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# THE JOURNAL OF EDUCATION AND AGRICULTURE,



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

## FOR THE PROVINCE OF NOVA SCOTIA.

### TABLE OF CONTENTS.

EDUCATIONAL DEPARTMENT.		PAGE.	AGRICULTURAL DEPARTMENT.		PAGE.
I. THEORY OF EDUCATION.—Physical Education—Muscular System of Organs—Physical Exercises, in-and-out-door,		161	I. THEORY OF AGRICULTURE.—Value of Scientific Instruction to Farmers,		170
Physical Training,		164	II. PRACTICE OF AGRICULTURE.—Importance of Deep Cultivation,		170
II. PRACTICE OF EDUCATION.—English Grammar,		165	Preparation for Root Crops,		171
III. OFFICIAL NOTICES.—Graduates at last Session of Normal School,		166	Manures—How much should be used,		171
To the Clerks of School Boards,		167	Seeds for Seeds,		171
Qualifications of Teachers,		167	Cultivation of Mangold Wurzel,		171
IV. EDUCATIONAL INTELLIGENCE.—Nova Scotia—Superintendent's Vi- sit to the Western Counties,		168	III. AGRICULTURAL INTELLIGENCE.—The Agricultural Societies of N.S.		172
Opening of Summer Session of Nor- mal School,		168	Letter from a Correspondent,		172
Dr. Cogswell,		169	HORTICULTURAL.		173
New Brunswick,		169	POETRY.—Be kind to each other,		176
			Advertisements,		176.

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No. 11.

## EDUCATIONAL.

### I.—THEORY OF EDUCATION.

#### PHYSICAL EDUCATION—MUSCULAR SYSTEM OF ORGANS—PHYSICAL EXERCISES, IN-AND-OUT-DOOR:

We have, discussed in order, the nutritive, the supporting and the cutaneous systems of organs, and, under each of these heads, respectively, we have considered at length the whole matter of the ventilation and temperature of school-rooms, the providing of the same with suitable and properly graded furniture, and the benefit arising from the order, the neatness and tidiness of the scholars. We proceed now to the consideration of a class of organs of greater importance, perhaps, than any we have yet brought under the notice of our readers, involving as it does, in no small measure, the relationship subsisting between the body and the mind,—the exercise of the muscular system deeply affecting the nervous, and that, the brain—the seat of thought. We crave the special attention of our readers whilst we lay before them a brief outline of the physiology of the muscles of the human body, and the various modes of exercising the same, not, only for the pur-

pose of securing their development and strength, but a larger amount of intellectual labour.

The muscles—of which there are upwards of 400 in the human body—zoologically speaking, are composed of fibres and blood, pervaded by nervous matter, and separated from one another by finely attenuated membranes. They are made up of three parts,—the two ends, called the origin and insertion,—consisting of sinews or tendon, and the middle or fleshy part. They are divided into two classes, the voluntary and the involuntary. By the latter, are meant those muscles that act independently of the will, such as those of digestion, circulation and respiration. By the former, are understood those muscles that perform their functions by an act of the will.—That part of the mind, called the will, operates upon the brain, the brain, upon a class of nerves, named *efferens*: and these nerves supply the stimulus by which the class of muscles designed for a particular act or movement is brought into play.

And how, it may be asked, do these muscles perform their functions? By the law of contractility, or that law by which the muscles are shortened by the swelling out of the middle or fleshy part; and, by this means, the bone is moved and action is effected.

These muscles grow and strengthen by exercise or use, by the diligent observance of the law of their being,—activity and repose, contraction and relaxation, by the regular and constant discharge of their appropriate functions. This is ex-

emplified and illustrated at all ages and in all circumstances. If exercise be withheld from the child, the whole muscular frame is stunted and enfeebled. In the adult, inaction causes the muscles to shrivel and waste. If a limb only be kept inactive, its muscles wither, while the rest of the frame is vigorous and grown. A broken arm having been bound up and kept immovable, for a month or more, comes out at the end of that time, scarce the half of what it was, the muscles having wasted away and reduced to a few slender fibres. And hence the practice, in the city of London, of beggars manufacturing shrivelled arms and legs, and giving themselves out as disabled soldiers or sailors, in order the more effectually to excite the commiseration of the benevolent and charitable.—Particular avocations, too, lay an impost on certain muscles, and leave the others, in a great measure, unaffected; and the result is, that the former become strong and athletic and brawny, whilst the latter are weak and slender; as may be seen by contrasting the muscles of the arm of the blacksmith with those of the man who follows a sedentary occupation.

And what is the cause of all this? By motion, or the use of the muscles, the circulation is active and vigorous, the blood issues into every crevice or interstice of the fibrous substance; the stimulating element is kept in full and efficient operation; and thus the muscles enlarge again,—they are gradually and steadily developed. And this exercise not only exerts a powerful influence over the muscular, but over every other system of organs. It promotes, as we have just stated, circulation; circulation increases respiration; respiration, exhalation; and exhalation, digestion,—and all these again reciprocally operate upon the muscles—and the muscles, through the exciting stimuli, upon the cerebrum, the seat of thought.

But this law of contractility has its bounds or limits, and can only be maintained by the constant alternation of relaxation and rest. The very continuousness of this exercise is fatiguing and exhaustive. Let any set of muscles be placed in a state of severe tension, and retained in that position for a lengthened period, and soon will the most arduous toil be felt to be a pastime in comparison. You may easily put this fact to the test, by attempting to hold the arm extended at a right angle to the body for the short space of ten minutes. He whose muscles, if indeed capable of the exertion, do not feel sore with fatigue at the end of that time, may think himself peculiarly fortunate in possessing a powerful constitution.—What happens to an arm may happen to the whole body.—And if the entire muscular frame be overworked by efforts which are either excessive or prolonged, the result must be debility, trembling, exhaustion, faintness, and even death.—Let such overworking be habitual, and then we know, both in men and animals, that the most disastrous consequences will inevitably ensue.

It is clear, then, that the real health and strength of the muscles depend on the due alternation of contraction and relaxation, of activity and repose. A certain amount of exercise is indispensably necessary, and the greater the variety, the more beneficial will that exercise be. But relaxation is just as much needed as contraction, repose as activity; and this that the restorative power of the muscles, the *vis medicatrix naturæ*, may be preserved, rallied and re-invigorated. In one word, if the muscular system of organs is to serve the great end of their being, they must be exercised, that is, the law of contractility must be rigorously attended to.

And here it may be asked, What are the rules that ought

to guide us in this exercise, that it may be productive of its legitimate benefit? Keeping in view the conditions of muscular action as already set forth, it must, we think, appear obvious to all, that this exercise, as Combe expresses it, *spring from, and be continued under, the influence of an active nervous or mental stimulus*. This point scarcely requires illustration. Everybody knows how wearisome and disagreeable it is to saunter along, without having some object to attain; and how listless and unprofitable a walk taken against the inclination and merely for exercise is, compared to the same exercise made in pursuit of an object on which we are intent.—The difference is simply, that, in the former case, the muscles are obliged to work without that full nervous impulse which Nature has decreed to be essential to their healthy and energetic action; and that, in the latter, the nervous impulse is in full and harmonious operation. The great superiority of active sports, botanical and geological excursions, gardening, turning, &c., as means of exercise, over mere monotonous movements is resemble to the same principle. Every kind of youthful play and mechanical operation interests and excites the mind, as well as occupies the body; and, by thus placing the muscles in the best position for wholesome and beneficial exertion, enables them to act without fatigue, for a length of time; which, if occupied in mere walking for exercise, would utterly exhaust their powers. Hence it is that the elastic spring, the bright eye and cheerful glow of beings thus excited form a perfect contrast to the spiritless aspect of many of our boarding-school processions of girls; and the results, in point of health and activity, are not less different.

But, in the second place, we would remark that this exercise, in order that it may produce the desired effect, *should involve as much variety of movement as possible*. The sphere of action of each muscle is strictly local, and it is only by calling them all into play that a general effect can be produced. Thus, by much walking, we may greatly develop the muscles of the legs, and yet leave those of the arms and chest comparatively feeble; or, by wielding a ponderous hammer, or rowing a boat, we may greatly develop those of the chest and arms, and leave the legs weak, and their circulation languid. For the same reason, a slow formal walk, with demure look and motionless arms, is much less useful than a smart walk or run, in which we cannot refrain from exercising the arm and chest also. Exercise, therefore, is most beneficial when all the muscles are called into play.

The next rule for the regulation of exercise is, *that it should always be proportioned in amount to the age, strength, state of the constitution and former habits of the individual*. A person, accustomed to daily activity, will feel invigorated by a walk of four or five miles in the open air, whereas the same distance will weaken another who has not been in the habit of walking at all. But, instead of inferring from this, as is often done, that exercise in the open air is positively hurtful to the latter, reason and experience coincide in telling us, that he has erred only in overtaking the powers of his system, and that to acquire strength and activity, he ought to have begun with one mile, and to have gradually extended his walk, in proportion as the muscles become invigorated by the increased nutrition consequent on well regulated exercise. A person recovering from fever begins by walking across his room perhaps ten times in a day, and gradually extends to twenty or thirty times, till he gains strength to go into the open air.—On going out, a walk of ten minutes proves sufficient for him

at first; but by degrees his strength and flesh increase, and his exercise is prolonged till he arrives at his usual standard. Such is the order of nature; but many sedentary people have no patience for such slow progress. When urged to take exercise, they grudge the trouble of going out for a short time, and think, that, if a walk of half a mile does them good, one of a whole mile will do more; and when they suffer from the error, they shelter their ignorance under the general assumption that exercise does not agree with them! Thence it follows, that, to be beneficial, exercise should always be proportioned to the strength and constitution, that it should be regularly resumed, after a sufficient interval of rest, and that it should be joined with a mental and nervous stimulus.

Another matter, that ought to be attended to in this exercise, and the only one we can specify, is *the time at which exercise should be taken*. Those who are in perfect health may engage in exercise at almost any hour, except immediately after a full meal; but those who are not robust ought to confine themselves within narrower limits. To a person in full vigour, a good walk in the country before breakfast may be highly beneficial and exhilarating; while to some invalids and delicate persons, it will prove more detrimental than useful, and will induce a sense of weariness which will spoil the pleasure of the whole day. To some, however, who have no appetite on rising, a short walk in the open air before breakfast proves very beneficial. Exercise should be resorted to only when the system is sufficiently vigorous to be able to meet it. In delicate constitutions this is the case at the end of from two to four hours after a moderate meal, and, consequently, the forenoon is the best time for them. If exercise be delayed till some degree of exhaustion from the want of food has occurred, it speedily dissipates instead of increasing the strength which remains, and impairs rather than promotes digestion. For the same reason exercise immediately before meals, unless of a very gentle description, is injurious, and an interval of rest ought always to intervene. Active exercise ought to be equally avoided immediately after a heavy meal. In such circumstances, the functions of the digestive organs are in the highest state of activity; and if the muscular system be then called into considerable action, the withdrawal of the vital stimuli of the blood and nervous influence from the stomach to the extremities, is sufficient almost to stop the digestive process.

