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# THE JOURNAL OF EDUCATION AND AGRICULTURE,



PROVINCIAL ASSEMBLY, HALIFAX, NOVA SCOTIA, CANADA, N. S.

FOR THE PROVINCE OF NOVA SCOTIA.

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Vol. I.

Halifax, Nova Scotia, June, 1859.

No. 12.

## EDUCATIONAL.

### I.—THEORY OF EDUCATION.

#### PHYSICAL EDUCATION—MUSCULAR SYSTEM OF ORGANS.

PHYSICAL IN-DOOR EXERCISES AS PRACTICED IN THE MODEL SCHOOLS OF THE NORMAL SCHOOL, GLASGOW—CONDUCTED ON THE TRAINING SYSTEM.

We shall particularise only two exercises which are *fundamental*, and which experience has proved to be the very best that have been devised for the purpose. The first is, to secure that the whole gallery of children may rise up and sit down *simultaneously*—quickly or slowly—in the most natural and easy manner; and the second is, to secure an easy carriage in sitting or walking, by placing the shoulders square—head erect—spine and ankles straight—and opening the chest. The repetition of these, like ever other part of the system, of course forms the *habit*, and, if exercised, will produce throughout the whole school as correct walking, sitting, and rising, and other movements, as are accomplished with the foot soldier or the cavalry horse, and, in unison with other simple physical exercises, as much benefit to the health and constitution.

#### NO 1.—SIMULTANEOUS RISING UP AND SITTING DOWN IN GALLERY.

To attain this object, the trainer commences the physical movements as follows—expressing the orders very distinctly and firmly, and repeatedly:—

No. 1. Shoulders back. (This naturally elevates the neck head.)

No. 2. Feet in. (Drawn inwards, with the tip of the knees exactly above the point of the toes.)

No. 3. Heels close.

No. 4. Toes out. (Forming an acute angle.)

No. 5. Hands on knees, not on the lap, but grasping the knees *gently*. (This causes the children to incline forward preparatory to, and in the best possible position for, rising,) the spine being thus rendered perfectly straight.

The trainer, in the first instance, and for some days at least, must *himself show the example*, by sitting on a chair at sufficient distance from the gallery—making every motion he intends the children to follow, and to see that each of the *five* motions be attended to *by every child*, also frequently repeating them day after day, until the habit of rising up and sitting down simultaneously, without confusion, or the slightest noise, be formed into a habit.

After a few weeks, the trainer may then cause them to understand, that the rising or lowering of his hand (which he must do very slowly), in a particular manner, which cannot easily be described on paper, is to be the signal for rising up and sitting down, as perfectly as a regiment of soldiers would fire a volley, and so free from bustle, in fact, that a mouse in the act of stealing cheese would not be disturbed. This gallery arrangement is not confined to the Initiatory or Juvenile, but is carried forward

and established in every department, and with children and students of every age.

#### NO. II.—THE FOUR MOTIONS

may be conducted by repeating 1, 2, 3, 4, as each motion is made, (the children standing upright) or by singing any suitable air, regulating the rapidity according to the tune.

1. Shoulders back by doubling the arms upwards, with the fists closed, and back of the hands pointing to the shoulder. (This of necessity squares the shoulders.)

2. Raise both arms perpendicularly, pointing the fingers towards the ceiling keeping the feet in the position noticed in the previous example, viz., *heels close, toes angled out acutely* etc., and at the same moment when they point and stretch their fingers towards the ceiling, that they rise on their toes as high as possible, and stand at full stretch for one or two seconds when required. (This secures *straightness* of arms, spine, and limbs.)

3. Is performed by simply returning to the first position, viz., No. 1.

4. Is simply throwing the arms perpendicularly downwards, with the palms of the hands *in front—quite a la française*, or *the reverse of raising to the ceiling*. (This secures that the spine must be straight and the shoulders square.) This exercise is highly valuable, as at once favourable to health and good order, and may be repeated several times a-day in the gallery.

#### INTELLECTUAL EDUCATION—ORIGINAL SUGGESTION.

We have already discussed the faculties of Perception and Consciousness, pointed out the food most congenial to their nature, and the best mode of administering that food, so that these faculties may be developed and strengthened. It is by means of these powers we obtain all our knowledge of the existence and properties of the world without, and of the phenomena and operations of the world within; and hence they are sometimes appropriately designated the *receptive* faculties. The knowledge, however, that is thereby obtained, is nothing but a knowledge of particular existences or of individual acts or states of mind. And did man possess no other powers, here, his knowledge would terminate; it would consist entirely of a series of disconnected, isolated facts, or acts, or phenomena, without the question why or wherefore being either asked or answered, and without the smallest desire of turning the knowledge acquired to any practical account.

But the intellect of man is not thus circumscribed in its energies. "When the ideas of perception and consciousness terminate, or, even, while they are present, a new series of mental phenomena arises by virtue of the original power of the intellect itself. These phenomena present themselves in the form of intuitive cognitions, occasioned by the ideas of consciousness and perception, but neither produced by them nor in any respect similar to them. They may be considered acts of pure intellection. . . . We can give but little account of these intellections, nor can we offer any proof of their verity. As soon as they arise within us, they are to us the unanswerable evidence of their own truth. As soon as we are conscious of them we know that they are true, and we never offer any evidence in support of them." And this power of the intellect we designate *Original Suggestion*. Innumerable illustrations of the existence of this faculty, even in our most juvenile years, might be furnished. Take the case of a little child just beginning to walk. He wills to move one of his little feet, and it instantly obeys. He wills to move the other, and it too is obedient to his call. He is conscious

of the possession of the power of locomotion, of going from one place to another. All that his perceptive faculty teaches is the fact of the distance he has travelled over. But he does not stop here. There immediately arises in his mind, by virtue of its own energy, the notion of cause and effect—of something in himself capable of producing this change in his position. Still more, he has an intuitive belief that the same effect can be produced in the same way. He tries again, and the same effect follows—he walks from one place to the other. There has thus been created in his mind not only the relation of cause and effect, but the important conviction that like causes will produce like effects. Again, the little child puts his hand into the candle, and that instant he feels the sensation of pain. By his senses the child obtains no other knowledge than the burning candle and the sensation of pain.—This is, in all probability, the whole knowledge that a brute would possess. But does the child stop here? No; there immediately arises in his mind the relation between the candle and the pain—the one being the cause of the other.—Along with this, too, there is the intuitive belief that the same cause will produce the same effect, and, therefore, no henceforward avoids putting his hand into the candle.

These inherent intuitions of the mind are divided by some writers on Mental Science into two great classes. 1st. Those unaccompanied by emotion, which are again subdivided into those occasioned by objects in a state of rest, giving birth to the ideas of space, number, &c., and those occasioned by objects in a condition of change, giving rise to the ideas of duration, power, cause and effect, &c. 2ndly. Those accompanied by emotion, which are also subdivided into the aesthetic and moral.

From the above illustrations it will be evident to all that this faculty of the intellect begins to unfold itself at a very early period in our history. Though it may not reach its full maturity or perfection till a more advanced age, it commences its operations even before the child can talk; it is, in fact, contemporaneous with the exercise of our perceptive faculties, and grows in proportion to the means that are employed for its cultivation and development.

A word or two now in reference to the improvement of this faculty in the young. This does not depend so much on the nature of the subject brought before it, as on the way in which it is done. Whatever are the subjects presented to our senses, or the states of mind through which we may pass, in both we have ample materials furnished for the operation of this faculty. The great requirement to be aimed at, is the habit of detaining the perception or the phenomenon of mind, in order to follow out to their full extent the suggestions which spring from the one or the other. In this consists the difference between a disciplined or well-trained and an undisciplined or superficial mind. The latter perceives the object and is conscious of a certain state or affection of mind, and here he stops, without any investigation or inquiry into the antecedents or the consequents. The former, unsatisfied with the mere observation or phenomena of things, patiently continues his train of reflection, aye, and until he arrives at a knowledge of the hidden relations by which all that is seen is united together and directed. "Millions of men," says Wayland, "before Sir Isaac Newton, had seen an apple fall to the ground, but the sight awakened no suggestion; or, if it did, the suggestion was neither retained nor developed. He seized upon it at once, followed it to its results, and found that he

had caught hold of the thread which could guide him through the labyrinth of the universe."

Now what is to be done to call forth and foster such a spirit in the young—the spirit of calm reflection, of patient thought, whatever be the object or subject presented to them? We can conceive nothing better fitted, for the accomplishment of this end, than to encourage them diligently and perseveringly to inquire into the reasons of things, and to follow out these reasons in all their bearings and relations. We do not mean by this remark that the young are to be encouraged to ask at their superiors in endowments or attainments the solution of their difficulties, or the answer of any puzzling question that may present itself. This course would undoubtedly impart information or knowledge, but it would not exercise, and by consequence would not strengthen, the faculty under consideration. It is, then, to urge them to the cultivation of this spirit by a firm yet humble reliance on their own intelligence and patient investigation. The discoveries or explanations of others may oftentimes be needed and prove of no ordinary value, but their greatest service is to induce the young themselves to prosecute their inquiries with more ardour, confidence and steadiness. And does not this, after all, constitute the master-function of the Educator of the young, not to pour in knowledge, however useful, but so to impart it as that all their powers, and this among the rest, shall be duly exercised and developed and strengthened.

#### MORAL EDUCATION—CONSCIENCE, ITS CULTIVATION AND DEVELOPMENT.

In a preceding number, we presented an outline of this important subject. We resume the theme and proceed to a more minute discussion of its various parts. And the first point to which we would solicit the attention of our readers is the law by which conscience, or the moral sense, is governed, and how it is to be cultivated and developed and strengthened. Upon this the whole fabric of moral education rests, and, therefore, it demands the most grave and earnest consideration.

That man is a moral being, that is, that he is capable of discerning the moral quality of actions, is a doctrine that few, if any, deny. Differences of view have oftentimes obtained and controversies waged as to what this power really is, and as to the designation to which it is most appropriately entitled; but the fact that man possesses such a power, or capacity, seems universally admitted. Not that this principle exists with equal force or power in all, or that all men discover the moral quality of actions with equal accuracy, any more than that they all see with equal distinctness. But what is maintained is, that all men perceive it in some actions; and that there is a multitude of cases, in which their perceptions of it will be found universally to agree. And over and above all, this sense or faculty is inherently simple and cannot be resolved into any other. It is also distinct from every other, making us acquainted with the existence of a distinct and separate quality of an action, whether performed by ourselves or by others. Why, then, should there exist such a reluctance to give it a separate designation? But we dwell not on this topic. Neither do we touch on the authority of this vicegerent of divinity within—an authority which from its very nature

is lordly and supreme. It is more to our purpose that we direct our thoughts for a little to the various ingredients or component parts of this all-powerful impulse.

