whole excellence of the series. In addition to the above there is a great number of publishers in every country—men possessed of highest respectability and of abundant means, who, looking upon the publication and sale of School-books as a good invest-

ment for their capital, engage the most distinguished scholars of the day in any particular walk of literature and of science, or the Teacher famous in some department of the educational field, to write a treatise or a series of books on a given subject, adapted for schools of a certain description. They get possession of the manuscript, bargain with the printer, and, in due time, send them forth to the public with every possible recommendation in their favour, and ply every means in their power for their extensive circulation. And this practice has been going on for years, and seems largely on the increase. And what, it may now be asked, does this state of things indicate? Unquestionably it indicates no ordinary amount of demand. And whence comes this appetency? Why such a voracity for new School-books? It is owing, we fear, in too many cases, to erroneous, or, at least, very indefinite views, as to what constitutes the very essence of education. Is it not a fact that hundreds and thousands imagine that the whole of education consists in the power of reading, or in the capability of going through a certain book or class of books? Books—books—what books do you use is the unceasing cry, as if the books were the system, the all of education. How often have we heard the fond parent describing the superior attainments of his child by some such expressions as these:—"He has gone through Grey, or Walkingham, or Lennie, or some such well known School-books; or, He is a first rate reader, he learned to read the Testament in six months." And yet not one of the faculties of that child may ever have been stirred. He has gone through the exercise mechanically, but his reasoning powers have remained untouched.

Let it not be supposed, by these remarks, that we undervalue the utility of books, or that we place them all on the same level. True we have no sympathy with those whose whole system of education seems to consist in a list of books or the variety of subjects taught. Our settled conviction is that the very essence of education consists not in the *what*, but in the *how*; not in the things taught, but in the manner in which they are taught, and therefore we regard the books as of comparatively minor importance to the method of teaching adopted, and to the capabilities of the Teacher in working it.

Does then the efficient Teacher of the most improved system of education require no School books? Unquestionably he does, and that mainly for two objects;—and it were well that the authors of these books kept these objects fully in view. The Teacher requires books, in the first place, that he may impart to his scholars the art of reading with correctness the language they may be studying. Whatever that language be, it is essential alike for the reading and speaking of it, that they attain the correct pronunciation of the words, the true accentuation, &c. But all this is an art, and the acquisition of any art, whether for expertness or proficiency, depends, in a great measure, on the pattern of imitation set before the learners; and hence the necessity of the living voice of the Teacher preceding and accompanying the books read, the lessons given. From the very nature of this exercise, it is easy to see what is the character of the books required here. They ought to be consecutive in their arrangement, proceeding gradually from the easy to the more difficult. As the process is entirely mechanical, it requires the best tools and the most skilful living agents to show their use—that is, books of the best description must

be employed, and a Teacher at hand competent to give instruction in this department of education,—to set the best copy before the scholars for their imitation. The compilers then of reading School-books in any language ought to have this object prominently before their mind—that these books are not so much for the purpose of communicating information as of furnishing exercises, properly arranged, for the acquisition of the art of reading, for the obtaining of a thorough knowledge of the language. Let this principle be unsparingly applied to all professed Reading Books and three-fourths of them would be declared unprofitable and worthless. They may contain a vast amount of information, but this is all. As to their furnishing pieces, consecutively arranged, for the exercise of the elocutionary powers of the scholar, they are of little or no service.

But, again, both teachers and taught require another class of School books altogether, in the shape of text-books. No one, we think, who has had any experience in teaching, who really understands his business, and whose heart is in the work, can have failed to observe the unsuitableness of a vast number of the School-books in use, on Grammar, Geography, Arithmetic, Geometry, Science, &c. These books are unavailing, not because of any deficiency, but mainly because, of a superabundance of matter. The grand aim of their authors seems to be to introduce every thing that can possibly be said on the subject under consideration, apparently more desirous to produce a large volume than to present the subject in a simple and in an inviting form. These books are put into the hands of the young, it matters not whether they are seven or eight, or eleven or twelve years of age, and the injudicious teacher, without any attempt to make a selection of the more important parts, requires his scholars to read over or to commit to memory chapter after chapter and page after page. He may, perchance, explain a word or a sentence here and there, but he never imagines it to be necessary to present any thing like an outline of the whole, or to turn to practical account the lessons already learned. And what is the result? The scholars, possessing no general view of the subject, perceiving little or no connection in its parts, and still less apprehending any practical application of these parts, or any benefit arising from the acquirements made, look upon the whole as an unmeaning jargon; and, instead of becoming interested as they proceed in the study, they but grow in dissatisfaction, until, in too many instances, they settle down in disappointment and disgust. Such a course may save time and toil to the teacher, but it is ruinous to the youthful mind; it is calculated neither to impart useful knowledge nor to improve and strengthen the thinking powers. And what is to be done so as to obviate this state of things, in so far as too many of the School-books are concerned? It is to throw them into a new mould, and to give them the structure and the form of text books. Instead of pressing into them every point bearing on the subject under discussion, it is to present in these books the very elements or first principles, with the rules plainly deducible; and these all founded on an array of facts or examples of the most direct description, which facts or examples ought to precede instead of following the principles, with their corresponding rules. Moreover these text books, in order more efficiently to serve the purpose, ought to be arranged in accordance with the age or epoch of development of the scholars; for the more initiatory classes, giving the broadest out-

line of the subject, and so onwards through two or three stages, till the whole subject stands forth in all its native bulk and stature.

And what does all this imply in reference to the Teacher? It distinctly implies that his office is mainly that of an expositor and illustrator, that he is daily to repair to the recitation room with his mind literally steeped in the subject that is to engage the attention of the class, with his views regarding it so definite and comprehensive, that he can borrow figure upon figure, illustration upon illustration, from objects and pursuits with which his scholars are acquainted, until he has rendered it plain to the meanest intellect. And what is requisite to enable him to do all this with efficiency and success? First, that he be a diligent student—every day advancing in his personal improvement; secondly, that he accurately prepare himself on the daily lessons of each class, and thirdly, that his library be well stocked with every variety of school and reference books.

III.—OFFICIAL NOTICES.

NORMAL SCHOOL ARRANGEMENTS.

The Provincial Normal School has two terms in the year. The Summer Term commences on the second Wednesday of May and closes the last week of September. The Winter Term commences on the second Wednesday of November and closes the last week of March. No Pupil-Teacher, except for very special reasons, is admitted after a week from the opening of each Term.

INTERNAL ARRANGEMENTS OF PROVINCIAL NORMAL SCHOOL, SANCTIONED BY THE BOARD OF DIRECTORS.

1. That the Seminary be in session six hours every week-day, Saturday excepted, commencing in summer at 8 o'clock, A. M., and in winter at 9 o'clock, A. M., and closing respectively at 3 and 4 o'clock in the afternoon, with an hour's interval.
2. That the Seminary be opened every day with praise, reading the Scriptures and prayer, and closed with the Lord's Prayer and Benediction. Pupils having conscientious scruples to these exercises are not required to attend. Accordingly the roll will not be called till they are over.
3. That the whole organization of the Seminary, the classification of students, the course of study pursued, the books used, &c., &c., be entirely under the direction and control of the Principal.
4. That the students be regular and punctual in their attendance at the Seminary, that they carefully observe the Regulations and Bye-laws of the Directors, and such instructions as the Principal may from time to time see fit to give; and that both within and without the Seminary they comport themselves in a manner becoming their future profession as the Educators of the young in this Province.
5. That the pupils duly respect the authority of the Teachers, and act towards each other with brotherly affection and forbearance; and that those guilty of any act of disrespect or who violate any of the Bye-laws be admonished and censured by the Principal for the first offence, and if persevered in, dismissed.
6. That all guilty of any act of gross immorality be summarily expelled, and their cases reported to the Board of Directors.
7. That all cases of sickness, sufficient to warrant the student's absence, be reported to the Principal as early as possible; that all who are absent from any one diet, or do not appear till after the roll is called, express in writing to the Principal the cause thereof.
8. That a copy of the following regulations and recommendations be sent to the Boarding-houses of the students

and be read by the Principal after the calling of the roll on the first Monday of every month.

1. That the students shall board and lodge in such houses and under such regulations as are approved of by the Principal.

2. That the ladies and gentlemen in attendance be not allowed to board under the same roof, and gentlemen of the School are not allowed to call on ladies of the School after six o'clock, P. M.

