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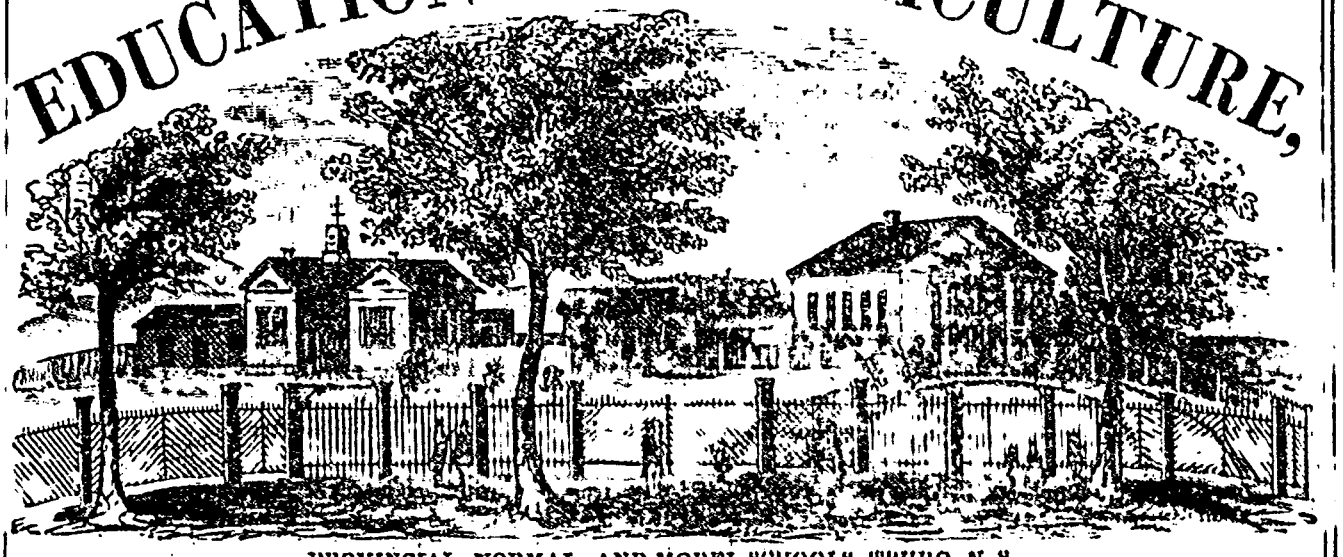

PROVINCIAL NORMAL, AND MODEL SCHOOLS, TRURO, N. S.

FOR THE PROVINCE OF NOVA SCOTIA.

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Vol. I. **Halifax, Nova Scotia, November, 1858.** **No. 5.**

EDUCATIONAL.

I.---THEORY OF EDUCATION.

PHYSICAL EDUCATION—TEMPERATURE OF SCHOOL ROOMS.

In the third number of the Journal, we discussed, at some length, the subject of the ventilation of school houses, and we would now offer a few observations on their temperature.—These two things are very closely allied, and have a direct bearing not only on the health and comfort of teacher and taught, but on the efficient discharge of their respective duties.—Were it merely the physical or temporal welfare of the parties concerned that were involved, the matter were of comparatively minor importance, but when it is recollected that the whole intellectual and moral culture of the young is essentially dependent on the ventilation and temperature of the school room, it assumes a very different aspect and demands the utmost possible care and attention. We have already seen how much the want of proper ventilation mars the whole efficiency of the school. Everything else may be well adapted for the accomplishment of the end in view—the teacher may be in every way qualified for his work, the scholars well disciplined and desirous of progress, the books, apparatus and other arrangements of superior order, but, if the ventilation is bad, all these advantages become comparatively useless. And so is it, to a certain extent, with the temperature of the school room. If it is either too low or too high, or very uneven, both the teachers and the scholars will be in a great measure unfitted for their work, and the objects for which the institution was established, will not be fully served, irrespective of any other injurious results.

What, then, constitutes the proper temperature of the school room, and how may this temperature be most perfectly and economically secured? are the questions before us.

The first question is very easily answered. The thermometer in a school room—and no school room should be without one—should range from 62° to 65°—that is, its minimum should be 62 and its maximum 65. This temperature will keep the physical frame in the most comfortable condition, and thereby give the mind full scope to do justice to itself. The grand point to be aimed at is evenness of temperature. This will require no ordinary amount of watchfulness, as the carbonic acid gas exhaled by the scholars, being about blood heat, will, in a very short time, produce the most marked effects upon the temperature of the room. These effects should be carefully noted and immediate remedies applied.

The next question, What is the best and cheapest means of securing an even temperature in our school rooms? is not so easily answered. If the school house is large and commodious, with several apartments, and capable of containing 300

or 400 children, there can be no doubt that pure air heated by a furnace is the best and cheapest method. But there are comparatively few such schools except in large and populous cities, where, we believe, this method is generally adopted.

In the generality of schools, however, the heating is either by means of an iron stove or of a common open fireplace.—And the question here naturally arises, Which of these means is to be preferred? We have no hesitation in stating in reply that, in our opinion, the iron stove is on the whole the preferable mode. It is, in the first place, much more economical than the open fireplace as ordinarily constructed. Where the latter is used, it has been estimated that nine-tenths of the heat evolved ascends the chimney, and only one-tenth is radiated from the front of the fire into the room. Besides, fourfold more fuel is required to warm a room by a fireplace than when a stove is used. Oxygen is of course consumed in a like proportion, and hence, when an open fireplace is used, there is necessarily a fourfold greater ingress of cold air to supply combustion than when a stove is employed. And what is of still greater importance, when a common open fireplace is used, it is next to impossible to procure a uniform temperature throughout the room. The cold air will be constantly rushing through every crevice at one end of the room to supply combustion at the other end, so that the scholars at one end will be suffering from cold, while those at the other will be oppressed with heat. All this may be obviated by the use of a stove. It can be easily set in a central part of the room, whence the heat will radiate, not in one direction merely, but in all; and if only one-fourth as much air is required to sustain combustion, as in a common fireplace, it will be readily perceived how a much more even and uniform temperature can be maintained.

But, notwithstanding the obviousness of all these statements, it is the opinion of some that iron stoves in school rooms are unhealthy; first, because they contaminate the atmosphere by reason of the carbonic acid that is emitted, and, secondly, because the aqueous vapour existing in the atmosphere, in its natural and healthful condition, is dispersed, and the air of the room becomes too dry These are no doubt great evils, and were there no means of averting them would militate very strongly against the use of stoves in schools, or in any other apartments. But they can be very easily guarded against.—To prevent the air in the room from becoming too much carbonized, all that is required is attention to the matter of ventilation, and this is indispensably necessary for the benefit of all, whatever is the kind of warming resorted to. Again, to supply the deficiency of the aqueous vapour, it is only necessary to place an evaporating dish, partially filled with pure water, on or near the stove, care being taken that this evaporation is not too copious, but in meet adaptation to the dimensions of the apartment.

It is clear, then, that the objections sometimes urged against stoves are altogether groundless—that they refer more to their abuse than to their legitimate use, and that they may with equal propriety be brought against any other means of heating, when that means is not properly attended to; and, therefore, that the position we have taken regarding the means of warming the school is a sound and safe one, that the stove is at once the best and cheapest in securing a uniformity of temperature.

In order to the accomplishment of all this, however, three things are indispensably necessary: First, The stove must be of the best construction; and, in size, adapted to the room it has to supply with caloric,—and the doors, the hinges or latches, and the pipes, must all be in good order. Secondly, The wood must be well seasoned and protected from the weather by a suitable wood-house. The principal reason why the stoves in our school-houses are so cracked and broken, and why the pipes are so rusty and open, lies in the circumstance that green wood, or that which is partially decayed or saturated with moisture, is used for fuel. There are at least three reasons why this is poor policy: 1st. It takes double the amount of wood. A considerable portion of the otherwise sensible heat becomes latent in the conversion of ice, snow and moisture into steam. 2ndly, The steam thus generated cracks the stove and rusts the pipe, so that they will not last one half as long as if dry wood from a wood-house were used. 3rdly, It is impossible to preserve an even temperature. Sometimes it is too cold, and at other times it is too warm; and this, with such means of warming, is unavoidable. It is thus clearly the interest, as well as the duty, of the Trustees of the school, not only to provide a thoroughly tight stove, but to see to it that an adequate supply of well-seasoned wood is stored up.

3. Another requisite for the securing and the preserving of an even temperature in a school, is, to use every means to prevent the admission of cold air through cracks or defects in the floor, windows and walls, causing it, even when stoves are employed, to be colder in the outer portions of the room than in the central portions and above the stove. This evil may be almost entirely obviated by a very simple arrangement, which will also do much to render ventilation at once more effectual and safe, especially in very cold and inclement weather. The arrangement is as follows:—Immediately beneath the floor—and in case the school-house is two stories high, between the ceiling and the floor above—insert a tube, from 4 to 6 inches in diameter, according to the size of the rooms, the outer end communicating with the external air by means of an orifice in the underpinning or wall of the house, and the other, by means of an angle passing upward through the floor beneath the stove. This part of the tube should be furnished with a register, so as to admit much or little air, as may be desirable. This simple arrangement will reverse the ordinary currents of air in a school room. The cold air, instead of entering at the crevices in the outer part of the room, where it is coldest, enters directly beneath the stove, where it is warmest. It thus moderates the heat where it enters, and, mingling with the heated air, establishes currents towards the walls, and gradually finds its way out at the numerous crevices, through which the cold air previously entered. If these are not sufficient for the purpose, several ventilators should be provided in distant parts of the room. This simple arrangement, then, provides for the more even dissemination of heat through all parts of the room, and thus secures a more uniform temperature, and, at the same time, provides a purer air for respiration, contributes greatly to the comfort and health of the scholars, and fulfils several important conditions which are essential to the most successful prosecution of their studies, and to the maintenance and improvement of social and moral, as well as intellectual and physical, health.

INTELLECTUAL EDUCATION—WHAT IT MEANS.

Though the human mind is one and indivisible, it is composed, like the body, of several parts, all intended for the performance of certain functions. These parts are usually regarded under the threefold classification of the Intellect, the Conscience, the Will, with the various Emotions. By the Intellect is understood that part of the mind which perceives, reflects, generalizes, remembers, reasons, imagines, &c.; by the Conscience, that part by which we are capable of moral obligation; by the Will, that motive force by which we are impelled to action. These again are made up of various attributes or states of being, or conditions of acting. The intellect, for example that part to which we are now more specially to call attention, exists in a great variety of states, performs certain important operations, and hence is spoken of as possessing certain powers, or faculties, or sensibilities. "For all practical purposes," says Professor Lyall, in his able treatise on "the Intellect, the Emotions and the Moral Nature," "there is no harm in speaking of the faculties of the mind, and of the mind operating according to certain faculties, in the way of discernment, comparison, composition, or, more generically, judgment. But more philosophically and simply the view properly is, that the mind, first by its own spontaneity and activity, and then according to certain laws, obtains its simple ideas, such as self, externality, matter, substance, with their varied properties—space, time, power: then, these ideas are *modified*, and we have the idea of *universal* space, *eternity*, causality *under all its phases:* we can limit or extend our idea of space *ad libitum*,—consider it as circumscribed by lines, and thereby derive the properties of figures, and construct the science of Geometry—divide time into periods, or consider it according to the observed motions of the heavenly bodies—regard the laws of motion and of force, and so obtain the mechanical sciences: and all this is just mind, one and indivisible in all its operations, regarding its ideas under those aspects in which they may present themselves to it, or may be capable of being considered—it is, in short, *intellection* operating in various ways, or intellection affected variously by limiting circumstances, supposed or actual." And, again, the same profound metaphysician thus observes, "We consider the mind possessed of *a spontaneous activity and inherent power*, by which our simple ideas are framed, products of the mind solely, and not indebted to sensation further than as the prompter or stimulant of mind: *that activity still in operation* gives us the modifications of our simple ideas, in which extended operation we see the laws above enumerated, and those principles of the mind—causality, generalization, deduction. We have the voluntary actions of mind, attention, abstraction. We have the state of imagination and the properties of memory and association."

