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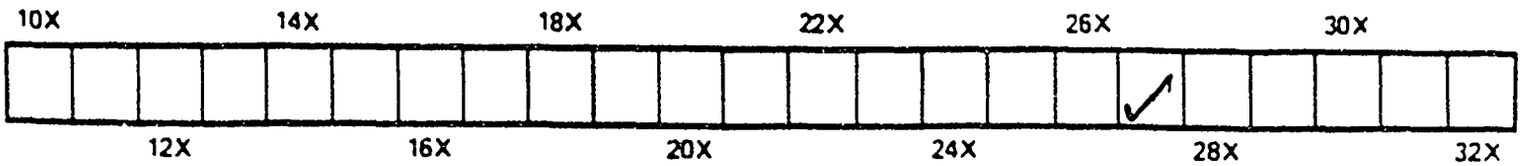

THE JOURNAL OF

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

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EDUCATIONAL.

I.—THEORY OF EDUCATION.

INTELLECTUAL EDUCATION—PERCEPTIVE FACULTIES.

We have already endeavoured to explain the meaning of Intellectual Education. We have, we trust, said enough to satisfy all, that it means something more than the enlightenment of the understanding on any given subject submitted to its consideration, or the imparting of the most valuable information in the most intelligible manner possible,—even the cultivation and development of all the powers of our intellectual nature. We have also expatiated, in general terms, on the means best fitted for this end, viz., the presentation of appropriate food, and this, in such a way, as shall secure the exercise of the scholar's own mind, through a process of picturing, questioning and ellipses.

We now proceed to the discussion of the various powers and faculties of the intellect, *seriatim*, and we take up first of all the *perceptive faculties*, those by which we become acquainted with the existence and qualities of the external world. The following compendious view of these faculties, is mainly derived from Wayland's Elements of Intellectual Philosophy.— 1st. I find myself, in my present state, in intimate connection with what seems to me to be an external world. I cannot help believing that I am in the study; that, looking out of the window, I behold in one direction a thronged city, in another green fields, and, in the distance beyond, a range of hills. I hear the sound of bells. I walk abroad and am regaled with the odor of flowers. I see before me fruit, I taste it and am refreshed. I am warmed by the sun and cooled by the breeze. I find that all other men in a normal state are affected in the same manner. I conclude that to be capable of being thus affected is an attribute of human nature, and that the objects which thus affect me are, like myself, positive realities. I cannot, then, escape the conviction that I am a conscious existence, numerically distinct from every other created being, and that I am surrounded by natural objects possessed of the qualities which I recognize. I know that the world around me is something absolutely distinct from the being whom I call myself. I am conscious that there is *a me*, an *ego*. I perceive that there is a *not me*, a *non ego*. I observe that all men have the same convictions, and that in all their conversation and reasonings they take these things for granted. 2nd. I however observe that my power of cognizing the existence and qualities of the objects around me is limited. There are but five classes of external qualities which I am able to discover, these are odors, tastes, sounds, tactual and visible qualities. For the special purpose of cognizing each of these qualities, I find myself endowed with a particular organization,

which is called a sense. These are the senses of smell, taste, hearing, touch and sight. Each sense is limited to its own department of knowledge and has no connection with any other.—3rd. When our senses are brought into relation to their appropriate objects, under normal conditions, a state of mind is created which we call hearing. So, if I open my eyes upon the external world, a state of mind is produced which we call seeing. This mental state is of two kinds. It is sometimes nothing more than a mere knowledge, as when my sense of smelling is excited by the perfume of a rose. At other times it goes further than *this, and we not only have a knowledge of a new* consciousness, but also the belief that there exists some external object by which this knowledge is produced. In the one case it is called a sensation, and in the other a perception. The external conditions on which these changes depend are as numerous as the senses themselves. Each sense has probably its own media, or conditions, through which alone its impressions are received. We see by means of the medium of light. We hear by means of the vibrations of air. None of these media can be used *interchangeably*. Each medium is appropriated to its peculiar organ. 4th. Physiologists have enabled us to trace with considerable accuracy several steps of the process by which the intercourse between the spiritual intellect and the natural world is maintained; by which impressions on our natural organization result in knowledge, and the volitions of the soul manifest themselves in action. A brief reference to our organization in this respect is here indispensable. The nervous system in general is that part of our physical organization, by which the mind holds intercourse with the external world, and through which it obtains the elements of knowledge. The nervous system is, however, of a twofold character. A part of it is employed in giving energy to those processes by which life is sustained, and the other is intimately connected with the thinking principle. The former we now dismiss from our consideration and proceed to say a few words on the latter. The organism which we use for this purpose consists of the brain and nerves. *The part of the brain specially concerned in thought is the upper portion called the cerebrum.* From the brain proceed two classes of nerves, which have been appropriately termed afferent and efferent. The afferent nerves connect the various organs of sense with the brain, and thus convey to it impressions from without. When an image from an external object is formed on the retina of the eye, a change is produced along the course of the optic nerve, which terminates in the brain, and the result is a change in the state of the mind which we call seeing. The other, or the efferent class of nerves, proceed from the brain outwardly and terminate in the muscles. By these the volitions of the mind are conveyed to our natural organs, and the will of the mind is accomplished in action. The process just now mentioned is here reversed. The volition of the mind acts upon the brain, the change is communicated through the nerves to the muscles, and terminates in external action. Thus the brain is the physical centre to which all impressions *producing knowledge tend, and from which all* volitions tending to action proceed. The proof of these truths is very simple. If the connection between the organ of sense and the brain be interrupted by cutting, tying or injuring the nerve, perception immediately ceases. If, in the same manner, the connection between the brain and the voluntary muscles be interrupted, the limbs do not obey the will. Sometimes, by disease, the nerves of feeling alone are paralyzed, and then, while the power of voluntary motion remains, the patient loses entirely the sense of touch and will burn or scald himself without consciousness of injury. At other times, while the nerves of sensation are unaffected, the nerves of volition are paralyzed. In this case, feeling and the other senses are unimpaired, but the patient loses the power of locomotion. Sometimes an effect of this kind is produced by the mere pressure upon a nerve. These remarks respecting the nerves apply with somewhat increased emphasis to the brain. If by injury to the skull the brain becomes compressed, all intelligent connection between us and the external world ceases.—So long as the cause remains unremoved, the patient in such a *case continues in a state of entire unconsciousness.* The powers of volition and sensation are suspended. If the brain becomes inflamed, all mental action becomes intensely painful, the perceptions are false or exaggerated, and the volitions assume the violence of frenzy."

Such is an abridged view of the perceptive faculties in general—such is a brief statement of the facts involved in our intercourse with an external world. We know, for example, that in order to the existence of perception some change must be produced in the organ of sense; that this change must be transmitted by the nerves to the brain, and that the brain must be in a normal state in order to be affected by the change communicated; and that the result is a knowledge or an affection of the mind. But as to the mode by which this knowledge is conveyed to the immaterial part of our being, we are utterly at a loss to divine. I am satisfied that the lighting of effluvia on my olefactory nerves is in no respect like the state of my mind, which I call the sensation of smell, but as to the manner in which one event becomes the cause of the other, how any change in matter can produce thought or knowledge, is, and in all probability will continue to be, a profound secret. The various attempts made to explain it, the doctrine of representative images among the rest, now happily exploded, have but landed their advocates in universal scepticism, or furnished a foundation for consistent atheism. Surely it were better, vastly better, at once to acknowledge our ignorance, and, as finite creatures, implicitly bow to the determinations and arrangements of Infinite Wisdom.

But, though we do not pretend to explain the mode of the intercourse carried on between the world without and the world within, the facts themselves are abundantly plain, and amply sufficient for our purpose as educationists. If it is through the five senses that the conceptive faculty is awakened, that is, that those impressions made by external objects return to the mind in the absence of the objects and at long intervals after their removal—if it is through the medium of our perceptive faculties that we are brought into mysterious communion with external nature, and obtain our knowledge of God as manifested in his works, then it is clear that too much importance cannot be attached to these senses, or too much industry displayed in their improvement and cultivation. This conceptive faculty, however little it may have been considered in our educational schemes, is nevertheless conspicuously predominant during the first years of life. Whenever, for instance, any familiar object or person is recognized after an interval by a child; as when a brother, or sister, or nurse, after an absence, is greeted by a smile of familiarity and the arms are extended, it is manifest that he connects the now present object—not with the same object before seen,—but with that image of it which has been conserved by the mind. So soon, therefore, as an infant is observed to recognize any thing or person, and of which recognition it gives indubitable signs, *so soon may* we be sure that the conceptive

faculty has come into operation, and this happens certainly in the third year, and often earlier. Or, if we go on to the time when the notion of property has first got a lodgment in the mind, we may meet with a pertinent instance of the vivacity of the conceptive power, when the little stickler for its rights finds its own horse or doll in its brother's or sister's hand, and then running to find brother's or sister's horse or doll, eagerly discusses the question of *meum* and *tuum*, and notwithstanding the close resemblance of the two subjects of debate, fixes its grasp upon the genuine and real *meum*. That is to say, this same lisping asserter of its rights, has retained in its brain a picture of its plaything so exact and particular that it serves it at any time as a *tally* by which it may recover the archetype. Again, take the instance of a child of three years old, and let it be one of only ordinary intelligence. Accustomed only to the objects of an inland and rural home, he accompanied his mamma, let us suppose, a year ago, to a watering place. Then at different times, during the intervening months, the striking objects of that new world have been recalled to his recollection in vivid language; and now, if he be questioned concerning those objects, and many others therewith associated, although the questions are varied as much as we please in phraseology, and although new points of view are taken, he will convince his catechist that there is present to his mind's eye a not indistinct set of pictures of the sea in its changing aspects—of the baths—of the buildings—of the equipages—of the downs. Or, let him be shown unexpectedly, a view of the pavilion, or of the chain pier, and his instantaneous recognition of them will make it unquestionable that the things seen so long ago exist still by their images in his mind.

But we need not hold on in this strain. This *conceptive* is the first purely mental power of which we are conscious, and it is evidently fed and sustained by the *perceptive*. And how can the instrumentality of parents and teachers be brought to bear with the greatest effect on the expansion and development of this power of the mind, how but by presenting to the various senses their appropriate food, and thus strengthening them by exercise. The cultivation of the various senses we shall take up in our next.