But it is time that we make some practical application of the principles laid down to the matter of school management and school teaching. In this respect, the muscular system of organs is vastly the most important of any we have yet considered, whether we regard it in the light of a means or an end, directly or indirectly. Looking at it as an end, we may remark, first of all, that muscular action deeply affects the whole matter of the health and growth of the body of the young. It enlarges and renders robust the muscles themselves, but it does far more. Muscular action exerts a most powerful influence over the whole of the physical frame, and especially over the nutritive system of organs. There is not in fact any one organ of the body that is not less or more affected by it. And what is the inference naturally deducible from all this? Plainly that everything in school ought to be avoided that has the smallest tendency to run counter to the due exercise of the muscles. Instead of keeping the children pent up in one posture for one, two, or even three hours, with the most tremendous threats if they dare to alter it, they

ought to be required to change every five or ten minutes, and every facility or encouragement afforded for this purpose.—Instead of contravening the law of nature,—the law of contraction and relaxation,—it is, we apprehend, the bounden duty, as well as the highest interest, of every teacher to direct and control that law, in order that he may render it subservient to the furtherance of his educational plans and proceedings.—For this purpose he ought sedulously to watch the condition of his pupils, and even during the time of their recitations and before they evince any symptoms of exhaustion he ought, by the use of certain signs—which may be called into requisition without the utterance of a syllable—require them to change their position. If they are standing, he may require them to be seated, and *vice versa*. Whatever is the class of muscles that has been for the longest period in a state of contraction, he must take care that these are relaxed, and the opposing ones called into exercise. Unless the trainer adopts this course the scholars will, in all probability, take the law into their own hands, and, in spite of all his remonstrances, will yield compliance to its dictates, though it be in the way of idle, mischievous pranks, or unruly conduct, or actual rebellion. And we know not which of the two is, in these circumstances, the more reprehensible—the scholar in this violation of the rules of the establishment, or the teacher in his self-complacent yet inexcusable ignorance.

But, again, muscular action may be viewed as a means as well as an end, and when properly regulated will secure a far greater amount of attention and intellectual labour. The connection between the eye and the mind is close and influential. When the eye of the listener is steadily fixed upon the eye and the whole countenance of the speaker, a closer attention and a readier access to the understanding and heart are secured and maintained. Hence the vast superiority of a *viva voce* address when due justice is done to it, that is, when the outer man of the speaker corresponds with the inner, as compared with the dead letter of the book. The teacher is bound to avail himself of this means. He should never, for example, commence a recitation lesson or engage in any exercise without, first of all, putting his class in order, that is, fixing them in the position most natural and best fitting, and especially with the eye either directed to the book or to his eye. He cannot, it is true, control the mind, but he can secure the fixedness of the eye; and this is one powerful means by which access is obtained to the understanding and the heart.

But muscular action operates more directly on the mind through the medium of the nervous system. It is well known that the whole muscular part of the physical frame is pervaded by the nerves,—that there is a set of nerves belonging to every muscle;—and that there can be no motion of the muscle without the nerves being affected. The change thus effected is communicated by cords of nerves to the cerebrum or seat of thought; and thus a change, too, is produced in that delicate piece of organization, and a fresh and healthful impulse imparted to its functions. By this means, too, the spiritual or thinking part of man's nature is rested or relaxed, and thereby better fitted and prepared for another and more determined effort. Thus it is manifest that every muscular movement deeply affects the powers of the mind and procures a much larger amount of intellectual labour. And from all this will be seen the vast importance of physical in-door exercises. These exercises may vary according to circumstances. Whenever the teacher observes any thing like general

inattention on the part of any class or section of his scholars, instead of scolding, or threatening, or flagellating, he should immediately call upon them to assume their right position—or to change their position—or to go through the various motions first, second and third—or to sing a song—or to take a march, which, if possible, should be accompanied with music, either vocal or instrumental. These exercises should be chosen by the teacher who takes the lead in them all, according to the condition or circumstances of the children;—care being taken to diversify them less or more on every repetition; for the moment a dull, monotonous routine is fallen into, that moment do they lose their effect. We shall give in our next an outline of these exercises—as well as of those performed out-door—as these are practised in the Model Schools connected with the Normal Training School in the city of Glasgow.

Need we state, farther, that these exercises produce a wholesome moral influence in every well conducted educational establishment, not merely in acting as a preventive against disorder and confusion, but in influencing indirectly the moral faculty. The children, generally speaking, take delight in these physical exercises, readily and cordially obey whatever instructions or orders are given forth regarding them; and thus they acquire a habit of obedience, which, being transferred to moral subjects and pursuits, is of the greatest benefit and utility.

### PHYSICAL TRAINING.

Quite as much aid does the mind derive from the body as from any other nutriment. We hold it to be utterly impossible for any one to bring the full fruits of the mind to bear on a feeble or diseased body. Very valiantly do many of us, with weak frames, powerless digestion, or infirm lungs, struggle against these intestine foes of ours; but it will not do. We may surmount many difficulties and make certain progress, but we cannot achieve the pace our minds and natural intellectual energies were constructed for, be that pace what it might. We have frequently had occasion to observe how rapidly school children advanced in learning, when a portion of the school hours was suddenly cut off and given to out-door labor of an invigorating kind. In some cases it has positively converted useless feeble flacid children with inert stolid minds, into handy, hardy boys; apt to teach, ready in acquiring knowledge and in understanding its application. Again, how palpably is a school always enlivened, and the work, though previously flagging, stimulated, when the manager or the committee man or the head master goes in and orders the windows to be opened.

*There is not one school or bed room in a hundred properly ventilated.*

Were this done, the mental power of every child in the room is immediately increased by twenty per cent.

We think a prize should be offered to any school master who would honestly carry into effect an establishment for young gentlemen where the *maximum* school work should be five hours, and the remainder of the day be given to out-door athletic pursuits, of which not only manly games, cricket, rowing, etc., should form part, but hard and systematic gardening. We warrant that these boys, if well taught, would distance the sicklier and feebler lads who do their eight, nine, and ten hours book work per diem, in any given course of scholastic competition. Then what an immensely increased power of moral training does this system give the masters. It is out of doors, in the work and friction of life, that the nature and character of each boy comes out, and it is thus that it can best, nay alone, be thoroughly pruned, trained and nurtured.

A good man, Mr Hopley, has taken up the subject of bodily exercise in a pamphlet he has sent us, which seems a forerun-

ner of some lectures which cannot fail to be very useful. Mr Hopley thus speaks of the general value of exercise:—

The more thought dwells on the importance of muscular exercise, the more important it appears.

We consider that the *only* way of maintaining the health of organs is by permitting them due activity; and then when we think of the number of organs—arteries, capillaries, veins, nerves, bones, cartilages, ligaments, heart, lungs, skin, with myriads of glands and other vital organs—which can be excited to due activity *only* by exercising the muscles;\* moreover, when we bear in remembrance that during healthful muscular exertion the mind is rendered active, the senses quickened, nutrition aided, the blood purified, and the whole man improved,—when we reflect upon these things, it is impossible not to feel that if the generality of mankind could but be brought to comprehend and observe the law of muscular exercise, it would be a great step towards eradicating disease.

Circumstances compel many to break this law; but many break it through ignorance, and children through the ignorance of those whose unperformed duty it is to teach them how to live.

He gives useful warning not to take exercise immediately after meals—a caution much required—a habit very prevalent at all schools, to which every child is prone.

Some well meaning preceptor, on rising from the dinner table, thus addresses his pupils;—"Our time is very precious. You know that I am anxious for you to get through your present course of studies as early as possible. But as you have been very diligent this morning, I will spare you an hour for a game of foot-ball. You will then come in all the more fresh for the performance of your afternoon duties, and I doubt not will continue to take great pains to do well, that we may have leisure for further relaxation in the evening."

Out rush the happy throng, and the preceptor follows and encourages to activity—praises their prowess, adds spirit to their game, and reaps gratification from the enjoyment of his boys. The sport at an end, they return to the school-room, and each sets ardent to work, anxious to show that he appreciates the little holiday. But first one finds his attention flagging; then another; then a third. Time goes on, and studies progress but slowly. The preceptor gently reproves now this scholar, now that; but inattention seems to be catching; none, or very few, are working with energy; there appears a general idleness. The principal (who enjoyed the fresh air, without the violent exercise) feels eager for work. He tries to arouse his boys to their duties, but without effect. He considers them lazy and ungrateful, and thinks it incumbent on him to be angry. The whole afternoon passes uncomfortably, and studies advance scarcely at all. Two or three pupils (fortunate in not having felt hungry at dinner time, or from some other incidental cause) have been successful in their endeavours, have gained several places in their classes, and are considered by the preceptor "good and thoughtful boys;" others feel themselves fallen in his estimation. When the pupils are left to themselves, "I don't know how it was," says one, "but I'm sure I tried to please." "So did I," says a second, "but somehow or other I could not work this afternoon." "Nor I," says a third, "I'm so sorry." "Let us," say three or four together, "ask if we may be called earlier to-morrow, and try to get it done before breakfast."

Now this is a simple picture of truth. And these are schoolboys' troubles, and schoolboys' feelings. And these things are constantly occurring. They are facts so common to so many schools, that there are few persons, accustomed to the routine of such establishments, but must call to mind numerous instances of afternoons passed in this manner. Here preceptor and pupils all wished to act well—all strove to do their best,—yet, all met with discomfiture. And why? *Because the Educational system was not based upon physiological principles.*

At the commencement of the afternoon studies, the food in many of the stomachs was in pretty well the same state as when first swallowed; the vital fluid was busy at the surface and extremities of each system; at first the boys work energetically; but soon the constitutional excitement produced in the play-ground, subsides; then there is a rush of blood to the abdominal regions—the more vigorous because up to this period Nature has been thwarted in her good designs: the various brains now deprived of that full supply of arterial fluid requisite for the active performance of their functions, and hence the supposed idleness and ingatitudo of the pupils, and consequent disappointment of the teacher. Probably one or two of the "good and thoughtful boys" are afflicted with stomach trouble the day following, because their nervous energy, directed by an anxious will, enabled them to keep up in their brains

\* The skin itself is studded with "myriads of glands," but these are a mere few compared with the countless myriads crowding the inner system, many of them of a highly elaborate and vitally important character, forming, indeed, large complex organs, and all, in a greater or less degree, dependent for their health upon muscular exertion.

an undue circulation of the blood which nature required for the digestive process.\*

And here we may see the error of *deep thinking* immediately after a hearty meal. No human organs require for the performance of their duties such an abundant supply of the blood as the brain and stomach. These organs, therefore, cannot work vigorously together. If superabundant blood be excited in the brain when the principal circulation should be in the regions of the stomach, the latter organ must be rendered more or less inactive. Nothing under a special miracle can hinder that student from being an unhappy dyspeptic, who persists, day after day, in poring over his books or problems without allowing the stomach either time or opportunity to carry on its functions.