Now in judging of any action before it is performed, whether by ourselves or by others, we are conscious of certain qualities which characterize it, and its morality among the rest. We may perceive it to be gratifying or self-denying, courteous or uncivil, in favour of or against our interest; but, in addition to one or other of these characteristics, we may also perceive it to be either right or wrong, morally good or morally evil. And this perception is very properly designated the *discriminative* of conscience.

But, besides this power, we may readily observe a distinct impulse to do that which we conceive to be right, and to leave undone that which we conceive to be wrong. This impulse we express by the words *ought* and *ought not*. Thus we say, it is right to tell the truth, and I ought to tell it. It is wrong to tell a lie, and I ought not to tell it. *Ought* and *ought not* seems to convey the abstract idea of right and wrong, together with the other notion of impulsion to do, or not to do, a particular action. And this, again, is called the *impulsive* of conscience.

Another quality of this monitor is the sensation of pleasure or pain felt when we comply with or resist its dictates. If we have obeyed the impulses of conscience and resisted successfully the influences at variance with it, we will be conscious of a feeling of innocence, of self-approbation, of desert, of reward. If the action has been done by another, we will feel towards him a sentiment of respect, of moral approbation, and a desire to see him rewarded. And if, on the contrary, we, or our fellows, pursue a different line of conduct, our emotions will be exactly the reverse. And this other ingredient of conscience is called the *emotional*.

So much for the nature of conscience. Let us now inquire how this moral sensibility of man is cultivated and enlarged, and thereby rendered subservient to the great end of its being. And here there is no difficulty. Conscience, like all the other organs and powers and energies of our nature, is strengthened by use and impaired by disuse. It is so with the body. Its nutritive, its supporting, its locomotive and its nervous systems of organs;—all these are increased in size, obtain solidity and strength, and discharge their respective functions entirely by exercise,—continued and appropriate and persevering exercise.

It is so also with the Intellect. Look at its faculties, Perception, Consciousness, Original Suggestion, Abstraction, Memory, Reasoning, Imagination; are not all these awakened and bestirred, expanded and developed, by use, by being brought in contact with objects or subjects, congenial to their respective natures and tendencies, and unceasingly and perseveringly plied therewith. And as it is with the body and intellect, so is it with conscience, it is improved by use, by harkening to its monitions and obeying its dictates.

Its *discriminating* power is strengthened by reflecting on the moral character of our actions, both before and after we have performed them, as well as by meditating on characters of pre-eminent excellence. Hence the benefit arising from the perusal of books, on biography and history, and hence too the reason of the Bible dealing so profusely in this style of composition.

Its *impulsive* power is also greatly improved by use. Every time we obey the impulses of conscience and resist the im-

pulse of passion its power is strengthened and its antagonist is weakened.

And more than this, there exists between the use of the discriminative and impulsive power of conscience a striking reciprocal connexion. The more a man reflects upon moral distinctions, the greater will be the practical influence which he will find them to exert over him. And it is still more decidedly true that the more implicitly we obey the impulse of conscience, the more acute will be its power of discrimination, and the more prompt and definite its decisions. And hence the beauty and force of the statements of inspiration, "If any man will do his will, he shall know the doctrine whether it be of God." "Unto him that hath, shall be given, and he shall have abundance, but from him that hath not—that is, does not improve what he hath—shall be taken away even that which he hath."

But to go still a step higher, the sensibility of conscience, as a source of pleasure or of pain, is strengthened by use and weakened by disuse. The more frequently a man does right, the stronger is his impulse to do right, and the greater is the pleasure that results from the doing of it. A liberal man derives a pleasure from the practice of charity of which the covetous man can form no conception. A beneficent man is made happy by acts of self-denial and philanthropy, whilst a selfish man performs an act of goodness by painful and strenuous effort, and merely to escape the reproof of conscience.—By the habitual exercise of the benevolent affections, a man becomes more and more capable of virtue, capable of higher and more disinterested and self-denying acts of mercy, etc, and until he becomes an enthusiast in goodness, more gratified in devoting his time and energy in the service of mankind than in any other business or pursuit.

Such is the law by which conscience is governed, such are the effects of obedience to that law. And what is all this but the force of habit. For what is habit but principle in exercise, a reiteration, a repeated acting of the same thing, until it has been woven into our very nature. And is it possible to overrate the force of habit on individuals, on families, on nations, on man's physical, intellectual and moral constitution. Do we want examples of its influence on the body, we have only to look at the gait of the soldier and sailor; or on the intellect, we have only to contrast the demeanour of the retiring student with the bustling merchant on Change; or, on the conscience, we have only to watch the effect of a continued indulgence in any evil propensity or in any virtuous act. In fact, every succeeding act of mind or body, whether good or evil, is strengthened by the preceding one.

And if such be the force of habit, who can calculate the mighty importance of the moral education of the young. If the training of an old horse, or the bending of an aged oak, or the converting of an old miser into a man of generosity, or the reclaiming of a drunkard, be a difficulty almost insurmountable, who can overestimate the advantage of the moral education of the rising generation. What, with God's blessing, may not be effected in a single generation. When, ah! when will nations, as nations, fully sympathize with the adage, "Prevention is better than cure." When, ah! when will they be as lavish in the expenditure of their means in providing the necessary apparatus for the moral education of the young as they are in providing penitentiaries, reformatories and asylums for the hardened in crime. When will one half of the pseudo-philanthropists and popular educationists of the day

display the same zeal and enthusiasm for the moral, as they do for the intellectual education of the young.

But we cannot continue this strain. We trust we have said enough under this head to satisfy every reasonable mind that moral education is something more, something far more lofty and commanding, than moral instruction. To impart sound, wholesome instruction to the minds of the rising generation, to give them clear and comprehensive views of the doctrines and precepts of Christianity, with their various relations and dependences, is a part, and an important part, of moral education. But to stop short here is just to act like the man who begins to build the house, but who goes no farther than the laying of the foundation, and expects therefrom all the advantages and comforts of a finished residence. And yet does not this constitute three-fourths of the moral education of the day? And who, then, need wonder at the slender results that have flowed from all the agencies and instrumentalities and resources that have been called into the field for the last fifty years. And who can fail to perceive the utter inadequacy of Sabbath Schools and Bible Classes, with all their benefits, for the accomplishment of this object, or hesitate to admit the vast superiority of parental and week-day school training to all other means that can be called into operation.

But, furthermore, we trust we have said enough to satisfy all, that moral education is something more than setting before the young a Christian, consistent example—an example thickly studded with all the beauties and excellencies of a vigorous and healthful morality. This, too, is of immense service—of greater service than the communication of the most valuable information, for the aphorism is literally true, "Example is more powerful than precept," and this simply because of the power and glory of the principle of imitation, which originated in the fact that man is a social being. And hence the whole spirit and genius of revelation teaching by example rather than didactic statement. But to stop short here, again, is like the man who expends a large amount of means in the construction of a dwelling-house, but who leaves off without either roof or cover.

What, then, is moral education? It is instruction in what is right and proper, bringing all to the test of eternal truth and righteousness, inculcating no lesson but what is either directly or inferentially set forth in the only infallible standard. It is the exemplification of all that is right and proper—an exemplification in strict conformity with the findings of revelation. But it is more. It is the actual doing of the thing, until it hath become part of our moral nature. It is to abandon some act of wickedness, and to practice the opposite virtue or grace, and to continue in the same course until it has received the force of a habit or second nature.—Take an illustration. The people of Scotland are signalized all over the world for their observance of public religious ordinances. And how did they acquire this pre-eminent distinction? Was it because their forefathers pointed out the obligation and privilege of such an observance? or was it because they showed their children an out and out consistent example? They did all this, but they did far more. They took their little ones by the hand, and Sabbath after Sabbath, opportunity after opportunity, they wended their steps through moss and moor, through lanes and streets, until they reached the house of prayer and safely seated them in the patrimonial pew. And when there, they watched over them with deepest

solicitude, and with earnest aspirations and prayers, that the Word preached with such simplicity and affection might drop into their tender heart, "as the small rain upon the tender herb and as the showers upon the grass." And when they returned to their homes they explained, and pressed upon their attention the lessons that had been inculcated. And such an air of cheerfulness marked the every movement of the parents, such a glow of benevolence played upon their countenance, and such flushes of intelligence and affection beamed from their eyes, that could not fail to convince the children that the Sabbath was indeed the crown of days, and that the sanctuary services constituted the brightest pearl in that crown; that it was indeed a day of blessing, not a day of gloom or melancholy, but one of richest enjoyment.

And to this, and this mainly, are we to attribute the fact above alluded to. It is not so much to the instruction they have received, or the example that has been set before them, as it is to the training process through which they have passed that they owe all this distinction. And this, this alone, is worthy of the name of moral education. And though the term *make* or *compel* the children to do or not to do, may grate on the ear of a morbid sentimentality, though to the young in these regions it may be unpalatable doctrine and accounted by some parents as harsh and tyrannical, yet is it in perfect harmony with all the arrangements of Providence, with the whole scope and genius of Christianity, with the most explicit declarations of Holy Writ. "For I know him that he will *command* his children and his household after him." "Because his sons made themselves vile and he *restrained* them not."

In our next article on this subject we shall consider the position of the Bible in the whole matter of moral education.

### III.—OFFICIAL NOTICES.

#### TO OUR READERS.

It will be seen, from the advertisement, that this number finishes the first volume of the *Journal*; and though our intercourse has been but short, you have had sufficient opportunity to judge of the character of the publication, and what you may reasonably expect for the future. We think we can say, without the least affectation, that we are not insensible of its manifold imperfections. To do full justice to such a periodical would require the undivided time and energy of any one individual; whereas we have only been able to give it the veriest fragments of both. With all its defects, however, we have reason to believe it has effected some good in elevating the tone of public feeling relative to the importance of popular Education, and whatever is the additional labour it has entailed on us, amid the multiplicity of our other duties, this is ample compensation. We are free to confess that our primary object in starting the periodical was the benefit of the Teachers, generally, and of those, specially who have attended the Provincial Normal School. The brief intercourse we have been enabled to hold with them through the medium of Institutes, and, still more, the shortness of the time that the majority of Pupil-Teachers have been able to remain at Truro, seemed to demand the necessity, for the purpose of imparting greater permanence and extension to our views on the subject of Education,—of opening up some other channel of

communication. It is on this account, mainly, that we have given a good deal more attention to what may be designated the inner-life, or real subject-matter of Education, than what is generally done in such periodicals. Nevertheless, we have endeavoured to present to you something like a *vidimus* of the leading aspects and topics of discussion of the day connected with Education, both in this and other lands;—and it is our desire and resolution to give a greater share of our attention to these matters in the future than we have yet been enabled to do. We therefore earnestly solicit from Teachers and others interested in the cause throughout the Province brief statements, of all that is going on in their respective localities. Whilst these communications would necessarily curtail the amount of our labour, they would also have the effect of stimulating others to go and do likewise. Next to the Teachers, stand in our estimate, the Parents of the rising generation. Once get them fairly aroused on the matter of the outstripping value of the education of their offspring, not merely in reference to time, but still more in reference to eternity, and all will go well. A tide of enlightened and benevolent and consuming zeal will set in, that will break down every opposing barrier to improvement, and cannot fail to give birth to that external system of management and that mode of support most conducive to the furtherance of that end.—We hope, then, to be able to give more time and attention to the consideration of those subjects calculated to stimulate and excite that class of our fellow-provincials. It is well known that we have appropriated a certain portion of our space to the pursuits of the Field and of the Garden. We have done so simply because of the deservedly important position assigned to Agricultural Chemistry in the present Educational Enactment, and still more because of the prospect held out of the establishment of an Experimental Garden and Farm in connection with the Normal School. We hope by this means to elevate the whole position of the farming population of the Province, the most numerous and the most important, by stimulating to the adoption of those measures through which practical Agriculture shall be more extensively reduced to a science, and greater energy of mind infused into the pursuit.