3. That smoking by the students in their boarding-houses, be not allowed, and that order, cleanliness and neatness are expected of all.

4. That the pupils conform to the general order and usage of the families in which they reside. Where it can be conveniently done it is desirable that the students breakfast, in summer, not later than 7 o'clock, and, in winter, not later than 8 o'clock, A. M.; dine at a quarter past 12 o'clock, noon, and sup from 5½ to 6½ o'clock, P. M.

5. That quietness be observed in the apartments during study, and that the hour for retiring to rest be 10 o'clock, P. M., and that a proper amount of time be devoted to sleep—six hours of natural repose being the minimum,—and that, at 1st, one hour of exercise in the open air be required each day, health, weather, &c., permitting.

6. It is specially requested that all violations of physical laws, likely seriously to injure health, be reported to the Principal.

7. It is expected that on Sabbath, the students preserve order and quiet in their rooms, and that they refrain from every thing like a dissipation of that day.

8. That any marked and continued disregard of these regulations be reported to the Principal.

CERTIFICATES OF NORMAL SCHOOL STUDENTS.

There are three classes of certificates granted to the graduates of Normal School, viz., First and Second Class Certificates for Common Schools, and Certificate for Grammar Schools or Academies.

Second Class Candidates.

The following are the branches of learning professed by the candidates for Second Class Common School Certificates:—

1. That they be able to read with ease, intelligence and impressiveness any passage, either in prose or verse, in 1st section of 4th Book Irish National Ser. and be well acquainted with the principles of pronunciation and of reading.

2. That they be able to spell correctly and with proper punctuation the words of an ordinary sentence dictated by the Examiners.

3. That they be able to write a plain, free hand, and be well acquainted with the rules of teaching writing.

4. That they do mentally any account in the simple and compound rules of Arithmetic, with correctness and expedition, and work on the slate any exercise as far as Interest, including Fractions.

5. That they be acquainted with the elements of Book-keeping.

6. That they be able to parse any sentence in prose or poetry which may be submitted, write grammatically any passage that may be read, and be well acquainted with the structure and composition of sentences, the Etymology of words, &c.

7. That they be familiar with the elements of Mathematical, Physical and Political Geography, as contained in Dr. Sullivan's Geography Generalized.

8. That they possess a fair knowledge of Natural History as set forth in 1st section of 5th Book of National Series.

9. That they possess some knowledge of School Organization and Government, and the most improved methods of teaching the various branches of a Common School education.

First Class Candidates.

In addition to the above, it is required of candidates for First Class Certificates

1. That they possess some knowledge of the elements of English Composition, and of the principles of Criticism.

2. That they understand the use of the Terrestrial Globe and be able to work the exercises of any Elementary Book thereon, and be able to draw outline maps of any country or continent.

3. That they be able to do any exercise in Mental Arithmetic as far as Simple and Compound Interest, inclusive, and work on the slate the most difficult accounts in any department of Commercial Arithmetic.

4. That Female candidates be familiar with the simple rules of Algebra and be able to demonstrate any Proposition in the first Book of Euclid; that Male candidates be able to solve problems in Simple and Quadratic Equations, and to demonstrate any proposition in the first four Books of Euclid.

5. That Female candidates be acquainted with the elements of Practical Mathematics, and that Male candidates know thoroughly the rules for the Mensuration of Superfices and Solids, the elements of Land Surveying and of Navigation, as far as oblique sailing.

6. That they know well the leading outlines of Universal History.

7. That they be able to stand a thorough examination on the various branches of Natural Science and point out the utility thereof to the Educator.

8. That they possess a popular knowledge of the elements of Natural Philosophy, and especially of Astronomy.

9. That they possess a clear and definite view of the end of education, and the means to be employed for the accomplishment of that end.

Grammar School Candidates.

In addition to the above

1. That they be thoroughly acquainted with the highest departments of English Grammar and Composition.

2. That they possess an accurate knowledge of Grecian and Roman History, and of English History down to the present time.

3. That they be well acquainted with Ancient Geography.

4. That they know the first six Books of Euclid and highest branches of Chambers' Algebra, or one of similar character, and also a thorough knowledge of practical Mathematics and Navigation.

5. That they stand an examination in Greek and Latin on the following authors:—

In Greek Testament, the whole of Luke's Gospel and Xenophon's Anabasis, Books I. and II., Anacreon's Odes, Homer's Iliad, Books I. and II.

In Latin, *Cæsar de bello Gallico*, Books I., II. and III., Livy, Book XXVI., Virgil's *Æneid*, Books I., II., III., IV., Horace Odes, Book I., and be well acquainted with the rules of Prosody and able to translate from English into Latin Prose and Verse.

6. That the knowledge of any of the Modern Languages, whether French or Italian, or German or Spanish, will entitle the possessor to special honors.

7. That they be well acquainted with the elements of Chemistry, and especially that division of it known by the name of *Organic*.

PRESENT TERM.

This Institution commenced its Summer Term on the second Wednesday of May last. The first week was spent in the enrolment of the students and in their examination with a view to classification. The following Wednesday the formal opening Lecture was delivered by the Principal, who took for his subject the Nature, History and Benefits of Normal Schools. Immediately thereafter the regular business of the Session commenced. The following is a list of the students at present in attendance and the counties whence they came:—

YOUNG LADIES.

Miss Susan Johnstone—Colchester.
Caroline Mackenzie—Pictou.
Charlotte Fletcher—Colchester.

Bessy Gourlay—Cumberland.
 Amelia Archibald—Halifax.
 Mary Annand—Halifax.
 Harriet McCurdy—Halifax.
 Elizabeth Walker—Lunenburg.
 Catharine Archibald—Guysborough.
 Martha Dickie—Colchester.
 Christina Ross—do.
 Janet Crockett—Sydney.
 Sarah McLeod—Colchester.
 Nancy Barnhill—do.
 Mary Eliza Delaney—Colchester.
 Mary Ann Waugh—do.
 Jane Fleming—do.
 Mary Johnstone—do.
 Susan Bently—do.
 Sarah Bently—do.
 Maria E. Kennedy—do.
 Thirza Holton—do.
 Flora Dickson—Paying Pupil.

YOUNG GENTLEMEN.

Mr. Roderick McGregor—Cape Breton.
 John McLane—Sydney, C. B.
 John Ross—Inverness, C. B.
 Angus Ross—Colchester.
 Charles Archibald—Halifax.
 James Christie—Colchester.
 Ronald McQuharric—Inverness, C. B.
 John Chipman—Annapolis.
 Daniel Cameron—Pictou.
 John Cameron—do.
 John Gunn—Inverness, C. B.
 Jacob Layton—Colchester.
 Duncan Duff—Pictou.
 James Little—Colchester.
 Caleb Phinney—Digby.
 John Blackader—Yarmouth.
 Samuel Raymond—do.
 Charles Darby—do.
 James W. Fraser—Pictou.
 Benjamin Christmas—Hants.
 Somerville Dickie—Kings.
 John D. Bruce—Pictou.
 H. Doano—Shelburne.
 John Cameron—Pictou.
 Lewis McKeen (Agricultural Student)—Cape Breton.
 David Taylor (Paying Pupil)—Inverness.
 Edward McCurdy—Colchester.

MODEL SCHOOLS.

The usual Quarterly Review of these Schools will take place on Thursday, the 15th July. The next quarter will commence, after Holidays, on Monday, 16th August.

These Schools are conducted, as far as practicable, in accordance with the Training System originated by David Stow, Esq., Glasgow, furnishing a complete physical, intellectual and moral Education, along with an industrial department for girls. With the common branches of Education are taught Mathematics, Latin, Greek and French, Science, &c.

FEEES.

| | |
|--------------------------------|--------|
| Primary Department per Quarter | £0 6 3 |
| Intermediate do do | 8 3 |
| High School do do | 11 3 |

In and around Trero good Board and Lodging for Normal and Model pupils can be had at from 8s. to 12s. 6d. a-week.

GENERAL NOTICES.

As it is exceedingly desirable that the Statistical Report of Education for the current year be more full and accurate than heretofore, the Superintendent of Education begs to call the attention of Teachers to the necessity of ascertaining, in good time, the exact number of children of a school age, that is, between 5 and 15, resident within the District;

and of the Clerks of Boards to endeavour to find some trustworthy person, or persons, to attend to this matter in those School Districts where there are at present no Teachers.