MORAL EDUCATION—WHAT IS IT? HOW GREAT ITS IMPORTANCE!

It is much to be feared that many use these words, and write and speak on the subject of Moral Education, who neither understand what they say, nor whereof they affirm. The term moral, like a great many others in the English language, is susceptible of no small diversity of meaning, and in this have not a few sheltered themselves, contending most earnestly for moral education, whilst they are all the while attaching their own acceptation to the words. We all know what is generally understood by a man of good moral character,—that it just means a person of sobriety, of justice, of correct and honourable dealing with his fellow-creatures, without the least allusion to the motives by which he is animated, or to the end he has in view in the conduct he is pursuing; or, if these are referred to, it is but too manifest that they are purely of a selfish, or secular, or worldly character. In the same sense is the term moral employed by not a few in connection with education. They are vehement in their support of moral education, but it is plain that all they mean by it is that the children be encouraged to speak the truth, or be punished for telling lies, because, in the one case, it is manly and creditable, and, in the other, cowardly and discreditable. Others, again, go a step farther on the matter of moral education. They insist upon the daily reading of the Sacred Scriptures in school, but not a word of comment by way of explanation or enforcement is to be offered, though in every other department or branch of study, not a sentence is passed over without every effort being made to bring it down to the level of the meanest intellect. Not an attempt is to be made in the daily intercourse between teacher and taught, or between the scholars themselves, to reduce the precepts of the Bible to practice, either in the stimulating to duty or in the deterring from crime. Should any child be detected in telling a glaring falsehood, not an allusion can be made to the awful judgment inflicted on Ananias and Sapphira, even though that thrilling narrative formed part of the chapter read in the morning. Such a course we regard as little else than a mockery of the Sacred Scriptures. It is like the soldier who equips himself with his furbished arms for the battle, and, after he has faced the enemy, refuses to use them. At all events, if it can be said that such children receive moral instruction in school, it surely never can be said that they receive moral education.

We take the word moral in its highest and most important sense, as referring to all those duties which spring from our relationship to God and to one another, and as discharging these duties out of love to our Creator and Saviour-God. When applied to education it just means the drawing out, the developing and strengthening by exercise of our moral sense, and this is done by bowing to its authority and complying with its requirements. That all have a conscience possessed of certain characteristics or properties, just as all have an intellect possessed of certain powers or faculties, and that this conscience is susceptible of immense improvement, of an ever increasing sensibility, are truths questioned by none. But this vicegerent of Divinity, as the Moral Governor of the Universe, this umpire of right and wrong in every one's breast, *does not constitute an infallible directory to our moral nature.* Like every other part of our being, it has shared in that dread and desolating catastrophe which has befallen the species, and neither its own efforts nor the auxiliaries of nature or Providence can restore it to its pristine authority and dignity. It needs illumination, it needs unerring direction, and none but the Lord of the conscience is capable of imparting either the one or the other; and this he has actually done in his own oracles; hence designated the only infallible standard of faith and morals. *That these sacred oracles may serve the end intended* they must be used in school—not read merely—but used by reducing their precepts to practice in the intercourse maintained between teacher and taught, and between the taught themselves, by constituting them the first and the last standard of appeal in all matters appertaining to the organization and government of the whole school establishment, as well as by plying the scholars with their motives to diligence and good conduct. By such appliances, continuously and perseveringly employed, the conscience of the young will be drawn out, enlarged and rendered increasingly sensitive. And this is what we consider moral education. We have no sympathy with those who seem to imagine that all that is necessary is the mere reading of the Sacred Scriptures in school without note or comment, or the slightest allusion to its truths or precepts. Better, infinitely better, that there be even this recognition of the Divine Word than none at all:—it is but a rightful act of homage to Him who is the supreme Lord of the conscience, and to whom both

teachers and taught are alike amenable. But we fear that many entertain the most unwarrantable expectations as to the benefits likely to flow from such a use of the Sacred Record. At all events, it is not moral education, it is not training up the child in the way he should go. Neither have we any sympathy with those who seem to think that it were better to allow the young to remain uneducated altogether than to give a merely secular education, or such an education as consists only in the cultivation of the intellect. Now, whilst we hold such an education as meagre in the extreme, as completely unsuited to the physical, intellectual and moral constitution of the young, and as curtailing most materially the intellectual education itself, yet we would much rather have even this education than none at all We would take it as an instalment and press forward for an education adequate to the necessities of the case, adapted to the nature of the recipients, and that if it were for no higher object than the expansion of the intellect itself. The culminating point of all education is that which is moral, such a moral education as we have briefly delineated, and this simply because the conscience or the moral part of our nature as far transcends the intellectual as the intellectual the physical—is that which most closely assimilates us to the divine nature, and by a participation of which we can alone taste of his blessedness. It is that which regulates and directs and controls the physical and intellectual, and which can alone render them truly beneficial. It is that which connects the present and the future in man's destiny, conjoins, blends and interweaves his temporal and eternal interests.

II.—PRACTICE OF EDUCATION.

HOW TO TEACH SPELLING.

There is no department of Orthography of such importance as Spelling. Grammatical blunders are bad enough, but mistakes in spelling are altogether intolerable; and he who makes them has no title to consider himself an educated person, and certainly ought never to pretend to teach others. And, this being the case, it becomes an interesting and important question to both teachers and scholars, how good spelling may be most speedily and thoroughly secured. We need scarcely describe the way in which this branch has been generally taught in bygone times, and still practised to a large extent in this and other countries. If the more difficult or anomalous words are selected and placed in the forefront of the lesson, the scholars are required to commit them to memory, and, if they are not so, the scholars are required to get the spelling of a paragraph or a certain portion of the lesson that has been recited. When the scholars are a little more advanced, they are put into regular Spelling-books, such as Mavor's, or Murray's, or Carpenter's, or some other of a similar description. These Spelling-Books are just a catalogue of words taken from some authorized Lexicon of the English Language, arranged consecutively according to the number of syllables, with a synonymous word or two appended. These spellings, with their explanatory words, are regularly committed to memory either in the school or out of it. They are generally part of the lessons to be prepared out of school, and are regarded with something like loathing by the great majority of children.

In many schools this way of acquiring a knowledge of the spelling of the English Language is exploded; and in others it is fast on the wane. And it is high time that it should be so; and simply because it does not serve the end; it never of itself will, or can make, good spellers. First, it leaves us unacquainted with the short monosyllabic and yet oftentimes anomalous words of the language. Accordingly, it will be found that those who are taught spelling after this fashion are generally most deficient not in the long, but short common words. Again, another objection that we have to this mode, is that it makes the learner depend almost, if not altogether, upon one of his senses, —the ear. And lastly, it is a purely mechanical process, for, though we may obtain something like an idea of the meaning of the words, there is no thought generated; there is no collocation of the words in a sentence, and by consequence no idea communicated. In room of this method, so irksome to the scholars, and so unfitted to awake mind, or rather, we should say, so admirably calculated to extinguish every other mental effort but the memory of words, many intelligent teachers now require the scholars to learn the spelling of the words of the whole or a part of the lesson of the day—the small as well as the big words. There is a great diversity of way in which this exercise may be recited or gone through. The teacher having given out a clause, and not less should at any time be given, the scholars may be required to spell letter about, or syllable about, or word about, or clause about. The greater the diversity in the recitation, the more attention will be aroused and the more interest will be awakened, independent altogether of the thorough familiarity it will give the children with all the small or monosyllabic words—a matter of the greatest moment, inasmuch as many of the long anomalous words in the language are made up of these. But, though this is a great improvement on the old fashioned system, there is another which we must notice, and to which we attach still greater importance. We have often called attention to the fact, that as we are sensible beings a far deeper and more vivid impression of any subject is made on the mind, especially of children, when we address them through the medium of two or three of the senses than through the medium of one. In the above sketched plan the sense of hearing is all that is brought into requisition. There is another of the senses that ought to be rendered available, and that is perhaps the most valuable in the process, we mean the sense of sight. And this is effected by dictation, that is, the teacher reads out the words or the sentences, and as soon as they are able the scholars write them down, either upon the slate or on the paper, with pen and ink. The only objection to this method is the length of time it takes. But this is more than compensated by the value of the results, seeing that this is not only an exercise in orthography, but in penmanship, composition, &c. Besides, there are several ways by which the exercise can be vastly accelerated. The teacher, for example, may correct one of the slates and require each of the scholars to do the same to his neighbour's; and, after this is finished, read one aloud, or the teacher may require one pupil to spell every word, with accentuation, &c., and allow the rest of the class to make the corrections.—There is, in fact, no end to the diversity of way in which this exercise may be gone through, all fitted to save time and to benefit those engaged.

And now it may be asked, Is there no use of catalogues of words at all, or of a text-book in spelling:—yes, unquestionably there is, and what ought to be the nature of such a text-book? It should contain either in columns or in sentences

formed for *dictation*, not the words in the language in reference to which no one experiences any difficulty, but all the words in the language liable so be misspelled,—such as:

1 Words similarly pronounced, but differently spelled.

2 Words similarly spelled, but differently pronounced and applied.

3 Words spelled and pronounced alike, but differing in signification.

4. Words liable to be misspelled either from the silence or unusual sound of one or more letters.

5. All words of unsettled orthography.

These words or sentences in which they occur, should be dictated to the pupils, who should either spell, or, if they are competent, write down the entire sentence on their slates. The latter mode is preferable, as it is only by *writing* that a practical and perfect knowledge can be attained.

There is a large list of such anomalous words in every language, and especially in the English, and there is no way of obtaining a thorough knowledge of their orthography but by committing the same accurately to memory, availing ourselves of all the aid we can derive from our senses. In order to give the children some interest in such a dry, unintellectual exercise as the mere spelling of these difficult, or peculiar, or anomalous words, every eighth, tenth or twelfth word that the children are asked to spell may be fixed upon and very shortly analyzed by familiar illustrations as outlines of a training lesson. The few words thus pictured out would not merely interest the children at the time, but give their mind the habit of analyzing all they read or spell.