But we must speak a word to you, as well as, of ourselves. We have to thank you, in the first place, for the support you have given the *Journal*, and for the confidence you reposed in us by the payment in advance. The cost, is as low as it could possibly be made, so as to save the Publishers from running any pecuniary risk. It is our intention, as soon as the circulation will warrant, to extend the number of our pages without any additional cost, and to improve it still more by the small remuneration of our contributors. We must look to you for an increase to the number of the subscribers. Were every Teacher and Farmer but to put forth a small effort in their respective locality, they might, we are persuaded, easily obtain five subscribers, and this, from the advertisement, would entitle them to a gratuitous copy. And surely this would subject them to no great sacrifice for the furtherance of their profession and calling, upon whose furtherance, we have no hesitation in saying, the whole future prosperity of our Province, socially and morally, depends.

We have also to return our best thanks to gentlemen whose literary and scientific productions have occasionally graced our pages. We hope, as we become a little better known and our objects more highly appreciated, to see those contributions generally increased. We desiderate exceedingly from the Normal Teachers communications relative to the practical working of the system in which they have been indoctrinated, their difficulties and encouragements in carrying it out. Such contributions would furnish us with the most befitting materials for discussion in our Editorial articles. We shall also be much gratified by learning from Farmers the results of their experiments in any of the departments of their calling, especially of the results of the application of certain manures to certain descriptions of soil, &c., &c.

The Teachers throughout the Province and the Secretaries of the different School Boards and Agricultural Societies will, we trust, act as Agents for the *Journal*.

### A WORD TO PARENTS ON THE EARLY EDUCATION OF THEIR CHILDREN.

In our last address to you we insisted on the importance of training the young, from the time they are capable of discerning the difference between right and wrong, to habits of implicit obedience. We cannot be too urgent upon this point.—The comfort of the parent and the happiness and improvement of the child depend on its being secured. And the sooner this work is begun, even before the child can well speak, the more easily will it be accomplished. We dwell upon the necessity of teaching the children the right and the wrong, in a manner adapted to their intellectual development. We take the subject where we left off—and go on to remark that something more is necessary than the communication of instruction, however well adapted that may be to the circumstances of the case, even the setting before them a consistent example.—Man is an imitative being, but he is especially so in the infancy of his existence. Witness the facility with which a little child will acquire the power of language, sometimes learning and remembering fifty or sixty words in the course of a day. Witness again the closeness with which the child of two years will imitate every movement, and gesture, and prank of the brother of four. And this plainly points out to you as parents, the indispensable necessity of accompanying your words with deeds, of doing yourselves what you exhort them to do. The acuteness oftentimes manifested by very young children in detecting inconsistencies and contradictions in others, is truly marvellous. And though your child may take no notice of what it sees, it will ruminate thereon; and though it would not dare to utter the sentiment, there is an inward consciousness that you are believing yourselves; that you preach one thing and practice another; and what is the effect of all this but to harden them against the reception of the most salutary instruction. See then that you watch over yourselves with godly jealousy, and evince by your whole conduct that you are submissive to the authority of your Creator and Saviour God, striving to carry into effect the spirit and letter of His law. If, then, you would be successful, by the Divine blessing, of curbing the first bursts of passion in your little children, you must be able to manifest a thorough control over your own. If you would inculcate kindness, you must exhibit this disposition in your own conduct. If you would dethrone selfishness in your child, you must show a willingness from your own conduct to forego personal comfort for the benefit of others. But more of this anon.

### A WORD TO TEACHERS ON THE NECESSITY OF A THOROUGH QUALIFICATION FOR THE RIGHT DISCHARGE OF THE DUTIES OF THEIR OFFICE.

We have already addressed you on the advantage of your drinking into the spirit of your office, and of realizing the responsibility therewith connected, and we would now say a word or two on the matter of your qualifications. These may be regarded as threefold,—personal, literary and professional. In reference to the first of these, such as neatness, order, punctuality, courteousness, conscientiousness, &c., we say nothing at present. And as to the second, we can but deal in generalities. It is a well known and established fact, that an individual may be possessed of exalted endowment and profound erudition and yet be a miserable Teacher. But it is equally clear that no one can be an efficient or successful Teacher without at least a certain amount of scholarship, and, if there be the aptness to teach, the greater the amount of scholarship, the greater the advantage. The time was, when professed Teachers engaged to teach their scholars certain branches, in order to acquire a knowledge of these branches themselves.—It was deemed by them quite enough, if they were only a stage or lesson in advance of their scholars. But this day, we trust, is rapidly declining, if it has not already altogether disappeared. It carries, we hold, an absurdity on the very face of it, and argues the most thorough ignorance of the nature of the

relationship that ought to subsist between the teacher and the taught. The Teacher, if he is worthy of the name, is the *prima* expositor of the branch of knowledge taught. It is his no, merely to make general statements, by which the subject will be plainly intelligible to a few of the more talented and expert of the class; but it is still more especially his to impart a clear and distinct apprehension of the subject to the most stupid and doltish, and for this purpose to borrow illustrations from objects and things with which they are familiar, the better to find an avenue to their understandings. And what does all this imply but a most thorough acquaintance with the subject in all its essential attributes, as well as in all its relations and bearings. Indeed, we hold it to be indispensably necessary that the Teacher possess ten times the amount of knowledge on the subject than it may be required, in order that he may be a workman that need not be ashamed; and thereby fulfil the object of his high commission. Let us exhort you then to the exercise of all diligence in increasing your stores of knowledge and of learning. Of course, those branches of knowledge that you profess to teach are invested with peculiar claims on your study and investigation. But you may rest satisfied that the higher you rise in general scholarship, you are only rendering yourselves more complete as Teachers.—For this purpose we would press upon you the benefits arising from adopting a regular course of study, and apportioning a certain amount of your time to each branch. And see that you rigidly adhere to your purpose. Let nothing but a providential interference divert you from your course. Hold on month after month and year after year in this way; and this will raise you to an eminence far above the general routine of your compeers. To encourage you in this course, we would strongly recommend you to court the society of those who are far more advanced in attainments than yourselves. Teachers' Associations, when judiciously constituted and wisely conducted, are admirably fitted to stimulate to diligence and perseverance in the prosecution of your studies. Your professional qualifications we must defer till another occasion.

### A WORD TO SCHOOL TRUSTEES ON THE SELECTION OF A TEACHER.

One of the most important duties incumbent upon you, in your official character, is the selection of a duly qualified Teacher for your District. It is altogether impracticable that the people themselves can negotiate any arrangement with the Teacher, and therefore the present Legislative Enactment devolves this duty upon you. The terms of the statute are these, "When the inhabitants of any district shall have provided one or more sufficient school-houses, and the trustees shall have engaged by written contract one or more competent teachers for the district, male or female, at a specific remuneration, to give instruction in reading, writing and arithmetic, the elements of English Grammar and geography, for a period not less than three months, the Commissioners, upon application of the Trustees, shall enter the school on a list, to be kept by them, for participation in the sum allowed for the support of Common Schools." Such is the character of the law under which we are now acting; from which it will be seen that it devolves this duty upon you, and a very responsible duty it is, involving consequences of no ordinary magnitude, in so far as the temporal and eternal welfare of the young of the district is concerned. The Teacher you are commissioned to engage must be a competent person for the situation, but the question is, What constitutes a competent Teacher, and how are you to judge in the matter of his competency? Some may say that the law, in so far as your duty is concerned, settles the whole matter of competency, in requiring you to engage only those Teachers who are possessed of a regular license, granted by the Board within whose bounds you live. But we very much fear that there are not a few in the Province who have a certificate to teach given after a legal form, and yet do not possess the requisite qualifications. But, besides all this, an individual may be competent to teach in one locality and not in another. What,

then, in these circumstances, ought you to do? You ought directly to apply to the Superintendent of Education, stating to him everything appertaining to the character of the school, the number of children in the district, the branches of education requiring to be taught, the remuneration and the mode of raising it, &c., &c. It is one of the special functions of his office to recommend the person he deems best qualified for the situation, to adapt, as far as his knowledge extends, the individual to the locality. If you do not choose to resort to this mode, but to take the whole responsibility of the appointment of the Teacher, you ought, first of all, to obtain the most satisfactory evidence of the moral character of the applicant. Though the number of immoral characters holding a license to teach in the legal form is much smaller than it used to be, there are still, we fear, some of this description, drunkards, profane swearers, Sabbath breakers and the like, going about the country. You ought then, first of all, to demand ample credentials on this point, and you ought here to be contented with nothing short of a duly attested certificate that the individual is in good standing with the denomination of professing Christians to which he belongs. Next to this, you ought to ascertain, as far as you can, the professional qualifications of the applicant, whether he has had such experience in teaching as to satisfy you of his capability to manage and organize and govern a school. All that the Commissioners can judge of in granting a license is his literary attainments, the amount of scholarship he possesses. But he may rank the foremost in this respect and yet be utterly incompetent in the whole management of an educational establishment, and thereby unfit to fill the situation you have in view. What, then, ought you to demand? You ought to insist upon his procuring duly attested certificates from the place where he last taught,—how long he remained there, &c., &c. In one word, it is your bounden duty, before you enter into an engagement with any Teacher applying for the situation at your disposal to use every means within your reach for ascertaining everything relative to his character and capabilities, remembering that the responsibility rests upon you, and that you are involved in the consequences of his instrumentality in that seminary whatever it be for weal or for woe.