Mr Hopley is a man after our own heart: he is no advocate for the dull old rusty ways which used to be mistaken for the paths of wisdom, when boys were trained in bag-wig fashion. He would make both repose and exercise cheerful things, thus vastly, as he justly contends, enhancing their aid to health.

Mirth is the best medicine for mind and body at that period after meals. By its action on the lungs it gives a healthful motion to the organs of nutrition, and increases the flow of blood where it is most required. "Laughter," says Professor Hufeland, "is one of the greatest helps to digestion with which I am acquainted; and the custom prevalent among our forefathers, of exciting it at table by jesters and buffoons, was in accordance with true medical principles." "Endeavour," he adds, "to have cheerful companions at your meals: what nourishment one receives amidst mirth and jollity, will certainly produce good and light blood.†"

But it is not "mirth and jollity" alone, it is *happiness of every kind*, that conduces to health. It may be received as an established fact in physiology, that every pleasure which does not tend to pain of body or pain of conscience—is improving to the system; and everything which conduces to health is not only in itself conducive to pleasure, but renders the sentient being more susceptible of pleasure. The very following after health is a following after lawful pleasure; and if, during the pursuit, a pain of any kind attack man's constitution, it should be regarded as a hint from Nature that he is departing from the right way.

And this brings us to the consideration (says Mr Hopley) of another point highly essential to be observed in the training of the muscles.—*Exercise always proves more beneficial to the system when it causes gratification to the individual: a matter easy to comprehend, if we reflect that every act is the consequence of an emotion of the mind,—and therefore, depends on the working of the brain.*

To take an example: The botanist in his rambles suddenly comes upon a rare and beautiful flower; admiration and a desire to possess the specimen are excited in the brain, the brain excites the nerves of motion; the nerves of motion excite the muscles of the hand, arm, &c.; the hand and arm are stretched forth, and the flower is grasped: with the muscular movements, the nerves of sensation are excited, and immediately indicate to the mind's organ, (even though the eye of the naturalist should happen to be averted) that the flower is in safe custody of his fingers.

Mr Hopley next dilates on the foolish mode in which our curved girls are rendered healthless and feeble, and makes many just remarks thereupon, which will appear amply set forth in his projected lectures.—*English Journal of Education.*

\* If, as is seen to be the case, it be highly injurious to join, directly after a full meal, in an energetic game of foot-ball, hockey, cricket, rackets, or any other sport requiring great muscular activity, it must be equally injurious for the working man to be engaged, under similar circumstances, in threshing corn, wielding the huge forging-hammer, or in any like laborious occupation. Vast numbers among our hard wrought classes suffer severely from the habit of taking (generally in a far too hurried manner) their most substantial meal about mid-day, and almost immediately after, returning to employments demanding severe bodily exertion. These flagrant violations of Nature's laws not only occasion an incalculable amount of stomachic disease, but lay the foundation of other serious maladies—maladies which might be altogether avoided by the institution of more rational arrangements.

† Hufeland's Art of Prolonging Life, Part III, chap. xii.

‡ In other words, every lawful and moral pleasure—every such pleasure as the tender and healthy conscience would not condemn.

## II.—PRACTICE OF EDUCATION.

### ENGLISH GRAMMAR.

THERE is not, perhaps, one branch of Common School Education which demands so much skill in teaching as that of English Grammar; and yet it is much to be feared there is none in reference to which so great an amount of imperfection obtains. The old rote method of teaching English Grammar still prevails in not a few of our schools; and even in those cases where that method has been abandoned and given place to one more rational and intellectual, there is still too much of mere verbal explanation and memory in the process. Is it then at all to be wondered at, that to so many intelligent children the study of this branch of knowledge should be so uninteresting and so unproductive of real practical benefit; and still more, that it should fail in cultivating those powers and tastes which, when clearly understood and properly taught, it is so well fitted to effect?

Now there is scarcely a branch of education where our system can be brought to bear with greater efficiency than that of English Grammar. It is a science, and necessarily must possess a large number of technical terms. These terms, before the lesson is prepared, require to be pictured out, or familiarly illustrated by objects within the range of the child's experience, and in language of course equally simple and intelligible. The terms by which the four great divisions of the science are characterized, viz., Orthography, Etymology, Syntax and Prosody, with all the subordinate divisions or classes, such as Nominative, Possessive, Objective, Singular, Plural, Relative, Demonstrative, Indicative, Subjunctive, Imperative, Infinitive, and such like;—all furnish ample ground for the truth of this observation, and prove incontestibly the necessity of something more than a mere verbal explanation to convey the real meaning of these terms to the minds of the young, to present them to the mind's eye as palpably as any external object is presented to our corporeal vision. But enough, of preliminary matter.

The teaching of English Grammar, according to our system, consists of two parts, *practical* and *systematic*.—The former of these again may be regarded in two aspects, the obtaining of a knowledge of the different sorts of words or parts of speech, and the acquiring of a facility in the use of correct, grammatical expressions. This practical grammar may begin at the very commencement of the child's educational career, or at any rate as soon as he is able to pronounce monosyllabic words. The trainer may ask all, or each child in rotation, what they would wish to have, provided they went to a toy shop? One will say, a top; a second, a whip; a third, a baby doll; a fourth, a gun. The teacher will then inform them that the names top—whip—doll—gun, are called *nouns*. But the boy who chose the top, or whip, might say, I want a large top or a long whip; large shows the kind of top, and therefore is an adjective, and long also is an adjective. Now, both these words are adjectives, because they tell or denote the kind of top or whip which you want, and so on. Thus the children may be taught the articles A and The, and also the verb, such as Robert spins his top, &c., &c. The little children may engage in these exercises even before they are able to read. When, however, they are able to read short simple sentences, they may be asked to name all the nouns it contains, and this they may continue for a number of weeks; then the adjectives, and then



the pronouns, &c., and so on, in the same way, till all the different sorts of words can be distinguished with ease,—the ordinary reading lessons forming the material of the daily practice in this exercise. But there is another important department in practical Grammar, and that is, training the young in all these exercises or recitations to speak grammatically. This is of primary importance. How often do we hear individuals who may be called superior grammarians in theory, yea, able to discuss some of its finer niceties, making the most fearful blunders when required to express their sentiments extemporaneously on any subject! And to what is this owing?—Plainly to the want of practice or training in their more juvenile years. With all their study of the subject of Grammar, and with all their speculative knowledge, they have been sadly neglectful of the practical—their teachers themselves committing the most woeful mistakes, and, it may be, violating the very rules on which at the time they are exercising their scholars. Now how is all this to be obviated? In no other way than training the young to speak correctly, and carefully correcting them when they make mistakes, the teacher himself striving not only to speak grammatically, but elegantly and impressively. This is one main object of the oral lessons practised by the pupil-teachers in the Normal School. But this is not enough to impart to the future teachers of the Province a capability of expressing themselves grammatically; and, therefore, they ought to pay every possible attention to their language, and endeavour to act here, as in everything else, as models of imitation to their pupils.

The other great department of English Grammar, in so far as its teaching is concerned, is what we have designated *systematic or by rule*. This has a reference to the study of English Grammar in an orderly consecutive manner, and is the course pursued in the more advanced classes, say from seven or eight years of age and upwards. No book even here ought to be used until the class is well acquainted with the leading outlines; and this the teacher ought to be perfectly competent to present, whatever be the Text Book in Grammar used. When this is done, then the Text Book may be proceeded with, piecemeal, presenting always a more particular outline of each of the four great divisions before entering upon the details. At the time the lesson is formally prescribed the technical terms ought to be well and appropriately pictured out, the whole process of communication between master and scholars being conducted in this, as in every other elementary branch, Elliptically and Interrogatively, Simultaneously and Individually. When rules are required to be committed to memory, it would be more in accordance with our system to unfold the principles involved, in the first place, to furnish an abundance of examples of these principles, and then to cause the pupils to construct rules for themselves; afterwards to compare the same with those employed in the Text Book, altering or modifying them according to circumstances. This would form an admirable exercise in composition, as well as train up the young to a thorough knowledge of the very essence of Grammar. Proceeding in this way, and accompanied with oral training exercises, direct from the master or during the ordinary reading lessons, the accomplished master will find little or no difficulty in carrying forward the pupils to the highest points in Grammar, whether in prose or poetry.

This is only an outline of the two modes of teaching English Grammar. We shall resume the subject on some future occasion, and present these modes in full detail.

### III.—OFFICIAL NOTICES.

In consequence of being from home while the last number of the *Journal* was passing through the press, a mistake has occurred in the List of the Graduates who attended the last Session of the Normal School,—the whole of the second division of the Second Class Diplomas having been omitted. As it is intended that the *Journal* shall constitute the authentic record of the graduates of the Normal School, we insert the whole list below:—

#### GRAMMAR SCHOOL DIPLOMA.

Mr Daniel McDonald, Sydney County.  
Charles Pitblado, Colchester.  
William Elder, Hants,

#### FIRST CLASS DIPLOMA.

Miss Sarah McLeod, Colchester.  
Emma Page, Cumberland.  
Mary Annand, Colchester.  
Nancy Archibald, do.  
Martha Campbell, do.  
Mary Jane Cambell, Colchester.  
Mary Jane Cox, do.  
Margaret C. O'Brien, Hants.  
Nancy Barnhill, Colchester.  
Lizzie Walker, Lunenburg.  
Bessie Steele, Halifax.

Mr Alexander McKay, Colchester.  
George Ross, do.  
Duncan McPhail, Inverness.  
Malcolm McKinnon, do.  
Roderick McNeill, do.  
Angus Ross, Colchester.  
Peter Campbell, Inverness.  
Campbell Stewart, Halifax.

#### SECOND CLASS DIPLOMA.

##### First Division.

Miss Elizabeth Thomson, Hants.  
Miss Mary Allan, Shelburne.  
Sarah Wilson, Halifax.  
Annie Pitblado, Colchester.  
Jane Gammel, do.  
Emma Homer, Shelburne.  
Letitia Crowell, do.  
Jane Reid, Pictou.  
Margaret Murray, Colchester.  
Lillias McLeod, Pictou.  
Susan Waddell, Hants.  
Martha Stewart, Pictou.  
A. J. McCurdy, Cumberland,  
Bishop, Sydney.