Such are the views of the human intellect entertained by Professor Lyall, as well as by the most eminent metaphysicians of the present day, and no one, we think, who calmly reflects upon the nature of mind can fail to perceive their soundness and their philosophy. Nevertheless, as the Professor says, "For all practical purposes there is *no* harm in speaking of the faculties of the human mind", and as these are the purposes for which we here introduce the subject, it may be as well that we abide by the old mode of phraseology, as the one best understood and with which our readers are most familiar. Looking then at the human intellect as manifesting or developing itself by certain powers or faculties, there is no small diversity in the arrangement of these powers by writers on Mental Science. Among the most natural and the most simple classification is the one adopted by Dr Wayland in his Treatise on Intellectual Philosophy; at all events we regard it as the most useful for all educational purposes. That practical writer enumerates the following eight faculties and sensibilities as appertaining to the Intellect, namely, Perception, Consciousness, Original Suggestion, Abstraction, Memory, Reason, Imagination, Taste. These faculties are thus briefly defined:—

1. The *Perceptive* faculties are those by which we become acquainted with the existence and qualities of the external world.

2. *Consciousness* is the faculty by which we become cognizant of the operations of our own minds.

3. *Original Suggestion* is the faculty which gives rise to original ideas, occasioned by the perceptive faculties or consciousness.

4. *Abstraction* is the faculty by which, from conceptions of individuals, we form conceptions of genera and species, or, in general, of Classes.

5. *Memory* is the faculty by which we retain and recall our knowledge of the past.

6. *Reason* is that faculty by which, from the use of the knowledge obtained by the other faculties, we are enabled to proceed to other and original knowledge.

7. *Imagination* is that faculty by which, from materials already existing in the mind, we form complicated conceptions or mental images, according to our own will.

8. *Taste* is that sensibility by which we recognize the beauties and deformities of nature or art, deriving pleasure from the one, and suffering pain from the other.

This classification of the properties or qualities of the human intellect is exceedingly natural, and arranged in beautiful and strictly consecutive order. By the first three, namely, Perception, Consciousness, and Original Suggestion, we obtain, as by so many receptacles, all our knowledge—and by the others, the knowledge we have already acquired through these faculties is modified. Such are the properties of the Intellect, that part of man's mental nature under consideration. And what, it may now be asked, constitutes the education of this part of our being? or, What is intellectual education?—Understanding the word education in its primary acceptation, intellectual education consists in the drawing out, the unfolding, the developing and the strengthening of all the properties or constituent parts of the intellect. And how is this effected? First, by furnishing the food congenial to these parts, and furnishing it according to the order of their development. Secondly, by furnishing that food in such a way as that it shall be properly digested; or, to speak without a figure, by presenting suitable subjects to these faculties respectively, and presenting them in such a way as that these faculties shall be developed and strengthened, and rendered subservient to the purposes for which they were designed. This latter department of the subject is encompassed with no ordinary difficulty. In our estimate, it constitutes the problem, for the solution of which every sound and enlightened educationist should direct his best effort and talent. It plainly involves two points, the theory or the philosophy of the thing, and the practise or the mechanical process by which it is to be effected. As to the former, the main question is, What are the means best fitted

to secure the actual use or exercise of the faculties of the scholars on any given subject? We answer this question at once by saying, that the only way of securing this is by the teacher's descending to a level with his pupils, and borrowing illustrations or pictorial representations of the fact or truth or principle intended to be lodged in the mind, from objects or pursuits or things with which they are perfectly familiar. If the image is direct, and bears clearly and unequivocally upon the fact or truth intended to be elicited, the scholars will naturally draw their own inferences or conclusions. If it is not so, the scholars will soon give clear and explicit intimation by their inability to deduce the lesson designed; and in that case, the teacher must just levy another tribute on his analogical or imaginative powers.

As to the latter—that is, the mechanical process by which this principle may be reduced to practise:—This is most thoroughly effected by a process of questioning and ellipses.—By questioning, the teacher ascertains the amount of knowledge possessed by the scholars on the subject under consideration, and by consequence what he has, and what he has not, to communicate.—By ellipses, the scholars acquire the power of walking by themselves, or, in other words, of exercising their own faculties. The teacher allows them not merely to supply words or clauses about which there can be little doubt or difficulty, but whole sentences, or, it may be, paragraphs; and thus they proceed from the known to the unknown, from the easy to the difficult, from the simple to the complex, from the visible to the invisible, from the finite to the infinite, aye, and until they can think and feel and act for themselves, and the powers and faculties which their Creator has bestowed upon them, are capable of being directed to those subjects or objects of inquiry that may chance to come under their notice.

This we hold to be the meaning of intellectual education. It is something of vastly greater importance than the analysis of words, or the explanation of clauses or sentences, by which the scholars may obtain a clear understanding of the facts or truths intended to be set forth. This may be intellectual instruction, or the imparting of knowledge in such a way as that it shall be level to the understanding of the meanest intellect,—but it is not intellectual education. Intellectual education includes all this, but it includes a great deal more, even the enlarging and ennobling of all the faculties appertaining to the intellect—and the method by which this end is arrived at is just the method pursued by the Great Teacher, by Him who was thoroughly acquainted with the most latent principles of our intellectual nature, who, in all His discourses and revelations, not only propounded with authority great and important truths, but, by borrowing illustrations from objects and things with which his auditors were perfectly familiar, propounded them in a way admirably fitted to give exercise and expansion to the intellect, whilst it hedged them in to certain moral convictions and conclusions.

II.—PRACTICE OF EDUCATION.

PRELIMINARY REMARKS ON TEACHING THE ALPHABET.

If there is any truth or force in the axiom, "Whatever is well begun is half done," it is specially so in the teaching of the Alphabet. The fact of acquiring a knowledge of so many characters or signs, known by the designation of letters of the alphabet, is of itself of comparatively small moment; but when the situation and circumstances of the recipients of this knowledge is reflected on, it assumes a magnitude which can scarcely be over-estimated. It is well known that this is the first lesson which the young are generally taught; it is the first attempt whatever, on the part of parent or teacher, to cultivate the youthful mind, to unfold that delicate bud destined to bloom for ever; and as is the first sprouting of the germ, so will the vegetation be—as is the bending of the slender twig, so will be the direction and growth of the future bough.—Besides, this is an epoch in the history of every child.—This is a period to which he has been looking forward with no ordinary anxiety. Much, very much, of his future progress in learning, will depend on the impressions made at the commencement of his career. If the alphabet is taught in the usual mechanical manner, it will fail to awaken any interest in the mind of the child, and all, therefore, will be dull and flat and monotonous; and all the more, if this is the sole exercise—as is generally the case—through which he is made to pass for months. If, on the contrary, the child is treated in any respect in accordance with his nature as a thinking, moral being;—if the teacher accommodates himself to the degree of the development of his intellectual powers, if he adapts himself to the sensible imitative properties of his nature, then will the child respond to his instincts, his mental powers will begin to be bestirred, and that spirit of curiosity and inquiry awakened, which, as it is congenial to his native aspirations, so will the gratification yield the purest enjoyment.

Surely, then, such a step must be one of no ordinary importance, in the history of every child, demanding the utmost measure of skill and patient perseverance, on the part of the teacher. If, at any time, in the education of the young, experience and discretion are required, it is then. Three or four months' injudicious treatment at the commencement may not only greatly impede their progress, but awaken prejudices and disgusts which as many years of more skilful management will scarcely succeed in conquering. And yet how little is this heeded by too many parents and teachers! Do not many parents seem to imagine that it signifies but little how or by what means the Alphabet is taught; and hence it is, they unhesitatingly declare that any teacher is competent at this stage; and, accordingly, to cheapen the cost, they designedly select some raw and inexperienced youth. And is it not the case, too, that many teachers regard this as altogether a subordinate employment, one from which they would rather be set free, if the parents could be induced to relieve them of the trouble. And, indeed, this is little to be wondered at, considering the way in which this task is usually performed—pointing out the letters in succession at each lesson until they are learned—a way as tedious and uninteresting to the teacher, as it is irksome and stupifying to the little children. But without dwelling longer on the vast importance of beginning aright, we would lay it down as a general principle, that whatever is the general system of education that is adopted, it ought to be brought to bear upon the teaching of the alphabet, as well as upon every other branch; indeed, that that ought to be the corner-stone upon which the whole building is erected. Now it is well known, that the system we have adopted, and are endeavoring to propagate, is sometimes called the *natural system*, because it professes to teach children just as they are, possessed of body, intellect, and conscience,

in indissoluble union, and sometimes the *training system*, because it essays to develope and strengthen all the energies and powers of that combined nature by use or exercise—to reduce this system to practise in the case of little children just entering school, we must treat them as rational, thinking beings, and yet very much under the influence of their senses. To teach the alphabet, or any other branch, under these conditions, nothing must be done but what we can assign a reason for; and the more extensively we find access to the understanding through the medium of the senses, the more successful are we likely to be. This, then, at once discards the old fashioned style of teaching the alphabet, learning the names of the letters, as a stepping-stone to reading, as altogether irrational and unmeaning—and introduces the principle of teaching the sounds of the letters, a considerable time, at least, before the names. This mode, although not perfect, and subject to some difficulties, in consequence of the disproportion between the number of letters in the alphabet, and the number of elementary sounds in the English language,—there being but 26 letters and upwards of 40 elementary sounds,—thereby imposing the necessity of giving several sounds to the same letter. Yet upon the whole, it is the most natural and useful in many respects. The word HAT, for example, easily pronounced after a knowledge of the sounds of the letters is obtained, is puzzling to the child, when spelt *aitch, ay, tee,*—the names of the letters having no natural association with the sound of the word HAT. There is, it is true, a number of anomalous words, such as ROUGH, WROUGHT, &c., which are equally difficult, whether we follow the principle of names or sounds. The majority of words as they are pronounced, however, bear a closer affinity to the sounds than to the arbitrary names of the letters. Children, therefore, learn more quickly and more agreeably by their being trained according to the sounds than the names of the letters. The names may be taught in a few weeks after the commencement of their studies, and then both methods may proceed together. But not only is this the most natural course, it is vastly the most useful, as it forms the best possible preparation for what lies at the foundation of all good reading, of all genuine elocution, —we refer to the muscular exercise of the lingual organs. One of the principal reasons of the imperfections that obtain in reading is the want of the exercise of these organs in the acquisition of the art; and how is this to be remedied? In no other way, we apprehend, than by teaching the sound or force of the letter, whether it be a labial or a dental, a palatial or a gutteral, and by persevering in the exercise until these respective organs are strengthened and brought into vigorous operation.