#### A WORD TO SCHOOL COMMISSIONERS ON THE LICENSING OF TEACHERS.

This is one of the functions of your office, and a fearfully responsible one it is. Here is your commission bearing on this matter, "The Commissioners shall examine all School Teachers and grant to such as they consider qualified and of good character, licenses to teach within the respective districts, and no teacher shall, without such license, receive any part of the money hereby granted." From these words it is plain that it is your duty not only to examine those who have never taught before, but those who hold licenses from other Boards of Commissioners and who have come to reside within your bounds. But is this generally done? Is it not a fact that when a teacher has once obtained a license, that license becomes a passport wherever he may choose to go? There may be some exceptions to this, but we suspect they are comparatively rare. And then, when conscience is made of this duty, there is every possible diversity of way in carrying it into effect. Some Boards have their teachers classified, and others have not. Some have examining committees, and others have not. Some have standards of qualifications, and others have not. We have no hesitation in saying that the whole matter of licensing teachers, now that there is a regular training Institution supported by the Province, demands on the part of the Legislature a thorough revision. So long, however, as the law remains in its present condition we would recommend the appointment by each Board of an examining committee, without the signature of whose chairman no license should be granted. The individuals composing this committee ought not only to be men of good scholarship, but who know something of the modern improvements in education, and if possible possessed of some practical experience, and there are some such in a goodly number of our Boards.—

But the most essential point to be attended to is the uniformity of the standard of qualification. This matter we referred to at some length in our last Educational Report: and, in the last number of the *Journal*, we provided a programme of such qualifications as a kind of general guide to the different Boards of Commissioners. We shall be glad to learn that this programme has received the attention of the Commissioners,—and that they are aiming at the adoption of its general features.

#### IV.—EDUCATIONAL INTELLIGENCE.

##### COLONIAL.

##### NOVA SCOTIA.

*Yarmouth.*—It affords us much gratification to observe in the papers of Yarmouth, the movement at present going on there, with a view to the erection of more commodious School premises. This thriving town has, like too many of our county towns, suffered much in its educational advancement by reason of the lack of acknowledged public school-houses, thereby opening the door for the encouragement of teachers starting on their own adventure, all carrying on their work independently of one another, thus depriving themselves of the advantages arising from the grading or classifying of the children, on a large scale. Hence the origin of a host of small schools in the same town or hamlet, adding largely both to the expense and inefficiency of the education of the place. We know not how it fares with Yarmouth now, but last summer, we are credibly informed, there were a score of schools in operation, where three or four might have sufficed. The first remedy to apply to this sore evil is the erection of commodious school-rooms, and we are right glad to see that the work has here commenced. Steps have been taken to raise, by assessment, the necessary funds, and we fondly trust that the true friends of education, who are the true friends of their fellow-men, will not be balked in their efforts by the comparative failure of such a course, but that they will be as willing to receive funds by voluntary subscription as they are by direct taxation. If needful, let them take both methods.

They ought to start with the determination of providing ample accommodation for 500 children. There are a great many more children of a school-going age within a mile and a half or two miles of Yarmouth, but it may be as well not to attempt too much at first. And how ought this accommodation to be parcelled out and located? In our opinion there ought to be a larger Central School capable of accommodating 200 scholars or more, consisting of 4 class-rooms, and one of sufficient size, with galleries, to contain all the scholars in attendance, in which they might assemble morning and evening for devotional exercises, as well as on public Review days. One of these rooms should be devoted to the Primary department, taught by a female—another to the Intermediate department, with one male teacher—and another, with recitation room, to the High School, where there should be two teachers, a Classical and Mathematical;—and all these departments under one head, and working out the same system of education, the lower feeding the higher or the more advanced.

Besides this large school in the centre, there ought to be two smaller ones at each extremity of the town, capable of containing 150 scholars each, with primary and intermediate departments. These two schools would provide accommodation for the more juvenile, while the more advanced might walk in to the central one. It might be well to place these schools under the Head Master of the Central School, in order that the same system may be followed out, and the scholars prepared, if inclined, to prosecute their studies in the High School.

These schools, including appendages and furniture, might be erected for the cost of £1500; the central one for £1000;



and the two affiliated schools for £250 each;—and we have not the smallest doubt that this amount could be very easily raised. The whole current expenditure of this establishment would not be more than £1000, making thereby the average cost of the education of each scholar less than two dollars a quarter, and this is much lower than it is at present. This plan would be vastly more efficient. Indeed we know not a finer field, in the whole Province, for working out a grand educational experiment, in accordance with our system. Perhaps it might be as well to finish, first of all, the central building. Let it be in efficient operation for half a year, and we have no fear but the others will follow. We shall regard with deepest interest every step taken in this important movement, a movement vastly more pregnant with consequences than any that has ever transpired since Yarmouth became a town.

#### PRINCE EDWARD ISLAND.

We trust that straightway something decided shall be done for the elevation of the standard of education in this beautiful little Island. In one respect this Island is far ahead of all the other Lower Provinces in the mode of supporting education,—the free system, as it is called, having been in operation there for some time. All that is wanting is the thorough and universal introduction of the system of education attempted by Mr. Stark—who, rather than that system should be denuded of its most important element,—the Bible,—nobly resigned his situation as Inspector of Schools, and returned to his native country. Though, generally speaking, the Superintendent of Education in any country has as much to do as he can well undertake, we have no hesitation in saying that the Island furnishes an admirable field for the combining of the two offices of Inspector of Schools or Superintendent of Education and of Principal of Normal School. We see nothing to hinder the Inspector, in such a place as the Island, from visiting all the Schools during the vacation of the Normal School; and for him actively to preside over the Normal School gives him innumerable advantages in reference to the future Teachers of the Province. He becomes thoroughly acquainted with their capabilities, both in a literary and professional point of view, thereby putting it completely in his power to place the right man in the right place. Besides, he is thereby furnished with the opportunity of imparting a portion of his own enthusiasm to the Pupil Teachers, not only to expound and exemplify the principles of the system, but to inspire them with a love for his calling. Every popular system of education, without the free and unfettered use of the Bible, and the inculcation of a morally founded thereon, is wanting in its grand, cementing, plastic bond,—its main-spring in intellectual as well as in moral education. That boon being secured, the next important step is to imbue the minds of the future executioners of that system with its spirit, which is just the spirit befitting their office. And this is the work to which our fellow-provincials, in educational matters, ought now to dedicate their time and energies.

#### ELEMENTARY SCHOOLS IN AMERICA.

The Superintendent of Common Schools, Poultney, Vermont, U. S., has issued to the Citizens a circular letter, containing a transcript of a Common School Bill, passed by the Legislative of the State at its last Session. He says: "We are now entering a new era in the history of Education in this State, and should commence with a definite understanding of not only the spirit but the very letter of the Law, and endeavour to see all its provisions faithfully carried out. I trust all School Officers, whose duty it is to execute, will give it a candid thorough reading, and preserve it for future reference, that none may have an excuse for non-performance of duty. School Committees, District Clerks, Teachers, Parents and Guardians—let us all be vigilant and do all that is in our power to carry out the purpose and intent of this act, and thereby elevate and improve

our wise and liberal system of education. The following is the Act.

*It is hereby enacted*

SEC. 1. The several towns in this state shall, at their annual March meeting, elect one person to be superintendent of common schools within such town, who shall hold his office during the school year commencing on the first day of April next after his election, and, when appointed by the selectmen, during the remainder of the then current school year; and who shall receive for his services one dollar for each day necessarily spent in the discharge of his legal duties, and a reasonable sum for his annual report to the March meeting; and his accounts shall be audited by the court auditor of the county in which he resides, and when approved, shall be paid out of the state treasury upon the order of the various county clerks, who are hereby authorized to draw orders therefor; but no order shall be drawn by an county clerk for the amount thus allowed to any superintendent until such superintendent shall have filed with such clerk the receipt of the secretary of the Board of Education for the statistical return of the preceding school year, required by law of such superintendent; but no superintendent shall receive compensation for his services while visiting schools for a number of days greater than twice the number of schools in the town for which he acts.

SEC. 2. The statistical returns required by law to be made to the secretary of the board, by the town superintendent of schools annually on or before the first day of September, shall hereafter be made and returned to the secretary on or before the first day of April of each year, and the secretary is directed on the receipt of such return to forward a certificate thereof to the superintendent making the return.

SEC. 3. The examination of teachers by town superintendents shall be public, and held in some public place after due notice given pursuant to law, in the months of May and November in each year, and citizens generally invited to attend; and no examination of teachers shall be held at any other time or in any other manner except in the discretion of the superintendent, and for the accommodation of teachers prevented by sickness or other unavoidable circumstance from attending at the regular public examination; and any superintendent examining teachers at any other time than the regular public examination shall be entitled to receive from each teacher applying for such examination the sum of fifty cents.

SEC. 4. Whenever, upon personal examination of schools, the superintendent of any town shall become satisfied beyond a reasonable doubt, that a teacher to whom a certificate has been granted, is incompetent to teach or govern his school properly, or setting a bad example before his school, the superintendent is hereby empowered in his discretion to revoke the certificate therefor granted to such teacher by filing in the town clerk's office of such town a statement in writing of his having made such revocation and delivering a copy thereof to the prudential committee and also to the teacher whose certificate is so revoked; and every teacher's certificate that shall have been duly revoked pursuant to the provisions of this section, shall immediately, upon the filing of such revocation, become thereafter null and void and of no effect, and such teacher's contract with the school district shall become void therefrom, and it shall not be lawful for the prudential committee to pay such teacher for any services thereafter performed as teacher.

SEC. 5. The division of the public money required by sec. 71 of chapter 20 of the compiled statutes to be made between the several school districts in each town on the first day of March, annually, shall hereafter be made on the last Tuesday in March in each year.

SEC. 6. That portion of the public money which is now by law required to be divided annually, to the respective districts in each town, in proportion to the number of their scholars between four and eighteen years of age, shall hereafter be divided to such districts in proportion to the average daily attendance of the scholars of such districts (who are between the age of 4 and 20 years) upon the common school in such districts during the preceding school year, such average daily attendance to be ascertained from the record thereof to be kept in the registers of such schools as is prescribed in this act, by adding

together the number of days of actual attendance of each legal scholar, as shown by the record, and dividing the sum, or aggregate attendance, by the number of days the school has been kept during the year, the quotient to be considered the average daily attendance required.

SEC. 7. The secretary of the board of education is hereby required to prescribe blank forms for a school register, conveniently arranged for keeping a daily record of the attendance of children upon the schools and containing printed interrogatories addressed to teachers, and to district clerks for the procurement of such statistical information as the board of education may seek to obtain in each year; and in the month of January of each year, the secretary shall procure, and furnish to the town clerk in each town in the state, a sufficient number of such registers to supply each district clerk in said district with one register for each school in his district for the ensuing school year. And it is hereby made the duty of each town clerk to receive such registers for his town, and immediately forward by mail to the secretary his receipt therefor; and, on failure to receive such registers by the first day of February in each year, the town clerk shall immediately notify the secretary thereof, who shall supply the deficiency forthwith. And it is made the duty of each district clerk, during the first week in March annually, to procure of the town clerk a register for each school in his district, and be responsible for the safe-keeping thereof.