Sarah Jane Davison, Colchester.  
Mr John Chipman, Annapolis.  
James Christie, Colchester.  
Donald McLeod, Cumberland.  
Robinson Cox, Colchester.  
Allan McMillan, Victoria.  
Alexander McRae, Richmond.  
Charles Kehnth, Lunenburg.  
Murdoch McKinnon, Inverness.  
Richmond McCurdy, Colchester.

##### Second Division.

Miss Isabella Muir, Colchester.  
Ann Miller, Pictou.  
Anna Beebe, Cumberland.  
Annie Leizer, Halifax.  
Mr. James Ross, Colchester.  
Allan McLean, Inverness.  
Nath. Hebb, Lunenburg.  
Frederick Lawrence, Inverness.  
James Forbes, do.  
Angus McDonald, Colchester.

## TO THE CLERKS OF SCHOOL BOARDS.

Instead of printing the Annual Report on the State of Education in a separate form, as was done last year, it was deemed more advisable to insert it in the pages of this Journal.—The permission of the Provincial Secretary having been solicited and obtained for this purpose, a thousand additional copies of the last number were struck off for distribution. A proportional number has been forwarded to the Clerk of each Board of School Commissioners, which, it is hoped, will be transmitted with as little delay as possible to the Teachers. Should there be any extra copies after the Commissioners and Teachers within your bounds are supplied, we shall feel obliged by your presenting the same to any around interested in the cause of Education.

In the Report above referred to, it was stated that a programme of the qualifications of the different classes of Teachers would be appended, for the information of candidates for license themselves, as well as for the guidance of the different School Boards. This was omitted. We therefore give below an outline of these qualifications. We know that some will object to these qualifications as too high, in the present educational condition of this Province. We have only to say, in reply to such an objection, that wherever a State Normal School exists, unless the standard of qualification is raised and raised progressively, such an Institution can prove of very little benefit, and by consequence, the means expended in its support can be little else than a waste of the public funds.

*Third Class Candidates.*

1. That they be able to read any plain passage in English Prose or Verse, with correctness and intelligence, and to spell from dictation any ordinary sentence.
2. That they write a plain, legible hand.
3. That they be able to work any exercises in the fundamental rules of Arithmetic, simple and compound, and also in Practice, and explain the principles involved in working the same.
4. That they know the elements of English Grammar, and be able to parse any easy sentence.
5. That they know the first principles of Geography, and, especially, be well acquainted with the Geography of the Province.
6. That they be acquainted with the best method of arranging and governing Schools.

*Second Class Candidates.*

In addition to the above, it is required of the candidates for Second Class Common School Certificates:—

1. That they be able to read with ease, intelligence and impressiveness any passage, either in prose or verse, in 1st section of 4th Book Irish National Series, and be well acquainted with the principles of pronunciation and of reading.
2. That they be able to spell correctly and with proper punctuation the words of an ordinary sentence dictated by the Examiners.
3. That they be able to write a plain, free hand, and be well acquainted with the rules of teaching writing.
4. That they do mentally any account in the simple and compound rules of Arithmetic, with correctness and expedition, and work on the slate any exercise as far as Interest, including Fractions.
5. That they be acquainted with the elements of Book-keeping.
6. That they be able to parse any sentence in prose or poetry which may be submitted, write grammatically any passage that may be read, and be well acquainted with the

structure and composition of sentences, the Etymology of words &c.

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

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

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

*First Class Candidates.*

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

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

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

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

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

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

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

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

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

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

*Grammar School Candidates.*

In addition to the above, it is required:—

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

2. That they possess an accurate knowledge of Grecian, Roman, and English History.

3. That they be well acquainted with Ancient Geography.

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

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

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

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

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

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



## IV.—EDUCATIONAL INTELLIGENCE.

## COLONIAL.

## NOVA SCOTIA.

## SUPERINTENDENT'S VISIT TO THE WESTERN COUNTIES.

In pursuance of the announcements given in preceding numbers the Superintendent of Education has, during the vacation of Normal School, visited, educationally, the counties of Lunenburg, Queen's, Shelburne, Yarmouth, Digby and Annapolis. In all these counties he has held several public meetings and Teachers' Institutes. The object of these public meetings is to endeavour to elevate the tone of popular feeling on the subject of Education, to awaken in the minds of parents a deeper sense of their responsibility and privilege in connection with the education of their children, and to offer such suggestions for the improvement and encouragement of education, in certain localities, as the circumstances of these localities may seem to demand. Though a great deal of apyness and indifference still obtains, in too many districts, relative to the work of the education of the young, yet there are here and there cheering indications of a better spirit rising into existence. Amongst other favorable symptoms there is evidently a growing demand for a more thoroughly qualified class of Teachers. The importance and the value of the education of the young have begun to present themselves in such a light as to satisfy the reflecting, that this business requires something more for the due discharge of its duties than a certain amount of scholarship, even a course of preparatory training, of professional qualification;—and hence the demand for Teachers who have attended the Normal School, and hence too the willingness of the people to provide a more adequate remuneration. The average emolument of the Teachers who hold a first class diploma from the Normal School, in the Western parts of the Province, cannot be less than a £100 per annum, if not £110. Along with all this, there is also a strong desire manifested on the part of many School Districts to provide more ample and more convenient school accommodation, with furniture suited to the different sizes of the scholars and all the other requisite appendages. In corroboration of all this the Superintendent of Education might refer, with perfect confidence, to what has been done and is now doing on behalf of Education in the District of Argyle, and in Sandy and Trout Cove on Digby Neck. There parents and others, christian men and women, are beginning to see that next to the promotion of their own best interests, comes the sound and the thorough education of the rising generation; and they are willing to toil and to submit to acts of self-sacrifice for the accomplishment of this end. And, surely, they are receiving vastly better interest for their gain, in this way, than in adding acre to acre or house to house.—Another cause of congratulation is the apparent decided conviction in the minds of the intelligent and well-conditioned in our more important county towns, that something must be done, and that with as little delay as possible, for the purpose of supplanting the present system of things in these towns, and of availing themselves of the educational advantages of more densely peopled localities. From these advantages, such as the number of children who can attend school, and the greater capability, generally speaking, of supporting education, we would expect education to be in a far more flourishing condition in these towns than in the more rural districts of our land. With a very few exceptions, however, this is not the case. It is our decided conviction that common education is in a worse condition in these small towns than it is in the country generally. And to what is this mainly to be traced? Not to any deficiency in the law, but to the encouragement given by Trustees and Commissioners of Schools to private Schools. A Teacher provides a School either by hiring a room or appropriating an apartment in his or her own private dwelling, commences

teaching, in three or four months fills up a return, obtains the signatures of the Trustees, and then presents the same to the School Board for his allowance out of the public funds. The law distinctly requires that before the Trustees engage a Teacher a school-house shall either be built or provided by the District. It is this, and this alone, that entitles it to the designation of a public School,—and this is the only kind of Common School entitled to a share of the public funds.—This state of things, then, of which we speak is no fault of the law, but of its executioners. It is gratifying, however, to observe in the great proportion of these county towns a dissatisfaction with the present system, and in not a few cases a determination to get rid of it with as much expedition as possible. Let them substitute one or two large Schools, capable of containing from 150 to 200 children, grade or classify the scholars, and appoint three or four teachers, under one head; and they will thereby secure the cheapest and most efficient education for the young in their midst.

The Superintendent begs also here to record the satisfaction he experienced in meeting and conferring with so many Teachers at the Institutes he held during his Western tour. The majority of these Institutes were, on the whole, well attended. There were a few cases indeed where scarcely a half of the Teachers resident within the bounds were in attendance. This may have arisen partly from the state of the weather, and partly from their great distance from the place of meeting. We trust that in the next educational enactment provision will be made for defraying the expenses connected with these Institutes. There cannot be the shadow of a doubt that they are admirably fitted to beget and foster a fraternal feeling among the Teachers themselves, to excite and encourage a desire for self-improvement, with a view to greater usefulness in their calling, and still more to bring about a uniformity in the mode of school-management and school-teaching all over the Province.

## OPENING OF SUMMER SESSION OF NORMAL SCHOOL.

This Institution was opened for the Summer Term on Wednesday the 11th instant. The first week was spent in preliminary exercises and in making arrangements. On Wednesday, the 18th, the formal opening took place by the Principal delivering a Lecture *On the Quantity and Quality of the Education that ought to be aimed at in every National System of Education, and the means to be used for the accomplishing of the same.*

The number of Pupil-Teachers in attendance is 15 more than on any former Summer Session; but what affords to us matter of peculiar gratification is the fact that the majority are from the Western Counties. On the commencement of any general educational undertaking, the majority of students generally belong to the immediate or surrounding vicinity. So was it with the Provincial Normal School; and, accordingly, one of the strongest objections brought against the Institution, with the view of putting an arrestment upon any further grants for its encouragement, was that it was purely a Colchester affair. This objection is, now, to a great extent, at least, removed.

The following is a List of the Students enrolled, with the counties whence they came:—

*Young Ladies:*

- Miss Elminn Cox—Colchester.  
 Jane Gow—Lunenburg.  
 Moriah Corbet—Annapolis.  
 Letitia Crowell—Shelburne.  
 Emma Homer— do.  
 Elizabeth Thomson—Hants.  
 Janet Mathieson—Cumberland.  
 Eliza Jane Crowdis—Victoria, C. B.  
 Louisa Crowell—Shelburne.  
 Louisa Wilson— do.  
 Mrs. McLennan—Inverness, C. B.  
 Miss Mary Kirkwood—Pictou.  
 Caroline Church—Hants.  
 Sarah Church— do.

Miss Janet Chipman—Colchester.  
 Jessie Baxter— do.  
 Mrs. Frost—Yarmouth.  
 Miss Isabella Kent—Colchester.  
 Fanny Fisher— do.  
 Harriet J. O'Brien—Hants.  
 Helen Koiller—Colchester.  
 Fanny McMurray— do.  
 Elizabeth Lauder—Pictou.  
 Anna Leaks—Cumberland.  
 Margaret Walker—Colchester.  
 Anna Greene—Halifax.  
 Isabella Etter—Hants.  
 Charlotte Fletcher—Colchester.  
 Esther Barnhill— do.  
 Nancy Barnhill— do.  
 Frances Blair— do.  
 Jane Cork— do.  
 Charity Snodden—Halifax.  
 Helen Page—Cumberland.  
 Barbara Hill—Digby.