With these preliminaries, we are prepared to take up the mode of teaching the alphabet according to our system, and this we shall do in our next.

III.—OFFICIAL NOTICES.

THE Superintendent of Education begs to call the attention of the Clerks of the Boards to the following intimations:—

1. That the Commissioners shall return to the Governor, on or before the 31st day of December next, a true account of the monies received and distributed by them, and a report of their proceedings, with such other returns as may be directed by the Governor.

2. That the Grammar School Returns for the two half years ending 30th April and 31st November be returned along with the general one.

3. That the Trustees of Academies forward before the end of December, to the Superintendent of Education, a duplicate copy of the report of their proceedings during the past year.

4. Will the Clerks state fully all they know about the division of their school section into school districts, and whether anything has recently been done by the Commissioners to make the division more perfect.

5. Will the Clerks be so kind as ascertain the exact number of children within each district capable of receiving instruction, that is, between 5 and 15 years of age. This is a matter of vital importance, as it is the only data whence we derive authentic information as to the quantity of education given.

6. It will be exceedingly obliging if the Clerks will find out the exact number of school districts within their bounds that possess no school houses at all, as well as the number that have school houses, but which are not tenantable in winter.

7. Will the Clerks state as correctly as they can the various Christian denominations to which the teachers within their respective bounds belong? There seems an unnecessary delicacy in the minds of some on this matter, as if it involved something inquisitorial. We see not how it should be accounted more so in Nova Scotia, than it is in New Brunswick or Upper Canada, and it is a matter of no small importance, bearing as it does so directly on the moral character of the teachers.

8. As it is desirable that the different educational institutions of the Province be fully reported, Dr. Forrester will be greatly obliged to the Secretaries of the different institutions to forward to him a full statement of the number of Professors and Students during the past year, the Income and Expenditure, &c., &c.

9. Are there any districts where the voluntary assessment principle for the support of schools is acted on, and with what effect?

A WORD TO PARENTS, AND ESPECIALLY TO MOTHERS, ON INFANT EDUCATION.

ISAAC TAYLOR, in his treatise on Home Education, divides the early life of man into the three periods of Infancy, Childhood, and Youth. The same able writer thus characterizes these periods:—

1. Infancy, embracing the period from birth up to the sixth year, is the period during which the *animal organization* of the mind is advancing more rapidly than at any other period of life. Infancy, therefore, is the season in which everything, so far as education is concerned, should be made subservient to the healthy growth and consolidation of the *Brain*. During infancy whatever might irritate or disturb the nervous system, is utterly to be condemned and avoided.

2.—Childhood, the second period of early life, embracing six years or seven, is the time during which the brain, having nearly reached its organic perfection, and ceasing therefore to be in a critical condition, the body—the muscular and osseous systems, and the digestive functions, expand, consolidate, and are or ought to be corroborated. Nature, therefore, still demands that our first cares be devoted to the welfare of the animal economy, and denies any such excitements to be addressed to the mind, as tend to disturb or retard the physical growth. Nevertheless the mind has now at its command a remainder or overplus of power, and it may therefore be wrought upon with advantage; for there is at our disposal some power of attention, and some intellectual motive; and while, during this flowering season, the plant should be kept in the sunshine of enjoyment, an initiation may be made, such as shall render the aftercourse of study less difficult by a degree of familiarity with the subjects it is to embrace.—As infancy is unconscious life, childhood is conscious life; and it is the season when the soul begins to recognize its individuality, and to inquire concerning its own well-being: it is now, therefore, that its free co-operation in the process of culture may

be secured, and that reflex sentiments springing from the experience of good and ill, may be brought into play, so as to enhance the man's own power, and to put it on the course of self control.

Youth, the third period of early life, commencing about the 14th year, extends beyond the time when the direct control of parents and teachers merges in the mind's rational control of itself, and when authority and implicit obedience give place to persuasion and moral influence. It is during this transitive period, and while the authority of the teacher is in full force and is yet conjoined with and is aided by the spontaneous energy of the pupil, that the arduous business of acquirement, in its various branches, and the strenuous processes of mental effort, are to be carried on."

It is on the first of these periods that we would, in a series of articles, now address to you a few observations. And in doing so I may say at the outset that I have no intention of saying a word on the physical treatment of your infants, save to insist on the benefit of plain and wholesome food and drink, regularly administered, of a copious supply of fresh air in all situations, and of cleanliness in all circumstances. It falls more within my province to bespeak your attention to the subject of moral and intellectual culture. I place *moral* first, not merely because it is foremost in importance, but foremost in order. At a very early period will your little ones present the most unequivocal proofs of their being possessed of a moral nature, capable of distinguishing right from wrong, moral good from evil, and along with this a belief in the existence of a Supreme Being. And it is to the culture and improvement of this part of their nature that you ought first of all to direct your attention. And what is the grand and most important lesson to be inculcated and carried out in this department?—It is *obedience*, instant, implicit and unreserved obedience.—This must be secured at all costs and all sacrifices. It lies at the foundation of all progress, both in the intellectual and moral department. It forms the main element of happiness to the little ones themselves, inasmuch as by reducing the number of their wants you add to the amount of their happiness. This obedience is all comprehended under requirement and prohibition. What is required and what is forbidden form the sum and substance of all obedience, and you must just be as strict and peremptory in the one as you are in the other. Be as cautious and slow as you may in making your demand, but when once made let there be no retreat, no resiling, let it be thoroughly and vigorously and perseveringly carried out. Satisfy yourselves that you are right in reference to the grounds of your refusal, and having taken your position adhere to it at all hazards. If you yield but once, you may take weeks, aye months, before you regain your authority. Consider well then before you act, and be firm. Let not the principle of personal convenience prevail, as in the case of the unjust judge mentioned in the parable. "And he would not for a while, but afterwards he said within himself, Though I fear not God nor regard man, *yet because this widow troubleth me*, I will arise and avenge her, *lest by her continued coming, she weary me.*" How often do we see and hear something like the following: "May I go and take an apple," says James to his mother in a peculiarly imploring tone. "No," says the mother, promptly and evidently without any reflection as to the decision she has made. James very composedly sits down, eyeing the countenance of his mother expressively, as much as to say, "I'll try you again soon." Before long he observes his mother quite busy with some other work, and he again pops the question, "May I go and take an apple out of the basket, mother."—Stung at the moment with impatience at the interruption, the mother answers instantly and emphatically, "No, no, James, you shan't have one." James still watches his mother's expression, and cannot discover there any signs of firmness, and he silently thinks to himself, "the third time never fails." So, after a minute or two, when the mother is somewhat puzzled with some difficulty, and is on the point of giving orders to a servant, he again asks, "May I go and take an apple, mother?" "Yes, yes, yes! do go along; I suppose you'll keep asking till you get it."

Now James goes and takes his apple, and then returns to philosophize upon this matter: "Don't believe she stopped to think whether I should have the apple, or not; therefore hereafter I shall never believe she really means no, when she says it. She acts without thought. I have also found that if I will but ask several times, I shall get it. So I shall know how to proceed next time." And what is the lesson to be taught the mother by all this? It is plainly this:—Carefully to consider the question addressed to her. Then let the answer be given mildly, but decidedly—"No, James." The very manner, quite likely will settle the question, so that James will not ask again. The answer once given should be firmly adhered to. In this way the infant would soon learn that "no means no," and that "yes means yes"—a matter of the greatest importance. But I cannot prosecute this subject farther at present. I shall resume it on some future occasion, and point out the necessity of combining example and training with instruction, and the motives that ought to actuate your bosom in the whole matter of the education of your infants.

A WORD TO TRUSTEES RESPECTING SCHOOL PROPERTY.

Every one knows and readily admits the benefit to the tradesman of a good workshop and convenient tools. Without these, however industrious and skilful he may be in his calling, he could neither do justice to himself nor to the piece of work in which he may be engaged. It is precisely the same with the schoolmaster. His workshop is the schoolhouse with the furniture thereto belonging. His tools are the text-books of the various branches of education taught, the blackboards, the maps, and the whole apparatus of external objects that may be required. Without these, it is impossible that he can carry on his operations with any measure of efficiency or comfort. It is therefore not only the bounden duty, but the highest interest, of the inhabitants of the district, to provide these for the Teacher, and after they are provided, to consign them to the charge of the Trustees lawfully appointed for the time being. As entrusted, then, with the externals of the education of the district, and acting as the representatives of the people in all educational affairs, I would earnestly bespeak your attention for a little, while I bring before you, as Trustees, a few of the duties of your office in all matters belonging to school premises. The moment, then, you are elected to the office of Trustees, you are the constituted legal custodiers of all the school property belonging to the district, and you are bound, in virtue of your office, to see to it that the same is preserved in the best possible order. For this end you ought, at the very outset, to take a correct inventory, both of the number and condition of the various articles,—get repaired what may have been injured or damaged, and, on consultation with the teacher, order any alterations to be made or any deficiencies to be supplied that he may consider indispensably necessary for carrying on with success his varied operations, and which may not involve any unreasonable outlay. After all has been done that is necessary with the schoolroom, furniture, ventilating and heating apparatus, the next thing that should be attended to is the *Blackboard*. It is not long ago since it was thought that a Blackboard was only required for a Grammar School or an Academy—that it was only of use to those who were considerably advanced in their mathematical studies. This is altogether a mistake. A blackboard is even more necessary for the initiatory than the advanced classes. Every one who has paid any attention to the progress of education, in more recent times, is aware of the fact that one of the improvements is the adaptation of the instruction given to the epochs of development in the human mind. Now, if very young children are more dependent on their senses than the adult, it is clear that they require a far larger amount of teaching through the medium of external objects, and in what way can objective teaching be imparted but by the Blackboard? All the Common Schools of the country should thus be provided with this instrument. It matters little as to the particular form or substance of this ar-

tick, whether it be a literal Blackboard, or part of the wall behind the teacher's platform, painted black, or a preparation in the cement of the wall itself, something that will serve this important end must be provided, and this may be done at no greater outlay than two or three dollars. The next thing you should attend to is Maps. The best way of teaching Geography is by outline Maps of any continent or country, and these drawn by the teachers themselves. Comparatively few teachers, however, possess the capability of drawing these outlines, and until there is a sufficient number qualified for this exercise, Maps must be employed. Every school should therefore, if possible, be provided with a Map of Nova Scotia, of the two hemispheres, and of all the continents. Almost all the schools in the Province have, at one time or another, been supplied with a certain amount of these maps; and what is the reason that when you enter into the school-rooms of the Province, you rarely find one or other of these, and if you do find any, they are sadly tattered and torn? The reason of this, in too many instances, is, I fear, laid at your door,—the door of the Trustees. The teachers know that their sojourn in the district is to be entirely temporary, 6 or 9 months, or, perchance, 12 months at the utmost. They therefore feel comparatively little interest in the preservation of the property of the school. It will serve their day, and that is all they care about. It is your special province not only to endeavor to provide the school-room with Maps, but to see that every requisite means is employed to preserve them from decay, and to charge the teacher for the time being with the entire responsibility of their care; and if any wanton abuse of the maps has taken place during the incumbency of the teacher, to withhold the supply till the damage has been repaired.—The only other thing that I can now notice as appertaining to your inspection, is the matter of text or school books. Nothing can be efficiently done by any, even the most skilful, teacher, unless the scholars are duly furnished with text-books, and every class should not only have the same book, but, if possible, the same edition of the book. Now, it may happen that some of the parents of the children may be unable to provide the necessary books, especially when they have a number of children attending school. In such cases, you should endeavor to get what may be required. The Legislature appropriates annually the sum of £600 for the purchase of books for the poorer localities, or for the more destitute children in any locality. A certain number of school books is sent annually, out of this sum, to the different boards of School Commissioners to be distributed in their county or section. You ought to see that the district over which you preside gets its fair proportion, and make application to the board accordingly. The first claimants of these books are the children of destitute widows; the second are the children of daily labourers with large families—and so onwards. The utmost impartiality should prevail in the distribution of these books. The intention of the Legislature in the grant is to aid the poor in educating their children; and therefore to give the books purchased therewith to all and sundry is neither more nor less than a perversion of the benevolent Act.