Of all the Spelling-Books we have examined there is none that places the whole subject on such a philosophical basis as "The Spelling-book Superseded" by Dr. Sullivan, one of the series of the Irish National School Books, and which has already passed through some thirty or forty large editions. This Spelling Book, however, should not be placed in the hands of the scholars till they are about eight or nine years of age, that is, till they can spell the common words of the language with considerable fluency and correctness, which in ordinary circumstances they will be able to do about the time indicated, provided they have commenced the spelling, as they ought to do, contemporaneously with their pronunciation of monosyllabic words.

MENTAL ARITHMETIC—EARLIEST STAGES.

In our introductory remarks on this subject, in a former number, it was premised that Mental Arithmetic should be commenced and carried on for some time solely by means of objects presented to the eye. If this branch of education is to be commenced with the youngest pupils, it should be taught in a manner suited to their infant capacities. With children of five or six years of age, it is useless to deal in abstract numbers; for in their minds abstraction and the other higher powers of the intellect are yet undeveloped: whilst the perceptive faculties exist in all their vigor, and are remarkably acute. By means of these then, at this early age, education in all branches of knowledge must be carried on—arithmetic amongst the rest. As we stated before, it is immaterial what the objects are, so long as they are placed before the eyes of the children. The teacher may take up from his desk a number of books, one by one, two by two, &c.; requiring his pupils to give the number held in his hand after each addition to it. He may then take away some of the books, in the same manner requiring them to tell how many still remain. And in this way, addition and subtraction being combined, the first ideas of the science may be imparted.

The teacher who gives this method a trial, and finds it to work admirably for some weeks, may think, after his pupils can readily perform the required operations upon the different objects within his reach, that he may then proceed to abstract numbers. But let him stop and consider. Why did he make use of objects at all? Was it not in order that his teaching might be adapted to the faculties of the child? And have these faculties so soon changed? No, though the system he has adopted is *the* one for drawing out and strengthening all the mental powers, it cannot impart to the child of six, the intellect of the youth of ten or twelve. The mental constitution of the child is materially the same, and consequently visible objects must still be used. "But," says he, "my pupils are already so far advanced that it is impossible to carry them farther by means of such objects as I can present them with. They should now go on to add hundreds and thousands, and to become acquainted with multiplication and division. If you will tell me any way in which I can arrange my objects so as to accomplish this, I will still use them, but if not I must proceed without them: for certainly you would not have my pupils remain where they are, for three or four years, till their faculties are more fully developed?" "Certainly not. This *arrangement* of your objects is just what you want. Make for yourself a wooden frame, twelve or fifteen inches square. Parallel with the sides fix eleven wires, ten at equal distances, the eleventh double the distance of the others. On each wire place ten beads, half of one colour and half of another—say red and blue—arranged as follows: three red, two blue, two red, three blue. Thus you will have one hundred beads on ten wires to represent units, and ten on the eleventh to represent hundreds; and so arranged, by twos, threes, fives, and tens, that any number not exceeding one thousand can be read of as readily as by the use of cyphers."

The instrument described, it will be perceived, is the Arithmeticon or Numeral Frame, without which no one should attempt to teach young children. The very first lesson may be given with it if preferred. But we would recommend the use of other familiar objects in the earliest stages; and afterwards, interspersed with the lessons on the Arithmeticon, objects should be daily used. Holding the Arithmeticon before the class, pass two beads and two beads, and the children will see that they make four; remove two, and two will remain. Pass three beads and four beads, and they will at once see that they make seven; remove two, and five will remain. Thus practise the class a few minutes every day, always carrying on addition and subtraction simultaneously. Multiplication and division should also be taught together. Thus, taking six beads, ask how many twos they contain; and if one of the class separate them on the wires into twos, all will see that there are three twos in six, and that three times two are six. Placing nine beads together, request one of the class to separate them into divisions of three each; it will at once be perceived that nine contains three threes, and that three threes are nine. In this way, by the aid of this instrument, the fundamental processes of addition, subtraction, multiplication and division may be speedily mastered.

Thus far the actual object has been before the children. The next stage is to use objects with which they are familiar, but not presented to the eye. For example, such questions as these may be given. Two houses and three barns—how many buildings?

Six stoves and four tables—how many? Three cows and four oxen—how many horns? Five horses and two geese—how many feet? Six chairs, four tables and three sofas—how many? Seven marbles, four jack tones and three pencils—how many? Eight boys, three dogs and four sheep—how many feet?—how many eyes? —how many heads? And introducing fractions, such questions as the following may be given,—the children *having previously been made acquainted with the terms half, third, fourth, &c.* If Emily has two apples, and she divides one into two equal parts, and gives Jane one of these parts; how many apples will she have left? Mary had four apples; she divided one of them into four equal parts, gave two whole ones to her mamma and one to her little sister, and ate one of the pieces; how many had she left? In such questions, though the objects are not in the room at all, they are nevertheless present to the minds of the children It is a step in advance. They who hitherto required the actual substance before them, have made such advances that they can dispense with these, and perform their operations upon objects the images of which exist in their minds. As these are unfolded, they are enabled to depend less on externalities, and rely more upon their internal capabilities. And soon perceiving that the mental operation is the same whatever the objects are, they will begin to generalize, and reckon without having any particular objects in view.—Thus we have them prepared for abstract numbers. But let the teacher beware lest he depend too much upon the newly awakened power of abstraction. Let him still make use of objects, visible and mental, during a part of each lesson. Let the numeral frame remain near his desk, and be brought into requisition every day. We are now prepared for abstract numbers, which will be taken up in our next.

III.—OFFICIAL NOTICES.

Clerks of School Boards.—This is the 15th of the month of January and there are still a dozen of the Returns of the Boards of School Commissioners awanting. In the last two numbers of the *Journal* Dr. Forrester urged the necessity of these Returns being forwarded as early as possible in December, and yet matters this year are in a worse condition than ever. The punctuality of more than the half of the Clerks does not mend matters, inasmuch as a general analyses cannot be made till the whole of the Returns are received. The money is payable on the 1st of November, the Boards of Commissioners generally meet on the first or second week of that month; and how the Returns cannot be forwarded by the end of November or beginning of December we are at a loss to comprehend.

Dr. Forrester begs to intimate, that Trustees and others, wishing to obtain Normal Trained Teachers at the end of the present term, must make application to him, stating all the particulars about the school, not later than the beginning of next month.

IV.—EDUCATIONAL INTELLIGENCE.

COLONIAL.

NOVA SCOTIA.

Reports of the Examinations of several Schools previous to the Christmas Holidays have appeared in the newspapers, viz., High School in Dalhousie College, Free Church Academy, National School, Miss B. Tupper's School, Pictou Academy, Wolfville Academy, &c., at all which the scholars are stated to have made a very creditable appearance.

Visit to River John.—On the 17th of last month the Superintendent of Education paid an educational visit to this thriving village, and held a public meeting in the evening, which, considering the inclemency of the weather, was numerously attended. The inhabitants of this pretty village seem all alive to the importance of having one general school for all the scholars of the district, with two, and, if possible, in course of time three teachers, with all the children classified according to their age and attainment, and all carrying on their operations in accordance with one general system, the younger departments feeding the more advanced, until they reach the highest branches in Classics and Mathematics. They have already obtained a beautiful and commodious site for school-rooms—and sufficient space for playground. The school-house is also already roofed and shingled, and it is earnestly hoped that a determined and persevering effort will be made to have it ready for the commencement of operations about the beginning of May next. The Ladies of the place, by whose efforts the building has been mainly brought into its present state of forwardness have only to resolve that it shall be finished at that time and go on in faith. Were all the villages or settlements in the Province that can command 150 or 200 children capable of attending school within a distance of two miles from the centre, to act out this principle, it would do more for the furtherance of education in the Province than the most admirably concocted Legislative enactment. It would be seen in one year to be vastly the most efficient and the cheapest.

Musquodoboit.—We have great pleasure in inserting the following brief account of the past history of education in this settlement from the pen of our esteemed correspondent, and hope that he will as soon as convenient furnish us with a statement of the present condition of education along the Eastern Shore:—

Musquodoboit, Dec. 24, 1858.

To the Rev. Dr Forrester.

Dear Sir.—Your short reference to the state of education in Musquodoboit in the *Journal* might be enlarged and given more fully. When I arrived in Musquodoboit they had two school-houses—miserable log huts, a discredit to a civilized people. The teachers for acquirements and attainments were not unequally yoked to the buildings. The great object of the parents was to get cheap teaching, and a pepper corn salary; but they have since discovered that no article can be cheap unless it is good and useful. We have now ten school-houses on the river, substantial buildings and most of them well furnished with books and maps. The late John McDonald gave the first impulse to education in Musquodoboit. He wrote a good hand, was a superior reader, and his scholars got the highest praises from the Rev. Dr Willis for their ready answers to Scripture questions.

When Mr. Souter came to the principal school in Upper Musquodoboit it had one English Reader and a half, and he left it with twenty-two. When the Rev. James Watson came here he was surprised to find some of Mr. Souter's scholars reading Sallust and Virgil.

The Rev. James Watson, the Rev. John McKinnon, the Rev. James Murray and Mr. Laird were all men of learning and acquired valuable laurels for their diligence and success Taking all in all few could surpass Mr. Russell in all the useful branches. Of late years I have paid little or no attention to the cause of education in Musquodoboit and cannot give a correct report. I hear the cause of education here has taken a lull. Several of the schools are vacant and others have been supplied with female teachers from the Normal School. They have lately commenced their labours, and have not yet had a fair trial, but I hope they will thread their way to honourable distinction, and some of them may in time reach the temple of fame. But, though dark shadows pass over the horizon, a brighter day will soon dawn, when ignorance will fly away like the spectre of night before the dawn of the morning. The tree of knowledge has strong roots in Musquodoboit, and it will spread its boughs and branches over a sharp and intelligent community. The schools of Musquodoboit will bear a favourable comparison with other settlements. I would like them still better if

they paid more attention to the Catechism and the Bible, for if education is confined to this life it has nothing of a purifying character. The tree of knowledge is not good for food unless sheltered with the tree of life. Balaam and Ahitophel were great characters, but sadly defective in moral acquirements. The devil is the most brilliant and intelligent character out of heaven, and Milton has drawn him with some good qualities, yet his character has not improved since the creation of the world.