#### Young Gentlemen.

Mr. George Frost—Yarmouth.  
 Albert Gayton— do.  
 Robert A. Dakin—Annapolis.  
 Augustus Hiltz—Lunenburg.  
 Reuben C. Raymond—Yarmouth.  
 Benjamin Rogers— do.  
 Lemuel Sprerry—Lunenburg.  
 Daniel Keiser— do.  
 Simeon Sykes—Yarmouth.  
 Nicholas Smith—Queen's.  
 Samuel O'Brien—Hants.  
 George Kent—Colchester.  
 Murdoch McKinnon—Inverness, C.B.  
 ——— Kelnroth—Lunenburg.  
 Frederick Lawrence—Inverness, C.B.  
 John A. Morse—Annapolis.  
 Hiram Eaton—Colchester.  
 Duncan Duff—Hants.  
 John Cameron—Sydney.  
 William Muench—Pictou.  
 John R. Downing—Colchester.  
 James G. Forbes—Guysboro.  
 James Christie—Colchester.  
 Donald McLeod—Cumberland.  
 Richmond McCurdy—Colchester.  
 George Ross— do.  
 Nathaniel Hebb—Lunenburg.  
 Samuel Raymond—Yarmouth.  
 John Blackadar— do.  
 Samuel Archibald— do.  
 Charles Darby—Shelburne.

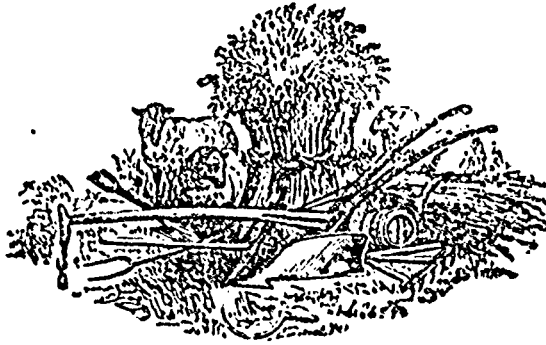
Dr. Cogswell.—This indefatigable philanthropist has presented to the Pupil-Teachers of the Normal School a full set of implements for the game of cricket, on condition that a club be formed and the game regularly prosecuted.—By this means the Doctor expects that this animating and athletic game shall be propagated and soon be in common practice throughout the Province. We most cordially sympathize with Dr. Cogswell's views on the subject of Physical Education, not merely because it is a means admirably fitted to promote the health and vigour of the body, but also of the intellect and conscience. The want of a gymnastic and calisthenic apparatus has prevented us, in a great measure, from carrying out our views of Physical Education as we desired, in connection with the Model Schools. Nevertheless we are doing what we can with the materials we possess for

its furtherance, and hope ere long to see our equipment in this respect much more complete. Dr. Cogswell has also presented a Nova Scotia Flag to the Normal School, of large dimensions, and of excellent quality, to be hoisted on a staff at the Schools, on Holidays. We tender publicly our best thanks to the Doctor for these valuable donations.

#### NEW BRUNSWICK.

Long before this time, we should have acknowledged the receipt of the Annual Report of the Chief Superintendent of Schools for this Province. The Report is mainly occupied with an account of the well-directed and energetic efforts of Mr. Fisher, during the time he has been in office, from which it is evident, much good has already stored. This is followed by extracts from the Reports of the four District Inspectors, viz., Messrs. Duval, Campbell, McLauchlan, Bennett. These extracts contain much valuable information respecting the present condition on the schools in that Province, and offer many useful suggestions with a view to their improvement. Then follows a brief statement by Mr. Mills, Head-Master of the Training School, on the condition of that Institution. It appears from that statement that there were during the past year 84 Pupil-Teachers in attendance and 94 children at the Model Schools. The whole cost of this department is £836 8s. 3d., inclusive of the salaries of the Teachers and the allowance made to the Pupil-Teachers for Board. We perfectly agree with the Superintendent and the Master of this department that nothing like justice can be done to it without suitable accommodation both in the shape of a Normal College and Model Schools, and, until that accommodation is provided, one half of the efforts made in the matter of supervision is comparatively unavailing.—We regret that the Legislature of New Brunswick, with its wonted liberality in the cause of Education, did not, during its last session, make provision for the erection of Normal School Buildings worthy the enterprise of that magnificent Province. People may reason as they may about the advantages of College or University Education in these colonies, but unless a substantial and suitable foundation is laid for the progressive elevation of the common education of the country, no best concerted plans for Colleges or Universities must prove a failure, and that just because they must be fed by the Grammar Schools or Academies, and these, again, by the Common Schools;—and the only true and enduring foundation that can be laid for this end is a thoroughly equipped Normal School or People's College.—An adequate Inspectorship is indispensable after you are provided with a due supply of qualified Teachers, but, before that time, the most careful inspectorship can accomplish comparatively little good. We know that this view is opposed to the general opinion, but, we think, it can be proved to be sound, notwithstanding. The Statistical Tables of this Report are drawn out with much fullness and apparent correctness, and present an admirable digest of the present condition of Education in every parish. The whole amount given by the Province of New Brunswick to the educational service last year was £29,082 8s. 7d., being about double the amount granted by that of Nova Scotia for the same purpose.

# AGRICULTURAL.



## I.—THEORY OF AGRICULTURE.

### VALUE OF SCIENTIFIC INSTRUCTION TO FARMERS.

No mistake is more common than to suppose that science means scholastic puppyism. Every practical farmer who understands cause as well as effect, is a scientific farmer. Indeed, every man, whatever may be his calling, who understands what he performs, and does not blindly follow mere empirical recipe, is a scientific man; while those who do not, are simple quacks. A mere farm laborer who works like a machine, obeying orders, is valuable as a laborer; but it is a great error to call such an one a practical farmer, simply because he can handle a tool and show warts on his hands. Science means knowledge reduced to a system so as to be easily taught and readily understood; and any farmer, whatever may be his expertness as a plowman, who cannot tell why he plows except by answering that crops grow better from such practice, makes a mistake when he calls himself a practical farmer. He should understand so much of nature's laws as to avail of them most profitably; and those who speak of errors in the application of chemistry or natural philosophy to farming, as science, do not know the meaning of the term.

By referring to our definition, it will readily be seen that no such thing as a scientific error can exist. It is the absence of science that causes errors, and not its practice. If nature's laws were clearly understood, what farm would be without under-drains? What field would be manured with inappropriate substances not deficient in the soil, and not required by the crops? Who would believe that redundant amounts of ammonia were more valuable than inorganic constituents in a proper state of progression, such as are found in the ashes of every plant? Who would repudiate the sub-soil plow or an under-drain? Who know that under-drained soils never suffer from drouth, and that sub-soiled meadows never run out, and who clearly understand the causes why these two facts always prevail.—*Working Farmer.*

## II.—PRACTICE OF AGRICULTURE.

### IMPORTANCE OF DEEP CULTIVATION.

There can be no question that the produce of most of our Nova Scotian farms might be greatly increased by deeper ploughing and clean cultivation. Four or five inches may do very well for a few years after the land has been reclaim-

ed from the primeval forest with a surface rich in organic matter; but after a while such shallow cultivation produces a stationary, or rather a retrograding, condition of agriculture, and recourse must be had to the employment of the best methods of deepening the staple soil, that a greater range may be given to the roots of crops in search of food, and to allow moisture and air to penetrate the soil freely, laden with life-giving power. In order to accomplish this necessary object, the farmer must invoke the aid of mechanical science, and look to the modern implement maker to supply him with such tools and machines as will render tillage more thorough and cheap. What we want, more particularly in this country, are such efficient and economically working implements,—such as scarifiers and grubbers,—as will enable the farmer to clean and deeply pulverize the soil after harvest, and before our long and rigorous winters set in, that the land may be in the best mechanical condition for early working and sowing in the spring. There can be no question that the approval and practice of deeper tillage are gaining ground in our older settled districts. Soils thus prepared sustain healthier crops through the often long and severe droughts of our summers, enabling the plant to search wider and deeper in search of food. Intelligent agriculturists have not worked their teams in herculean ploughing and subsoiling of 15 or 20-inch furrows, in stiff clay soils, without spreading the fame of their results; practice has not toiled or science preached in vain; and at the present time we believe that the most valued boon to the farmer would be the placing in his hands a power that could make trench-work and deep-stirring cheap and easy, instead of a costly and somewhat dreaded operation.—In the better cultivated districts of Britain, ploughs to work twelve inches deep are no longer deemed preposterous; and as we come nearer and nearer to the successful hauling of draught implements by steam power, the production and testing of the best heavy land plough becomes a closer struggle between manufacturers, and a livelier subject of attention to the practical farmer.

There is no occupier who would not like to have his land in as fine tilth, and as clean, as a garden,—deeply worked, pulverized, and enriched; only (as he will tell you) he must raise and be able to market greengrocers' and fruiterers' produce, in order to make such perfect cultivation pay. As long as grain and roots and fodder are worth no more per acre than at present, there is a limit to the amount of tillage it will answer to bestow in growing them. Give him a power cheaper and stronger than that of horses, and still more than that of workmen,—a power that eats only when at work, never wearies, and will accomplish the tillage wholesale at the right time, instead of being obliged to plod on, bit after bit, often in unsuitable weather, and he will soon show what an augmentation of produce, and how many other advantages, follow a better and superior style of culture.

The increased yield of our grain crops by deeper ploughing and underground draining, where needed, would, if fairly calculated, appear to many absolutely incredible. The risks of injury by insects, rust, &c., would be reduced to a minimum, and the average produce probably doubled. Thousands of acres of our grain-producing land has never been cultivated four or five inches deep, beneath which is often to be found a foot of soil abounding in the necessary mineral and organic matter, constituting the food of plants, and which only requires to be broken up and exposed to the action of air and rains, to yield to the growing crop its abundance of hidden treasure. With regard to Indian Corn, it is stated upon good authority, that in the Western States, upon the deep rich soils of the prairies, with the present shallow and imperfect system of culture, the average yield is under 30 bushels per acre, whereas upon the poorer stony soils of the New England States in consequence of deeper ploughing and more thorough working the land, double and treble that amount is frequently raised. Upon poor sandy subsoils, deeper ploughing should be proceeded with progressively, as the turning up at once a large quantity of such soil, without a heavy manuring, might be temporarily

Injurious. It is proper also to observe, that upon soils naturally wet, little benefit can be expected from deeper culture till the land is drained. Draining, indeed, is the first indispensable means of improvement on wet lands,—the foundation of all subsequent ameliorations, and should always precede, rather than follow, deep cultivation. In preparing land for spring grain, it will be found most advantageous not to plough generally less than seven or eight inches deep; and for root crops an additional depth of as many inches by the subsoil plough, with a liberal dressing of well decomposed manure, will be found the most remunerating.—*Canadian Agriculturist.*

#### PREPARATION FOR ROOT CROPS.

As the live-stock of Canada has of late years been rapidly increasing in quantity, and, in most districts, improving in quality, the supply of a sufficient amount of suitable provender, becomes a question of great moment to every farmer; since the mixed system of husbandry, or the breeding of stock and the raising of grain, is the one universally prevailing in this country. The main object of the farmer is to produce the largest amount of grain, and sustain the greatest number of animals of the best quality that his farm will allow, without diminishing, but rather increasing, the natural and permanent productiveness of the soil.