Such are a few of your duties in so far as the school property is concerned. And why do I plead with you so earnestly for the fulfilment of these duties. It is entirely because of the magnitude of the end in view, the more efficient intellectual and moral education of the rising generation. If the tradesman can perform a larger amount of work when his tools are in good order, and the work done of a vastly superior character, it is equally so with the teacher. It is yours to see after the providing of his tools. How deep then your responsibility and how high your privilege!

A WORD TO THE COMMISSIONERS OF SCHOOLS ON THE DIVISION OF THE COUNTY OR SCHOOL-SECTION INTO DISTRICTS.

This is one of your first and most important duties as Commissioners of Schools. The terms of the present educational enactment on the subject are to the following effect:—"The Commissioners, except those for the City of Halifax, may form new school districts, and sub-divide or alter the limits thereof, and of those now established; but no sub-division or alteration shall be made until after public notices of the intended sub-division or alteration, to be posted up for ten days at least within the district, and, after considering such objections as may be raised by persons interested therein." These are the powers committed to you by the law of the land, the legitimate and discreet execution of which involve, the most momentous results to the whole interests of education. On the occasion of the issuing of a new Commission, this ought to be the first point towards which the members thereof ought to direct their best energies. And every now and again there ought to be a revision of the same, owing to the great changes that are yearly taking place in many settlements of the Province. But the present defective condition of the school districts, with the remedies that may and ought in my opinion to be applied, is fully discussed in the last Educational Report I presented to the Legislature. The portion of that Report bearing on this subject I beg to subjoin, earnestly commending it to your calm and deliberate consideration:—

From the above table it will be seen, that, whilst there are twenty two returns in which the sections are marked, there are not less than ten in which they are not; and from which we may safely conclude, either that there are no school sections within the bounds of these boards, or that they are so indistinctly defined as scarcely to be worthy of the name. But even in those returns where these sections are given, there is too much reason to fear that, in not a few, the boundaries are not very accurately delineated, at all events, there does not seem to be any general principle established for regulating the division of counties, or the districts assigned the different boards of school commissioners, into school sections. Since 1826, the time when the present system of school boards came into existence, there does not appear to have been any authoritive revision or re-appropriation. The commissioners, it is true, under successive enactments, have been charged with a supervision of these sections, and, in several instances, have undergone no small amount of labor and of personal inconvenience to adjust matters, in certain localities. But they have naturally felt a delicacy in interfering, unless where the initiative was taken by the people of the sections themselves; and thus their instrumentality has been mainly directed to particular cases, to meet some pressing emergency, or to settle some local differences. In these circumstances, need we wonder that so much confusion and irregularity should prevail respecting the whole matter of school sections; that there should exist so many boards of school commissioners without any clearly defined school sections, and, what is worse, that, in not a few instances where the settlements are more densely peopled, or where villages may have sprung up or largely increased, there should be found two or three bodies of trustees, sometimes self-elected, and sometimes without any specific boundaries assigned them, all carrying on their operations quite irrespective of one another, and that, too, in what properly and legally constitutes but one section. This last mentioned irregularity has placed a complete arrestment on the whole progress of education wherever it has existed. It has broken down and frittered away into mere fragmentary schools what might have been one or two largely attended and efficient educational establishments. It has encouraged an inferior class of teachers, because of the inadequate remuneration afforded. And what has been the result? In those very localities, where, from the abundance of materials, education should have been in the most efficient and flourishing condition, both in point of quantity and quality, and shedding its benign influence over the whole surrounding country, there is it most sickly and languishing.

This matter demands from the legislature the most grave and earnest consideration, as little or no progress can be made in the common education of the country without some remedy being applied thereto. A careful and formal revision and readjustment of the school sections of each county ought to be effected, under the auspices and direction of some special local commission, and provision made for a repetition of the same every ten years. Whoever may be charged with this duty, whatever the discretionary powers given, they ought to have certain instructions for their general guidance and direction. The following are a few of the points to which, in my opinion, they ought to pay due regard:—1st. That, if possible, the section shall contain such a number of families as shall, generally speaking, furnish between 50 and 60 children capable of receiving instruction; 2nd. That the capabilities of the section to support, in point of means, an efficient school, be taken into account and well weighed, 3rd. That, in the allocation of any section, the

minimum ought to be three miles square, so that if he school house is placed pretty near the centre, the children will have about 1½ mile and a half to travel.—Horace Mann and Dr. Brereton, the two greatest educational authorities on the side the Atlantic, both deprecate the two great splitting up, *territorially*, of the school sections, and state, as the uniform result of their observation, that the children living at the greatest distance from the school house make the greatest progress.—4th. That where the population of a section extends to upwards of 75 and less than 150 children capable of attending school, arrangements ought to be made for providing two teachers—a primary and a more advanced. If the population is densely located, these two teachers ought to carry on their operations under the same roof; if not, the school houses may be situated at a proper and convenient distance, and still be under the same trustees, the same system, and the same mode of management. By this means the education would be much cheaper and vastly more efficient:—5th. That in towns and villages, with a population of school-attending children exceeding 200, these towns or villages should be divided into sections containing that number of children, and provision made for the erection of model schools in each, with three or more teachers, all carrying on their operations under the same roof and under the same head

IV.—EDUCATIONAL INTELLIGENCE.

COLONIAL.

NOVA SCOTIA—EDUCATIONAL VISITS BY THE SUPERINTENDENT.

Dr. Forrester has during the last *two* months held educational meetings at the following places.—New Glasgow, Pictou, Little River, Little Tracadie, Caledonia, St. Mary's, Guysborough, McNair's Cove, and Musquodoboit; and in Cape Breton at Plaister Cove, Ship Harbour, Whycocomah, Margaree River, Baddeck, St. Ann's, Boularderie, Sydney Mines, The Bar, Sydney Town, West Bay, Arichat. These meetings were all respectably attended, and the majority of them were crowded. They were all addressed on some department of the subject of education. The Superintendent of Education is more and more impressed with the conviction, by every tour of visitation, that the cause of education is slowly but steadily progressing, and that a deep interest is being awakened for its furtherance. All that is awanting is the appointment of a thorough staff of local inspectors, to impart shape and permanence and extension to this interest.

Dr. Forrester also held Institutes for the benefit of the teachers within the bounds of the Boards of School Commissioners of Northern and Southern Pictou, of Eastern Halifax, of Guysborough and St. Mary's, of Northern Inverness, C. B., of Victoria, C. B., and of Richmond, C. B.—Some of these Institutes were largely attended, and others comparatively thinly. The Superintendent desires especially to record his gratification at meeting again this year so many of the teachers of Southern Pictou at New Glasgow. There were about thirty in attendance, all of whom seemed to take a deep interest in the proceedings. It was the intention of the Superintendent to insert in the *Journal of Education* a list of the teachers who were present at this and the other Institutes he held, in order that Commissioners, Trustees and others interested in the cause of education might see what teachers are desirous of professional improvement. Seeing that the Legislature not only sanctions, but requires these Institutes to be held as frequently as it is consistent with the other duties of the Superintendent, it is plainly the bounden duty of every teacher receiving public money to be in attendance, nay, if he possessed anything of the spirit of his office, he would hail these meetings as a high privilege. These Institutes are neither more nor less than Normal Schools in miniature; and whilst they are admirably fitted to diffuse a fraternal feeling amongst the teachers, they are not less fitted to infuse into their minds greater professional zeal, more enlightened and advanced views on the theory and art of education, and thereby to bring about greater uniformity in the practise.

EDUCATION AND PROGRESS AT BEDFORD.

Rev. Dr. Forrester,—

Sir,—The only apology I offer for intruding upon the pages of your excellent *Journal* is, that I think there are facts connected with the Bedford school that ought to be known for the sake of the cause of education, and I know of no other person who will communicate them; they are at your disposal.

On Monday evening, the 2nd inst., I was called upon to preside at an interesting meeting of the inhabitants of this little village, to devise measures to continue the labors of Mr. G. W. Dakin, a graduate of the Normal School of Truro, who has established himself there as a most efficient teacher the year past.

Some remarks were made from the chair in reference to the object of the meeting, contrasting the difference between the present meeting and the one over which I had the privilege of presiding a year ago.

Then they were about to try an experiment, both in regard to the teacher and the system then introduced, as they were strangers to both. *Now* they were reaping the benefits of the year's labors,—hazarding nothing, as they were perfectly satisfied with the teacher from personal acquaintance, and well knew that a better investment of their funds could not have been made than in the expenses of supporting the school. Their attention was directed to the importance of continuing the school in which the teacher, children, parents, and all were so deeply interested—that a change would be extremely hazardous, &c., &c.

Mr. Dakin then made some touching remarks respecting the object he had in view in taking the school—the great responsibility of the teacher to whom is assigned the charge of young immortals, composed of physical, moral, and intellectual natures to be trained for time and all its responsibilities, and for eternity with its stern realities. He also stated with what interest and concern he had prosecuted the duties of his high vocations, and spoke of the endearing relationship existing between him and his pupils, and he could not think of relinquishing his interesting charge, &c., &c.

It was evident from the matter and manner of his brief communication that he largely possesses the soul of a teacher.

The meeting then passed a number of important resolutions with great enthusiasm, some of which I give you.

1st. That the school be continued another year.

2nd. That Mr. Dakin be the teacher.

3rd. That he receive £125, inclusive of Provincial allowance, for his services.

4th. That the salary be raised by voluntary subscription.

5th. That the salary be paid quarterly in advance.

6th. That they do all in their power to keep up the respectability of the school.

7th That there be suitable provision made for warming and cleaning the house—the contract taken by the lowest tender, the expenses of which to be paid proportionably by the scholars.

These (with others) were moved, seconded, and spoken to by a number of gentlemen present with telling effect, without a discordant voice.

Here is a *model* country school. The house, teacher, and the business-like manner in which the whole matter is attended to, is worthy of commendation, and a pattern worthy of imitation by many older and wealthier places.

I have great pleasure in visiting the school and in recommending it. There are no sore hands, sore heads, nor sorry countenances to be seen there. If any one wishes to make their little children intelligent and happy, let him send them there, or to a similar school if it can be found.

I believe in the natural system of teaching,—it is carried out there. This system is new in this country, but it is destined to outlive all others.

Ministers, teachers, and all interested in the cause of education, are invited to call and examine for themselves.

Wishing you every success in your great and important work, I am, yours, &c.,

T. H. Porter.

Sackville, November 3rd, 1858.