The Trustees of the School Districts should lose as little time as possible in apprising the Clerk of the Board of School Commissioners of their having engaged a Teacher and when he commenced operations. When the Trustees neglect to inform the Clerk the Teacher himself ought to do so, whether he holds a License or not.

The Trustees of Grammar Schools are requested to forward to the Superintendent of Education duplicate copy of the semi-annual return of their school sent to the Financial Secretary's Office.

The Trustees of Schools and others desirous of obtaining Normal trained Teachers, either for Common or Grammar Schools, are requested to communicate with the Principal of the Normal School during the months of February or August, that is, a month before the close of each Term—giving, at the same time, a full statement of particulars regarding the schools to be supplied.

All advertisements of Trustees wanting Teachers, or Teachers wanting situations, will be inserted gratuitously in this Journal.

All information regarding Educational proceedings in any part of the Province, such as the examination of Schools, the erection of School-houses, Educational Meetings, &c., to be forwarded to the Editor by the end of every month to ensure their being inserted in next number.

Special attention will be paid to the communications of Teachers on any matter connected with their profession.

A WORD TO THE PARENTS OF NOVA SCOTIA.

In every movement touching the education of the rising generation, you are deeply interested. Upon you primarily and directly, has the Almighty and gracious Creator devolved the education of your offspring. This is the dictate of nature, ratified and ennobled by that of inspiration. And this education, need we say, is something more than the providing of suitable means for the growth or development of the physical frame, or for the promotion of the temporal welfare of your children; it is the cultivation and improvement of their intellectual and moral nature; and that not merely to fit and qualify them for some particular business, or vocation, or profession, but for fulfilling the great end of their being here, and thereby preparing and ripening them for a higher sphere hereafter. The instincts or laws of nature constrain you to care and toil for the bodies of your children. Nothing can be more beautiful or more praiseworthy than to see parents expending their energies, physical and mental, in providing the means necessary for the support of the bodies of their offspring, denying themselves personal conveniences and comforts for their benefit, for the advancement of their worldly prosperity. And yet after all, what is the body but the mere shell or casket, the integument or outer covering, enclosing a jewel of incalculable value,—a jewel which no creature or host of creatures can purchase— a jewel which makes man the very image of his Creator, naturally, and, by the application of the remedial economy, will also do so, morally. And if you labour and toil so much for the bodily welfare of your children, what ought you to do for their mental! If you are willing to make such sacrifices for the perishable part, how much more for the imperishable! If you are so interested in their temporal welfare, how much more ought you to be in their eternal! And just as mind is infinitely superior to matter, and the things of eternity to the things of time, so is your instrumentality in this field all the more lofty, and dignified, and encouraging. You may not be able to alter the stature of your children, or to change their physical sea-

tures, or to make one hair white or black, but who will venture to set any limits to your agency in the education of mind—in the expansion and enlargement of their intellectual and moral nature. The best laid schemes for the advancement of the worldly reputation of your children may be all in an instant dashed to pieces,—the means you have stored up, the thousands of gold and silver you have accumulated, may all be dissipated or turned into a curse; but if you proceed in a right spirit, with due humility and dependence, in the intellectual and moral education of your children, not an effort you put forth, not a fact or truth you communicate, not an impress you make, but will tell, and tell extensively, upon the whole of their future career, upon the whole of their immortal destiny. Like the little rill from the mountain, which, receiving one tributary after another, grows in volume and in rapidity, and swells, as it rolls on to the ocean, the mighty tide of its waters, so will it be with a sound and enlightened Christian education. Not only will your children, and your children's children, down to the latest posterity, reap the benefit of your instrumentality, but you will thereby bequeath to the human family a legacy vastly more valuable than the triumphs of the warrior, the discoveries of the philosopher, the achievements of mere natural benevolence, in the cause of distressed and suffering humanity; and as one age succeeds another will the results of your agency be widening and deepening, till they mingle in that universal chorus which will peel its strength and harmony in one unceasing strain throughout the bliss and brightness of the eternal day.

Let me then, with all respect, exhort you as parents to seek to realize your responsibility and your privilege. You may be careless and neglectful of your duty, through ignorance, and allow your children to grow up as they list, imagining that you have done all that is required, when you provide for them food and clothing. Or you may be aware of, and ready to acknowledge, to a certain extent at least, the obligations devolving upon you, but you are so much engrossed with your worldly avocations,—and all for the temporal welfare of your household,—that you have not a moment to devote to their mental improvement; and therefore you just allow them to share in the means that may exist around, satisfied that you have done all that is required of you, when you contribute your due proportion for the support of these means. Or you may profess, and that in no measured terms, the honored dignity and responsibility connected with the mental and moral education of your offspring, but you have not made a study of the subject, and you are therefore completely ignorant of the improvements of modern times on the matter of education. There are however Sabbath-School and Week-day Teachers, in every respect competent for the task, and with perfect confidence you hand your children over to them, without the least inquiry as to their mode of management, or as to their profiting by the advantages they enjoy. It is quite enough for you to know that they are at some school. But will these views and sentiments, will these apologies and exonerations rid you of your responsibility, or lessen the criminality of your neglect? Not one whit. As well might you attempt to break the link between the Creator and the creature, as between the parent and child. And while this relationship continues to subsist, the responsibilities and obligations arising therefrom must exist also. Would that Parents saw and felt all this as they ought! Would that they realized the obligation to provide the necessary food for the mind as much as they do for the body! Would that they believed that the Church and the State are alike dependent on them, as the nursery of training, and as the reservoir of supply; and as they are faithful and diligent in the discharge of their duty, so will the supply subserve the great ends of the body politic, and the body ecclesiastic. And have we not, my fellow parents, the most animating encouragements to give ourselves with energy, and zeal, and perseverance to this important work? We have the natural impressibility of our children to operate on. As it is in the vegetable and animal kingdom, so is it in the mental. We can bend with ease the young sappling, but what strength is required to bend the sturdy oak! We can train the young dog or horse to perform the most extraordinary feats—but when old, how feeble our

instrumentality. So is it with the tender mind. If, as has been said, man is a bundle of habits, when is his susceptibility in acquiring any habit greatest? Unquestionably it is in his more juvenile years. As then we train our children, so shall they be when they grow up to manhood and womanhood. But to encourage us yet the more, we have the blessing of the Most High tendered to us in the fullest and most unequivocal terms. Here, if anywhere, we have line upon line, precept upon precept, testimony upon testimony. As there is no relationship more endearing, so there are no duties to which there is attached a richer or more satisfying communication of heavenly support, than the duties springing from the relationship between parent and child.—And furthermore, if there is no agency so blessed of God, so there is none that brings a richer revenue of glory to the Supremo Being, or so pregnant with blessings to the human family. Parents of Nova Scotia, we earnestly solicit your sympathy and co-operation. We firmly believe that the system of education we are labouring to carry into effect, is based alike on nature and revelation, but without your assistance all our efforts will prove, in a great measure, nugatory. Let, however, our hearts and energies be united, and what, under God, may not be, what shall not be effected.

A WORD TO TEACHERS—MALE AND FEMALE.

Fellow labourers, it is for your benefit mainly that this Periodical has been started, and therefore it might seem almost superfluous to address you directly. Still there is, as you must perceive, a marked difference between the various duties and exercises of your profession, and your personal character. It is no doubt true that between the calling of any man, and his conduct, there exists the closest relation. This is especially the case in educational employments. Let the best system of education be adopted, if that system be not thoroughly worked, it will prove a comparative failure. And to work it thoroughly the operator must possess certain qualifications and attainments, along with an ardour of enthusiasm in his calling which no difficulties can quench, no disappointments can baffle. So satisfied am I of this, that ever since I entered upon the duties of my present office, I have spared neither time nor labour in enlisting your sympathy and co-operation in all my plans and projects, and in endeavouring to convince you that my highest desire has been to advance your usefulness and comfort. With the stereotyped Teacher, i. e., the Teacher who imagines that he has arrived at perfection in his calling, and who, class after class, and term after term, goes the weary round of his perfunctorial services—or the hiring Teacher, who has assumed that office for no other purpose than to obtain a piece of bread;—or the imbecile Teacher, who has betaken himself to the calling because he has failed in every other employment,—with the one or the other of these Teachers, I have no community of sentiment, and cannot conscientiously bid them God speed. But wherever and whenever I have met a Teacher who seemed to be possessed of any zeal in his calling, or any desire to improve himself professionally, I have endeavoured to stimulate and befriend him by every means in my power. And it is with the view of effecting this object more extensively, that I intend to address a few words to you, personally and directly, in every subsequent number of this journal, in the assurance that you will candidly test my counsels; and if they commend themselves to your judgment and conscience, that you will cheerfully and perseveringly aim at reducing them to practice.