With a view of increasing and improving the domesticated animals of the farm, it has been found requisite in the Islands, whose soil and climate are so peculiarly adapted to the production of grass and a rich permanent pasturage, to cultivate the various kinds of root crops upon a scale of great magnitude. And it is to the production of an ample supply of nutritious food of different varieties that we must mainly look for an explanation of the immense numbers of farm animals, and their superior excellence, which characterize the agriculture of Great Britain and Ireland. Previous to the introduction of the turnip, beet, carrot, &c., into field culture, both the amount and quality of live stock were very different to the present state of things. The same reasons are equally applicable here. Neither our heavy crops, nor artificial or permanent pastures are of such a character as to support large flocks and herds, without the aid of vegetables cultivated in the best manner and on a commensurate scale. Our farmers are beginning to understand that it must be a losing business to go to the trouble and expense of importing or breeding improved stock, without providing for them a sufficient amount of food of the best quality; and experience has determined that a mixture, consisting of hay, roots and grain, is the one by far best adapted to meet the increasing demands of this new and improved order of things.

The season has now arrived when active preparations must be made to secure these objects. It is generally to be recommended to plough land intended for root crops, deeply in the fall, and to prevent the stagnation of water upon the surface either by underdraining or surface furrows, the former being incomparably the best. Give the land a thorough working as early in the spring as its state will admit, always bearing in mind that for fine seeds especially, the ground should never be touched while in a wet state; a rule which applies with increased force to all kinds of heavy and retentive soils. The thorough mechanical preparation of the land for root crops, or indeed for all others, is a matter of primary importance, affecting the growth and amount of the crop in a variety of ways.

The next consideration is the adaptation of the soil to a special object in what may be termed a chemical point of view; or in other words the supplying of crops with the necessary kind and amount of food which they require. This brings us at once to the all-important question of manures. And here it may be observed that it will only end in loss and disappointment to attempt the raising of roots, for the purpose of cattle feeding, without first bringing the soil into a suitable condition, first by deep and clean cultivation;

and second, by the application of manures, in kind and quantity adapted to the requirements of the crop, and the actual condition of the soil. Farm yard dung, unless thoroughly decomposed, which state generally involves a great loss of manuring constituents, should be evenly spread over the surface and well incorporated with the soil. Bone-dust, guano, and the fine artificial manures, are generally best applied in the drills with the seed, taking care that guano, for instance, does not come into direct contact with the seed, as its germination might thereby be weakened or entirely prevented.—*lb.*

#### MANURES—HOW MUCH SHOULD BE USED.

We are daily asked how much manure should be used per acre—sometimes in relation to the Phosphate of Lime, sometimes Peruvian Guano—and we always answer, as much as you can use with increased profit. The practice is quite common among farmers, to use only so much as they think will produce a crop. Our experience has been, that very much larger quantities may be used with increased profit. Thus, we have found that 200lbs. of Nitrogenized Super phosphate of Lime per acre, would produce 50 bushels of shelled corn on our soil, but by increasing the quantity to 600 lbs. per acre, we have several times produced 110 bushels. And in putting down land to grass with the same quantity, and top-dressing every spring thereafter with 150 lbs. per acre, we have been able to cut three tons of timothy hay; but where we have used 300 lbs. instead of six, in the original manuring, the crop has been much less and the profit materially less; for the production of an extra ton of hay even the first year alone, leaves an excess of profit in favor of the use of the greater quantity. While with carrots and other root crops, and particularly those crops known as market truck, or any manure needed by the soil may be used, in four times the usual quantities, with increased profit.

The market gardeners at Harsymus, near New York, never return from market with empty wagons. For every load of vegetables carried to the market, they bring back a load of stable manure; and many of them used a hundred loads per annum, and increased profit in so doing. As we before remarked, the farmer who has sufficient capital to conduct his business with the greatest amount of profit, should not experiment to know how little manure will give him a crop, but rather to know how much manure he can use with an increased ratio of profit. For if in the current year he can get a return of \$50 per acre more in the form of carrots or any other crop, by using \$40 more of manure, he not only profits \$10, but he now leaves his land in a condition for years to give him a continued increased profit. Nor should he neglect in his future tillage of the same soil to augment the quality of the manurial matter, as long as it continues to give an increased product beyond the cost of the manure added. We know of market gardens near New York, which would be cheaper to a new operator at \$50 per annum rent, in consequence of the present occupant having manured highly, and still profitably for a series of years, than would adjacent soils without a rent, all other circumstances being equal.—*Working Farmer.*

#### STEEPS FOR SEEDS.

The above subject has for a long time engaged the attention of many experimenters, and with various results. Strong solutions of any of the well known materials used, are apt to injure the germs of seeds, while weaker solutions, being held by the spongy coatings, frequently not only secure earlier germinations, but by a timely supply of necessary pabulum, secure vigorous plants, which, as a necessity of proper conditions in their early stages of growth, yield larger returns. Among the materials used we would enu-

merate the following:—Saltpetre, Sulphate of Ammonia, Carbonate of Potash, Carbonate of Soda, Soluble Phosphate of Lime, etc. We should be glad to learn from those who have used steep, what has been their success.—*lb.*

### CULTIVATION OF MANGOLD WURZEL.

The comparative failure of the turnip crop in some districts is directing more attention to other root crops. In King land, no other crop is coming into such rapid favour as mangold, and it is not improbable that at no distant date it will occupy an equal, if not a greater breadth, with that of Swedish turnips. In England generally, both the climate and soils are suitable for the cultivation of mangold. In Scotland experience hitherto has shown that, except in the south-west and west of Scotland, the climate is not so suitable as that of England. To those of our readers who have made experiments, or who intend making experiments with mangold for the first time this season, we direct attention to a report of a discussion at the Kingscote Agricultural Association, Gloucestershire. Information is here furnished which can be turned to advantage. The weight of roots grown by Mr Burnott is more than the average, being from 28 to 38 tons per acre. He states that he knew of 55 tons being grown last year on a heavy clay soil at an expense of £7 6s per acre for manures. Cultivators in Scotland cannot expect to grow above one half this weight even at an expenditure of £7 6s for fertilisers. As mangold cannot be injured by liberal applications of manures, all intending to cultivate it should not stint the quantity. A mixture of portable manures along with farm yard manure is the most suitable application on moist soils. Where the farmyard manure was applied to the land in autumn, portable manures should be applied at the time of depositing the seed of the mangold.—*North British Agriculturists.*

## 111.—AGRICULTURAL INTELLIGENCE.

### THE AGRICULTURAL SOCIETIES OF NOVA SCOTIA.

The Legislature, at its last meeting, in accordance with the recommendation of the Educational Committee, appointed the Superintendent of Education to be the medium of communication between it and the various Agricultural Societies throughout the Province, to confirm all the applications for grants from the public funds, if found correct, to receive all the Reports from these societies, and to present to the Legislature an annual statement of the condition of these societies. Many of our readers are aware that the Legislature of 1858 abolished the Central Committee with its paid functionaries, and referred all applications for money, the reception of the reports, &c., to the Honorable the Financial Secretary. The agricultural committee finding that that officer was not able to give the subject of Agriculture that attention which its importance demanded, and, being desirous, at least, to retain the present organization, if not to infuse some more vitality into the same, requested the Superintendent of Education to act in the above-mentioned capacity. This he consented to do entirely in the hope that ere long something more efficient would be done for the encouragement of Agriculture throughout the Province, that the benefit that would arise to any movement of the sort from the preservation of the present organization, might be realized, and that the opportunity might be afforded of publishing in the pages of the *Journal of Education and Agriculture* the results of the various agricultural experiments and exhibitions made by the associations throughout the Province—so that other districts may be duly ap-

prized and thereby stimulated and encouraged to imitate—if not to outstrip. But over and above all these reasons, the Superintendent of Education has undertaken this work because it is his decided conviction that the experimental Garden and Farm in connection with the Normal School ought to form the grand rallying point of all agricultural operations for the Province. It is earnestly hoped that this contemplated movement will soon be carried into effect, and that some scientific and thoroughly practical man will be appointed to preside not only over this department, but over the whole agricultural interests of the Province. The Superintendent of Education hopes soon to open up a correspondence with the secretaries of the different Agricultural Societies in the Province, and to consult with them as to the best course to be pursued, with the view of infusing fresh vigor into these societies, and of rendering them still more instrumental in the furtherance of this branch of the public service.

MUSQUODOBOIT, May, 1859.

DR. FORRESTER,—

I am glad that you are turning the attention of your readers to Agriculture, and endeavouring to unite education and general intelligence with the cultivation of the land. The cultivation of the soil is the earliest and the noblest of all employments,—an occupation taught man by his Maker in the morning of the world, and while he follows it with solemn meditation and reflection, he may gather flowers which will flourish in the paradise above. The king himself is supported by what grows in the field, and the fruits of the earth are the great store house for the human family. Nine tenths of mankind are nine-tenths of their time working for what they eat. A garment will wear a long time, but a meal must be repeated every day. Mother earth will yield her treasures and her fruits in proportion to the diligence and industry of her children. In the first stage of society the woods and the waters supply the wants of man, and hunting and fishing are their employments. Feeding cattle is the next stage. The Jewish patriarchs were graziers, and had great flocks of cattle; but their stores were scanty when Abraham himself had neither a loaf of bread nor a joint of mutton in his border, for when the three mysterious strangers approached his tent door, a messenger was despatched to the herd for a calf and Sarah must cook a cake on the hearth for immediate use. But when men cultivate the soil they can eat the finest of the wheat and drink the blood of the grape. Merchants are the most wealthy class and form the most powerful aristocracy. Some of your Halifax traders have sprung up like rockets, and would throw the nobility of other lands in the shade.

The Musquodoboit people have tried every way by hook or crook to make a living. They have hunted the moose, speared salmon, and fed cattle. They have kept store, and sold rum, tobacco, nails and ox bows. For the last ten years they have nearly all turned their attention to ploughs and harrows, and the cultivation of the land. It appears to be the best trade they ever tried, and they have wonderfully succeeded. Their forests are yielding to the hatchet and the plough share, and logs and swamps where mosquitoes kept their courts, and frogs held their town meetings are converted into wheat fields and rich meadows. They have good mills, threshing machines, horse rakes, and other improvements. They sell cattle, butter and wool. Their fields are neater and the grass greener than it was ten years ago. The dark shadows of mortgages have nearly disappeared, and the men tread the earth with a lighter heart and a firmer step than they did years ago. The dark and dingy dwellings of the old times with broken windows stuffed with sheep skins and petticoats have been pulled down, and good buildings carpeted to the door, erected in their room. They have five churches, and ten schoolhouses. The settlement is not wealthy, but thrifty. The people are sharp-sighted and calculating, and a Jew could not manage all his worldly business with more forecast and penetration than they do.