I am, yours sincerely,
JOHN SCROTT.

NEW BRUNSWICK.

Parish School Advocate.—This spirited periodical has now been in existence for about a year, and has proved of good service to the cause of education. The selections are admirable, and the original matter argues a thorough knowledge of the present condition and relations of these Lower Provinces. Mr. Munro, the enlightened Editor, is the author of several books, which do credit both to his talent and industry. Amongst the rest is a volume on the Industrial Resources of New Brunswick, which contains a large amount of well-digested information.

Training and Model Schools.—It affords us great pleasure to learn that these Schools, for the benefit of the future teachers of this fine Province, are upon the eve of commencing. Mr. Mills and Mr. Glendinning have been selected as the Teachers, the former for the Training and the latter for the Model School department. If the system does *very* much, and the teacher *much*, for the cause of education, no one can fail to perceive the vast importance of the success of this undertaking. For ensuring this, two things are requisite—a thorough staff of teachers all enthusiastically engaged in carrying out theoretically and practically the self-same system, and the attendance of at least ten months on the part of the Pupil-Teachers.

CANADA.

The Normal School for Upper Canada.

The summer half-yearly Session of the Normal School closed on the 15th ult. The number of candidates who *applied* for admission was 196 (a large increase on any previous Session)—103 males, and 93 females. The number of candidates admitted were 95 males, and 91 females—total, 185. Of these, about 100 had been teachers before applying for admission to the Normal School. A considerable number left during the Session, from a variety of causes. The numbers present at the final examination were 70 males and 79 females—total, 149. The Council of Public Instruction appointed Examiners in connexion with the Masters of the Normal School. The examinations were on paper from printed questions—including in all upwards of 1500 examination papers. The number of Provincial certificates awarded is as follows:—

	Male Teachers.	Female Teachers.	Total.
First class,	14	11	25
Second class,	40	42	82
Whole number of Provincial certificates granted,			107

No third class certificates are now issued, and some of the second class are only granted for a limited period.

After mature consideration, the Council of Public Instruction has determined upon the following changes in the Normal School. 1. To raise the standard of qualifications for admission to the Normal School, so that teachers of higher qualifications may be trained and sent forth to meet the demands made for teachers. 2. The half-yearly Sessions, instead of commencing, as heretofore, on the 15th of May and the 15th of November, and closing the 15th of April and the 15th of October, are to commence on the 8th of January and the 8th of August, and close the 22nd of June and the 22nd of December. The close of the half-yearly Sessions of the Normal School will thus correspond with the periods at which it has now become customary in many parts of the Province to engage Teachers—namely, at the beginning of each half of the civil year,—and also with the periods of the half yearly returns and payments of the School Fund to the Common Schools.

The next Session of the Normal School will therefore not commence until the 8th of next January, instead of on the 15th inst.—*Educational Journal, U. C.*

BRITAIN AND IRELAND.

A very able paper appears in the November number of the North British Review from the pen of one with whose compositions we are already well acquainted, and who understands better perhaps than any one living the whole exterior and interior of the present condition of education in Britain and Ireland. We intend to give an epitome of the whole article in our next. In the mean time it may be stated, that whilst the author would throw no impediment in the way of denominational effort, he at the same time valiantly contends for a national system of education as the only way of meeting the exigencies of the case. He shows that, notwithstanding all the good effected through the parochial system of Scotland, it does not possess the power of extension, and is thereby utterly inadequate for the elevation of the immense masses in the community ripening for the Jails, Penitentiaries and Reformatories of the land, and thus multiplying at a very rapid ratio the increase of the taxation. Passing from Scotland to Ireland, he unhesitatingly pronounces, by an array of incontrovertible facts, the present national system, after having been in the crucible for a quarter of a century, as a complete failure, proclaimed to be so by Lord Derby himself, the originator of the system, and that mainly because it excludes the Word of God from the schools, its principle being a combined literary education with a separate religious instruction,—this separate religious instruction having been but in a very few instances administered. In proposing a newly modelled national system for these countries he insists, first of all, that all enactments excluding the Word of God from the public schools should be repealed; and, with the view of obviating the various difficulties connected with the religious element, that legislation should deal, not with the education in the school, but with the local managers or Boards out of it; that such a constitution be given to the Local Boards as will be a guarantee, that the best instruction secular and religious will be imparted; that they be constituted on the tacit recognition of the threefold responsibility of the parent, the Church and the State. These, with certain modifications, are the views given forth by Sir James Kaye Shuttleworth, Secretary to the Lords of the Privy Council, in his admirable treatise on Public Education. But this writer goes far above and beyond all this, and insists on compulsory education. "All experience," he says, "attests, that to raise the sunken, or to arrest the sinking, something more direct and stringent is needed,—in short, that compulsory education is now a national necessity."

ENGLAND.

LORD JOHN RUSSELL'S REMARKS ON EDUCATION AT THE NATIONAL ASSOCIATION FOR THE PROMOTION OF SOCIAL SCIENCE.

I pass to the subject of Education. I will not waste your time in examining and refuting the objections which have been made to the general education of the people. It may suffice for me to say that it is education which enables the Scotch labourer's son to compete with the most favoured of his contemporaries, to rise to the highest posts of dignity and power, and to scale the loftiest eminences of science. It is education which enables the United States of America to proceed in their wonderful career, upheld by the most popular institutions, without serious disturbance of law and order. It is education which in England has mainly prevented such tumults as forty years ago broke the peace and alarmed the minds of this country; it is education which has bound the mass of the people to the Throne by the links of an enlightened loyalty. Popular or national education has been a matter of warm contention among sects and parties till the present year. Sir J. Pakington, who presided in the Department of Education last year, and who deserves the highest credit for his labours on this subject, proposed in the late session of Parliament, with the concurrence of the best friends of the cause, that an address should be presented to the Queen in favour of the appointment of a Royal Commission to inquire into the present state of the education of all classes in England and Wales. The late Government acceded to this proposal, and the present has named commissioners of high reputation and weight in the country, of whom the Duke of Newcastle is president. From this Commission

we look for a fair and impartial display of facts, upon the bearing of which Parliament and the nation can decide. Opinion is still in the grizzle upon the subject. For my own part, I confess that, anxious as I am for the progress of education, I am quite willing to renounce any desire to establish in this country the system of France, Austria, or Prussia. The freedom of choice in our modes of popular instruction, the noble fountains of literature, sacred and secular, *which are open to the youth thirsting for knowledge*, the power to range over the writings of Bacon and Shakespeare, and Milton and Addison, seem to me to make our national education, imperfect and incomplete, as it is still far superior to those continental models. I must not omit to mention the great efforts which have recently been made to improve the education of the middle classes.

THE COMMISSION OF INQUIRY INTO THE STATE OF POPULAR EDUCATION.—The Royal Commissioners lately appointed to inquire into the state of popular education in England, are expected "to consider and report what measures, if any, are required for the extension of sound and cheap elementary instruction to all classes of the people." The Commissioners have selected as specimens of the country at large, ten districts, two metropolitan, two agricultural, two manufacturing, and two mining—one of which has been allotted to each Assistant-Commissioner. The inquiries of the Assistant-Commissioners will fall into two principal divisions. 1stly, Statistics; and 2ndly, the condition, methods, and results of education. *The second division of the subjects of inquiry includes* such as may be classified under the following heads:—1. The supply and demand of education; 2. The mode of education; 3. The subject-matter of education; 4. The results of education. The Commissioners wish to ascertain, exclusively as a question of fact, what are in practice the difference between the course of religious instruction afforded by different religious denominations; what (if any) are the recognised formularies adopted by them, and how far those formularies are taught in such a manner that the pupils have such perception of their meaning as children of an early age and average intelligence may be expected to acquire. In connection with this subject the Assistant-Commissioners will inquire whether or not it is *frequently* the case that parents of one religious persuasion send their children to schools in connection with other persuasions; and, if so, upon what terms as to special provision for their religious instruction or attendance on religious worship, and whether in practice such terms are enforced.

NATIONAL SYSTEMS.

CONTINENT OF EUROPE.

The progress that has been made throughout the Continent of Europe in the establishment of national systems of education, since the commencement of the present century, is truly astonishing. We say nothing now respecting the character of these system—this we shall afterwards notice. It is a fact, that there can scarcely be said to be one country where there does not exist some external public system of education. In Russia, for example, there are not less than 1,200,000 of the youthful population under instruction, and about 600,000 mainly supported by the Government—a much larger *number than is usually conceded*. Here follows a list of the countries where public systems exist.—1st, Germany; 2nd, Prussia; 3rd, Saxony; 4th, Baden; 5th, Netherlands; 6th, Hesse Cassel and Nassau; 7th, Bavaria; 8th, Austria; 9th, Switzerland; 10th, France; 11th, Belgium; 12th, Scotland; 13th, Denmark; 14th, Sweden; 15th, Norway; 16th, Russia; 17th, Greece; 18th, Italy, in Lombardy and Venice, Sardinia, Tuscany, Rome, Naples; 19th, Spain; 20th, Portugal. The oldest of all these in present form was the one established in Germany in 1559, under the auspices of Luther and Melancthon; and, perhaps, the most complete of all purely national systems of education, both in its external and internal arrangements, is the Prussian. The *compulsory* law, as it is called, or that law which compels parents to send their children to school within a certain age, secures the regular attendance of the pupils, and this enables the educational authorities to prescribe by law a thoroughly consecutive course of study. In our next we hope to be able to present our readers with an outline of the Prussian system of education.

CONTINENT OF AMERICA.

REPORT OF THE SCHOOL COMMITTEE OF THE CITY OF BOSTON FOR THE PAST YEAR.

The various School Committees are required by law to make a thorough examination of their respective Schools, during the month of July, and give in their reports in August. These reports are referred to a special committee of the Board, who make such selections as they deem expedient and publish a general report. It is this report that is now before us, and from it we make the following extracts.

The *system of public instruction* in the city of Boston comprises three grades of schools,—the Primary, the Grammar and the High Schools.

Primary.—These were first instituted in 1818, and now number 211. The average number of pupils in these schools, for the five months ending with the 31st of January last, was, boys, 6,731; girls, 6,002; total, 12,733; giving to each school an average of about 60 pupils.