And at this, the commencement of our written intercourse, what point can I more besittingly press upon your notice than the necessity of carefully examining yourselves, as to the motive that first induced you to undertake your present office, and by which you are still animated in discharging its duties. In other words, that, with all sincerity and faithfulness you individually put to yourselves the question,—“What manner of spirit am I of?” Am I engaged in my present work only for the sake of the emolument it may bring, or because of the sphere of usefulness it opens up? Have I enlightened

and enlarged views of the natural capabilities of the human mind, and have I anything like an adequate sense of the awful responsibility of being its educator? Do I look upon gold as the contemptible dross of earth, when compared with the imperishable gem which is to be polished and brought out into heaven's light, to shine for ever? Am I seeking the highest of all rewards, an approving conscience and an approving God, and keeping in their proper subordinate place all earthly rewards? Am I recognizing and reverencing the handiwork of God in every child, and labouring with the desire of being instrumental in training it to the highest attainment of which it is capable? These are questions of paramount importance for every Teacher to put to himself, not only at the commencement of his teaching career, but throughout all his subsequent labours. You will not suppose for a moment, after all I have said and done, that I undervalue natural gifts or attainments. These are necessary to constitute a successful Teacher, but these may be possessed, and possessed in no ordinary measure, and yet, if the true spirit, if the right motive is not there, the life, and force, and glory of the Teacher are wanting, and by consequence all his labours will be slavish, and all his intercourse with his scholars unprofitable. And, alas! how many of the teachers are in this situation! Is it not a notorious fact that too many resort to the work of Teaching, from the most unworthy motives,—such as the love of filthy lucre, or the consciousness of imbecility in any other business, or from mere personal convenience. Do not others, again, betake themselves to it as an entirely secondary object, for the purpose, it may be, of enabling them to prosecute their own studies, and of keeping up with their classes, or as a stepping stone to something more lucrative, to something beyond, and, in their estimate, higher in the scale of respectability? And do not many others engage in Teaching without duly considering the nature or the responsibility of the office, or without perceiving at all the necessity of making any preparation for the discharge of its arduous duties.

Let me then entreat you to consider and ponder what manner of spirit you are of. Realize the awful importance of the work, and the responsibility it involves. Come to its performance after you have sufficiently pondered its nature and its responsibilities, and devoted your best powers to a thorough preparation for its high duties. Above all, see that your motives when you enter the School-room be such as will be acceptable in the sight of God, when viewed by the light beaming out from his throne.

“ Oh! let not then unskilful hands attempt
To play the harp, whose tones, whose living tones
Are left for ever in the strings. Better far
That heaven's lightnings blast his very soul
And strike it back to Chaos' lowest depths
Than knowingly, by word or deed to send
A blight upon the trusting mind of youth.”

A WORD TO TRUSTEES, OR LOCAL COMMITTEES OF MANAGEMENT.

In addressing Parents, I urged and pressed the necessity of their doing their part in the furtherance of the Education of their children, that it is not only their paramount duty, but their highest interest, to labor, and, if need be, to make every sacrifice in order to provide for them an education adequate to their means. But it is impossible, in the very nature of the case, that the Parents of a school district or section, can, in their individual capacity, make the necessary arrangements for the accomplishment of this end. They can only act through the medium of representatives. Accordingly, our law provides for the appointment of three Trustees at least in each School section, whose business it is to take charge of the whole of the school property of the District, whether of buildings, or furniture, or books, or apparatus; to negotiate all matters with the Teacher, and to see that the engagement entered into is implemented;—in one word, to co-operate in every way with the Teacher, in carrying on the Education of the locality. It is for these and such like objects that you are selected by the inha-

bitants of the district. For the time being you act for them. You carry out to the best of your ability their desires and instructions. And who can fail to perceive the responsibility which this office imposes upon you, and the many and arduous duties it involves;—and yet is it not indispensably necessary? Without a vigilant Trusteeship the whole School Property, which may have been accumulated, at no small expense, will go to ruin, as may be seen in hundreds of cases. Without it the whole cause of education is at the mercy of circumstances—for there is no one to select a Teacher adapted for the locality; and if, perchance, one worthy of the name should pass along, he is scarcely settled when he resolves to move; just because he feels that there are none to uphold his hands in his many difficulties. Without a thorough Trusteeship there can be no advancement in the education of the locality; and are not all equally interested in this work, not only for the preservation of property, but for the whole industrial and social elevation of the community? And should not all this lead you to accept the office, and vigorously to discharge its duties? But you have higher motives and encouragements. You have the whole educational interests of the locality entrusted to you, and can there be a finer field of philanthropy, or a more important sphere of Christian usefulness? For the time being you are the representatives of education in the neighbourhood, and while you are striving to act for the benefit of all, you are but promoting the education of those who are near and dear,—it may be your own children. These considerations I would exhort you to ponder and weigh. I am not ignorant of the difficulties to which you are exposed, and especially those that arise from the indifference and lethargy of Parents themselves;—perhaps three-fourths of the district give themselves no concern about your proceedings. They may send their children or they may pay the appointed fees, but all the while they are wishing you to understand that they are conferring an obligation upon you. I know too, how often many of you are obliged to advance money in behalf of individuals, in order to keep faith with the Teacher, and that too without any certain knowledge of its ever being refunded. Let not these difficulties however, dishearten or discourage you—rather let them have the effect of stimulating you to more zeal, and to more insinching perseverance. Much has yet to be done to awaken right sentiments in the minds of the people, yea, of parents themselves, in the cause of education. Look upon all this, however, as but an extension of your sphere of usefulness. Labor for a higher reward than that of human gratitude; and this you shall not be without. Esteem it not only a duty but a privilege to be engaged in this work, and this will elevate you above all the unthankfulness you may meet; it will remove many of the most formidable barriers that lie in your way.

I believe that much, very much might be done in the various districts to facilitate your proceedings, and to render your position comparatively free from the annoyances with which it is beset. What is wanting is a more healthful tone of mind on the whole subject of education. Then would all be found as one united, determined band of brethren, furthering the great work. It shall be my aim, as it is my duty to labour in imparting such a tone. And in the mean time I shall crave the liberty of bringing before you, time after time, such observations regarding the importance, and the duties, and the honours of your office, as will, I trust, prove beneficial for your direction and encouragement. I feel perfectly confident that you will weigh well these observations, and do what you can to carry these suggestions into effect; and so be honored instruments in advancing the educational interests of the districts over which you are placed.

A WORD TO COMMISSIONERS.

I have now had the pleasure of meeting with the greater portion of you three times, on occasion of my educational tours throughout the Province, when I directed your attention to educational matters, either of a more general or local charac-

ter. I rejoice in the opportunity now afforded me of expressing to you publicly the satisfaction I have experienced by the interest you manifested in the cause of education, the readiness with which you listened to any suggestions that I may have had to offer, and your willingness to carry these into practical effect. I have often intimated to you the desirableness of some channel by which I might address you more frequently, and in a more permanent form. That channel is now opened up through this Monthly Periodical, and I trust it will prove of benefit to us all.

It appears to me that a local Board, presiding over the educational interests of a County, or a large section thereof, is a wise and judicious arrangement. If it is right and proper that the inhabitants of a school district should possess representatives to see after their individual and combined interests educationally, it is equally right and proper that the Government be provided with representatives, whose province it is to stir up the different localities, and to see that the intentions of the Legislature in the educational enactments are fully complied with.

But to be somewhat more particular, it is yours, first, To do all in your power to have the school districts carefully defined, and to insist upon the inhabitants meeting in a legal form for the appointment of Trustees. Secondly, To examine, and license, and classify the Teachers. Thirdly, To apportion the Provincial Funds placed at your disposal in accordance with law. And Fourthly, To carry out the intentions of the Legislature in regard to School Books and Library Books, and generally to aid in the promotion of education within the bounds of your Board.