SEC. 8. It is hereby made the duty of every teacher of a common school, before he commences his school, to procure from the clerk of the district in which he shall teach, a school register, and therein keep a true record of the daily attendance of each scholar who may attend such school, while under his instruction, in accordance with the form prescribed in such register, and at the close of his school shall enter in said register correct answers to all statistical enquiries therein addressed to teachers, and return such register to the district clerk previous to the receipt of his wages as such teacher. And it is hereby made the duty of each district clerk to comply with all the requirements made of him in the register or registers of his district, in reference to the statistics of his district, and make oath to the correctness of his returns before a justice of the peace of the county in which he resides, and file said register or registers in the office of the town clerk, on or before the 21st day of March in each year, and no portion of the public money in any town shall be distributed to any district whose school register or registers shall not be properly filled out and filed in the town clerk's office, pursuant to the provisions of this act.

SEC. 9. The time, not to exceed two days, actually spent by any teacher of a common school in attendance upon the teacher's institute, held, pursuant to law, in the county in which such teacher shall be employed, during the time for which such teacher is engaged to teach such school, shall be considered as time lawfully expended by such teacher in the service of the district by which he is employed, and in the legitimate performance of his contract as teacher.

SEC. 10. The chairman of the prudential committee of the various districts composing the Union district, shall together constitute the prudential committee of the Union district, and the member of the prudential committee of any school district first elected, shall be considered the chairman thereof: *Provided*, that whenever such Union district shall be formed of an even number of districts, there shall be added to said committee one person, resident in such Union district, who shall be chosen annually at any legal meeting of said Union district duly warned for that purpose, and who shall hold his office for one year thereafter, and until another shall be chosen.

SEC. 11. The Board of Education is hereby directed to select, or procure to be selected, a list of grammars, geographies, arithmetics, readers, and spellers, to be used in the district schools in this State, limiting the text book in each of said branches to one or more, in their discretion. Such selection shall be made previous to January first, A. D. 1850, and shall be published in all the newspapers in the State, in said month, of January, A. D. 1850, and also inserted in each school register. And said list of books, when thus made and published, shall become authoritative and binding upon the Board of Education, superintendents and teachers, until January first A. D. 1854, and

teachers and superintendents shall recommend for use in the district schools, as new books shall become necessary for instruction in the branches named, no other than books included in said list so established.

SEC. 12. The Secretary of the Board of Education shall annually prepare and print three thousand five hundred copies of his annual report, and have the same ready for distribution on the assembling of the legislature each year, and shall distribute the same as follows: one copy to each town superintendent; one copy to each district clerk, and one copy to each principal of a high school, union school or academy in the State, the necessary copies for all, except members of the legislature to be forwarded by the secretary to the various town clerks, and be by them distributed in the same manner in which the laws are distributed.

SEC. 13. It is hereby made the duty of the trustees of all academies and grammar schools which have been incorporated by the legislature of the State of Vermont, to cause their principals to return to the Secretary of the Board of Education, on or before the first day of April in each year true and correct answers to such statistical enquiries as may have been addressed to them by the Secretary in the month of January previous.

SEC. 14. All acts and parts of acts inconsistent with this act are hereby repealed.

SEC. 15. This act shall take effect from its passage, provided that the apportionment of the public money to the various school districts for the school year ending on the last day of March, A. D. 1850, shall be made on the last Tuesday of March, A. D. 1850, in accordance with the provisions of the law existing at the time of the passage of this act.

To the Editor of the Journal of Education.

DALHOUSIE COLLEGE, HALIFAX, JUNO 1, 1850.

SIR,—

I should be glad, by the medium of your journal, to submit to the teachers of the province a proposal for a slight extension of our arithmetical terminology, which, I believe, would be of considerable use in education.

The word *times*, and the affix *th*, are freely used along with the common numerals—*as four times, a fourth, twenty-seven times, the twenty-seventh, &c.*

I propose that their use should be extended to all arithmetical terms which will admit of them, as integer, divisor, multiplier, quotient, numerator, denominator, &c.

This, by saving accumulation, would give brevity and precision to numerous arithmetical expressions, and greatly lighten and exemplify the explanation of a variety of arithmetical principles.

This will be at once seen from the following illustrations.

We could tell the pupil that,—the dividend is divisor times the quotient, or quotient times the divisor, that the quotient is the divisorth part of the dividend, and that the divisor is the quotientth part of the dividend; that the product is multiplier times the multiplicand, or multiplicand times the multiplier, that an aliquot part of a quantity is any part which it contains integer times, instead of the awkward indefinite expression, "an exact number of times"; that a fraction is numerator times the denominatorth part of 1, or the denominatorth part of the numerator—the double view of a fraction being thus given with singular precision in a very few words, &c.

Let any one attempt to give the substance of the preceding sentences without the use of *times* and *th* in the way proposed, and he will at once see the advantage of these extensions of our present terminology, in the contrast with the tedious, circuitous, ambiguous expressions to which he will be obliged to have recourse.

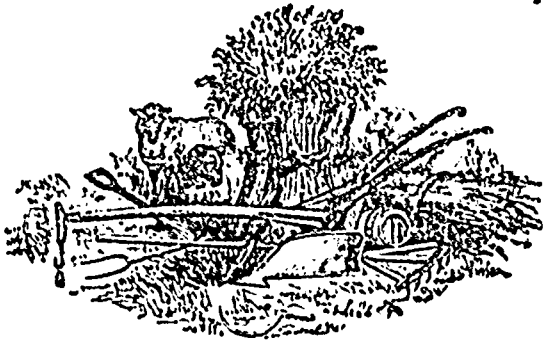
The force of these new expressions may not at once be appreciated, or they may sound a little strange and harsh; but a little practice would soon remove these objections,

and place in our hands an important aid in inculcating the principles and explaining the operations of Arithmetic.

Respectfully soliciting the attention of the profession to the subject,

I am, sir,  
Your very obedient servant,  
HUGO REID.

## AGRICULTURAL.



### I.—THEORY OF AGRICULTURE.

#### THE ANALYSIS OF SOILS.

A few years since very high expectations were raised of the great practical benefits to agriculture from chemical analysis of soils. The earlier analyses were little to be depended upon, but of late they have been conducted with much greater care and scientific exactness. The most minute ingredients of soils have been strictly determined by measure and weight. Yet with all this exactness and deep scientific research, it would be difficult to point out a single instance in which this mere chemical analysis of the soil, has been of much direct benefit to practical agriculture. Some light has no doubt been thrown thereby upon the hidden processes of vegetable nutrition, and the composition and requirements of plants; but the chemist has been hitherto unable by his most refined analysis, to give the farmer such precise instructions as to the preparation of the soil for special crops, as to ensure in all cases a successful result. The fact is, pure science can do but little for agriculture, unaccompanied by *experience*. We would not underrate the service which chemistry has already done to agriculture, particularly in relation to the nature and composition of manures, and in her onward progress great triumphs are no doubt in store. But it should always be borne in mind that the mechanical condition and preparation of the soil, as well as its chemical composition, together with the state of the weather and other conditions, have a great influence on the amount and quality of the crop. The following remarks of a writer in the *North British Agriculturist* are worth consideration:—

“To analyse a soil, and determine from the results the degree of its fertility and its adaptation to particular crops, was one of the first problems placed before the agricultural chemist, and from its solution the greatest advantages to agriculture were anticipated. As yet these expectations have not been realized, nor can this be considered as a matter of surprise.—The progress of our knowledge, in place of simplifying, has complicated the question, and has shown that the fertility and infertility of a soil is dependent upon a variety of circumstances, of which its chemical composition is only one. Instances exist in which the barrenness of a soil can be distinctly traced to the deficiency of some one or other of the necessary elements of plant life; but in other cases, a barren and a fertile soil may present an almost perfect similarity in composition, and contain

all the elements required by plants in proportion known to be amply sufficient for their healthy growth. The difficulty of explaining these facts has been increased, just in proportion as soil analyses have become more minute, for their tendency has been to show that the instances in which infertility is due to the absence of any of the essential constituents of the plants are comparatively rare, and that quantities which we are apt to overlook as totally unimportant, may be amply sufficient for all that is required. One-tenth of a per cent of potash, soda, or phosphoric acid, may appear a quantity so small that the chemist might be justified in neglecting it, and yet a soil containing these quantities is capable of affording an abundant supply of these elements to many generations of plants; and notwithstanding this there are soils containing a much larger quantity of these substances, which, if not absolutely barren, are only capable of supporting a very scanty vegetation. These facts have rendered it obvious that it is not merely the presence, but the accessibility, so to speak, of the constituents of a soil that must be determined; and when the chemist, in addition to the exact proportions of these minute quantities, is required to ascertain the various forms of combination in which they exist, it is natural that he should show little disposition to enter upon a branch of investigation of such complexity, and which in the present state of our knowledge is likely to give only negative results.

The difficulties of this investigation have been so fully recognized by Liebig, that he has pronounced it impossible to arrive at a satisfactory knowledge of the composition of the soil and its suitability for particular crops, by analysis alone.

### II.—PRACTICE OF AGRICULTURE.

#### TIME OF PRUNING TREES—“CAPE BRETON NEWS.”

In the April number of the *Journal*, speaking of the work that ought to be done by the Farmer or Horticulturalist about that time, we mentioned the pruning of Fruit Trees.—It would seem that this paragraph was inserted in the *Cape Breton News*, which attracted the attention of some skilful Horticulturalist in the vicinity of Sydney, who, fearing lest any might be led to put into practice the recommendation thus given, in his opinion, to the no small injury of their Orchard, immediately came to the rescue, and either wrote or caused to be written an article on the subject, which appeared in the Editorial columns of that excellent and spirited paper of the 14th May. When we noticed this article we were so much engaged with other matters that we could not command time to write a reply to its statements. We, however, sent a brief note to the Editor, announcing our intention of presenting our views, at more length, on the subject in this number of the *Journal*. We rejoice to find that there are individuals in Sydney, C. B., or anywhere else, testing our statements on this or on any other subject connected with Agriculture or Horticulture, and we are pleased to observe that our esteemed friend, Mr. Ward, attached so much importance to the subject as to give it a place under his *Editorial*.