All industrious people are slowly but steadily going a head. We have a few drones in the settlement who refuse to work and they are the same as they were many years ago, tugging at a piece of an indian cake and a herring, and complaining of the badness of the times. Well might Solomon send the sluggard to the ant to consider her ways, because by her forecast and industry she lives in the hardest season while grasshoppers sing and dance in summer and starve in winter. Those thriftless people often remind one of Rip Van Winkle who forgot himself and slept for 18 years on the Katskill mountains. The great defect in Rip's composition was an insuperable aversion to profitable labour. He would assist a neighbour in the roughest toil, and was a foremost man at all country frolics. Rip was ready to assist at every body's business but his own, but as to doing family duty, and keeping his farm in order, that was impossible. He maintained that it was of no use to work his farm, it was the most petulant little piece of ground in the whole country. Every thing about him went wrong and would go wrong in spite of him. His fences were continually falling to pieces; his cow would either go astray or get among the cabbages; weeds were sure to grow quicker in his field than any where else. The rain made a point of setting in when he laid out work to do. Rip had an easy well oiled disposition that he could eat either white bread or brown bread as it came to hand. He spent whole days in talking over sleepy stories about nothing. He was in danger of dying from indigestion, had it not been for a termagant wife—in many respects a tolerable blessing, who with a flourish of a broom-stick, and a volume of household eloquence, set fire to his tail and aroused him from his lethargy.

A CORRESPONDENT.

## HORTICULTURAL.

We have long designed to devote a small portion of our space to the subject of Horticulture. Though the great leading principles involved in the art of Agriculture are also involved in that of Horticulture, yet there are many topics and spheres of action embraced in the one, not to be found in the other. Organic Chemistry is here vastly more extensive in its practical application, embracing not only esculent roots and grain, but the whole range of the vegetable kingdom—herbs, shrubs and trees. Here, too, the modes of propagation are much more diversified. Not only have we propagation by seed, as we have generally in the field, but by buds in all its processes, whether by engrafting, or inoculating, or piping, or laying. And the operations in the garden are equally diversified—trenching, digging, hoeing, raking, sowing, grafting, transplanting, pruning, &c., &c.

Now there are three grand departments in every complete horticultural establishment. There is the Vegetable, the Flower, and the Fruit Garden. The Vegetable garden embraces the cultivation of every vegetable production prepared for food by cooking, and hence designated culinary. The Flower garden comprehends the cultivation of all indigenous and exotic plants. The Fruit garden or Orchard embraces the growth of all sorts of fruit, stone or otherwise, and these whether they ripen in the open air or require artificial heat.

It is our intention, in subsequent numbers of our Journal, to say a word or two on one or other of these departments.

As this is the season for sowing culinary vegetables, we give below a few brief hints on this subject, taken from the *Canadian Agriculturist* :—

"In selecting seeds, the first thing to be attended to is to choose the best to be had, and if possible obtain them from a responsible seedsman. Never buy those which are "cheap" because they cost less, for they will prove the "dearest" in the end.

Most kinds of seeds grow more freely if soaked in soft water from 12 to 48 hours before sowing. Seeds of a hard na-

ture, such as blood beet, mangel-wurzel, nasturtium, &c., often fail from want of attention to this circumstance. Indian Corn, Peas and numerous others soaked four hours in a tepid solution of chloride of lime and water, mixed in the proportion of one-fourth of an ounce of the lime to a gallon of water, and then sown in the ordinary way, have been known to throw out germs in twenty-four hours.

The seeds of common garden cress, immersed in oxygenated muriatic acid, will germinate in six hours; whereas, when immersed in water alone, they will not show signs of vegetation in less than thirty hours.

*Kidney or French Beans* may be planted any time in May in drills, two inches deep, the beans two inches from each other, the drills about 18 inches apart. If a regular succession is required, sow a few every few weeks, from the 1st of May to the 1st of July.

*Broad or Windsor Beans* do not succeed well in this climate, the summer heat coming on them before they are podded, which causes the blossoms to drop off. The best soil to grow them is in a rich stiff clay, and on a northern border, shaded from the mid-day sun. Sow in drills two feet apart, the drills two inches deep, and the seeds three inches apart.

*Blood Beet, Long and Turnip*, may be sown in a good rich, deep soil, about the first week of May. Draw drills about a foot apart and one inch deep; sow moderately thick; when the plants are up strong, thin them out the distance of six inches from each other in the rows.

*Brocoli and Cauliflower* require a deep rich soil, of a clayey nature and highly manured. To produce early Cauliflower, or Brocoli, the seed ought to be sown in a hot-bed early in March. When the plants are quite strong and hardy they may be planted out in the garden about the middle of May. Plant in rows two feet square. The kinds that will do well in this climate are the Early London and French Cauliflower, Purple Cape, and Walcheren Brocoli.

*Cabbage*, both early and late, may be sown any time in May. The best situation for raising the plants is a rich damp piece of ground, partially shaded. Seed sown in a situation of this kind is not so subject to be destroyed by the black flea. When the plants are strong they may be planted out in rows and managed the same as directed for Cauliflower. The best kinds for summer use are the Early York, Battersea, and Yannek; for winter use, the Drumhead, Large Bergen, and Flat Dutch.

*Cucumbers* may be sown in the open ground any time in May. They require a good rich soil. Sow in hills four feet apart, leaving only three plants on each hill. The cucumber and melon vines are liable to be attacked by a yellow fly or bug. Soot, charcoal dust, and soap suds, applied to the plants, will assist in keeping them off.

*Musk and Water Melons* may also be sown at the same time, taking care to sow the different kinds a good distance apart from each other, as they are apt to mix. Plant in hills, six feet square, leaving only three plants on each hill. When the plants have grown about six inches, stop or pinch out the top of the leading shoots; which will make the plants throw out lateral shoots, on which you may expect to have fruit.

*Carrots*.—The most suitable ground for growing Carrots is a deep rich soil, that has been well manured the previous year. Sow any time in May, in drills one foot apart and one inch deep. When the Carrots are up, thin them out, four inches apart, and keep the ground free from weeds. The kinds that are generally sown in gardens are the Early Horn, Long Orange, and Red Surrey; for field culture the White Belgian and Altringham. The produce of one acre of field Carrots, when properly cultivated, may be rated at from 500 to 800 bushels. In cultivating them on the field system, the drills ought to be two feet apart, and the Carrots thinned out, at least twelve inches asunder.

*Celery*.—This vegetable is much esteemed as a salad. It requires considerable attention to grow it to perfection. To have early celery the seed requires to be sown in a hot bed in the month of March; for winter celery, the seed may be sown at any time before the middle of May. Sow on a small



bed of rich fine earth—beat the bed down with the back of the spade; sift a little fine earth over the seed; shade the bed with a mat or board until the plants begin to appear. Celery plants ought to be picked out into a nursery-bed as soon as they are two or three inches high. Cut their roots and tops a little before planting; water them well, and shade them from the sun until they begin to grow. Let them remain in the nursery bed about one month, after which they will be fit to transplant into the trenches. The best sort of soil to grow Celery in is deep rich loam, and in an open part of the garden. Mark out the trenches a foot wide and three feet between each trench. Dig the trenches one foot deep, laying the earth equally on each side. Put three or four inches deep of well-rotted manure into the bottom of each trench; put a little of the surface soil over the manure; dig it well up, incorporating the soil well with the manure; dress the plants by cutting off the long leaves and the ends of the roots. Plant in single rows along the centre of each trench, allowing six inches between each plant. Water them well, and shade them from the sun until the plants begin to grow. In earthing up Celery great care should be taken not to cover the heart of the plant.

*Lettuce* is easily raised from seed, which may be sown from the first of April to the end of June. If good headed Lettuce is wanted, the plants should be transplanted out on a rich piece of ground in drills, 12 inches apart, and six inches in the drill. The Malta, Green Cross, and Victoria Cabbage, are the most suitable kinds to sow, as they head without tying up.

*Onions*.—The yellow and large red are the best for a general crop. The ground for Onions should be well prepared, by digging in plenty of well-rotted manure. The seed may be sown from the middle of April to the middle of May. Sow in drills one inch deep and twelve inches apart. When the young onions are up, thin them out to the distance of three inches apart.

*Parsnips* require a deep rich soil. Sow in drills, one inch deep, and the drills 15 inches apart. Cultivate the same as directed for Carrots.

*Radishes* should not be sown in the open air sooner than the middle of May. They require a deep, sandy soil, that has been well cultivated and manured the previous year.

*Rhubarb* is a perennial plant and may be raised from seed. Sow about the middle of May. When the plants are one year old, they should be transplanted into very deep rich soil, in rows three feet apart. The foot stalks of the leaves should not be cut until the plants are two years old.

*Salsify* is an excellent vegetable. The roots, when properly cooked, resemble oysters in flavor. The seed may be sown from the first of April to the middle of May. They require the same kind of soil and cultivation as directed for Carrots.

*Spinach* is a useful vegetable, and very hardy. Seed sown in the month of September will stand over the winter, and come in for early greens in the spring. For summer use, seed of a round Spinach may be sown from May to July. It requires a rich soil. Sow in drills, one foot apart.

*Tomatoes* are much cultivated for their fruit. To have them early, the seed should be sown in a hot-bed, early in March. When the plants are a good size, and Spring frosts are over, plant them out in the garden; let the plants be four feet apart. Plant on a south border near a fence, and they will produce abundance of fruit.

*Turnips*.—One of the best sorts for the garden is the Early White Stone, which may be sown from the middle of May to the end of August. Sow in drills, fifteen inches apart, and thin out the plant to eight inches asunder. Field Turnips, such as Swedish, Aberdeen, Yellow, &c., may be sown in drills, two feet apart, about the middle of May. White Globe, and Flat Norfolk, will do to sow about the middle of July.—Turnips are very apt to be eaten by the black flea. A good remedy is to steep the seed one night in train oil. This will greatly promote germination, and the growth of the young plants."

THE following Garden hints are from the *Gardener's Monthly*, an excellent Philadelphia periodical. These hints are intended for the temperature of Philadelphia in the month of April, and they are equally applicable in this climate for the month of May:—

#### FLOWER GARDEN.

The most active period of the year in this department has now arrived, and much of the success of the season will depend on how the work is performed now. In preparing beds for flowers, it is of first importance that the soil should be deep. It should be dug up or subsoiled to the depth of eighteen inches at least, and a fair dressing of enriching material given them. The best kind of soil to grow flowers is in the top soil—say too inches in depth—of an old piece of woodland. This may be mixed at the rate of about one half with the natural soil. Where this cannot be had, some very rotten stable-manure or the old sods from the surface of a common will do. It is not well to have the soil very rich, or more leaves than flowers will result.