We take this opportunity of tendering our best thanks to Mr. Porter for his kindness in forwarding the above communication for insertion in the pages of the *Journal*. Mr. Porter is altogether unknown to us, but there is now a bond of connection between us, which time and personal intercourse will strengthen and cement. One great object we had in view in commencing this *Journal* was to furnish a medium for such communications; that others might be induced to go and do likewise, and so the cause of education have full and free course. Now that there are teachers endeavouring to act out the system, we would fain see them established throughout the length and breadth of the Province. Need we say how gratified we should feel to receive from the friends of education reports of these operations.

MILTON, NEAR LIVERPOOL, QUEEN'S COUNTY.

It affords much pleasure to announce that the inhabitants of this beautiful and thriving little village have agreed voluntarily to assess themselves for the support of education, and to raise £300 for this purpose. But they have done more, they have acted like men of understanding in the distribution of these funds. Like almost all the other villages throughout the Province, Milton was well nigh educationally eaten up by the number of small schools, all acting irrespective, and independent of one another. We are informed that they have determined to abolish this state of things and to concentrate all their forces on one large school, to grade the children according to their age and attainments, to place them under two or three teachers who shall all carry on the same system, both in the management of the school and in the whole character of the education given, the more initiatory teachers preparing the scholars for the more advanced. Never did the people of Milton make a better investment of such a capital. We believe that they shall receive sevenfold back into their own bosom, not only in temporal but in moral good things.

MUSQUODOBOIT.

This settlement, both Upper and Middle, has been for the last quarter of a century, distinguished for its intelligence and industrious habits. No one can travel from the one end of the settlement to the other, a distance of upwards of twenty miles, without perceiving the most manifest proofs of the truth of this remark. Three or four weeks ago we returned from a long tour throughout the Eastern Counties, including Cape Breton, and finished off in Middle Musquodoboit, and we saw about double the quantity of ploughed land here to what we witnessed in any other settlement; and, besides, we observed a number of Farmers engaged in that first of all improvements in Agriculture—drainage. The leading road in the settlement is of a superior character. Originally well made and well kept, we question whether there is to be found any where in the Province the same number of miles of road in such order, and that too entirely supported by Statute Labour. A variety of causes has no doubt contributed to this state of things. One of these is evidently the advanced state of Education in the settlement. For the last twenty years or so, the settlement has been favoured with a succession of eminent and successful Teachers, who have been instrumental not only in diffusing enlightened views on the subject of education, but on other kindred topics. In confirmation of this we have only to refer to the superior style of several of the School-houses. Witness the one in the Upper Settlement in which Mr Colquhoun recently taught, and still more a new one in progress of erection in the Middle settlement. In the last mentioned edifice there was a Soiree held on the 11th inst., at which we happened to be present, and never did we attend a Meeting so well sustained throughout, by the admirable tact of the Chairman, and by the excellence of the speeches and the music,—not forgetting the good and substantial tea and desert that were served up. The chair was occupied by Mr Thomas Sedgewick, Student in Divinity, and the meeting was addressed by the Rev Mr Sedgewick, Messrs. Deehman, Elnakim Archibald of Tatmagouche, McCurdy, Kent, and by the Rev Dr Forrester, Superintendent of Education. The peculiar charm of the meeting was the free and easy interchange of sentiment that prevailed, rendering it truly a social meeting in all its aspects. But the fabric, however important, is only the shell of education, the kernel is the style of education imparted—and the inhabitants of Musquodoboit are fully alive to all the advantages arising from the Modern improvements in the science and art of teaching, and to the importance of maintaining the Normal School in a state of high efficiency if the cause of popular education is to progress. Accordingly, they have contributed their due quota of Normal Students, and are extending their encouragement by employing their services in the different schools of the settlement, and we are glad to add with some measure of success. The Editor of the Journal had recently a communication from the Rev John Sprott, a true veteran in the cause of Education, and who, octo-genarian though he be, is still labouring to extend its blessings along the Eastern Shore, from which we make the following extracts.—"I think that the Normal School Teachers are rising in favour in Musquodoboit. Mr Archibald, from Truro, has successfully cultivated a piece of rough ground at Little River, and raised the School at that place to a high degree of efficiency. The Teacher at the head of Musquodoboit from Cape Breton, has won an honest reputation by active labours. A Miss Archibald from Stewiacke has broken up a virgin soil in a poor district at Bennie's Brook. I was astonished the other day to see the activity and energy which this young woman had introduced into the School, and the great progress which young children had made in Geography and Scripture Reading."

OPENING OF THE WINTER SESSION OF THE NORMAL SCHOOL.

This Institution was opened according to announcement on Wednesday, the 10th instant. The three first days, as usual, were occupied with the enrollment of the names of the pupil-teachers and with the testing of their attainments in the common branches of education. Monday the 15th, and Tuesday the 16th, were also occupied with preliminary work in the various departments, each teacher exercising the whole at one and the same time. On Wednesday, the 17th, the formal opening of the Institution took place by the delivery of a Lecture by the Principal. The subject of the lecture on this occasion was, "*The Office of the Teacher.*" After a few introductory remarks Dr. Forrester proposed to bring under the consideration of his audience the following topics:—1st. The nature of the office itself; 2nd. Its responsibilities; 3rd. Its importance and usefulness; 4th. The high qualifications it demands, and the duty of diligent preparation for their attainment; 5th. The condition of education at this moment in the Province, and the peculiar difficulties and encouragements of the Teacher. These points, embracing such an immense range of thought, the Doctor merely glanced at. But it is earnestly hoped that both from the appropriateness of the the theme and the seasonable observations made, the students in attendance have been fired with professional enthusiasm, and that they will prosecute their studies with unwearied diligence and success. After the delivery of this lecture, the students were all classified into three divisions and commenced their work straightway. It has been wisely and judiciously arranged by the Directors of this Institution that one week's grace shall be allowed for the admission of students. On the expiry of that time the doors are shut, and none are afterwards admitted without their names being submitted to the whole of the pupil-teachers, the reasons of their lateness stated, and the sanction of the whole school for their admission obtained.

It must be cheering and encouraging to the friends of education generally, throughout the Province, to be informed that there are not less than twelve more pupil-teachers in attendance this Term than have ever been on any former occasion.

The following is the list of the names of the students already enrolled, with the counties to which they belong. It is supposed that there are three or four more on their way from Cape Breton, who have been detained by the weather or some other untoward circumstance.

YOUNG LADIES.

Miss Elizabeth Steele—Halifax.
Elizabeth Walker—Lunenburg.
Thurza Dodson—Colchester.
Ann Miller—Pictou.
Nancy Archibald—Colchester.
Bessy Gourlay— do.
Susan Johnston— do.
Mary Johnston— do.
Sarah McLeod— do.
Mary Annand— do.
Nancy Birnhill— do.
Martha Campbell— do.
Mary Ann Waugh— do.
Mary Jane Cox— do.
Mary Jane Campbell— do.
Emma Page—Cumberland.
Sarah Johnston—Colchester.
Hannah Upham— do.
Jessie Archibald— do.
Sarah Jane Dawson—do.
Letitia S. Crowell—Shelburne.
Emma Homer— do.
Sarah J. Bishop—Sydney.
Sarah A. Wilson—Halifax.
Annie S. Leizer— do.
Isabella Muir—Colchester.
Martha Stewart—Pictou.
Susan Waddell—Hants.
Eliza Jane Thomson—Hants.
Annie K. ithladdo—Colchester.
Agnes J. McCurdy—Cumberland.
Jane McLeod—Pictou.
Margaret C. O'Brien—Hants.
Jane Elliott Creighton—Pictou.
Jane Reid— do.
Elizabeth Stephens—Colchester.
Jane Gammell— do.
Anna P. Beebe—Cumberland.
Margaret J. Murray—Colchester.
Annie W. Kennedy—Inverness, C. B.
Mary Allan—Shelburne.
Eleanor Johnston—Colchester.

YOUNG GENTLEMEN.

Mr. Nathaniel Hill—Lunenburg.
James Ross—Colchester.
Donald McLeod—Cumberland.
John Shaw—Richmond, C. B.
George Shaw— do.
William Ehler—Hants
Robert Henry—Halifax.
James C Forbes—Inverness, C. B.
Campbell Stewart—Halifax.
Charles Khelnorth—Lunenburg.
Neil M. Mullen—Victoria, C. B.
Allan M. Mullen— do.
John Macdonald—Cape Breton.
Edwin McNutt—Colchester, C. B.
Robinson Cox— do.
Frederick Lawrence—Inverness, C. B.
Angus Macdonald—Colchester.
George Ross— do.
James Little— do.
David Taylor, (Paying Pupil)—Inverness, C. B.
James Christie—Colchester.
Angus Ross— do.
John Chipman—Annapolis.
Richmond McCurly—Colchester.
Roderick McNeille—Inverness, C. B.
Malcom McKinnon— do.
John McKinnon— do.
Alexander McKay—Colchester.
Mr. Allan McLean—Inverness, C. B.
Murdoch McKinnon, do.
Peter Campbell— do.

From the above list it will be seen that there are thirteen counties out of the eighteen represented at the Normal School. It is matter of regret that there are still so few from the Western Counties. We receive numerous applications from these counties for Normal Trained Teachers, and we do what we can to supply the demand, but it is impossible for us fully to meet that demand unless the Commissioners, Trustees, Parents and others in these counties, interested in the cause of education, exert themselves more vigorously to send to Truro the more promising and talented of their young men and young women to be trained. We do not see how the distance of these counties from Truro should operate in preventing their attendance, seeing that there is provision made in the Normal School Bill for the defraying of the travelling expenses; besides the distance is as great from many places in Cape Breton, and yet that does not seem to put any obstruction in the way of the attendance of the pupil-teachers in these regions.

V.—REVIEWS OF SCHOOL BOOKS.

FOURTH BOOK OF LESSONS OF IRISH NATIONAL SERIES. Baltimore: J. B. Thomson & Co. Halifax, N. S.: A. & W. Mackinlay, 1857.

It is well known that the Legislature of Nova Scotia, with the view of bringing about greater uniformity in the School Books of the Province, has sanctioned the introduction of the Irish National Series as the cheapest, and the freest from allusions to denominational differences. Objections have been made—and, we think, not without foundation—by several Boards of School Commissioners, to the Fourth Reading Book of the Series, because in the Geographical Department so little was said about British North America, and even that little in some respects incorrect.—To obviate these objections it was deemed advisable to publish a new edition of this number of the series, giving a more accurate and detailed account of Canada, New Brunswick, Nova Scotia, Cape Breton and Prince Edward Island; see pages 135, 136, 137. The above edition is the only one containing this account.

AGRICULTURAL.

I.—THEORY OF AGRICULTURE.

In previous numbers we have discussed the subject of soils in general. We have also referred to the division of the soils of Nova Scotia, in Principal Dawson's valuable Treatise, under the following heads:—1. The soils of the Metamorphic

District of the Atlantic Coast. 2. The soils of the Metamorphic Districts of the inland hills, embracing the Silurian and Devonian systems. 3. The soils of the Carboniferous and New Red Sandstone Districts. 4. The Marine and Pure Alluvia, or Marsh and Interval Soil. 5. Bog soils. Of the first and second kinds of soils, their treatment and productions we have already furnished some extracts from the publication referred to. We proceed now to the others, arrayed as they are in groups, corresponding to the distribution of the underlying rocks.

SOILS OF THE CARBONIFEROUS AND NEW RED SANDSTONE DISTRICTS.