And now, in replying to the animadversions above referred to, we have no hesitation in reiterating our statement, and in maintaining our position, that the months of March and April, or the time immediately preceding the bursting of the leaf-bud, is the best time for the pruning of all our Fruit Trees, with the exception of those that yield what are called Stone Fruit, such as Peaches, Apricots, Nectarines, Plums, and such like. Now let it be remembered that the question before us is not as to what is the object or the benefit of pruning, but what is the season of the year best adapted for this purpose? And on what principle ought such a question to be decided? Plainly, we think, on the principle of the general benefit to the tree, and of the rapidity of the healing of the wound in-

flicted on the tree by the lopping off of the branch or bough—that is, the covering of the incision with new bark. As to the first of these points, we believe that it is more for the general benefit of the tree that pruning should be effected at the time mentioned than in the month of June or later in the season, and for this reason: The flowering of every tree or plant is exhaustive in its process, emitting carbonic acid and not oxygen, as the leaves; that generally takes place, in the Orchard, about the end of May or beginning of June; and, therefore, for the grower to go to the pruning of the trees after this exhaustive process has taken place, is to denude himself of the fruit without any compensation to him or to the tree in general, at least in so far as that year is concerned. But the second point or principle is perhaps the more important. In the opinion of the skilful and experienced Horticulturalist of Sydney, it would seem, from the allusion made to bleeding, to constitute the all to be attended to in pruning. We are as anxious as any that none of the nutriment of the tree shall be exuded and thereby lost; in other words, we think it of paramount importance that every means shall be used for the prevention of the discharge of its fluids; and for this purpose we would recommend the use of paint or of any other approved composition that would exclude the air, and still more would we insist on the great advantage of choosing the time for pruning that we can secure the flow to the wounded part of the greatest amount of the organized sap of the tree. But that we may make ourselves understood on this point we must say a word or two on the circulation of the sap of the tree, and the ends accomplished by that circulation. Every one who knows anything of Vegetable Physiology is aware of the fact that the plant not only depends on the mineral or soil in which it is growing for nourishment, but that the very substance, chemically regarded, of which the plant is composed must be in the soil or else it won't grow. These substances, in a state of solution, are absorbed by the rootlets or sporogoles, which act like a sponge, on the principle of capillary attraction.—When these substances, in this condition, enter the rootlets they are nothing but earthy or mineral matter or inorganic bodies, and they continue to be so till they reach the leaf, which is at once the stomach and lungs of the vegetable kingdom, as well as the type of the whole plant. This crude sap is strongly attracted by the solar rays operating upon the green chlorophyll of the leaf, and is generally supposed to flow in the newly formed wood. By these agencies a chemical change is effected on the crude sap in the leaf, by which the inorganic substance is converted into a living organism, and thereby assimilated to the very nature of the plant itself. Thence it is diffused, just like the vitalized blood in the animal kingdom, by another set of ducts or vessels between the bark and the previous year's deposit of wood. In the case of perennial, and, especially, of biennial herbaceous plants the greater proportion of this organized substance is deposited in the roots, and remains there till the following spring as the reservoir of nourishment to the plant the following year.—But in the case of shrubs or trees this organic substance is conveyed to every part and is deposited between the bark and the young wood of the previous year. When the leaves fall off in autumn the crude sap ceases to flow, and this organized matter becomes endurated or consolidated, forming the ring that is seen on the cutting of oxogenous trees in temperate climates, and by which the age of the tree can be pretty accurately ascertained. But part of this organized matter—and to this point we beg the special attention of our readers—is deposited in the roots of the tree, remaining there in a fluid state till the following spring; and when the temperature reaches a certain degree, this organic sap, which has been greatly enriched by all the secretions, ascends and lends its powerful aid in expanding the leaf bud before the crude sap has begun to flow. This organized matter possesses much healing virtue, and, being desirous to obtain its benefit, we prefer to cut off the branch of the tree just before or during the earliest stages of the return of this nutritious substance to the extremities of the tree, which is, in this country, in ordinary seasons, from about the middle of March till near the end of April. We are anxious, as stated already, to get

the wounds made by pruning as speedily healed as possible, and seeing that this is most likely to be accomplished in the way described, we prefer to prune the Orchard from the middle of March till towards the end of April. Along with this physiological reason for the position we have taken, with some consideration, it affords us much pleasure to be able to state that the very same position is maintained by D'Albret, Du Breuil and Professor Lindley, the greatest of living Horticulturalists both in Britain and France. These gentlemen do not go at such length into the physiological reasons as we have felt it our duty to do, but they are equally decided as to the time. We would not have dwelt so long on this subject had it not been for the positive, oracular declarations of the "skilful and experienced Horticulturist of Sydney." We would just refer him to the May number of the *New England Farmer*, where he will see that the matter is not so settled and determinate as he seems to suppose. On the point of the best time for pruning Stone Fruit Trees we have neither time nor inclination at present to enlarge. Suffice it simply to say that the copious exudation which they give forth, after any of the branches are cut off at any time, does not, in our apprehension, arise from the general sap of these trees, but from secretions or glands, which seem to serve pretty much the same purpose in the vegetable that they do in the animal kingdom. This exudation is, however, much less during the time the branches of the tree are in full foliage, in consequence of the resinous or gummy substance contained in these secretions mingling more with the general circulation, and thereby contributing more to the general nourishment of the tree. For this reason the summer season may be more advantageous for pruning this kind of Fruit Trees than the spring, but even then the utmost care and precaution are requisite for the averting of the *bleeding* process, and for the preserving of the general strength of the tree.

#### DIFFERENT SORTS OF TURNIPS, WITH THEIR RESPECTIVE PROPERTIES.

##### SWEDES.

*Skirring's Extra Improved.*—Bulbs rather oblong in shape, with finely rounded shoulder, and grows higher out of the ground than the other varieties. By having recourse to a judicious choice of bulbs to "breed" from, we have produced a marked improvement in the character of this Swede, and it may be safely relied on as the most robust grower and heaviest cropper in cultivation.

*Lothian Purple Top.*—An established well known sort—handsome shaped, solid bulb, of a good size, with smaller top or shaw than Skirring's.

*Hardy Green Top.*—A superior very old variety, which has latterly been greatly improved by selecting proper stock to raise seed from. Generally, except on rich soils, the crop may not be extra bulky; should there, however, be a deficiency in this respect it is compensated for by its excellent keeping and feeding qualities. It succeeds remarkably well on peaty soils.

*Laird's Improved Purple Top.*—A finely formed bulb, with long entire cauliflower-like spreading leaves, and on rich loamy soils yields a good crop, but is not equal in hardness to any of the preceding.

##### YELLOW.

*Green Top or Aberdeen Improved.*—When due attention is paid to a proper selection of the stock, it is questionable if there be a better variety of Yellow than the "Green Top or Aberdeen" in cultivation, it being hardy, nutritious, and an excellent keeper; in too many instances, however, it has disappointed the farmer by the spurious character it has assumed through inferior seed, which produces only small stunted bulbs with a profusion of coarse tops. Our Improved stock, yielding as it does a very bulky crop of finely formed solid bulbs, having moderate sized tops, has, since its recent introduction, met with an extraordinary demand, and given the greatest satisfaction.—

(The common Green Top Yellow may still be had by those who prefer it.

**Purple Top (Skirving's Variety).**—A well known and very generally esteemed sort, which gives a heavy crop and has good feeding qualities, but not so hardy as the Green Crop, and is more liable to mildew in the leaves.

**Threeedale Purple Top.**—Recently introduced, and is considered a better keeper and firmer in the texture than the preceding variety.

**Dale's Hybrid.**—Produces an extra heavy crop finely shaped bulbs; is a first rate variety for early consumption, and from the bulbs growing considerably above ground, is well adapted for sheep feeding. The stock now offered has been selected with much care, and is quite superior to what is usually sold as Dale's Hybrid. If not better than the variety recently introduced as the "Fosterston Hybrid," it will be found at least equal to it.

**Improved Early.**—This is altogether a most desirable Turnip, having a large handsome shaped bulb, with small tap root, and rather small top or *shaw*. Is greatly relished by cattle, and if stored before severe frost sets it, it will keep sound and juicy till spring. Being of very quick growth it is invaluable for late sowing, and unless wanted for early autumn use, it should not be sown till towards the end of June, and sowing may be continued up till the middle of July with the certainty of having a full crop. (This variety has a beautiful deep yellow bulb, with a bright green crown, and is quite distinct from the "Orange Jelly.")

**Long Tankard.**—Long shaped pale yellow bulb, and from its growing much out of the ground is very good for shallow soils, but is readily injured by frost.

#### WHITES.

**Large Pomeranian Globe.**—The best White Globe in cultivation. Bulbs large and of a uniform globular shape, with smooth transparent white skin.

**Green Globe Imperial (or Green-Topped White).**—The hardiest of all the Whites, and is a large free growing sort; a good globular shape, solid and juicy. Excellent for dairy and young stock during the early part of winter.

**Lincolnshire Red Globe.**—An improved variety of the old Red Norfolk; bulbs extra large, finely shaped and juicy. Is well adapted for early consumption.

### RAISING ROOT CROPS.

#### MANGEL-WURZEL.

Mangel-wurzel should be sown as soon as the ground is in a warm and dry condition, and with but little risk of severe night frosts. The drills are commonly made too close; on good land, and with the larger sorts of mangels, 30 to 36 inches is not too wide. All plants require abundance of light and air which is particularly the case with farm root crops; and sufficient room should always be left for frequent cultivating with the horn-boe during the season of growth, without the risk of bruising the succulent plants. The long, red mangel produces the heaviest crop on rich and deeply cultivated land; but upon shallow soils the yellow globe variety is better adapted. Mangel wurzel is by far a more certain crop in this country than turnips, not being so liable to injury from insects, and rooting deeper in search of food. It will also keep longer in the Spring, and may be given in larger quantities to cows, without imparting an unpleasant flavor, as turnips do, to the milk and butter. It requires, however, to be thoroughly protected from frost, being in this respect almost as tender as potatoes. For feeding purposes it ranks inferior to Swedish turnips. From the large amount of sugar which it contains, all kinds of stock, including horses and pigs, consume it with avidity. No farmer ought to be without a small portion, at least, of this useful root, which is invaluable to newly-calved cows in early Spring.

#### SWEDISH TURNIPS.

The Swedish turnip is a root whose valuable qualities are too well known to need particular description. It has long constituted the sheet anchor of the British farmer. Turnips in this country succeed best on new land, rich in organic materials. They should be sown in drills from 24 to 30 inches asunder, and well thinned out in the rows. The precise distance at which the plants should stand, is an important and somewhat difficult point to ascertain in practice, and depends on the nature and strength of the soil, the variety of the turnip, character of the season, and other circumstances. As a general rule, people are too apt to crowd their plants, thereby materially injuring the quality and amount of the crop. If sown, too early, Swedish turnips are peculiarly liable to mildew. The latter end of May and beginning of June will, in general, answer best; and it is particularly important that the state of the ground and weather should be such as to hasten germination, and push the young plants into what is termed the rough leaf, when they are beyond the attacks of their fatal enemy the fly. The purple top-variety may be considered as yielding generally the largest weight per acre; but Laing's improved—a finer and somewhat smaller kind—is better adapted to market, and domestic use. The Swedish turnip is hardy, and may be preserved through the winter in the field, in heaps, taking care not to cover too thickly, and to allow of ventilation by means of openings through the mass, otherwise the heat generated by the mass will set up fermentation and speedily effect decomposition. The Swedish turnip is an excellent fattener of stock, and in this respect is considered for practical purposes unrivalled.