The total average attendance for the same period, was 10,221, or a little more than 80 per cent. of the average whole number. This gives to each school an average attendance of *a little less than 50 pupils*. The whole number of teachers is 211. The annual amount of the salaries paid to these teachers is $77,089.

The defects of these Primary Schools with the remedies proposed are thus described by Mr. Philbrick, the present Superintendent of Public Schools for the city of Boston:—

"I propose, therefore, to specify three defects, which are common, in a greater or less degree, to *all* these schools, and which seem to include and comprehend almost all those minor faults and imperfections which we often have occasion to observe and correct.

The *most important* of these defects is *the want of that kind of teaching which really educates*; which imparts a knowledge of things, as well as of the forms and sounds of words, and which duly develops the various faculties of the mind,—*training* the pupil to right *habits* of thought, of feeling, and of action. This kind of teaching is not at all rare in our Grammar Schools, especially in the upper classes; but it is a remarkable fact, that it is, so far as I am capable of judging, but very little practiced in our Primary Schools. In place of it, we have what is called "the rote system."—The memory is almost the only faculty regarded, and only *one element of that, viz: the memory of words*, while the memory of the understanding is seldom called into exercise.

In my visits, it was very uncommon to hear, in any of these schools, a single question or remark by the teacher which had any reference to the understanding of the children. In many cases, the reading was but little more than the mechanical pronunciation of an unknown tongue. There is a text book in daily use in all these schools, entitled "Spelling and Thinking Combined;" but in all the exercises in this book, I never saw the slightest evidence of any attempt at the combination indicated in the title.

Another general defect is the want of profitable employment for the children, especially in the lowest classes. Go into any of these schools at any time of day, and in nine cases out of ten, if not in forty-nine out of fifty, three-fourths of the pupils will be found without *profitable* employment.—Thus the time of these children is wasted, for precious months and years in succession. But this great waste of time is not the only evil arising from this defect. Many bad habits are formed. The strength of the teacher which should be expended in teaching, is necessarily taxed to a great extent by the incessant vigilance and care requisite to *keep these idlers out of mischief, and to secure some reasonable* degree of stillness.

The third and last defect which I shall mention, is *the want of a vigorous and efficient system of moral culture*. I need not speak of the importance of this element in every system of instruction for the young. No one will deny or doubt that it should be regarded as the very corner stone. I would not be understood to say that there is not at present any good, healthful moral influence exerted in our Primary

Schools; but I feel bound to say that the amount of moral culture and moral training bears no sort of proportion to what it ought to be.

Such are the three general and radical defects in our Primary Schools, to which I would respectfully, but earnestly, call the attention of this Board. To prevent misapprehension, I ought to state explicitly that there are a very few exceptional schools, in which these defects exist in a comparatively small degree.

Without attempting an exposition of the causes of these defects within the narrow compass of this Report, I must content myself with a brief statement of what, upon careful deliberation, appear to be the best remedies.

1. A classification of all these schools. The superiority of the classified schools is very evident. The theory is sound. No doubt there are objections to it, as there are to every possible arrangement, but they are believed to be out weighed by the advantages gained.

2. Let every school be supplied with a stationary chair, a single desk, and one of Holbrook's slates, for each pupil. The slate should constitute a part of the school apparatus, never to be taken from the school room. The desk should be constructed with a suitable aperture for the safe deposit of the slate. This is a necessary means for securing the right instruction and training of the pupils. These facilities will favor a proper physical development.

3. Let a Manual be prepared, under the direction of this Board, which shall set forth the objects to be aimed at, the principles to be observed, and the methods to be used in all the Primary Schools.

4. Provide the requisite facilities and encouragements for the teachers to perfect themselves in the difficult art of teaching and governing a primary school. This is by far the most important of the measures recommended; for, without it, the others, and all others that can be imagined, will avail comparatively little.

I regard it as a fixed fact, as certain as anything that can be known, that all our Primary Schools can be brought up to the requisite standard of excellence only by insisting upon it as a thing indispensable, that every teacher, either before or after entering the service, shall be properly trained and instructed in the art of keeping a primary school. The teacher makes the school; it is training that makes the teacher.

Grammar Schools.—There are eighteen Grammar Schools in Boston, and the city is divided into eighteen corresponding districts.

Of the eighteen Grammar Schools, six are for boys exclusively, six for girls exclusively, and at six both girls and boys attend, but in separate rooms, and under distinct corps of teachers. The cost or estimated value of all these eighteen Grammar school houses, or estates, amounts to $808,237.30. This property has actually cost the city over a million of dollars. In making provision for the Grammar Schools, in the erection of buildings, alterations, and the repairs made from time to time, the city has expended, since the adoption of the first charter, nearly twelve hundred thousand dollars. But, as in several instances the original structures were destroyed by fire, or demolished that new and better ones might be erected, and many of the repairs were rendered necessary by the constant use of the buildings, it would not be a fair mode of ascertaining what the schools cost for a single year,—1857, for instance,—to take the interest on the whole of this sum.

The interest on the cost or present estimated value of the Grammar School estates, as given above, is	$48,197 23
Adding to this the salaries of all the teachers,	131,522 88
The expense for repairs, fuel, &c., for 1857,	32,166 14
We have the cost of all the grammar schools for the year,	$212,186 25

The whole number of pupils at the Grammar Schools is 11,126. The average attendance is 10,111. The *highest* cost of education at any school, as deduced from the above statistics, is $23.90. The *lowest* is $14.75. As the salaries are mostly the same in all the schools, this difference in cost arises mainly from the difference in the expenses for repairs, fuel, and the value of school houses. The average cost in all the Grammar Schools is $18.16.

High Schools.—There are three schools of this grade in our system of Public Instruction, viz. the Public Latin School, which is intended to fit boys for college,—the English High School, which aims to give boys such thorough culture in all English branches, and in some modern languages, as shall fit them for the higher departments of mechanical, manufacturing and commercial business,—the Girls' High and Normal School, where it is proposed to train up assistant teachers for our Primary and Grammar Schools, and to give instruction in the French language and in all the higher departments of a good English education.

General Statement.—As a general statement, it is true of all three of the High Schools that their connection with the other grades of schools is not sufficiently intimate, nor do they have the proportionate number of pupils that ought to attend them.

The cost or estimated value of the High School estates, is	$80,336 58
The interest on this, chargeable to the schools, is	4,450 61
The expense for salaries, repairs, fuel, &c., is	25,791 83
Making the total cost of the High Schools,	30,242 47

The whole number of pupils at the three schools is 526. The average number is 503. Making the annual average cost of education, per scholar, $60.12.

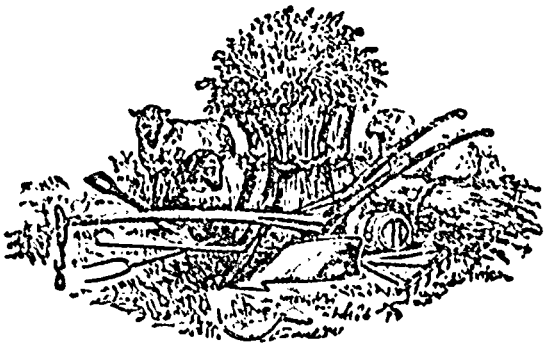
POETRY.

THE TEACHER'S GRACES.

O'er wayward childhood wouldst thou hold firm rule,
And sun thee in the light of happy faces,
Love, hope, and patience, these must be thy graces
And in thine own heart let them first keep school
For as old Atlas on his broad neck places
Heaven's starry globe, and there sustains it,—so
Do these upbear the little world below
Of Education,—Patience, Love, and Hope.
Methinks I see them grouped in seemly show,
The stretched arms upraised, the palms aslope
And robes that, touching as adown they flow,
Distinctly blend like snow embossed in snow:
O part them never! If hope prostrate lie,
Love, too will sink and die.
But love is subtle, and doth proof derive
From her own life that hope is yet alive;
And bending o'er, with soul transfusing eyes,
And the soft murmurs of the mother dove,
Woos back the fleeting spirit, and half supplies;
Thus Love repays to Hope what Hope first gave to Love.
Yet haply there will come a weary day,
When overtasked at length
Both Love and Hope beneath the load give way.
Then with a statue's smile, a statue's strength,
Stands the mute sister, Patience, nothing loth,
And both supporting does the work of both.

S. T. Coleridge.

AGRICULTURAL.



I.—THEORY OF AGRICULTURE.

MANURES.

Manures are generally regarded as twofold, organic and inorganic;—the former consisting of all vegetable and animal substances, and the latter of all saline and mineral. In our last we considered the subject of Stable Manures, perhaps the most important subject that can occupy the attention of the Farmer. We proceed in this number to make a few more extracts from various sources on the more rapidly decomposing remains of animals and plants,—as dead animals, blood, night soil, fish offal, parings of hides, green succulent weeds, sea-weeds. The first extract is from Dawson's valuable work.

The animal manures of this class, are of great value, being almost entirely composed of the materials which are most wanted for the production of the most nutritious parts of vegetables. The vegetable manures of this class, though less valuable, afford, in addition to their woody fibre, much alkaline matter, and some nitrogen; and some of them contain animal substances, which add greatly to their value. Such manures should not be left exposed, nor should they, except in case of necessity, be applied in a fresh state to the land; as in their raw state, a slight excess of them often exerts a poisonous influence, and much of their richness is also apt to be wasted. They should be mixed with earth or peat, in the proportion, in the case of the richer kinds, of three to one; and well covered with a coating of earth. The whole mass will thus become a rich and valuable manure. In many parts of this Province, there is sufficient fish offal, if treated in this way, to fertilize large tracts of barren land; whereas it is now totally wasted, or spread on grass land, to taint the air with odours which, if retained under ground, would furnish the elements of life and vigour to the crops. The same remark applies to dead animals, and all the putrescent refuse which is *apt to accumulate about yards and outhouses. Exposed on* the surface, these things are pestilential nuisances; buried in the compost heap, they are the materials of subsistence and wealth.