These occupy the low country of Cumberland, Colchester, Pictou, Hants, King's County, Annapolis, Guysborough, Sydney, and the counties of Cape Breton; and in some places rise on the flanks of the hills. I group together the soils of these two formations, though geologically very distinct, in order to avoid troublesome geographical distinctions. They include, however, a great variety of soils, which may be arranged under the following heads:

1 Loamy and marly soils of the carboniferous system. These usually occur in the vicinity of the large deposits of limestone and gypsum, which are found in so many parts of our Province. As examples, I may mention the soils of Mabou, Whycocomagh, Long Point, Middle River, Bedeque, Boulardarie Island, (North end), Red Islands, Irish Cove, and other parts of the low land of Cape Breton; Antigonish, South River, Merigomish, part of East and West Rivers Pictou, River John, Cape John, Tatamagouche, Gulf Shore of Wallace, Wallace River, Pugwash, and various places thence to Minudie: much of the South of Colchester, and North of Hants, especially Stewiacke, Shubenacadie, Newport and Windsor, Gay's River, and parts of Musquodoboit River. In all these localities, and many others, the prevailing soil is a sandy or clay loam, of reddish colours, well supplied with lime, gypsum and phosphates, and deserving the character of a first class upland; though in some of its more tenacious varieties, more thorough draining than it has yet received is required. Professor Johnston characterizes the lands of this description in New Brunswick, as equal to the best upland of any country.

It is worthy of mention, that this description of soil is often covered with mixtures of hemlock, spruce, and hardwood, though often, also, with fine hardwood forests; and in some districts, forest fires have produced an appearance which causes its value to be much underrated.

Valuable though these soils are, there is often too good reason to perceive, that by the wretchedly exhausting system of cropping too often pursued, they have been reduced to absolute sterility. In such cases, subsoil ploughing would often do much to restore them; and it generally happens that lime, gypsum, marl, swamp and sea mud, are not far distant, and if applied liberally with vegetable manures, would do much to restore fertility.

2. Clays, sands, and stony grounds of the carboniferous district. These are light coloured or reddish stiff clays, white and grey sands, and ground filled with flaggy fragments of hard sandstone, or occasionally with pebbles or other rocks. These varieties of soil are scattered very irregularly over the carboniferous district, depending on the nature of the neighbouring rocks, which may be shales wasting to clay, soft sandstones, or hard flaggy sandstones and conglomerates. All these soils are much inferior to the class last described, though they often occur in its close vicinity, or intermixed with it.

Many of the clays of this class, though stiff and cold, are strong and productive when drained. Lime, coal ashes, peat compost, and sand, or sandy marls, improve them very much, and may often be applied at small expense; attention to drainage is, however, a main point in their cultivation.

The lighter lands of this class are often very poor, and are deficient in almost everything that contributes to the fertility of the soil. Nothing, in short, in the way of manure, will come amiss to them; though the farmer must consider whether it be worth his labour to attempt their improvement. I have, however, known many patches of such light sandy or gravelly land, by the continued application of mineral and vegetable manures, converted into very productive and very early and sure land.

The stony soils of this class are often very forbidding in their aspects, and sometimes quite useless. In some places, however, I have observed that the stones occur principally at the very surface, and have beneath them good and deep loam. In this case the stones may be built into walls, and leave usually a very large and productive soil.

3 Loams, and sands of the new red sandstone. These soils are limited to the country bordering on the Bay of Fundy. They occur near Truro, and in a band skirting both sides of Cobequid Bay.—They also occur at Salter's Head, Barn-cote, and other places on the northern shore of Hants; and more extensively in the valley of Cornwallis, and thence toward Annapolis. They are generally of a bright red colour, and vary from loams, to sandy loams, and light sands—the latter being sometimes of a whitish colour The red loams and sands abound in oxide of iron, lime, and gypsum, except when run out. They are, however, often deficient in phosphates and *alkalies*. Hence, while they are admirable for the culture of the apple, potato, and Indian corn, they are inferior as grain soils to the best soils of the carboniferous and silurian districts. A notable instance of the lightest sandy lands of this class occurs in Aylesford. Such land requires the same treatment with the light sands, of the last described class. The bog mud of Aylesford, if carted on the sand, would do much toward enriching it; and the bog would be at least equally benefited by a dressing of sand. The lightness, earliness, and great natural draining of soils of this class, in Nova Scotia and Prince Edward Island,—in which latter country they occupy a large area,—make them very desirable to new settlers. It is questionable, however, if—except for the culture of fruit, potatoes, and corn—they are as valuable as much of the heavier land, which is less esteemed. The improvement of agriculture in most countries, adds to the estimation in which heavy lands are held.

4. Soil of the trap district. This is confined to the North Mountain of King's and Annapolis, and its prolongation in Digby, and to a few isolated patches on the opposite side of the Bay. It contains all the chemical elements of fertility, bears a fine natural growth of timber, and yields good crops to the new settler; but is said to fail rapidly under tillage. This must depend either on mechanical defect, in relation to absorption of moisture, or on wasteful management on the part of the cultivator. It is at least admirably adapted for pasturage, and its chemical composition shows that it is well fitted for grain crops, if its mechanical disadvantages can be overcome—which is no doubt possible, except where the ground is either very shallow or very stony.

ALLUVIAL SOILS.

Of these, we have first, red marsh, secondly, blue marsh, low marsh or corky dyke; and thirdly, interval.

1. The red marsh, though varying somewhat in quality, is the best soil in our Province, and much of it compares favourably with the most celebrated alluvial soils of the old and new worlds. The following analysis of recently deposited marsh mud from Truro, will serve to shew the composition of this kind of soil.

	Moisture,		.5
	Organic matter,		1.5
Soluble in Water.	Chlorine, Soda,	as common salt,	.095 .115
	Potash,		.013
	Sulphuric Acid, Lime,	as gypsum,	.073 .061
	Alumina,		085
	Magnesia,		.094
Soluble in Hydrochloric Acid.	Carbonate of Lime,		3.60
	Oxide of Iron,		2 74
	Alumina,		1.20
	Magnesia,		.11
	Soda and Potash,		.8
	Phosphoric Acid,		.09
	Silicious sand (very fine)		87.00

It will be observed that, in the above analysis, all the substances previously mentioned as contained in fertile soils, are present. This marsh mud is not only a valuable soil, but is carted on upland with excellent effect as a manure. When we take this fact in connection with the circumstance that 87 *per cent* of the whole is only silicious sand, and that only one and a half *per cent* of organic matter is present, we can appreciate the vast importance of the substances contained in it.

Such soil requires no foreign appliances to render it fertile. It has however one weak point—its small proportion of phosphates; and I suspect, that if there were not occasionally present in it, fragments of fish bones and other similar organic matters which do not appear in an analysis, this deficiency would appear in a somewhat rapid falling off in its productiveness. It is certain, that the best varieties of this kind of soil will bear continued cropping without manure for a very long period. It is however also certain that it gradually runs out, and the owners of the older marshes already have occasion to inquire for the means of restoring its productiveness.

Draining is well known to be essential to the fertility of the marshes, and there are in this Province many valuable tracts of this land in a comparatively useless condition from its neglect. Admitting the

sea water to deposit new mud, is also a well known remedy in the case of failing, or naturally, poor marsh. It is attended however, with the serious disadvantage of causing the loss of several crops.

It seems probable that in the deeper kinds of red marsh, subsoil or trench ploughing might prove very advantageous after the surface has been somewhat run out. There can be no doubt however, that in the heavier kinds of marsh, it would require to be accompanied by very thorough drainage.

It may also be deserving of inquiry if tile drains would be more serviceable than the open ditches in common use. Tiles could be very easily and cheaply made of the marsh mud itself, and when once laid, would require far less attention than ditches; and could be laid in any direction, and in any number, without interfering with the working of the soil.

Lastly, the composition of the marsh mud indicates, that the application of bone dust would probably be attended with the most marked results, particularly, in increasing the certainty of grain crops, and in producing the more valuable kinds of grasses—Guano would have a similar effect, but a good dressing of bone-dust would be more permanent in its effects. I would recommend to owners of poor or worn out marsh, to try the experiment, and calculate from the increase of crops, whether it would not be remunerative.

2. Blue marsh, sometimes called inner marsh, low marsh, corky dyke, grey marsh. This forms the subsoil of the red marsh, and generally occurs in a belt along the inner margin, next the upland, where the surface is lower than the outer edge, in consequence of the tides depositing the coarser mud near the channels, and finer mud in smaller quantity near the upland. In those parts of the Province where the tides are only of ordinary height, all the marsh that exists is either of this kind, or boggy marsh, composed almost entirely of vegetable matter. The blue marsh usually contains more vegetable matter than the red, and often assumes the character of a boggy swamp. It emits a fetid smell when recently turned up, and the water, oozing from it usually stains the ground with a rusty colour. It has the appearance of being a rich soil, but, though it produces, in its natural state, crops of coarse grass when broken up, it is of little use.

Its chemical composition gives the true reason of its comparatively worthless character, and also suggests a remedy. The vegetable matter present in this kind of marsh, acting on the stagnant sea-water, has decomposed the sulphate of soda, of which a small quantity is present in the tide-water, and has set free its sulphur, in the form of sulphuretted hydrogen, which acting on the oxide of iron in the mud, converts it into sulphuret of iron, and changes its colour from red to grey. The sulphuret of iron remains unchanged, while submerged of water soaked, but when exposed to the air, it passes into sulphate of iron, or green vitriol; a substance poisonous to most cultivated crops, except the oat, which can put up with a little of it. Hence the bad effects of disturbing the blue marsh—hence also the rusty colour of its water. Land in this state, can be easily tested by drying a small piece of it and making it red hot in the fire, on taking it out, it will be found to emit a strong sulphureous smell, and on cooling, its red colour will be found to be partially restored.

The remedy is draining and lining, and such land will usually stand, without injury, a heavy liming. Draining admits air and takes off the saline water. Lime decomposes the sulphate of iron, and forms sulphate of lime and oxide of iron, both useful substances. The cause and cure of the blue marsh thus involves a series of chemical changes; the last of which may be represented, as follows:

Sulphuric Acid and Oxide of Iron, with Lime } converted into } Sulphuric Acid and Lime, with Oxide of Iron.

When the blue marsh is too low to admit of proper drainage, the only mode of improving it is to dig trenches to the tide channels, and thus admit the muddy tide waters to deposit over it a coat of red mud. Both of these methods have already been employed with success in some parts of this Province.

Though the Blue marsh is by itself so unproductive, yet those varieties of it which contain a good proportion of vegetable matter when drawn out and composted with lime or marl, form an admirable top dressing for upland grass.

3. Interval of fresh water alluvium occurs along most of our rivers, in variable quantity and quality, but is generally a fine and productive soil. It requires the same management with upland soils, and except where it has a loose gravelly subsoil, would often be improved by draining. It is lamentable to see, in the older settlements, so much of this valuable soil almost ruined by an exhaustive system of cropping.

It is worthy of notice that ever since the first cultivation of the alluvial soil of the Euphrates and the Nile, irrigation by running water has been found to be a most efficient means of promoting and restoring the fertility of this kind. Many of our intervals are annually overflowed by freshets, and sometimes with very injurious results. But it is a matter deserving of inquiry, whether a regular and systematic admission of the water of the rivers and tributary brooks, might not repay its expense, by its beneficial effects on the crops. Muddy water let in, in this manner, would not only top-dress the soil, but tend to elevate it above the reach of the freshets and even clear water flowing gently over the surface for a limited time, is known to be highly fertilizing, though the theory of its operation is not well understood.