**THE TURNIP FLY.**—Many devices have been recommended against the attacks of the turnip fly, but no absolute specific appears as yet to have been discovered. Mr Poppy's scheme for escaping it consists in sowing alternate rows, or occasional patches of common turnips in the midst of the Swedes, in the belief, to which his experience had led him, that the fly would confine itself to the former. He has since found that mustard attracts the fly from both common and Swedish turnips.

Mr Grey, of Dilston, has for some years past planted field potatoes in rows alternately with Swedish turnips, on land which had been worked, manured, and drilled up in the previous autumn, or very early in the Spring, the potato seed being put in with the spade. This he did to preserve the potatoes from the prevalent disease; and the turnips were always the best in the field.

Lord Grey states his experience of the same practice thus:—"It is a curious thing that in one field, where I have tried your experiment of sowing two drills of turnips together between the drills of potatoes, the turnips have entirely escaped the fly, though in all the rest of the field, sown at the same time, they are completely destroyed." It would seem that the potato top is so distasteful to the fly, as to afford protection to plants of another kind growing in immediate proximity.

We were told by a Canadian farmer who has had considerable experience in raising turnips, that he has never wholly lost his crop by the attacks of the fly—and seldom indeed much injured. His practice is to sow very thickly, and as soon as the smooth leaves begin to appear to scatter over the drills a quantity of quick-lime, dry wood ashes and soot, intimately mixed; the proportion of lime being equal to the other two ingredients.

#### CARROTS AND PARSNIPS.

Carrots and parsnips have of late years been introduced to field culture, but to a much less extent than turnips, even in the most agriculturally advanced countries of Europe. The Belgian variety of carrot yields a large return when not sown too thickly; and it is much recommended for horses, especially in the Spring of the year, before there is a sufficient growth of grass for feeding. It is said that horses fed with small quantities of carrots through the Winter and Spring seldom, if ever, become broken-winded. Any kind of succu-

lent food given in conjunction with dry fodder would, no doubt, be beneficial in that respect. Both carrots and parsnips are excellent for milch cows; as the flavor of the milk and butter is not thereby affected. These crops require to be sown early in drills eighteen inches apart, upon good, well and deeply prepared soil, and should be thoroughly hoed once or twice during the period of early growth, so as to keep the surface friable and entirely free from weeds. We would advise farmers to commence their culture of these crops on a small scale. Nothing short of thorough management will pay.

### III.—AGRICULTURAL INTELLIGENCE.

#### REPORT OF COMMITTEE ON AGRICULTURE.

THE Committee on Agriculture have to report—

That in accordance with the course pursued by the Legislature for several years past, refusing aid towards the erection of Grist Mills and Oatkilns, they have rejected the petitions of Sutherland and Mitchell, George Hill and John Shea.

That under the Report of the Committee on Agriculture last Session the Grant to the Central Board was withdrawn, and by resolution of the House the Returns from the several Local Societies were directed to be sent to the Financial Secretary's Office to be checked and audited before payment of any moneys thereunder.

This system your Committee find has not worked well, the important duties and large amount of work already chargeable on that Office not permitting the Financial Secretary to give the time and attention necessary to correspond with and maintain unanimity of action among the several Agricultural Societies throughout the Province, the Returns from these are consequently in many cases imperfect, give but a meagre account of the state of their crops, and the Committee were unable in so full a manner as they would wish to gather the information necessary to enable them to form a correct opinion of the Agricultural results of the past year. So far as an estimate can be had by the Returns of the Societies in those counties from which reports have been sent we are induced to believe that the crops of all kinds have generally been productive and of fair average quality—that the Agriculture of the Province is steadily increasing, and a more extended and improved system of Husbandry being adopted.

The Committee were gratified to learn that, under the inducements offered by the Legislature, a superior Bone Mill with improved machinery for manufacturing crushed bones has been erected at Wallace, in the County of Cumberland; at which, during the past year, upwards of one thousand bushels of this highly beneficial fertilizer have been manufactured, and that in all cases where the same has been used its results have proved highly remunerative.

The importance of employing special manures as auxiliary fertilizers, especially in the cultivation of Turnips and other Root Crops, is now universally admitted and practised wherever Agriculture is successfully carried on. In this Province phosphates of lime, in the form of bone dust and superphosphates, the result of dissolved bones, are comparatively unknown. The experience of the best Farmers in olden countries has fully proved their efficacy and paying properties, and now that they can be had of home manufacture every effort should be made to induce our Farmers to give them a trial.

The Returns made to the Financial Secretary's Office show the existence of only thirty-three Societies during the past year which have drawn from the Treasury £325, being a decrease of twelve Societies as compared with the previous year, although several others, it is supposed, are in operation, and will yet qualify themselves so as to be entitled to draw their portion of the Agricultural Grant.

This diminished number of Societies, and apparent lack of

zeal on the part of many of them, particularly in the more distant counties, have been mainly caused, as the Committee are induced to believe, from the want of some central organization and proper channel through which unity of action and information on many points on which they may desire to be informed can be had. The Committee are of opinion that this can be best accomplished and at the smallest expense; and the present Agricultural organization, the retention of which we believe to be essential to the advancement and prosperity of our Provincial Agriculture; and which has only been attained by the labour of many years and the expenditure of a large amount of the public money; be best advanced by placing the Local Societies to some extent under the control of the Superintendent of Education, and in connection with the Model Farm at Truro. The present duties of that office cause him to travel over the Province, and an opportunity will thus be afforded to him of personally meeting the Societies in the different localities and infusing into the sluggish renewed vigour and spirit.

We recommend to each county an Agricultural Grant of £30, being the same sum given last year to be apportioned to the different Societies, and paid on the same conditions as heretofore.

We herewith submit a resolution for the purpose of carrying into effect our views in reference to the future management of the several Local Societies.

We recommend the Rev. Dr. Forrester the sum of fifty pounds, in consideration of the services to be performed by him in connection with Agriculture.

Herewith we append the first account of the Treasurer of the late Central Board of Agriculture, showing a balance in hand of

£169 7 6	
To which we add the amount realized from sale	56 4 3
of Agricultural Stock in the Spring of 1858	}

Making a balance from these sums of £225 11 9

This sum we recommend to be repaid into the Treasury, subject to future Agricultural Grants.

Lastly, we recommend that any portion of the Agricultural Grant to which the several counties may be entitled, and which may hereafter remain undrawn for one year after the time of appropriation, be retained in the Treasury and refused payment.

ALEXANDER MCFARLANE, Chairman.

Committee Room, 4th April, 1859.

*Resolved*, That for the present year the accounts and reports from the several Agricultural Societies should be sent to the Superintendent of Education at Truro, by whom all such accounts, when examined, shall be sent to the Financial Secretary's Office, and on his certificate of their correctness the sum which each Society shall be entitled to receive from the Agricultural Grant shall be paid. And a report from such Superintendent, showing the condition and operations of these Societies, shall be submitted to the Legislature at its next Session.

#### CIRCULAR.

TRURO, 1st JUNE, 1859.

DEAR SIR,—

I beg to forward to you, as Secretary of the Agricultural Society, the following Resolution passed by the Legislature last Session, and shall feel greatly obliged by your bringing it before the Members of your Committee:—

*Resolved*, That for the present year the accounts and reports from the several Agricultural Societies should be sent to the Superintendent of Education at Truro, by whom all such accounts, when examined, shall be sent to the Financial Secretary's Office, and, on his certificate of their correctness, the sum which each Society shall be entitled to receive from the Agricultural Grant shall be paid. And a

report from such Superintendent, showing the condition and operations of these Societies, shall be submitted to the Legislature at its next Session."

I may state that I consented to discharge the duties involved in the above Resolution entirely in the hope that the present organization of the Societies might be upheld, and that, through the columns of the *Journal of Education and Agriculture*, the proceedings of these Societies might be more widely diffused through the Province; and still more that an opportunity might be furnished, through the record of these proceedings, of presenting and pressing the claims of this important branch of the public industry upon the attention of the Legislature. With these objects in view, and as no formal report was made last year of the condition of the Agricultural Societies or of the cause of Agriculture generally, might I ask you to forward me, at your earliest convenience, a reply to the following queries:—

1. What is the present condition of Agriculture in your district—state whether you consider it stationary or progressive during the last few years, and what causes have mainly operated in the case of the one or the other?

2. Is there anything like general attention paid to the Rotation of Crops?

3. Are any artificial fertilizers used, or any attention given to the manufacture of Compost Beds?

4. What is the average amount of Arable Land cultivated by each Farmer, and what may be the proportion of Grain and Root Crops?

5. Do the Farmers generally possess a copy of *Dawson's Agriculture of Nova Scotia*?

6. Is there any Periodical on Agriculture circulated in the District?

7. From your own observation, do you think that the Agricultural Societies, as at present managed, have been productive of benefit to the cause of Agriculture? Please make any suggestions calculated, in your opinion, to render them still more beneficial.

8. State what you believe to be the grand desideratum for imparting an impulse to this important branch of industry.

I am, Yours truly,

ALEXANDER FORRESTER.

## SCIENTIFIC.

ALEXANDER VON HUMBOLDT.

(Abridged from the Daily News.)

Alexander Von Humboldt died on the afternoon of Friday last.

The remarkable brothers, William and Alexander Von Humboldt, were descendants of a Pomeranian family. William made himself a memorable name in Germany, and Alexander in the whole civilised world. William, the elder by rather more than two years, was a philosopher in the realms of literature and art, while Alexander devoted himself, not to the study of the human mind or its productions, but to the medium, or movement in which it lives. William was frankly told by his friend Schiller that his mind was of too ratiocinative and critical a cast to permit him to produce works of art, in literature or otherwise; and his highest achievements were accordingly in the department of philology. He died, honoured and beloved, in the seventieth year of his age, in 1835. He had signed the Treaty of Chatillon, and attended the Vienna Congress as the representative of his country. His brother attended the Congress of Verona in the King's suite. The elder incurred the royal displeasure by his liberal tendencies; but the younger enjoyed grace and distinction at Court to the end; patronage being showered upon him, without too close an inquiry on the one hand, or

too frank an explanation on the other, in regard to the principles and practice of government.