As soon as all danger of frost is over, the border plants will have to be planted out. They should not be taken at once out of the greenhouse to the open ground. It is better to set them in a sheltered spot in their pots for a few days, until the leaves have become somewhat hardened. Before turning them out of their pots to the flower-beds, water well first; the soil must be pressed firmly against the balls of the roots, as they are planted in the ground.

Where bedding-plants have to be bought, it is not good policy to choose tall, delicate plants, that have been forced early into growth. Select such as are green, dense, and bushy, and have vigorous looking foliage. Fine leaves, at this season, is a greater sign of health than fine flowers.

As soon as the grass on the lawns commences to grow, if it has had a top-dressing of manure in the winter, whatever straw may be on should at once be cleanly raked off, and as soon as it is long enough to take the edge of the scythe, it should be mowed. It is of first importance that the first mowing should be done as early as possible in the season. If left to grow long before the first cutting, the leaves get yellow at the base, and at every cutting after the yellowness appears, totally destroying the fine green color which gives the lawn its chief attractions. Where a first-rate mowing is desired, it is best to roll the grass the day before cutting. The grass is then pressed all one way, and cut evenly, and any dirt or stones pressed beneath the surface that would otherwise take the edge off the scythe. A good lawn-mower keeps his scythe very sharp. Some grind a little before each regular set-to at mowing. Those who are not accustomed to mowing lawns, should take but a few inches in width at a time, so as not to "score." With a little thought and judgment, any field-mower can soon become a good lawn-hand. A sharp scythe is the chief element of success.

In planting out for summer show, climbing vines must not be forgotten. Screens can be formed of them, besides many beautiful and fanciful objects, and then their training over strings, wires and arbors, afford much pleasant and interesting occupation for the ladies.

The sowing of hardier annuals should be finished as soon as possible, according to directions furnished last month. The tender kinds, such as Balsams, Globe Amaranthus or Bachelor's Buttons, Thunbergias, &c., should be put in about the end of the month. There is now pretty well known an Orange Globe Amaranthus (*Gomphrena Hoveyi*), introduced several seasons ago from Mexico by Mr Hovey, of Boston, and in an open sunny spot, is really a very beautiful kind to grow. The Cypress vine, both white and crimson, is rather impatient of cold, and had better not be sown till the end of the month. Gladioluses are becoming a very popular summer-blooming bulb, as Hyacinths are for winter and spring. They are very beautiful, and thrive in any rich sandy soil. They also may be planted the end of the month. The same may be said of Tuberoses. Do not forget when the autumn comes, to take up the roots, as they are injured by the first frosts.

I prefer the present and May to any other for trimming

box-edgings. They look much better when cut to a conical form, than when squared at the top, and besides, are much less liable to die out in patches.

This is the best part of the spring, on the whole, to plant evergreens. For immediate effect, they are usually planted much thicker than they are ultimately able to occupy with any credit to themselves. In planting, take care to plant those that will finally remain first, and fill in the temporary ones after. It is not uncommon to see trees—a Norman Spruce, for instance, that will in a few years possess a diameter of thirty feet, planted perhaps but six or eight feet from the edge of the walk, and no other near to stay when the one so inconveniently close has to be removed.

Deciduous trees and shrubs may still be planted,—the longer, however, they are delayed till the middle of May, the more severely they should be pruned at planting. If this be attended to, there is no risk, if even the tree has burst nearly fully into leaf.

#### FRUIT GARDEN.

Grafting can be continued till the buds of the trees are nearly pushed into leaf. Sometimes, from a pressure of other work, some valuable scions have been left on hand too late to work. It may be interesting to know, that if such scions are put in the ground much the same as if they were cuttings, they will keep good for six weeks or two months, by which time the bark will run freely, when the scions may be treated as buds, and will succeed just as well as buds taken from young summer shoots.

In planting dwarf Pears, it is very important to have them on a spot that has a moist subsoil, either naturally, or made so by subsoiling or mixing some material with the soil that will give out moisture in dry weather. Trees already planted on a dry gravelly subsoil, should have a circle dug out two feet deep and two or three feet from the tree. This should be filled up with well-enriched soil. If the dwarf Pear does not grow freely, it is a sign that something is wrong. It should at once be severely pruned, so as to aid in producing a vigorous growth. The dwarf Pear, and many other kinds of fruit trees, are often liable to the attacks of the scale, a white insect, which gives to the tree a powdered appearance. These may be readily destroyed before the buds burst, by syringing the tree with water heated to 160°.

Strawberry-beds are very frequently made at this season, and though they will not bear fruit the same year, are much more certain to grow, and will produce a much better crop next year than when left till next August. Though it is a very common recommendation, we do not value a highly-manured soil. It should be well trenched or subsoiled; this we consider of great value. In rich soils there is too much danger of having more leaves than fruit.

#### VEGETABLE GARDEN.

Those who look with peculiar affection on the "sour kroust" barrel, must look out at once, if not already sown, for good cabbage seed. The Drumhead is the kind most generally used; but those in the secret give a knowing wink when the Savoy is named in that connection. Purple Cape Brocoli, Autumn Cauliflower, and Red Dutch Cabbage, by those who "love" pickles, must also be sown. After all the receipts given for preserving these seeds from the Turnip fly, the best plan is to sow the seeds in a frame or box with high sides. The "little jumper" does not seem to like to risk his limbs by a high leap, or his nasal organs may not be good—or "what the eye does not see the heart does not grieve for," or for some other reason, he leaves them alone under such circumstances. Celery, with most families, is an important crop, and should be sown about this period. A very rich moist spot, that will be shaded from the mid day April sun, should be chosen; or a box in a frame by those who have the convenience.

Tomatoes, Egg-plants, Peppers, and similar plants, every gardener tries to get as forward as possible. South of Philadelphia they may be out unprotected by the middle of the month. Here we seldom risk them before May. The same may be said of Sugar Corn, dwarf and Lima Beans, Okra,

Squash, Cucumber, and Melons. No "time" can be set for growing these, except not to sow till the ground has become warm. A few warm days often makes us "feel like gardening," but unless the ground is warmed, the seeds will be very likely to rot. Here we sow about the first week in May. Onions for seed should be sown in rich soil, but very thickly, so as not to become larger than marbles. Very far North, where they perfect in one year, this advice is, of course, not intended. A crop of Carrots should be sown the end of April. In moist seasons the earlier crops are liable to run to seed.

Much has been written about growing Potatoes, and the plan of covering the sets with straw, leaves, or brushwood, before covering slightly with soil, is quite popular. Early York Cabbage sown last month, or kept over the winter, must now be planted out where there is a demand for summer greens; and to meet this want, another crop of Spinach may yet be sown.

Few things mark a well-kept garden better than an abundance of all kinds of herbs. Now is the time to make the beds. Sage, Thyme, and Lavender, grow from slips, which may be set in now precisely as if an edging of box were to be made of them. They grow very easily. Basil and Sweet Marjoram must be sown in a rich warm border. Salsify and Scorzonera like a damp rich soil.

#### PEAR TREES—MODE OF PLANTING.

In these days when every citizen seems to be determined to own at least a dwelling place in the country, and when each in turn is anxious to surpass his neighbors in pear raising, they should at least know how to put out their trees. Many suppose that a hole dug in the ground, large enough to admit the roots of the tree, is sufficient to secure its future prosperity. Such operators make the same mistake as was made by Dr Johnson, when he cut a small hole through the door for the kitten, in not having made a large one for the cat.

Every tree is intended doubtless by its owner to become larger, and this is scarcely possible, without an augmentation of the quantity of roots.

For a dwarf pear the soil should be underdrained. In addition to this the holes should be dug four feet in diameter, and where practicable four feet in depth, the surface-soil laid on one side of the opening, and the sub-soil on the other; the latter never to be returned to the hole from whence it is removed. An ordinary borer, such as is used by those who put out telegraph posts, may then be turned down into the soil at the bottom of this hole, and at its center, to the depth of three feet, and removed by reversed turning, without lifting out the loosened soil or borings. The holes should be filled up with surface-soil taken from the surface between the tree and the next hole, which may be replaced in turn with the sub-soil removed from the hole. This, by the combined effects of sun and atmosphere, will eventually become surface soil; and as the pear tree will not come in contact with it for one or two years, its quality can be of no consequence. A pear tree which is placed out in such a cistern or opening, will be surrounded by a storehouse of pabulum suited for its growth for many years. In time of drouth its roots may pass down into the soil and find moisture; so large a portion of soil surrounding it being of looser texture is rendered capable of absorbing the fertilizing gases from the atmosphere, receiving dews and rains more freely, and the very ingredients of soil it contains undergoing more rapid chemical changes, such as are necessary to free its inorganic constituents for the use of the tree, than in the adjacent soil. When pear trees are grafted on the quince, they should be inserted in the ground low enough to bury three or four inches of the pear stock, and thus secure the formation of pear roots. Under such an arrangement the quince roots will insure bearing to the pear tree, while the pear roots will give it longevity.

In throwing the earth from the hole, the tree should be held at its center, so that the falling earth should gradually determine the direction of the roots downward; and the tree should

not be pumped up and down by hand so as to abrade the smaller roots. When in place, and the earth is filled into the surface, it may be slightly settled by a single pail of water thrown immediately about the trunk. This will cause a portion of the soil to adhere closely to the roots and thus insure moist contact, preventing root blasting, so common with careless planting. Trees so put out are seldom if ever unsuccessful. Barn-yard manure should not be mixed with the soil. Indeed, ammoniacal manures of any kind are not called for by trees when first put in place. Those who will read the letter of L. E. Berekman's, published in the *Working Farmer*, on the effect of phosphates on pear trees, will perceive that the application of a slight quantity of the Nitrogenized, or Potash Super-phosphate of Lime to the surface of the soil when putting out pear trees, will insure their immediate growth and success; for as in his experiment, trees which by exposure may be supposed to have become somewhat injured before being put in place, are recovered by the use of this fertilizer while those to which it is not so applied occasionally fail. A slight mulch on the surface, of salt hay or other waste material, prevents the immediate effect of the sun, and secures the humid condition of the upper soil, so favorably to the production of new spongioles from the roots. We have put out many hundreds in the way recommended above, and always without failure.

POETRY.

BE KIND TO EACH OTHER.

Be kind to each other!  
The night's coming on,  
When friend and when brother  
Perchance may be gone!  
Then 'midst our dejection,  
How sweet to have earned  
The best recollection  
Of kindness—return'd!

When day hath departed,  
And memory keeps  
Her watch, broken-hearted,  
Where all she loved sleeps!  
Let falsehood assail not,  
Nor envy disprove—  
Let trifles prevail not  
Against those we love!

Nor change with to-morrow,  
Should fortune take wing,  
But the deeper the sorrow,  
The closer still cling!  
Oh, be kind to each other!  
The night's coming on,  
When friend and when brother  
Perchance may be gone!

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