II.—PRACTICE OF AGRICULTURE.

EFFECTS OF THE GROWTH OF THE TURNIP.

We have often pressed the benefits that may naturally be expected to arise from the more extensive growth of this root in this Province. It was probably little imagined by those who first recommended the Turnip for field culture, that it was to be the means of introducing an entirely new era into the agricultural practice and productiveness of Great Britain.—And yet such has been the effect; and no other vegetable is yet known, the general culture of which in that climate could have produced the same results.

1 To consume the turnips more cattle were kept. These cattle were valuable, both in manufacturing beef and in converting vegetable matter into enriching manure. But the same quantity of turnips was found to add more to the weight of one animal than of another. Attention was thus more generally drawn to distinctions of breeds to the value of family and individual constitution among our domestic animals. Societies were formed for the encouragement of improved breeds—cattle shows were instituted—premiums were given,—and thus that remarkable revolution has been brought about which enables the stock farmer to bring to market an animal of little more than two years of age, as heavy, as fat, and more esteemed by the consumer, than those which were slaughtered for our forefathers at the age of six or seven. Then,

2 The larger production of enriching manure by the increased and better fed stock, gradually produced an almost equal revolution in the growth of corn. Two consequences especially remarkable have followed from the continuance of this practice of richer manuring—the old corn lands have been made to yield an increased produce of nearly one half, while the poor and valueless soils of former days now grow crops as large and heavy as were reaped from those which were then called rich.

3 But this rearing and fattening of stock, besides the turnips for winter food, demanded early grass for their keep in spring when the supply of roots was exhausted, or when they ceased to retain their wholesome and nutritive qualities. Thus the artificial grasses, the clovers, ryegrass, foxtail, and numerous others, were tried and recommended as giving a rich and early bite of grass in spring, or a more abundant crop of hay in autumn. A new traffic, that of agricultural seeds, sprung up, and this system of green cropping, as it is called, obtained not only a wide extension, but a permanent and established place in British husbandry.

4. Yet the greatest benefit of this green cropping does not consist in the larger amount of food for cattle, which it enables the farmer to raise on the same extent of land, without lessening the quantity of corn he yearly carries to market. The introduction of a skilful rotation or course of cropping to which it has led, is of far more importance in a national point of view. The practice of taking corn crop after corn crop—even as far, in Scotland, as fifteen or twenty crops of oats, or till the produce fell to two or three seeds—has not yet entirely disappeared in remote parts of the country. Nothing could be more ruinous to the land than such a course of procedure—nothing so likely to impair the future average produce of corn in districts in which it existed.

It is difficult to bind down either farmer or proprietor to any other mode of culture than that which seems likely in *his time* to yield the largest profit. Mere abstract condemnations of the old system of corn after corn were of little benefit in arresting the evil. But when it came to be seen that more money was to be made immediately, while the land was also longer kept in heart, by alternating a green crop with one of corn, the temptation to the evil practice was removed, and the *alternate husbandry* carried the day among all intelligent men, *and wherever the land was considered fitted for the growth indifferently of either crop.*

5. Meanwhile, this new husbandry demanded a more constant

and careful working of the soil. New modes required new instruments; these new instruments being contrived and made by men familiar with all the resources of modern mechanical skill, to accomplish a definite end at the least cost of material, and with the least expenditure of physical force, brought into glaring prominence the defects of the older agricultural machinery. Hence the heavy wooden gave place to the lighter iron ploughs—the lumbering four-horse waggon was succeeded by the quicker two or one-horse cart and gradually the *grubber*, the *improved* (Finlayson's and others) *harrow*, the *horse-hoe*, and the *scarifier*, began to do portions of the work of the plough, and thus to admit of the spring seed being put in upon clay lands at an earlier period of the year. Those who are familiar with the tillage of Essex, Hertford, and Suffolk, are aware of the benefits which, in these counties, have been derived from sowing barley upon their clay lands in January and February, instead of, as formerly, in April and May.

6. These lighter implements suggested quicker work. The drill and the horse-hoe could not be permitted to linger in the land, like the old berkshire plough, nor the hind to drag his slow foot behind them as his father had done in ploughing his ancient furrow. Thus horses of a quicker step were sought for, and improved breeds, like the Cleveland coach-horse, uniting a quick step with great strength and endurance, gradually replaced, in improving districts, the old, heavy, and cumbersome races. "My father," said a Staffordshire farmer to us once, when speaking of this subject—"My father kept fourteen farm horses, and was always behind with his work. On the same farm, I employ only eight, but they have a little blood in them, and my work is never behind."

7. We have said that the alternate husbandry was introduced wherever the land was considered suitable indifferently for either crop. On stiff and wet lands, which abound in many countries, it was found that the turnip could not be grown with advantage, upon such soils, therefore, the alternate husbandry could only be partially introduced. The next step was so to dry, and loosen, and mellow these soils, as to fit them for the growth of green crops. This was accomplished by the introduction of a system of thorough draining, by which the excess of water was carried off, and the air was permitted to enter the soil. Experience has shown, that such a system of drainage does loosen the stiffest soils, and many practical men assert, that there is no clay so stiff in which a skilful farmer may not now be able to raise a profitable crop of turnips.

To the drain succeeds the subsoil plough. There are few soils upon which it ought not to be called in to perfect the stirring of the land; there are as few, we believe, by which the expense of using it will not be amply repaid.

To this stage of improvement the practical agriculturists of Great Britain may be said to have generally advanced. Nearly all now concede the value of the drain, and many acknowledge the efficacy of the subsoil plough. They have obtained admission into large tracts of country, and they are struggling hard to force an entrance into many more. In a former article, we showed how wide a field lay open for the expenditure of capital in the general drainage of the country—how profitable such an outlay was likely to be to the individual cultivator—and how important to the nation at large. It is interesting to bear in mind, that the introduction of the turnip has given rise to the entire series of improvements to which we have adverted, and the culture of the turnip is still the *immediate* object, for the more general attainment of which these latest improvements are sought to be introduced.

DEEP PLOUGHING.

It has afforded us much gratification to observe a greater number of farmers engaged in ploughing than we recollect at this season. We recommend to their perusal the following remarks of Judge Peters on deep ploughing, which seems as much neglected in Prince Edward Island as in Nova Scotia, and from a similar cause, that desire or necessity to go over a large surface quickly and with little labour, which is so injurious to every branch of agriculture in new countries:—

The deeper the soil is, the nearer together can plants be made to grow, and the greater number of them will obtain perfection, and, consequently, the larger will be the crop. A deep soil also suffers less from drought and from moisture, than when it is shallow; when a great deal of rain falls, the water sinks into a soil loosened by deep ploughing; such a soil absorbs a quantity of moisture, proportionate to its depth, before it suffers any to return to the surface. This is the reason why garden ground, which is well tilled with spade labor, never suffers from excess of humidity, even when the surface of shallow soils would be drenched with moisture. So long as the water does not stand on the surface, it does little or no harm to the plants. Deep lands retain the moisture which they absorb for a considerable time, and communicate it to the surface, when that becomes parched and dried up.

Nor is this all. Crops of grain grown on deep soil suffer much less from sudden changes of temperature, or from drought or from heat; because their roots, being able to penetrate further, feel changes in the weather less. During very hot weather, it is evident that the plants are much fresher in deep than in shallow soils.

Lastly, it has everywhere been remarked that grain grown on deep soils is much less liable to be laid, even when very rank in growth; this is doubtless owing to the greater degree of strength which the depth of the roots gives to the lower part of the straw—a strength which grain growing on shallow soils can never attain, because then the fresh shoots put forth by plants growing closely together, cannot find sufficient nutriment to enable them to retain their full vigor.

But if we would have a soil attain all these advantages, and permanently possess them, it is requisite that from time to time it should be ploughed to the very bottom of its vegetable layer, turned over, loosened, and every part submitted to the beneficial action of the atmosphere, unless this is done it will, if merely ploughed shallow, generally lose all those advantages of which we have been speaking. From repeated treading of the horses feet while ploughing, a hard crust, or pan, will be formed immediately beneath the sphere of the plough's action, which cuts the earth beneath it from all communication with the atmosphere, and no root can penetrate it. Thaer says:

"Experience has convinced me that it is not necessary that this deep ploughing should take place every year, but that it should be repeated once every six or seven years, especially if, during the interval, the depth of the ploughings given to it are varied, for nothing contributes so materially to form the crust spoken of as repeated ploughings of equal depth. Land ought, therefore, to be ploughed every seven years to the bottom of its layer of vegetable soil, and the intervening ploughings may be more or less superficial and varied in their depth, according to the purposes for which they are bestowed."

There can be no doubt that the shallow ploughing generally adopted in this island is a most erroneous practice. There may be some cases where the vegetable soil is very shallow and rests on gravel or sand, where the farmer cannot plough deep without injury, but most of the soil of this island may be ploughed eight or nine inches deep with the greatest advantage. Take most of the worn out lands of the island and plough them with a furrow of six honest inches deep, and they will at once yield a better crop than they have given for the last ten or fifteen years, because the soil which would then be brought to the surface has not been exhausted. Some will try this experiment, and find what I say correct; but do not imagine because you see this worn out land all at once give a good crop, that it will continue to do so; its fertility is caused by a little fresh earth, from which certain substances necessary to growth of plants have not been taken, and it will soon be exhausted if you crop it without manuring, therefore sow it with buckwheat and plough it in, and treat the land as recommended in the chapter on green manuring.

Two years ago I had an opportunity of testing the advantages of deep ploughing. A field of about four acres, which had been very much exhausted, was intended for turnips and carrots; in cross-ploughing, I directed my ploughman to go nine inches deep, which, as it had only received the ordinary kind of shallow ploughing before, was very hard work for the horses, and when half the field was done I found it necessary to go three inches lighter, as the horses could not stand it. The cross-ploughing was east and west, the drills of turnips and carrots ran north and south: the part ploughed shallow and that ploughed deep were manured exactly alike, and the seed sown at the same time; but any one, in walking over the field, could see the great superiority of the crop on the deeply ploughed land, on pulling, we estimated the yield of turnips on the deep ploughed land to be about one hundred and fifty bushels, and the carrots about eighty bushels per acre over that on the shallow. The subsequent wheat crop on the deep ploughed land also maintained the superiority. I mention this as an instance of the benefit of deep ploughing, but by no means recommend any one to follow my example of deepening so suddenly; the deepening should be gradual, that is, going an inch and a half to two inches deeper at each ploughing, until you get eight or nine inches turned up. Thaer remarks.

'In the greater number of cases in which it is desirable to plough the land to a greater depth than has before been attempted, it is best not to add above two inches in depth of virgin earth at a time to the vegetable soil; more than this quantity cannot be properly ameliorated and mixed with the upper layer.'

And this deep ploughing which brings up the new earth, ought

to be done, if possible, in the summer or early in the autumn, so that the newly turned earth may be exposed to the air for the longest period of time. The air acts on the certain substances in this new earth, and fits it to sustain plants, which in many cases it would not do when first turned up; an example of this may be often seen in earth dug from cellars; when first taken up, plants would not grow in it, but by being spread on the grass lands it absorbs the gases from the atmosphere, and its mineral substances are prepared by the action of the air for the plants, and thus the spots on which it is spread become more fertile. In the same manner new earth turned up by the plough enters into contact with the atmosphere, and every particle of it becomes saturated with atmospheric substances, and the new earth thus increases the fertility of the field.