William was born at Potsdam in 1767; and Alexander—or, as name stands at full length, Frederick Henry Alexander Von Humboldt—was born at Berlin in 1769, on the 14th September. Their father died when they were twelve and ten years old; but their mother, and a cousin of the Princess Blucher, was a woman of fine capacity and cultivation, and the family fortunes were good, so that the boys had every educational advantage. Alexander received his academic training at Gottingen and Frankfort on the Oder, and a part of his scientific instructions at the Mining School of Freiburg. Nothing could be more marked than his early determination towards natural science, and towards travel in pursuit of his researches. The more he was thwarted and hemmed in by the obstruction of war, the intenser grew his desire to explore the heights, depths, and expanses of the earth, in order to extort the secrets of nature. Geology did not exist; and for want of the generalisations with which he more than any other man has since furnished us, natural science was fragmentary and confused to a degree scarcely conceivable to students now entering on that vast field. His investigation and arrangement of details was perfectly marvelous from its scope and equality of treatment; his generalisations were so splendid, and so fruitful beyond all estimate, that it is a reluctant judgment which ranks them below his more concrete studies, in regard to quality; but there can be no difference of opinion about his failure in his highest effort, as exhibited in his "Kosmos."

Humboldt's preparation for this, which he considered his crowning work, may be said to have begun when he became the pupil of Werner, the first geologist, at Freiburg, when he was two-and-twenty. He had already travelled in Holland and England, and even published a scientific book—on the Basalts of the Rhine. He was employed as a director of the Government mines; and in the course of his travels to explore the mineral districts of various countries, he lighted upon Galvani in Italy, and became devoted for a time to the study of animal electricity, and to the observation of some of the phenomena of the animal frame which were supremely interesting to him in his latest days. In 1849 he verified, to his own entire satisfaction, and that of his philosophical condutors, the fact of the deflection of the needle as a result of human volition, through the medium of muscular contraction. "The fact," he said in his letter to Arago, the next year, "is established beyond all question of doubt." "Occupied myself for more than half a century in this class of physiological researches, the discovery which I have announced has for me a vital interest. It is a phenomenon of Life, rendered sensible by a physical instrument." Thus were his earliest and latest scientific interests linked by the discoveries of the remarkable age in which he lived; but what an experience had he undergone meantime! He had stood on higher ground than human foot had till then attained. He climbed Chimborazo to the height of 19,300 feet, an elevation since then surpassed, but never attained till that June day of 1802. He went down into the deepest mines, in pursuit of his geological researches. He not only visited three of the four quarters of the world, but explored parts of them which were then completely savage in the eyes of the civilised world. It was through no remissness of his own that he did not travel in Africa. He was at Marseilles, on his way to Algiers and to the top of Atlas, whence he meant to go to Egypt, when the war, which seemed to stop him at every outlet, turned him back. While chafing under his confinement in Europe, he did the best he could within that prison. When the war raged in Italy, he travelled with Von Bach in Styria, examining the mountains and their productions. When London was inaccessible, he went to Paris, where he made the acquaintance of his future comrade, Bonpland. When the war came to Germany, he was off to Spain; and there, at last, he met his opportunity. He obtained a passage to South America, and narrowly escaped imposing upon us the honour or disgrace, whichever it might be, of having Alexander Humboldt for

our prisoner of war. He has told in his works of his recent of the Peak of Teneriffe (which just enabled him to deny not having taken Africa in his course of travel), and of what he saw and felt among the vast rolling rivers, and grassy plains, and tropical forests, and overwhelming mountains of South America. He explored Mexico, landing on its Pacific side, after having crossed the Andes; and then, by way of Cuba, visited the United States, and lived two months in Philadelphia in 1804. The world had never seen such scientific wealth as Humboldt brought to Havre in his collections in every branch of natural history, illustrated by such a commentary as he was now qualified to give. He planned an encyclopaedic work which should convey in detail all his discoveries and classified knowledge; and the issue of this work was one of the mistakes of his life which cost him most uneasiness. After twelve years of constant labour he had issued only four fifths of this prodigious series of works; and it has never been completed, though portions have dropped out even within a few years. Before those twelve years were over—that is, before 1817—he had been overtaken in research and forestalled in publication by men whom he had himself, by his example, inspired and trained. In the next year he broke off from this slavery, and visited Italy. He was in England in 1826. He was then regarded as an elderly man, being fifty-seven years old, and notorious for a quarter of a century.

He fixed his abode at Berlin, and immediately became a royal favourite, and consequently a politician. He was made a Councillor of State, and tried his hand at diplomacy. But those are not the things by which he will be remembered; and nobody cares to dwell on that part of his life, except those who would fain have Englishmen see that the foreign method of rewarding scientific or literary service by political office seems never to answer well in practice. When Alexander came to England with the King of Prussia, on occasion of the baptism of the Prince of Wales, his appearance in the royal suite gave a sort of jar to English associations about the dignity of office. It was felt that that splendid brow wore the true crown; and many a cheek flushed when the sage played the courtier, and had to consult the royal pleasure about his engagements with our scientific men as a lacquey asks leave to go out. It is certain, however, that Humboldt took kindly to that sort of necessity. He was a courtier all over. We see it in his overpraise of all savans whom he names, and by his dexterous omission of such names as the Court or learned classes of Berlin did not wish to hear of. We see it in his cumbrous style, which is more like a network to catch suffrages than a natural expression of what the writer was thinking about. Those who knew him in his last days saw it in the contrast between his written and spoken comments on his contemporaries. After hearing one of his dramatic descriptions of sittings in the scientific Academies of the European capitals, with satirical presentments of the great men there, his elaborate compliments to the same persons, incessantly issued in one form or another, have been found very curious reading. There was no envy or jealousy in this—only an irresistible provocation to amuse himself and others, through his insight into human nature. He was thoroughly generous in the recognition and aid of ability; or rather, as he was high above all competition, regarding Science as his home, he looked upon all within that enclosure as his children. It was with a true paternal earnestness and indulgence that he strove for their welfare. Almost every man of science in Germany who has found his place has been conducted to it by Humboldt; and this, not only by a good use of his influence at Court, but by business-like endeavour in other directions.

The hindrance imposed on his scientific researches by his political position was very evident on occasion of his last long journey. By the express desire of the Czar he travelled to Siberia, in company with Ehrenberg and Gustav Rose, in 1829, and explored Central Asia to the very frontier of China. Yet this journey, which, if he had set out from Paris, he would have thought worthy to absorb some years, was hurried over in nine months, as he happened to set forth

from the Court of Berlin. He did great things for the time—instituting observatories, improving the Russian methods of mining, kindling intelligence wherever he went, and bringing home knowledge, more great and various than perhaps any living man but himself has gained in so short a time. After his return he spent the rest of his life, with intervals of travel, in maturing the generalisations by which he has done his chief service of all, that of indicating the laws of the distribution of the forms of existence, and especially of biological existence. He also compiled his "Kosmos" from the substance of sixty one lectures which he delivered in Berlin in 1827-8. His frame wore wonderfully, and there was no sign of decay of external sense or interior faculty while younger men were dropping into the grave, completely worn out. He was the last of the contemporaries of Goethe; and as the tidings came of the death of each—philosopher, poet, statesman, or soldier—Humboldt raised his head higher, seemed to feel younger, and, as it were, proud of having out-lived so many. If silent, he was kindly and gentle; if talkative, he would startle his hearers with a story or scene from a Siberian steppe or a Peruvian river side—fresh and accurate as if witnessed last year. He forgot no names or dates, any more than facts of a more interesting kind. In the street, he was known to every resident of Berlin and Potsdam, and was pointed out to all strangers as he walked, slowly and firmly, with his massive head bent a little forward, and his hand at his back holding a pamphlet. He was fond of the society of young men to the last, and was often found present at their scientific processes and meetings for experiment, and nobody present was more unpretending and gay. He has been charged with putting down all talk but his own; but this was the natural mistake of the empty-minded, who were not qualified either to listen or talk in his presence. There was no better listener than Humboldt in the presence of one who had anything worth hearing to say on any subject whatever.

It is a great thing for Germany that, at the period when the national intellect seemed in danger of evaporating in dreams and vapours of metaphysics, Humboldt arose to connect the abstract faculty of that national mind with the material on which it ought to be employed. The rise of so great a naturalist and initiator of physical philosophy at the very crisis of the intellectual fortunes of Germany is a blessing of yet unappreciated value; unappreciated because it is only the completion of any revolution which can reveal the whole prior need of it. If Alexander Humboldt suffered, more or less, from the infection of the national uncertainty of thought and obscurity of expression, he conferred infinitely more than he lost by giving a grasp of reality to the finest minds of his country, and opening a broad new avenue into the realm of nature to be trodden by all people of all times.

#### BIBLICAL DISCOVERIES—ANCIENT MANUSCRIPTS AND INSCRIPTIONS.

Professor Tischendorf, who had been sent by the Russian Government on a journey of scientific exploration, in a letter from Cairo, dated the 15th of March, states to the Minister of Saxony, Herr Falkenstein, that he has succeeded in making some valuable discoveries relative to the Bible. The most important of these discoveries is a manuscript of the Holy Scriptures from the fourth century, consequently, as old as the famous manuscripts of the Vatican, which hitherto, in all commentaries, maintained the first rank. This it will have to share in future with the newly-discovered manuscript, if Herr Tischendorf be not mistaken. In 346 beautifully fine parchment leaves, of such size that only two can have been cut out of one skin, it contains also the greatest part of the Prophets, the Psalms, the Book of Job, the Book of Jesus Sirach, the Proverbs, the Song of Solomon, and several of the apocryphal books of the Old Testament; but then the whole of the New Testament is complete. Another discovery of Professor Tischendorf's is described as a com-



plete manuscript of the Epistle of Barnabas, and of the Shepherd of Hermas, both said to belong to the second century of the Christian era. Herr Tschendorf hopes, from the munificence of the Russian Government, that he will be enabled to give immediate publication to these three manuscripts. A most important discovery of inscriptions has been made in the Holy Land near Mount Sinai.

The following account of the excavations which led to the discovery, we owe to a friend:—"Suez, April 9.—I made the most interesting discovery close in front of the cave of Mugarnah. I felt so convinced that some of the large blocks there contained inscriptions, that I examined them very closely, and on washing the dust and sand from a huge block of many hundred tons weight, I found, to my great delight and surprise, not less than six inscriptions, of which I have five; the remaining one it was impossible to take, owing to the peculiar position of the stone. I then proceeded in my search, and on passing my hands underneath a huge block, I could distinctly feel some tablets. I fortunately possessed four crowbars, and, with the assistance of ten Arabs, I succeeded in about three hours in raising it and turning it over upon its face, and I have never seen any inscription more beautifully preserved. You will find these impressions exceedingly well taken, and I hope they will prove interesting. I have been to Mount Sinai and Mount Serait since I wrote last. I ascended the highest peak of the latter mountain, and found it covered with inscriptions of the Sinaitic character. No one has ascended the summit besides myself, except Burckhardt, who has given a very accurate description of it. Dr Lepsius ascended a lower peak. I never had so hard a day's work in my life." The inscriptions have reached London, and are in the hands of Mr Birch of the British Museum.—*London Athenaeum.*

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