As *Sea Weed* is a very important manure, and is very extensively applied in many parts of this Province, a few additional remarks may be made respecting its composition and uses. The ashes of sea weed have been found to contain:

Soda and Potash, . .	15 to 40 per cent.
Lime, . . .	3 " 21 "
Magnesia, . . .	7 " 15 "
Common Salt, . .	3 " 35 "
Phosphate of Lime, .	3 " 10 "
Sulphuric Acid, .	14 " 31 "
Silica, . . .	1 " 11 "

These are all important substances, and, in addition to the nitrogen contained in the organic part of the weed, must exercise an important influence. Sea weed, however, is but a temporary manure, as it decays very rapidly; and it is extremely unwise to place the whole dependence on it, to the exclusion of other manures, especially of the stable manure. The farmer should save his stable manure, and consider the sea weed an additional, or supplementary aid. In this way there will be no danger of his having to complain that, notwithstanding constant applications of sea manure, his land is becoming poor. He must also remember, that sea weed does not contain all the materials of land plants, in due proportion; and that, therefore, it cannot supercede the necessity of other fertilizers. With respect to composting sea weeds, some good farmers in the western counties compost carefully all the weed obtained in autumn, and apply, in the recent state, that procured in spring. It has also been successfully applied as an autumn dressing to grass. This is certainly better than the practice, which I have observed in some places, of top dressing grass with the stable manure, and applying nothing in the drills with green crops but sea weed.

Land weeds form a somewhat useful kind of manure, as they are often rich in alkalies, and other constituents of crops. Rank roadside weeds are especially valuable; and their removal prevents the dissemmination of their seed, and improves the appearance of the country. The ploughing in of green vegetables—as buckwheat, clover, or turnip crops,—may also be considered as the application to the soil of a somewhat rich vegetable manure of this class.

II.—PRACTICE OF AGRICULTURE.

EXPERIMENTS WITH DIFFERENT MANURES MADE ON TURNIPS AT MILLFIELD, KELSO, IN 1858.

The soil is fine alluvial. The turnips of the white globe variety were sown on the 2d of June, and weighed on the 2d November.—The manures were applied at the rate of 45s per acre, carriage paid to the nearest railway station.

	Tons.	Cwts.	Qrs.
Bolivian guano,	25	0	3
Valparaiso do.,	53	6	0
Peruvian do.,	22	10	0
Patagonian do.,	22	10	0
Californian do.,	20	7	0
Dissolved bones,	20	7	0
West Indian guano,	19	8	2
Rape dust,	19	8	2
B. Dissolved bones	19	3	0
Dissolved bones (Berwick),	19	0	1
Upper Peruvian guano,	18	4	1
Mexican do.,	18	4	1
Ammon. diss. bones	16	12	0
Patent Wool manure,	14	12	0
Saw dust steeped,	10	15	0

In the following trials, Peruvian guano, costing at the rate of 22s. 6d. per acre, was mixed with 22s. 6d. worth of each manure noted:—

	Tons	Cwts.	Qrs.
1. Patagonian guano,	25	17	0
2. Dissolved bones,	25	8	0
3. West Indian guano,	23	16	3
4. Upper Peruvian do..	23	15	0
5. Steeped Saw-dust, costing only the guano's price,	23	8	3
6. Patent Wool manure,	21	0	0
7. Californian guano,	19	3	0
8. Mexican do.,	18	7	0
9. Rape dust,	16	12	0

—*North British Agriculturalist.*

IRISH AGRICULTURAL STATISTICS, 1858.

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Subjoined is the following summaries of Irish agricultual statistics, just issued for the year 1858:—

ABSTRACT OF CEREAL CROPS.

	1857. Acres.	1858. Acres.	Decrease. Acres.
Wheat	569,646	551,385	8,260
Oats	1,980,934	1,976,929	4,005
Barley	211,288	190,721	20,587
Bere and rye	21,374	16,489	4,885
Beans and peas	13,586	12,376	710
Total	2,735,828	2,848,401	38,427

Decrease on cereal crops, in 1858, 38,427 acres.

ABSTRACT OF GREEN CROPS.

	1857. Acres.	1858. Acres.	Increase. Acres.	Decrease. Acres.
Potatoes	1,146,647	1,160,056	13,409	—
Turnips	350,047	337,877	—	12,170
Mangold wurtzel and beet root	21,629	30,027	8,398	—
Cabbage	30,011	33,107	3,086	—
Carrots, parsnips, and other green crops	21,602	23,450	1,848	—
Vetches and rape	34,740	63,441	—	1,299
Total	1,604,576	1,617,859	26,751	13,469

Increase on green crops, in 1858, 13,282 acres.

GENERAL SUMMARY.

		Acres.
Increase of green crops,	in 1858	18,282
Do. on meadow and clover,	do.	54,686
	Acres.	
Deduct decrease on cereal crops	38,428	
Do do. on flax,	6,166	do. 44,593
Total increase in the extent of land under crops in 1858,		23,375

—

TOTAL NUMBER OF LIVE STOCK IN EACH YEAR, FROM 1855, TO 1858, INCLUSIVE.

	No. of horses.	No. of cattle.	No. of sheep.	No. of pigs.
1855	556,287	3,564,400	3,602,342	1,177,605
1856	573,408	3,587,858	3,694,291	918,525
1857	599,782	3,620,954	3,452,252	1,255,186
1858	610,717	3,661,594	3,487,785	1,402,812
Increase or decrease in numbers from 1855 to 1858	54,430 Increase.	97,194 Increase.	114,557 Decrease.	225,207 Increase.

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FEEDING CATTLE WITH CORN.

—

Could oats, barley, or wheat be given to older feeding stock with advantage, instead of oilcake at present prices, and which of the three grains are best?—B. A.—[Oats can alone be given with advantage along with, not instead of, oilcake; say, oats, 40 lbs. per bushel, at 20s per qr. The bruised oats should be heated with hot water, and afterwards covered up to retain the heat—what is prepared the one day, should be used the next day.]—*Ib.*

—

LIVE STOCK.

—

One rule is applicable to all—feed regularly, and study to secure the comfort of the animals.

HORSES require considerable attention, particularly when in low condition. To prevent derangement of the digestive organs, feed with a mixture of substances, limiting the quantities, and supplying these at regular periods. Avoid all long yokings, and especially exposure to wet; keep the legs dry, and see that the skin is kept clean, and the legs well rubbed after the animal has been exposed to cold and wet. Keep the stable clean, and secure a pure atmosphere by having the ventilation as perfect as possible.

CATTLE being fattened should have a regular supply of food. Increase the allowance of concentrated food as the condition advances. The quantity may be as much as 10 lbs. per day, for the last month. A mixture of cakes—linseed, cotton seed, and rape—with bruised grain, is the most suitable If chopped straw and pulped roots are allowed in preference to sheed turnips and straw, a gruel may be made of the concentrated food, and poured over the chaff.

YOUNG STOCK should be kept comfortably, but not overfed with cake or corn. The allowance of turnips should be restricted, cake being substituted in part for the turnip. Exposure to dampness, whether in the field or in house, should be avoided.—*Ib*

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POULTRY,

—

Fed on boiled potatoes, grain, and other vegetable food, will continue to lay eggs if the food is given warm; a little suet and flesh may be given occasionally. Keep the hen-house clean, remove the guano weekly, and strew the floor with dry ashes, earth, or sawdust. Prepare the larger kinds of poultry for the market; dispose of turkeys as soon as a sale can be effected.—*Ib.*

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CAPITAL FOR A FARM.

—

In your next number would you oblige me with your opinion as to the amount of capital required to stock and work a farm of about 160 acres (English), half arable and the remainder grass; the ploughed land is of a sandy loam, a little sideland, and takes three horses to plough part.—AGRICOLA. [You put the question indistinctly, not stating the quality, locality, and how you intend to crop the land. For arable land £10 per acre is the common estimate; for grass land this may vary from £1 to £10, according to the quality of the grass. The latter sum will not even stock the best description of pastures with grass.—*Ib.*

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IMPROVEMENT OF DAIRY PRODUCE, &c.

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Scientific agriculture has done much for the improvement of the soil, and also in feeding of stock, but I have long considered that an improvement might be made in feeding dairy stock, so as to produce a higher flavour in butter and cheese, and also an improvement of stock, and after considering the nature of some plants, I thought that the heather might have this effect, which induced me to give it a trial; and after several trials on several cows, I found that it had a good effect. It greatly improves the milk, butter, and cheese, when given in a right proportion for the cow. I give each cow about 3 lbs. of ground heather and 1 lb. of locust meal per day in water, They are very fond of it—they leave their best feeding to drink it; and in order to improve the stock, I give the cows that are giving milk for calves as much heather as may be considered safe to give. I give the calves ground Italian grass, or any kind of young hay in the milk to drink (this, as it were, gives them a long summer's grass), and that produces a calf with a strong constitution on one-third part of the milk commonly given to calves—they are good feeders when cows. And as for feeding to fat, I grind the sheaves of oats as they come from the field, mix with meal, and a few boiled turnips; a good feeding cow will eat a common sheaf of oats in two minutes, and be good fat in six week's feeding, with very few turnips, and particular fine beef. The best and cheapest feeding that I find for swine is ground hay and meal, which produces very fine pork,

Were farmers to adopt the above system, they would find it e-

economical, and the consumer would have richer flavoured milk, butter, cheese, and flesh meat. The above note is founded on practice, and you may consider it worth your notice.

WILLIAM AIRD.

Aird's Mill. Murkirk.
—*Ib.*

NATURAL SPORTS.

The origin of the varieties of a plant is often involved in obscurity. Plants growing in a state of nature seldom produce varieties or sports, but they frequently do so when *cultivated by man.* Although mere cultivation does not perhaps directly give rise to varieties, yet it seems to render almost all vegetables liable to change, and the higher the state of cultivation in which plants are placed, they are the more likely to sport. The wheats which *arise from artificial* fecundation do not transmit their characteristics with constancy, while a natural sport has seldom been found to change in any way. Sports are sometimes found to be inferior, and sometimes superior to the original race. But a *good variety may safely* be regarded as the forerunner of a better one, and there is no way so certain of improving the wheat plant as by adopting the sports of nature which she may be said to invite man to cultivate.