Make it a rule to plough your lea land five or six inches deep, but let the deepest ploughing be given when the land is intended for turnips, carrots or other roots. I would not recommend new earth to be brought up in ploughing land which has been in turnips or other roots, and which is intended for wheat or barley, because the manure which has been applied with the roots will then be turned too deep. I think that by thus turning up new soil when ploughing turnip land for wheat, my wheat crop has been injured, which is easily accounted for. Land from which turnips or other roots has been removed, must be ploughed late in the fall and sown with wheat very early in the spring, and the new earth, not having been long enough exposed to the air to absorb the gases and have its mineral substances fitted for the plants, checks instead of assists the growth of the wheat.

I have no doubt many will say the horses here could not carry so deep a furrow as I recommend. If they are badly fed they cannot, but let farmers keep fewer and feed them well, and any of our Island nags will be able for the gradual deepening recommended, and when once the ground is well stirred to eight or nine inches deep it is easy to plough to that depth afterwards."

DAIRY MANAGEMENT—MILK.

If new milk is designed immediately for the market, it should be put into a tin can, and carried there with as little motion as possible; and in warm weather, it will be right to put the milk vessel into a tub of cold spring water until the time of taking the milk away; this, it will be observed, is a different thing from putting water into the milk.

Milk to be kept at home, is taken to the dairy and set for cream in a wide shallow cooler, five or six inches deep, which allows the cream to rise to the surface sooner than if it were in a deep vessel.

Whether the dairy utensils be of wood, metal, earthenware, or glass—and the time will come when strong and solid glass coolers will be cheap and common—they should be kept perfectly clean. The wooden tubs, coolers, churn, skimming dish, strainer, and butter prints should be frequently scalded and secured, and exposed to the sun and air; for sourness, or any impurity in milk vessels, injures the flavour of the milk and butter.

Fresh milk consists of the oily substance which becomes cream and butter, curd and whey, which are separated from each other by certain processes.

Milk set in a cooler is usually fit to be skimmed in twelve hours; and if sweet cream and prime fresh butter are wanted, it is best to skim the morning's milk regularly in the evening, and the evening's milk in the morning; but in very cold weather, it may be necessary to leave the milk untouched for twenty-four or thirty-six hours (where butter-making is the object), for cream will not ripen sooner when the temperature is very low; even a longer time may be advisable for the resting of the cream on the milk (if it is not to be churned soon afterwards), because thus it keeps in a sweet condition, better than if mixed with other portions of cream in a pan. Its ripeness may be judged of by putting a knife into it and drawing it out; if no milk rises in the cut, the cream is ripe for churning. It should be taken up with a scollop shell or skimming dish, and collected in a stone-ware jar.

In very large dairies it is the practice to churn each meal's milk by itself, by which a greater quantity of butter, as well as sweeter buttermilk, is obtained. It is certainly bad to let the cream become more than slightly sour; yet a little acidity assists the separation of the butter from it

However, I need not dwell on this mode of management, which is not suited to a cottager.

Though cream that has not lain long on milk is sweeter, and the butter better flavoured, than when the milk becomes sour before the cream is taken off, it is more prudent, when *butter-making* is the principal object, to leave the cream on the milk for at least twenty-four hours, to give time for all the oily particles to rise.

SCIENTIFIC.

LOWER CARBONIFEROUS COAL-MEASURES OF BRITISH AMERICA.

A paper by Principal Dawson, giving an account of the present state of knowledge respecting these interesting beds and their fossils, was read before the Geological Society of London, at its meeting of April 28th. The following is from the Abstracts of Proceedings of the Society:

"Deposits indicating the existence of the Coral flora and its associated freshwater fauna at the beginning of the Carboniferous period, are well developed in Nova Scotia and New Brunswick, with a clearness and fulness of detail capable of throwing much light on the dawn of the terrestial conditions of the Coal-period, and on the relation of these lower beds to the true coal-measures. This lower series comprises shales and sandstones (destitute of marine remains, but containing fossil-plants, fishes, entomostraca, worm-tracks, ripple, and rain marks, sun-cracks, reptilian foot-prints, and erect trees) and great overlying marine limestones and gypsums. These are distinct from the true coal-measures by their position, mineral character, and fossil remains, In the western part of Nova Scotia (Horton, Windsor, &c.) the true (or Upper and Middle) Coal-measures are not developed; and here the Lower Carboniferous marine deposits attain their greatest thickness. The lower coal-measures (or Lower Carboniferous freshwater or estuarine deposits) have here a thickness of about 600 feet. These beds are traceable as far as the Shubenacadie and Stewiacke Rivers. The outcrop also on the south side of the Cobequid Mountains, where the marine portion is very thin, owing perhaps to the fact of these mountains having been land in the coal-period.

Along the northern side of the Cobequid Range the upper and middle coal measures and the marine portion of the Lower Carboniferous series are of great thickness. The freshwater-beds are absent here, though brought up on the northern side of the coal-trough of Cumberland, where, as well as in New Brunswick (Peticodiac River, &c.), they are remarkable for their highly bituminous composition, their well-preserved fish-remains, and the almost entire absence of plants. To the north, at the Bay of Chaleurs, the great calcareous conglomerate, with sandstone and shale, 2766 feet thick, described by Logan, and containing a few plant-remains, probably represent the Lower Coal-measures of Nova Scotia. In eastern Nova Scotia and Cape Breton, the Middle Coal-measures are found at Caribou Cove and elsewhere; the marine limestones and gypsums, and the underlying sandstones and shales, are seen at Plaister Cove, also at Right's River, and St Mary's River.

In Nova Scotia these olde Coal-measures, as compared with the true coal-measures, are more calcareous, more rich in remains of fishes, and have fewer vegetable remains, and indications of terrestrial surfaces. They occur generally along the margins of the coal-areas, near their old shores; and, as might be expected under such circumstances, they are associated with or replaced by beds of conglomerate derived from the neighbouring highlands of Devonian or Silurian rocks. When the conglomerates are absent, alternations of sandstones with sandy and calcareous shales occur, with frequent changes in character of the organic remains; the general aspect being that of muddy estuarine deposits, accumulated very slowly, and discoloured by decaying organic substances. The supply of sediment, and the growth and preservation of vegetable matter appear to have been generally on a smaller scale in this early carboniferous period than subsequently. In those districts where the true coal-measures are least developed the lower series is most important; showing that the physical and vital conditions of the Coal-measures originated as early as those of the Mountain-limestone; and that locally these conditions may have been contemporaneous throughout the whole period; but that in some localities the estuary swamp deposits first formed were completely submerged and covered by oceanic deposits, whilst in others early marine-beds were elevated and subjected to the conditions of gradual

subsidence and vegetable growths indicated in the great coal-measures of the South Joggins, Pictou and Sydney.

In Nova Scotia the Lower Coal-measures are characterized by a great preponderance of *Lepidodendra* (especially *L. elegans*) and *Poacites*, with few Ferns or Sigillariæ. The middle Coal-measures are rich in Sigillariæ and Ferns, as well as *Lepidodendra*. The upper Coal-measures especially abound in Conifers Calamites and Ferns. *Prlæyniscus*, *Gyrolepis* or *Acrolepis*, *Centrodus*, *Rhizodus*, and *Ctenacanthus* are the chief fossil fishes of this Lower Carboniferous series. Unio like shells are nearly the only remains of Molluscs.

THE COMET.

Many of our contemporaries have devoted some space to a description of the magnificent spectacle of a comet which most of our readers must have witnessed during part of the months of September and October; but several of them have given currency to an opinion that this splendid object was the well known and long expected comet which last appeared in 1580, the year in which the Emperor Charles V. closed his earthly career. That comet it has been calculated ought again to visit this portion of our system between the years 1856 and 1860; for there are two of its former visits recorded with considerable exactness, and from these data it appears that it takes 280 years to complete its revolution. The comet which we have lately seen is a total stranger to our astronomical history, and from certain calculations based on recent observations its orbit is so much more extensive than that of Charles V.'s Comet that above 2,000 years must elapse ere it again is seen from the earth. This comet is known as Donati's from an accomplished Italian, now assistant Astronomer at Florence, who discovered the new comer as a telescopic object in June. Since which it rapidly approached the earth, and passed between the Earth and the Sun at a distance of nearly fifty millions of miles from these two bodies. It is now as rapidly leaving our neighbourhood and pursuing its appointed course through the realms of space. The very near proximity of this comet to the Earth, as well as to the Planet Venus, during its recent visit, without perceptibly disturbing these bodies, has confirmed the opinion of the best Astronomers that the nucleus of a comet is very much less ponderable than the Celestial bodies with which we are better acquainted, and the tail which always issues from the comet in a direction opposite to the bearing of the Sun, would seem possibly to be a reflection of light depending upon the comet's position with reference to the sun rather than a gaseous emanation from the comet itself. The comet of 1844 in passing the Sun swept its tail round through an arc of more than 120° in five hours, keeping it pointed away from that body, a rapidity of movement which can hardly be attributed to any thing with which we are acquainted but light, and this would appear to confirm the hypothesis that the tail is a reflection depending upon the transmission of light from the Sun. If Donati's Comet had reached the path of the Planet Venus three days sooner than it did, that Planet would have been immersed in the tail. But it is probable that no harm would have occurred had this been so—for the comet has much less density than our atmosphere and could not penetrate it.—Were it not so the gravity of so large a mass must have materially disturbed the Solar System. The nature and object of these great heavenly bodies is still wrapped in mystery, but experience and science both concur in believing that their paths are as truly marked out for them as aught else in the spangled heavens, and that the peculiar fitness which the Creator has shown in all his adaptations has not been omitted in the laws which regulate the apparently eccentric *motions of the Comets*.—[COMMUNICATED.

ORIGINAL HISTORICAL CONTRIBUTIONS.

The dangers incident to Royalty and high station are singularly illustrated by the history of the demises of King James VI.'s ancestors on either side of the house. First, on his father's side. His father, Lord Darnley, was strangled, and afterwards blown up in bed with gunpowder. His grandfather, the fourth Earl of Lennox, (Darnley's father,) was shot at Stirling whilst Regent of Scotland. The father of this Earl was murdered in cold blood by a bastard of the Earl of Arran. The father of this last was killed at Flodden Field, 1513, and the great grandfather of this last (viz., Sir John Stewart of Darnley) was killed at the seige of Orleans in 1428. The grandfather of this last again (viz., Sir Allan Stewart of Dreghorn) was killed at the battle of Hal Edon Hill, and Sir Allan's father perished at the battle of Falkirk.

Thus we find that of King James' paternal ancestors in the direct male line seven out of ten met with a violent death.

The nearest parallel record that can be produced is most probably that which tells of the manner of the deaths of his maternal ancestors. His mother, Mary Queen of Scots, was beheaded. Her father, King James V., died of a broken heart. His father, James IV., perished at Flodden Field. His father, James III., was assassinated near Stirling. His father, James II., was killed by the bursting of a cannon.—His father, James I., was assassinated at Perth, and his father, Robert III., died of a broken heart.

These facts, taken into consideration along with the circumstance that James VI.'s son, Charles I., was beheaded, might well deter the ambitious from their sometimes treasonable aspirings, and dispose the poorest to hearken with a willing ear to the counsel of Him who charges His people to be content with such things as they have.

This number of the *Journal* has been delayed a week, that the proceedings connected with the opening of the Winter Session of the Normal School might be reported.

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