And do not these weighty matters with which you are intrusted by the Province demand a great amount of educational zeal, of enlightened knowledge in the progress now making in this important work, of devoted philanthropy, of high-toned patriotism? Persuaded as I am that you are desirous to further the great cause of education within your own bounds, I shall take occasion, time after time, to direct your thoughts to the functions which the Province expects you to discharge, and shall with all faithfulness and frankness endeavour to point out the way in which this may be most efficiently done. In the meantime, allow me to press upon you the vast importance of your present position, and the obligation imposed upon you to dedicate a certain portion of your time every week to the furtherance of the cause of education. If you would just resolve to give one hour or so a week to the work, either in keeping your mind abreast with the views of the day, or in active employment, stirring up Trustees or visiting Schools, you would be perfectly amazed at the result in the course of one or two years. I know that most of you are busily engaged with your worldly calling, and that every moment of your time is occupied in looking after your farms and your merchandise,—and who does not highly commend your diligence? But surely you cannot be so overwhelmed with business, as by a little arrangement to spare the portion of time just indicated.

When I visited the neighbouring States as an educationist, I saw much to admire and to praise in the whole external machinery, in the commodious school-houses, in their nicely fitted furniture, and in the copious supply of Books. But there was one thing that struck me more than all others, and that was to find the busily engaged merchants in the cities of Boston and New York, dedicating an hour every day, and some of them two hours, to school visitations, to attendance at Committee meetings, &c. And why did they do so? Was it because they and their families were less dependent upon their commercial exertions and watchfulness? Or was it because an emolument was bestowed on them for their labours? Or was it because they were desirous to while away a few irksome hours? No, No! The grand reason was that these men were in some measure, at least, impressed with the conviction that there was real economy, substantial saving, in this course of procedure; that let them accumulate what they will, there was no security for their property, but in the industrial pursuits of the young; and that it was vastly more beneficial to their families, in a temporal point of view, to have education advanced, than to support Jails and their appendages, or a large constabulary es-

tablishment. And still more, these merchants saw clearly that the perpetuation and progressive improvement of their republican institutions, on which they had set their heart, depended entirely on the education, intellectual and moral, of the rising generation. Ponder these views and facts, and methinks you will no longer complain of lack of time, or begrudge a few hours every week. But I would have you to take a still more commanding platform. Is there no gratification arising from the expansion of intellect, from the elevation of the affections, from the exhibition of all the virtues and graces that adorn humanity? Is there no reward in the helping on of what is most significantly designated a fashioning and moulding process? Your consciences must compel you to answer in the affirmative. And has not Providence placed you in one of the most commanding positions, on high vantage ground, for lending your aid in the furtherance of these objects, in the accomplishment of an end so benignant and so glorious?

IV.—EDUCATIONAL INTELLIGENCE.

COLONIAL.

NOVA SCOTIA—PAST HISTORY AND PRESENT CONDITION OF PUBLIC EDUCATION.

THE first Act of the Legislature connected with Education was passed in 1811. The main feature of this Act was the granting of £25 per annum to every school sustained by a contribution of £50 from the people. This Act continued for fifteen years, when it was superseded by one passed in 1826, which provided a special sum for each county, to be administered according to certain conditions by a Board of School Commissioners. The sum of £2,600, granted in 1826, was raised in 1831 to £4000. This remained till 1845, when a Bill was passed the Legislature, which, with other provisions, granted the sum of £11,170 for the Common School Education of the country, with about £2000 for more advanced schools. This Bill continued in force till 1850, when another came into operation, and which is the one under which we are now acting. In this enactment the sum granted for common and advanced schools continued the same, but there was some additional grants made, such as £600 for the purchase of School Books for poor children and £500 per annum for School Libraries. Along with some other improvements this enactment made provision for the appointment of a Superintendent of Education. J. W. Dawson, Esq., of Pictou, now Principal of McGill College, Montreal, a gentleman possessed of no ordinary tact, rare sagacity, good business habits and high scientific attainments, was appointed to the office. Mr. Dawson's official visits throughout the Province imparted a mighty impulse to the cause of Education. At his instigation George Young, Esq., as chairman of Educational Committee reported a Bill to found a Normal School, which was thrown out on the third reading. Mr. Dawson continued in office for about two years, when he resigned. In 1853 substantially the same Normal School Bill was introduced into the House of Assembly by Samuel Creelman, Esq., the then Financial Secretary, and passed. Amongst other arrangements this Bill provided that the Principal of the Normal School shall be *ex officio* Superintendent of Education, and be released altogether from the inspection of schools. The present Incumbent was appointed to his office in 1855; and since then has lectured or taught on an average four hours every day during each session of the Normal School, visited almost the whole Province three times, delivered public Lectures on Education in all the most important settlements, held Teacher's Institutes within the bounds of each Board of School Commissioners—and, in the absence of Inspectors, visited a goodly number of schools.

The Normal School was opened at Truro in November, 1855. The attendance since then has averaged 100 Pupil Teachers per annum, and this without any encouragement from the Legislature save £100 for Scholarships to the most deserving students, which sum was withdrawn last ses-

sion of Legislature. About 140 of the Pupil Teachers have graduated, receiving either first or second class certificates; and of these about 120 are labouring as Teachers in different parts of the Province. The Teachers in the Normal School are—Rev. A. Forrester, D. D., Principal, who lectures on Education as a profession, on Natural Science, &c.; C. Randall, Esq., Teacher of English and Classical Literature; W. E. Mulholland, Esq., Teacher of Mathematics and Natural Philosophy; and Mr. Somerville Dickie, Teacher of Music. The whole annual cost to the Province of the Normal School, including the contingencies of office of the Superintendent of Education, is £900, being several hundred pounds less than any similar Institution in Britain or the Colonies.

Since the Normal School was opened a suite of Model Schools, as practising schools for the Pupil Teachers, has been built a few yards from the Normal College by a grant of £500 from the Legislature, supplemented by £200 raised by the inhabitants of Truro and neighbourhood. These Model Schools were opened in June, 1857, and are now attended by 200 scholars. There are four teachers—J. B. Calkin, Esq., Head-Master, Mr. H. Webster, of Intermediate, Miss Sophia Christie, of Primary Department, and Miss Jane Greaves, Teacher of Sewing, Knitting, &c. These schools are supported by Fees of scholars and an Endowment of £200 by the Legislature and £25 by Commissioners of Schools for the District. The whole current expenses to the Province of the Normal and Model Schools and Superintendent of Education, &c., are £1141.

Land for an Experimental Garden and Farm on a small scale adjoining the Normal School has been purchased, but no money has as yet been granted by the Province for carrying out this project.

In the Report of the Superintendent of Education for 1857 it is stated that the sum of £45,435 7s. 6d. was expended in payment of the salaries of Teachers of Common and Grammar Schools; £13,379 16s. 4½d. of that sum, by the Province and £32,055 11s. 1½d. by the people; making the average cost of each child receiving education 10s. 10½d. being for the people 6s. 7½d. and for the Province 4s. 3½d.; and the average salary of each Teacher £45 per annum: that there were 38,187 children receiving instruction, which, according to the last census, will give 1 to almost every 6½ of the population, or, according to the common increase since that time, 1 to about every 7: that the average time, in weeks, in which the schools were held, was, in winter, 18½, and, in summer, 21½, making as near as may be ten months in the year: that there were 273 schools in which neither Geography nor Grammar was taught, and 13 of the Common Schools in which Classics were taught: that there were 44 Grammar Schools in operation, attended by 1476 in winter, 1738 in summer, that those studying Mathematics and Classics were 1074, and that the support derived from the people amounted to £2,453 10s. 5d., and from the Province £818 14s. 9d.: that besides Mount Allison Institution at Sackville, N. B., there were six Academies receiving more or less aid from the Province: that including Gorham College there were seven Collegiate Institutions in the Province, all denominational: that, in winter, there were 905 Teachers, of which 655 were males and 250 females; and in summer 1099, of which 579 were males and 520 females: that 598 school houses were reported as good and comfortable, 171 as bad, and 186 as log school houses.

Under the present Educational Bill the Province is divided into 33 Boards of School Commissioners, who are appointed by the Government; the territory under each Board is divided into school sections or districts, presided over by Trustees appointed by the inhabitants of these districts.—The duties of the Commissioners are mainly these:—1st. To see that the school sections are properly defined; 2nd. To distribute the Provincial funds according to law; 3rd. To license the Teachers. The duties of the Trustees are mainly these:—1st. To take charge of school-house and property belonging to district, to select and to engage the

Teacher, to certify that the Teacher has done his duty, and to see to it that the terms of engagement with Teacher are fully implemented by the people.

NEW BRUNSWICK—PAST HISTORY AND PRESENT CONDITION OF EDUCATION.