The varieties of wheat *throughout the world* are numerous, but considering how long and how extensively this plant has been cultivated, they cannot be said to arise very frequently, and perhaps few farmers have observed a sport to originate in their own crops. *There is often a family likeness between the grain of sports and* the parent race, although the appearance of the plants when growing may be very dissimilar, and it is possible that varieties may arise with the most opposite characteristics, without differing much *in the form and quality of their seeds.* But there is no way of judging of the properties of sports, without repeatedly reproducing them in the ordinary way, and the most valuable ones may be expected to be found mingled with the best variety. When a sport *has been selected for propagation, an opinion should not be hastily* formed of its merits, which will seldom be fully brought out until the third crop has been reaped—the thin sowing, and consequent luxuriance attending the first attempts at increase, often imparts a high coloured and coarse appearance to the grain. In raising new *varieties, it is judicious to avoid gardens and all situations subject* to the depredations of fowls, and if possible, select a field cropped with a distinct variety of wheat, and as a security against game and other animals, let the plot be surrounded with a wire fence. The *fecundation of the florets taking place in the bud,* and before the opening of the chaff valves for the ejection of the anthers, seldom, perhaps never, does one variety of wheat spontaneously fecundate another.

With the view of *improving the wheat plant,* the following measures are suggested for the adoption of agricultural societies:—

1st. To ascertain the characteristics and comparative merits of the *varieties at present cultivated.*

Without a knowledge of the characteristics of the different kinds of wheat, it is impossible to distinguish one from another, and their worth can only be determined by estimating their comparative merits. On this subject two farmers are seldom found to agree, and scarcely one of the profession seems to continue of the same opinion for many consecutive years. It is believed that no set of experimented trials with different varieties made, and repeated with such care as entitles them to be considered correct, have ever been submitted to public notice, and little exists upon this important subject beyond vague conjecture. On an accurate knowledge of the worth of existing varieties depends success in the improvement of the wheat plant.

2d. To offer premiums for varieties new in the agriculture of Britain, and congenial to the soil and climate of the country.

The varieties at present cultivated being unalterable, it follows that improvement in the wheat plant can only be effected by the introduction of new kinds, and hence the necessity of knowing the productiveness of the old in order to have a standard for testing the new. In the first place such premiums should be offered as would sufficiently remunerate competitors for selecting and raising new varieties, and in the event of any of them proving upon trial superior to the standard old one, the remuneration ought to be augmented. Time should be given for preparing for the competition, and candidates guaranteed that they shall have the uncontrolled sale of the produce of their varieties. A detailed history of the origin and propagation of the varieties, so far as they are known, should be required, and no restrictions imposed, but evidence that they have been found suitable to the climate of the country.

3d. To have exhibitions of varieties when approaching maturity growing contiguous and under a parity of circumstances.

The exhibitions being intended to afford information to practical men, the collection might be limited to approved varieties, and such new kinds as are likely to prove useful, and after the first year samples of the grain of the crops previously exhibited might be shown on the ground with the growing plants. When the meetings of a society are itinerating, the wheats could be sown to suit any place of meeting, and by enclosing the ground and charging for admission, their cultivation might be found to entail as little loss as the other departments of a general agricultural exhibition.

If wheats were exhibited in something like the way which has been pointed out, their properties when growing, and their matured grains would be seen under a parity of circumstances, and agriculturists enabled to select the kind most suitable for their purpose.—Superior varieties would become extended, and inferior ones curtailed in cultivation, while facilities would be afforded for introducing new wheats of merit; seedsellers would become guarded in their commendations, and checked in passing off one kind for another.

III.—AGRICULTURAL INTELLIGENCE.

CHARTER OF THE HIGHLAND AND AGRCULTURAL SOCIETY OF SCOTLAND.

In the Supplement we publish the Charter of the Society. We give this, as several members of the Society have requested us to publish it, and have also asked information as to the powers granted by the Charter. We will briefly indicate the leading provisions. It appears that in 1781, the Society was first constituted by the title of the Highland Society, at Edinburgh. A Charter was obtained in 1787. The objects were "*to inquire into the state of the Highlands and Islands* of Scotland, and of the inhabitants, and into the means of the improvement of that part of the country." The present Charter was granted 18th June, 1834, the name being changed into the Highland and Agricultural Society of Scotland. Provisions are contained as to holding real and personal property—lending out funds—forms of executing deeds, &c. It states that actions are to be *prosecuted in the name* of the honorary secretary in his official capacity. The Society consists of ordinary and honorary or corresponding members. The number of honorary members resident in the United Kingdom is limited to 20—the number of foreign associates also to 20. Members are elected by ballot—the provisions being more fully stated in the bye-laws. The Society is to hold *two meetings—one upon the second* Tuesday of January—the other in May or June, as determined by the directors. Occasionally general meetings may also be called by advertisement by the directors. Twenty members constitute a quorum. At the Janurary meeting the election of President, Vice-President, and officers takes place. The Board of Directors consist of 30 members of whom seven are, at least, to be newly elected—the necessary condition being usually resident in Edinburgh or in its immediate vicinity—also ten extraordinary directors, who may be occasionally resident in Edinburgh. Immediate vicinity should admit of considerable latitude, especially where railway communication exists. At the meeting of the directors seven constitute a quorum—the chairman to have the casting vote. The Secretary, for conducting the general business of the Society, is annually appointed—also other officers or servants, and the salaries fixed by the directors—these appointments, with salaries, being subject to the approbation of the January General Meeting, *the directors having the power to remove such officers.* Payments by the ordinary members to the funds of the Society are regulated by the bye-laws—honorary or corresponding members not being subject to payment. The payment

of ordinary members to be paid at or before the General Meeting, to secure the right of voting. Persons once elected members cannot resign without having paid up his life subscription in annual contributions. This condition is not generally known. The Directors have power to enforce payment. The Society has the power of expelling members. There are regulations as to the depositing of moneys in bank, the investment of capital stock, and the uplifting and management of it. The General Meeting has the application of the revenue—putting annually certain sums at the disposal of the Directors. Accounts to be annually made up by the treasurer and submitted to the annual meeting. Power is given to make bye-laws.

As the operation of the Society depends upon the bye-laws, the importance of these is the more obvious. The annual payment of ordinary members is £1 3s 6d; a life subscription being 12 guineas. Annual payments, however long continued, cannot be redeemed at less than £7 1s. Regulations as to election of members are made. Power to dispense with the individual ballot. By the 4th bye-law, the president does not continue in office more than four consecutive years. Other changes provided. It is provided that any ordinary director who shall have retired to the country for a year, or shall be resident in town and shall not have attended a meeting of the board of directors during the same period, unless prevented by bad health, shall be held to have vacated his seat in the direction. The 5th bye-law regulates certain details in conducting the business of the board of directors, they meet on the first Friday of each month during the sittings of the Court of Session and occasionally, upon intimation by the secretary. It also provides that all members of the Society, though not in the direction, may attend the meetings of the directors and deliver their opinions, but they shall have no vote. Ladies, members of the Society, may vote by proxy. An auditor of accounts annually elected. The duties of the ordinary secretary are thus defined by the 10th bye-law.—The secretary, who receives a salary for his trouble, shall write the minutes and proceedings, and carry on the ordinary correspondence of the society, and superintend the keeping of the records, papers, and correspondence. The said records, papers, and correspondence, shall be at all times subject to the inspection of the board of directors, or any member thereof.

We have very great satisfaction indeed in inserting the following communication from our unknown correspondent at Yarmouth. It is exactly of the nature of the communications we would like to receive from Farmers all over the country—stating the results of their experiments in any particular department, and arousing the attention of their fellow husbandmen to the improvements that are now going on. Were the Experimental Garden and Farm in operation, the Agricultural department of our *Journal* would become vastly more valuable. Should the Legislature at the ensuing session give any encouragement to this branch of our Educational undertaking, we intend to enlarge the *Journal* and devote double the space to Agriculture. In the mean time we tender our best thanks to "Cultor" and hope to hear from him frequently.

For the Journal of Education and Agriculture

Your November number contains a very useful article on Turnip culture: the only misfortune about it is, that it stands little chance of reaching those to whom the suggestions and information contained in it should be most valuable; as I imagine not many farmers take the *Journal*.

In Nova Scotia we do not seem to be sufficiently aware yet of the value of root crops; for as a general thing they are but little cultivated; almost every farmer plants a quarter or, perhaps, half an acre in roots, and thinks that this is enough, as it is all he can perhaps find a market for; forgetting that his cattle and horses are the most valuable consumers and customers of these articles.

The Turnip, common and insignificant as many persons consider it, has created as great a revolution in England as almost any of the wonderful inventions we read and hear so much about. The annual value of this one root in England was reported to Parliament a year or two ago to be upwards of *three hundred millions pounds sterling*, or *fifteen hundred millions of dollars*. It has passed into a popular proverb, the truth of which remains unquestioned, that, were the turnip crop of England to fail in any one year, the Government would be unable to pay the interest on the national debt.

Did it but receive more attention and better cultivation in Nova Scotia, it would soon prove its value here, as it has done in England; and so well impressed are American farmers with the fact of its being the main stay of all successful cattle feeding, that you find their papers continually lamenting the circumstance of their climate not being favourable for the extensive and successful growth of this esculent. This is a disadvantage that we have no cause to complain of in Nova Scotia; our climate is well adapted to its growth; and is more like the climate of England in humidity, than perhaps any part of North America. If any farmer would try the experiment of giving each of his working cattle only so small a quantity as half a peck daily of cut turnips, or other roots, he would find them in a finer working condition in spring, even after the hard work of winter, than they are usually found to be when fed on dry and dusty hay alone: he would also find no trifling return in the increased richness of his manure heap.

The growth of the turnip has been found to be the best preparation for a crop of grain, especially wheat: if the land has been well ploughed and properly manured for turnips, it is found on their removal to be in good condition for reviving grain, especially if a part of the turnips, say half the crop, or even a quarter, or less still, has been fed off the ground by sheep; as they will have manured the land sufficiently in addition to what is received for the turnip crop.

Every farmer would find it to his advantage to plant more of these roots, and to keep a small flock of sheep to consume a portion of the crop on the ground. The turnip stands frost well enough to allow of its remaining in the ground for feeding purposes generally until Christmas in most parts of Nova Scotia. Bloomfield says—

"Beneath dread winter's level streets of snow
The sweet nutritious *turnip* deigns to grow."