This Province is divided educationally into counties, parishes, districts.

The Legislative Educational enactments of this Province did not assume any very definite shape till 1833, when an Act was passed authorizing the Sessions to appoint three Trustees in each parish, who were charged with the whole management of the Educational interests thereof. The inhabitants of each School District were obliged to pay £20 to the male and £10 to the female Teacher, which, being duly certified, entitled the Teacher to a similar amount from the Province. Another Act was passed in 1837, which was substantially the same as the preceding, with the exception of the appointment of a Board of Education for each county, whose main function consisted in examining and licensing teachers. In 1847 another Act was passed, with the following provisions—1st. A Provincial Board of Education; 2nd. The establishment of a Training School at Fredericton; 3rd. The classifying of teachers by Board according to their qualifications, and their receiving emolument from the Province according to the class they held; 4th. The appropriating of £1000 for the purchase of School Books; 5th. Teachers not availing themselves of Training School receiving £10 less than those who did. In 1852 all former Acts were repealed, and a new enactment passed which possessed the following new features—1st. The appointment of a Provincial Superintendent and a local Inspector for each county; 2nd. Provision made for the voluntary adoption of the Assessment principle; 3rd. A Board of Education as before with the Superintendent as Secretary; 4th. Trustees required to divide parishes into districts, to assist in providing school houses and procuring teachers; 5th. Allowing on an average £200 to each parish, and teachers where Assessment principle was adopted to have 25 per cent. over and above the allowance to teachers of the same class in other parishes; 6th. The establishment of a Training School at St. John. In 1854 another Act was passed, which merely altered one section of the preceding, fixing the following scale of salaries for teachers—1st class male, £37 10s., 2nd, £30, 3rd, £22 10s.; 1st class female, £27 10s., 2nd, £22 10s., 3rd, £17 10s.

We have before us the Report of the Superintendent of Education for the past year, from which we extract the following items:—There are 1120 school districts, but only 958 school houses, and of these 146 are vacant. The number of children attending school is 30,000, leaving upwards of 23,000 of school going age without instruction. The average time in which the schools have been in operation is 86 weeks. The number of male and female teachers 952, of whom 566 held third class licenses. The average salary of males £40 15s., and of females £25 2s. Of these teachers 208 are Episcopalians, 198 Roman Catholics, 148 Presbyterians, 144 Methodists, 237 Baptists, 5 Congregationalists, and 3 others. The sum granted by the Province to the 13 counties is £18,258, and subscribed by inhabitants £20,000, which with small sums derived from other sources makes the grand total of £38,637 12s. 9d. expended on parish school education. Besides this there is the sum of £6841 2s. 6d. expended on various Educational Institutions, which raises the total amount given by the Province for Educational purposes during the year 1857 to £27,889 11s. 6d., and makes the sum from all sources, £48,089 11s. 6d.

A new Educational enactment was passed by the Legislature of this Province on the 9th of April last. We shall give a synopsis of this Bill in our next. In the meantime we cannot omit noticing the ample provision made by this Act for the supervision of this department of the public service, and the noble liberality of the Legislature in the sup-

port thereof. Underneath is a list of the officers with the salaries attached:—

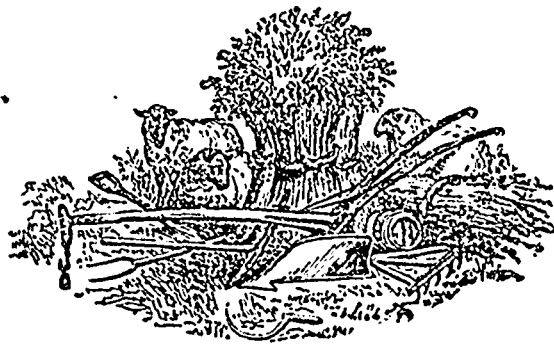
| | | | |
|--|-------|---|---|
| Chief Superintendent of Education | £300 | 0 | 0 |
| Contingencies of office, say | 150 | 0 | 0 |
| Clerk to Chief Superintendent | 150 | 0 | 0 |
| Four Inspectors of Schools | 1000 | 0 | 0 |
| Training Master | 250 | 0 | 0 |
| Model School Male Teacher | 125 | 0 | 0 |
| " Female do | 75 | 0 | 0 |
| Pupil Teachers at Normal School £6 each, attendance last year 81 | 504 | 0 | 0 |
| | £2554 | 0 | 0 |

Under this Bill the following appointments have been made by His Excellency the Lieutenant Governor, viz., Henry Fisher, Esq., Chief Superintendent of Schools; George Thompson, Clerk to the Chief Superintendent; Edmund H. Duval, Inspector for the counties of King's, Albert and Westmorland; John Campbell, Inspector for the counties of Queen's, Charlotte and St. John; James McLaughlan, Inspector for the counties of Victoria, Carleton, York and Sunbury; John Bennet, Inspector for the counties of Kent, Northumberland, Gloucester and Restigouche.

As the general Revenue of the Province has risen so has the Common School Service Grant. In 1853 it was £13,656 9s.; 1854, £17,526 4s.; 1855, £18,414 4s. 1d.; 1856, £20,639 12s. 1d.; 1857, £21,048 9s. 6d.

It is intended to pursue the same course with the other British Colonies, with Great Britain and Ireland, and with other countries, in subsequent numbers of this Journal.

AGRICULTURAL.



I.—THEORY OF AGRICULTURE.

AGRICULTURE VIEWED IN ITS RELATION TO SCIENCE.

Many seem to imagine that Chemistry is the only science that has to do with the pursuits of Agriculture. This is quite a mistake. It is no doubt true that the successful cultivation of the soil is mainly dependent on this Science, and especially on that branch of it known by the name of *Organic*. But there are other sciences on which skilful Agriculture levies a tribute, and from which it receives much support; and these are, principally, Geology, Vegetable Physiology, and Zoology. Indeed we know of few employments that invade so universally the kingdom of nature, or one in reference to which the application of science is so beneficially felt. One great object in this department shall be to trace this relation, and that not merely for the purpose of rendering the cultivation of the soil more productive, but still more for the purpose of exercising, and strengthening, the reflective powers of the thirty-five thousand of our population who are daily engaged

in this honorable calling, and thereby elevating and ennobling the whole of the economic and social fabric.

I. AGRICULTURE IN ITS RELATION TO GEOLOGY.

The Soil is the first care of the husbandman. This he tills, and cultivates, and weeds, and from this he reaps the reward of his labours. And whence are soils derived? They are, primarily and in their inorganic structure, derived from the disintegration or crumbling of the rocks on which they lie.—The air, the rain, the frost and other agents, tear down the solid rocks into very fragments, and convert them into soil.—But rocks are essentially different in their nature, both mineralogically and chemically. Some consist of granite, others of trap, others of clay-slate, and others of limestone, &c. If rocks thus differ in their nature, it is obvious that the loose materials which are formed by their decay must differ in like manner—must resemble in their nature and composition the rocks on which they rest and from which they have been derived. Hence the natural differences which are observable among soils of different districts—and hence also the striking similarities by which soils are sometimes found to be characterized over large areas. From the crumbling of the granite rock, for example, we have coarse, sandy soil, sometimes covered with a kind of black vegetable mould; from the trap, we have an open loam, usually reddish, rich and fertile; from the slate rock, a clay more or less cold, stiff and impervious; from the sandstone, an open and often a hungry sandy soil.—And what is the conclusion deducible from all this? It is obviously this,—a close, interesting and practically useful connexion between Agriculture and the science of Geology. I am a Farmer and am skilled in the rearing of stock or in dairy pursuits, or perhaps the bent of my inclination lies in the fattening of cattle by roots, or, it may be, I have had much experience in the growth of grain. I am desirous of immigrating to some unknown country, say New Zealand, where I wish to prosecute my favourite branch of Agriculture. And what am I in these circumstances to do? Am I to go thither and roam about, expending my time and means, till I fall in with the character of the soil most congenial to my prospective employment? There is not the slightest necessity for all this expenditure of time and means, if there is a correct geological map of the country. That map which, by its different colours, represents the areas covered by rocks of different kinds and ages represents also the general nature, capabilities and limits of the several soils to which the fragments of these rocks have given rise. And with this map before me, though thousands of miles away, I can select the very spot most suitable for my purpose; and for this I am indebted to the science of Geology.

II. AGRICULTURE IN ITS RELATION TO ORGANIC CHEMISTRY.

Not only are plants, stones and animals mutually dependent, they actually resemble one another in their nature, in their chemical characters. They all consist of two kinds of matter, to which chemists give the name of organic and inorganic, or combustible and incombustible. But they resemble one another far more closely than this. For instance, it has been found that a soil which is so naturally fertile that it will grow a long succession of crops, without any addition of manure, always contains in its inorganic part a notable quantity of ten or eleven different chemical substances. These constituents are potash, soda, lime, magnesia, alumina, silica, iron, manganese, sulphur, phosphorus, and chlorine. Soils which require no manure are thus constituted; and there are many such among the virgin soils of all our Colonies. Now, why must there be these ten or eleven substances in all fertile soils? It arises entirely from the fact that the plant, when chemically analyzed, contains nine or ten different substances, which are exactly the same as are present in the inorganic part of the soil. These substances are to be detected, in greater or less proportion, in the ash of all our cultivated crops, and they are wholly derived from the soil. As the plant can get these substances only from the soil, it is clear that the soil must contain them, if the plant is to grow in a healthy manner upon it.—But though every plant we cultivate, taken as a whole, leaves

an ash in which all the above substances are to be found, some plants contain more of one substance, and others, of another. Some contain more lime and magnesia, others more potash and soda, others more sulphur, or phosphorus or chlorine; and thus the general law appears to hold good, that under precisely the same circumstances one kind of crop will usually take up from the soil, more of one kind of inorganic matter, another crop more of another kind. And not only so, but as different parts of the same plant contain these substances in very different proportions, so will they take up more at one time in the growth of the plant than they do at another.

To secure, then, the full and vigorous growth of any one plant, there must be a complete adaptation of the contents of the plant to the contents of the soil. And how is the skillful Farmer to discover whether this adaptation exists? He must first of all chemically analyze the plant, in order that he may find out its ingredients and the proportion in which they exist. Then he must ascertain the nature of the soil, out of which he wishes to take the crop of the plant he has thus analyzed, and be guided accordingly. If the soil is deficient, he must make up what is wanting. If it contains any one substance in excess he must endeavour to remove it, or, at any rate, to counteract its influence. If it is generally exhausted, a manure must be added which shall contain and therefore convey to it an adequate supply of all the things which all our crops and all their parts conjointly carry off. If it is specially exhausted, the addition of one or more of these substances will be sufficient. So much for the relation which Agriculture bears to Organic Chemistry.

III. AGRICULTURE IN ITS RELATION TO VEGETABLE PHYSIOLOGY.

Vegetable Physiology, it is well known, is just a department of Phytology, or of the science of Botany. There are two views to be taken of any plant. We may either regard it in itself or in its relation to other plants. When we do so, in the latter sense, we consider it in its resemblances or differences to the other hundred thousand species of plants that have been discovered, and that for the purpose of classification, denominated Systematic Botany. When we regard the plant in itself, we consider everything appertaining to its structure, its organs, and the functions which these organs discharge; and this branch, generally speaking, is designated Vegetable Physiology. Now there are two classes of organs, those essential to vegetation or the growth of the plant, viz., the root, the stem and the leaf;—and those essential to reproduction or propagation, viz., the stamens and pistils. In reference to the organs of vegetation, it may be stated that whilst they are all indispensably necessary for the carrying on of the assimilative process, or the conversion of the crude juice into the living vegetable organism, in striking analogy to the digestive, the circulatory and the respiratory organs in the animal kingdom, they have each a certain office to serve. The root absorbs, in a state of solution, the mineral substances congenial to the plant, and acts as a reservoir of nourishment for the plant the following spring, especially in the case of biennial plants; the stem conveys the juices and serves as a support to the leaf, and, in exogenous trees, deposits that carbon, which is designed to accomplish such important purposes in Political Economy, in the whole manufacturing and commercial world; and the leaf, under the influence of the solar rays, changes the crude juice into the very nature of the plant, whilst, at the same time, it acts as a powerful exhalant and absorbent.

We have been led into this train of observation, with the view of eliciting the real use or office of the root. That organ takes up the substances which the plant requires, and this it does through the spongioles or rootlets. Every root, strictly speaking, has three parts, the rootlet or the small fibre, the middle or fleshy part, and the collar or neck. The most important of these is the small fibre at the extremities of the root branches, called, as already mentioned, the spongioles. These, by the power of capillary attraction, absorb the substances congenial to the plant, convey these substances, in a state of solution, to the vascular tissue, thence it is sent to the leaf through the attraction of the solar influence. Here we would beg the special attention of the reader to the elective power or instinct, if you

will, of these spongioles. It has been already noticed that whilst all plants possess the substances already enumerated, some require a larger proportion of one substance than another, and that one part of the same plant requires a much larger proportion of one substance than another; and that, if plants do not receive the substance essential to their growth, they will wither and decay, or, if they do not receive that particular substance that any one part requires, that part will be affected in like manner. Now how is the requisite supply administered, and that at the very time when the exigencies of particular parts demand? It is administered entirely through these rootlets, which seem to possess a marvellous elective power of receiving or rejecting according to the nature of the plant, pretty much in the same way that chemical elective affinity acts. An experiment was once made with the Elm, that most graceful ornament of our Intervals. A deep trench was dug around the tree, so deep that it penetrated beyond the rich alluvial soil which that tree required. The rootlets were soon to be seen, descending the sides of the trench, next to the trunk of the tree, till they reached the bottom; and, instead of piercing the stratum of soil there, they crossed the bottom of the trench and ascended the opposite side till they reached the very layer from which they had been dislodged. This surely is enough to show the relation which Agriculture bears to Vegetable Physiology.

IV. AGRICULTURE IN ITS RELATION TO ANIMAL PHYSIOLOGY.

Animal Physiology bears the same relation to the science of Zoology that Vegetable Physiology does to the science of Botany. Now, the several parts of the animal body leaves, when burned, a quantity of ashes. This establishes a general analogy between the plant and the animal. But the analogy is closer than this. For, first, the proportion of this ash, varies in different parts of the animal, as it does in those of the plant. The fresh bone leaves one-half of its weight, when burned, the fresh muscle not more than one-hundredth part. Yet, as in the case with the plant, the small proportion present in the muscle, is as essential to its constitution and healthy existence, as the large quantity in the bone. The composition of each part is specially adapted to the purposes it is intended to serve. But of what substances does this ash consist? It contains the same substances as are present in the ash of the vegetable food which the animal eats. There are found in it, potash, soda, lime, manganese, oxide of iron, oxide of manganese, sulphur, phosphorus, and chlorine. Thus the analogy between the soil, the plant, and the animal, becomes closer and closer at every step.

Looking back for a moment at the plant, we now see not only that all these substances are essential to the growth and existence of the plant, but why they are and must be so. In adorning and beautifying the earth, plants serve only a subsidiary purpose. It has, indeed, pleased the Deity to invest them with forms and colours, which are grateful and refreshing to the eye of man, but to impart this gratification is not the end or purpose of their being. Their function is to prepare and minister food to the animal races. Now this function they could not perform unless they contained all that is required to build up the several parts of the animal body. Is it not a beautiful provision, therefore, that plants should be unable to grow where they cannot procure that which it is their natural purpose and duty to procure for the animal. To the instructed ear the plant seems to have acquired a voice. "I need not grow here. I should be of no use if I did. I should only cheat the senses of the unsatisfied animals, exhibiting the semblance without possessing the substance of its natural food." The soil, therefore, must contain all the substances we have named, because the plant refuses to grow without them; the plant must contain them all, because the animal could not live unless they were present in the vegetable food. This, again, may suffice to show the connection between Agriculture and Animal Physiology.

We have now, as briefly as we could, indicated the relation of Agriculture to Science. We have only glanced at the more salient features of the subject. In subsequent numbers we shall resume the theme, and discuss it in all its varied details. In the mean time we adduce a few inferences, which may tend

to show the benefits arising from the scientific cultivation of the soil.

1st. It is clear, that if the principles in the foregoing remarks were reduced to practice, an immense amount of animal labour would be saved. The cultivation of the soil would then become almost as exact as the laws of combining proportion in the science of Chemistry.

2nd. Such a style of Farming would ensure a vastly larger crop of every kind of grain and esculents. And this again would affect the whole animal creation, adapting itself to the design of the Farmer in the management of his livestock.

3rd. It would enable the tillers of the soil of any country, to supply the wants of the inhabitants of the soil,—of the whole population, except in extraordinary cases of dearth or famine, which no wisdom, or foresight, or power of man could avert.

4th. This mode of procedure would dignify and ennoble all the pursuits of the Husbandman.

II.—PRACTICE OF AGRICULTURE.

By the practice of Agriculture we understand the giving effect to the principles we have already laid down. All that we may advance on this branch of the subject shall be brought under the two heads, *General* and *Special*. Under the former we shall comprehend all those employments of the Farmer that may be performed at any period that may best suit his convenience, though he should aim as much as possible at regularity and order in all his operations, as it is in this way he will not only accomplish the greatest amount of labour, but what he does will be most beneficially felt. Under the second head we shall embrace the work, that in ordinary circumstances, should be done during the currency of the month the Periodical is issued.—Here we shall have no lack of subjects, and hope to be able to throw out some hints that may prove of practical utility to the Farmer, thereby not only largely augmenting his temporal well-being, but elevating his whole social and moral condition.

We had prepared for insertion here an article on Surface Manuring, but want of space compels us to pass on to the special work of this month.

SPECIAL WORK FOR THE MONTH OF JULY IN NOVA SCOTIA.

Weeds.

The curse is still in process of fulfilment, "Thorns also and thistles shall it bring forth unto thee." The land must be poor indeed which does not at this season of the year produce an abundant supply of weeds, which, like the corrupt principle in the human heart, too often shoots far ahead of the crop sown. In Nova Scotia, whether in the fields or gardens, their growth is amazingly rapid; and, unless destroyed before the crop reaches any stage of advancement, bid fair to master it altogether. As the weeds, then, generally grow much quicker than the seed sown, it is of the greatest possible consequence to rid the ground of them even before the crop makes its appearance. As in the case of animals much, very much of their growth and perfection depends on the way in which they were treated or nursed when young, so is it with vegetables. If the weeds are allowed to grow till the plants are in an advanced stage, the soil is robbed of those very substances which the plant requires, and robbed at the very time when it is most needed. Besides, the plants being drawn up by the weeds, assume a spindly enfeebled form, which materially affects their whole future growth. It is therefore in every way necessary for securing a good crop that the weeds be carefully pulled out as early as possible after they make their appearance. Of course we here principally refer to those weeds that are annual. The perennial weeds, such as couch-grass, bishop-weed, &c., &c., ought, if possible, to be thoroughly cleaned out of the land before it is cropped; and, if this cannot be done, it were vastly better to allow the field to remain unoccupied, or fallowed and thoroughly worked during the summer. There cannot be a greater waste of time and means than to sow seed or cultivate the soil when it is foul or thickly studded with perennial weeds. It is neither doing justice to the seed,

nor the soil, nor the manure, and the produce at the end of the year will furnish but a poor remuneration for the toil of the Husbandman. It is otherwise, however, with annual weeds.—There is no way of extirpating them but by pulling them up or hoeing them out of the ground. Some think it enough to cut them down either with the reaping hook or scythe, but this is just to perpetuate the evil, by converting the annual into biennial plants. They ought to be thoroughly rooted out, and that, if possible, on their first appearance.

Hoeing and Thinning.

This is a matter of the greatest consequence in all green crops, and especially in the case of biennial roots. It does not matter how well the soil is cultivated, or how suitable the fertilizing media to the nature of the soil and of the crop, if the hoeing or thinning process is either partially neglected or delayed till too late.

1. **TURNIPS**.—This is of the greatest importance for the Turnip crop. If the Turnips are not thinned at the proper time, and the hoeing not judiciously attended to, it will affect to a far greater extent than is generally supposed the whole future produce. Now this process of thinning, to be done effectively, should consist of two stages. The first stage ought to be when the leaf of the plant is almost two inches in length. To facilitate this process, as well as to allow the air a free admission through the soil to the roots, the plough ought to be run up the drills, removing the earth about two inches from the young plants. This earth will thus cover the weeds between the drills, which, by decomposition, will enrich the soil. The hand-hoe should then be taken and the Turnips thinned about five inches apart. Some hoes are the exact width. When this is the case the work can be much more expeditiously gone about. The more the roots are loosened and exposed the better, as it admits a free circulation of air and urges the rootlets to push out and grow, and thereby to bring a greater supply of nourishment to the bulb, as well as to fix it more steadily in its position for future growth. When the plants have grown considerably, and the leaves begin to touch one another, it will then be necessary to give them another thinning, removing every alternate plant and thus leaving them about ten inches asunder. When the land is very weedy the horse-hoe should be run between the drills once before and once after the second thinning.

2. **MANGOLD WURTZEL**.—This is a most valuable esculent for cattle, and, from the large quantity of saccharine matter it contains, of special benefit to milk cows. If sown in drills, pretty nearly the same process may be gone through, as with the Turnip. As to the distance between plant and plant, much here as, in other cases, depends on the character of the soil. If it is rich and well fitted for the growth of biennial roots, containing a sufficient supply of the alkalis, the distance may even extend to fifteen inches with advantage to the crop. It is the worst economy to allow plants of any sort to crowd each other—much of the foliage is thereby deprived of the free current of the atmospheric air and of the solar rays, and the crop is neither so large nor so good.

3. **CARROTS**.—In the culture and management of the Carrot every means should be employed to render the soil as friable as possible. The oftener the plough and horse-hoe are run through the drills the better for the growth of the root. There is no necessity of thinning the Carrot more than 4 inches apart.

4. **PARSNIPS**.—This valuable root should be thinned as soon as the plants appear one inch above the ground. They ought to be eight inches apart.

5. **POTATO**.—This is the month for working the soil in which this most valuable esculent is growing, and the more thoroughly it is worked, the more productive will be the crop. Perhaps there is not a department in Agriculture where the labour of the Husbandman will be more amply remunerated than in the cleaning and cultivating of the young Potato plant. This arises from the very nature of the tuber itself. It is not, as many imagine, a root, but a subterranean stem, every eye, as it is called, forming a distinct bud. And what is every bud, whether on the stem or branch, but a distinct plant. What is every tree of the forest but a repetition or multiplication of buds.—

Now the bud derives no small portion of its nourishment from the atmosphere, and the more, therefore, that the eye or bud in the subterranean stem of the Potato is brought in contact with the air the larger and more nutritious will be the cellular tissue around. And what method should be pursued to effect this? The earth ought to be frequently loosened or stirred up, and raised high on the aerial stalk, so as at once to admit a free circulation of air and give encouragement to the formation of new subterranean buds.

C. HAY-MOWING.—Before another number of our Journal be issued, the time may have arrived, in the more early situations of the Province, for the cutting of the artificial grasses and preparing them for being stored in the Barns. A word or two had better now be advanced, touching the time that the grasses should be mown. Glaring mistakes are committed by not a few, on this point. Their great object seems to be to obtain a bulky crop, and therefore they allow their Timothy or Ryegrass to remain long after the flower has disappeared, evidently ignorant of the fact that what they gain in quantity they lose in quality. Every one acquainted with the laws of Vegetable Physiology, knows that the flowering process is exhaustive, arising evidently from the nature of the substance exhaled by the flower. The leaves of the plant exhale oxygen gas, and hence a copious supply of this supporter of animal life is thrown off into the atmosphere; and hence, too, the mistake that plants in the bed-chamber of a delicate consumptive person are, under any circumstances, injurious. The flowers, on the contrary, exhale carbon, thus depriving the vegetative organs, the root, the stem and the leaf, of a considerable portion of their strength, and especially of that substance which, in a climate like this, with its severe and protracted winters, is of peculiar value.—There cannot therefore be a doubt that the best time for cutting the artificial grasses is just when the flower-stalk has reached its height and is about to burst into blossom. It may not be very easy to fix that time, when the Hay Crop is made up of natural grasses, as is the case in almost all our Marshes and Intervals. But there is no such difficulty in the case of cultivated grasses or clovers. As, then, the Sugar-Cane Planter carefully observes the time when that valuable plant is on the eve of flowering and orders it to be cut, so ought the Farmer in reference to his Hay Crop. We may advert to the matter of Hay-making in our next. Let it suffice in the mean time to notice that the less the Hay is bleached by the rain or exposed to the evaporating influence of the summer sun, and that the greener it is lodged in the Barn, provided it be thoroughly dried, the more nutritious will it be for the cattle.

Want of space compels us to leave out altogether the Horticultural Department.

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