The writer tried the experiment, a few years ago, of leaving some turnips all winter in the ground just as they grew. They were not covered with any protecting material except the snow that fell, which was melted again entirely off them by rains and thaw. They were fully exposed to all wind and frost, and froze as hard as it was possible for them to freeze in our coldest weather. Alternately freezing and thawing, they remained in the ground until spring, when they began to put out leaves and tasted as sweet and good as if pulled at the usual time in autumn. The kind thus tested were the common white.

Would it not be as well to try on the Farm attached to the Normal School some experiments as that just mentioned, with the cabbage and turnip? If a few were left out all winter, and in the succeeding spring were found to ripen seed, varieties of each would be thus obtained which might be perfectly hardy, and able to resist our coldest weather in the open ground, the whole winter.

A trial with the ordinary drum head cabbage, by leaving it out all winter, (as was done with the turnip just mentioned,) was likewise made a few years ago. In the spring it grew and ripened seeds, from which most excellent heads were subsequently grown. These trials are worth attempting, because the climate is not so severely cold in winter in Nova Scotia as in most parts of North America, nor is it so open as in England.

It may be satisfactory to those persons who are deterred from growing turnips more extensively than they would wish,

on account of the ravages caused by the fly, to know that the *Mark Lane Express* gives as a remedy for the fly and the black caterpillar the planting of ordinary mustard seed near the turnips. It is stated that those insects will not attack the young turnip plant as long as they can get the mustard, so great is their preference for the latter. The experiment then of planting mustard for this purpose is worth trying, and if proved to be efficacious will certainly be simple, easy and cheap.

CULTOR.

Yarmouth, December 24, 1853.

SCIENTIFIC.

CHEMICAL ANALYSIS OF THE SPA-SPRING WATER WINDSOR, N. S.

During the late Christmas vacation, I took in hand the examination of a mineral water well known to the inhabitants of Windsor, and its neighbourhood, flowing from a spring on the property of C. B. Bowman, Esq., long entitled, on this account, "Spa Spring." The water has for many years enjoyed the reputation of being chalybeate, and its attributed medicinal proprieties have been called into requisition by various votaries of health, who from time to time have sought its aid in regulated draughts. It is also well known as a very favourite drink of horses and cattle. Under these circumstances, I thought an investigation into the nature of the water, might be interesting, as throwing light on the cause of its qualities, which must depend on its chemical composition, and also as a contribution to the Natural History of the Province.

The chalybeate character of the water was inferred from its possessing a strong inky taste, and also from a certain red deposit found in the conduit pipes through which it ran, both of which were justly considered as due to the presence of iron. Experiment, however, shews that there is really very little iron in the water as it issues from its outlet, as is seen at once in the following results of an *analysis made on the water carefully collected in a small reservoir* filled immediately from the spring rising beneath.

The water was perfectly colourless and clear—very brilliant—had very little decided taste, and that not inky; its temperature was 49° Fah., that of the air being 31°.

An imperial gallon, weighing 70,000 grains or 10 lbs. avoirdupois afforded 137,91 grains of solid matter, composed of these ingredients:

	Grains.
Carbonate of lime	17.50
Carbonate of iron	0.40
Carbonate of magnesia	0.31
Sulphate of lime	*106.12*
Sulphate of soda	0.68
Sulphate of potassa	0 38
Sulphate of magnesia	11.02
Chloride of solidum	0.90
Silica	0.60
	137.91
Free carbonic acid	0.64

The *quantity* of these constituents justly entitles the water to the name of mineral water, and comes very near that in some of the most celebrated waters—as, *for instance, in the thermal spring of* Bath, in England, which yields 144 grains in a gallon; but from their *quality* or *nature* the spring is clearly not chalybeate, but calcareous, the two chief ingredients being sulphate and carbonate of lime, while iron is present in but minute amount. The third most abundant ingredient is the sulphate of magnesia or Epsom salts, and the water is known to possess purgative properties when taken in considerable quantities, but the salt is not so plentiful as to cause this effect in small draughts of the water.

The inky taste and the red deposits are due to the action of the water on the soil and to its admixture with the soakage water, and are only observed where precautions are not taken to keep the water as nearly as possible in the state in which it issues from the earth. For a long time no such precautions were taken, and consequently those effects being constantly observed were held as directly resulting from the spring water; but by recent arrangements Mr Bowman has caused the water to run into a trough in the Forks road through a wooden pipe, and in these there is but a minute yellowish, not red, deposit, though they have been years in use, while in another wooden pipe into which the water, as mixed with soakage from the soil, runs, there is abundance of the red ochery deposit, consisting, in great part, of peroxide of iron. The iron is dissolved from the soil by acids resulting from decomposition of vegetable matter, and by the free carbonic acid of the water, and gradually deposited by reason of chemical changes among the ingredients of the two waters. The very large amount of sulphate of lime shews that the water must be long in contact with plaster rock, the great characteristic of the district.

The results of this examination may be of some service in directing medical men who may be consulted as to the propriety and advantage of drinking at the spring, of which they are best able to speak when they know the real nature of its water.

HENRY HOW.

King's College, Windsor, January, 23, 1858.

SCIENCE ANSWERING SIMPLE QUESTIONS.

Why is rain water soft? Because it is not impregnated *with earth and minerals.*

Why is it more easy to wash with soft water than with hard? Because soft water unites freely with soap, and dissolves it instead of decomposing it, as hard water does.

Why do wood ashes make hard water soft? 1st. Because the carbonic acid of wood ashes combines with the sulphate of lime in the hard water, and converts it into chalk. 2nd. Wood ashes converts some of the soluble salts of water into insoluble, and throws them down as a sediment, by which the water remains more pure.

Why has rain water such an unpleasant smell when it is *collected in a rain water tub or tank? Because it is impregnated* with decomposed organic matters, washed from roots, trees or the casks in which it is collected.

Why does water melt salt? Because very minute particles of water insinuate themselves into the pores of the salt, by capillary attraction, and force the crystals apart from each other.

How does blowing hot foods make them cool? It causes the air which has been heated by the food to change rapidly, and gives place to fresh cool air.

Why do ladies fan themselves in hot weather? The fresh particles of air may be brought in contact with their face, by the action of the fan; and as every fresh particle of air absorbs some heat from the skin, this constant change makes them cool.

Does a fan cool the air? No, it makes the air hotter by imparting to it the heat of our face by transferring its heat to the air.

Why is there always a draft through keyholes and window crevices? Because the external air, being colder than the air of the room we occupy, rushes through the window crevices to supply the deficiency caused by the escape of warm air up the chimney, &c.

If you open the lower sash of a window, there is more draft than if you open the upper sash. Explain the reason of this. If the lower sash be open, cold external air will rush freely into the room and cause a great draft inward; but if the upper sash be open, the heated air of the room will rush out, and of course there will be less draft inward.

By which means is a room better ventilated? By opening the upper sash, because the hot, vitiated air, which always ascends towards the ceiling, can escape more easily.

Why does the wind dry damp linen! Because dry wind, like a dry sponge, imbibes the particles of vapor from the surface of the linen as fast as they are found.

Which is the hottest place in a church or chapel? The gallery.

Why is the gallery of all public places hotter than the lower parts of the building? Because the heated air of the building ascends, and all the cold air which can enter through the doors and windows, keeps to the floor till it has become heated.—*Dr. Brewer's Guide to Science.*

Hugh Miller's Museum.—The geological museum of the late Mr Hugh Miller has been purchased by the home government for £500. In addition to this sum, another of about £600 subscribed all over the country, with a view to the purchase of the collection, will be handed to Mr Miller's widow. The collection will remain in the Edinburgh Museum.

THE LATE SIR W. REID, K.C.B.

Major-General Sir W. Reid, K.C.B., late Governor of Malta, died on Sunday. He belonged to the corps of Royal Engineers, and obtained his commission in 1809; became a Captain in 1814; Brevet Lieutenant Colonel in 1837; Brevet Colonel in 1851; and Major-General in 1856.

Within a year of receiving his first commission he was sent to the Peninsula, and served to the end of the war. He was at the three sieges of Badajos, the siege of Ciudad Rodrigo, the siege of the Forts and the battle of Salamanca, the sieges of Burgos and San Sebastian, and battles of Vittoria, Nivelle, Nive, and Toulouse, and was wounded at Badajos, Ciudad Rodrigo, and San Saba-tian. He was present at the attack on Algiers under Lord Exmouth in 1816. In 1832 he was employed at Barbadoes in rebuilding the Government buildings which had been destroyed by the hurricane of the preceding year, and then he first conceived the idea of endeavouring to trace the laws which govern the movements of these agents.

Subsequently, as Governor of Bermuda, Barbadoes, and Malta; as chairman of the Executive Committee of the Great Exhibition of 1851; and as the author of the "Law of Storms," he rendered services to this country which ought not soon to be forgotten. Of the local improvements which he effected in his several governments, and the vigour and spirit which he infused into his administration of their affairs, we cannot speak in detail. It is not too much to say that the success of the Exhibition, at least in its early stages, and, above all, its punctual opening at the appointed time, were in a great degree owing to his tranquil energy and determination, which in some instances refused even to yield to the highest influence. At the close of the Exhibition he was made a K.C.B., and the government of Malta was conferred upon him, which he administered during the Crimean war; and there were not a few persons here who regretted that he had not the administration of the war itself nearer to the scene of action. He only returned last summer, at the expiration of the usual period of colonial government. His well known work on the "Law of Storms"—that is, on the laws of motion of the tropical whirlwinds—was founded in a great measure on his own experience in the West Indies, where he had been on Military duty before his government of Bermuda. This work, it may not be generally known, is not merely a theoretical investigation, but of eminently practical value to all who have to navigate in the seas both of the East and West Indies. What was, in fact, a second edition of it was published a few years ago under the title of the "Progress of the Development of the Law of Storms." It is remarkable that such a work should have proceeded from a military and not a naval officer; but Sir W. Reid's mind was one that could not be idle, or fail to be impressed with any phenomena either of the natural or moral world with which he was brought into contact. He possessed the placid and calm temper of a true philosopher, with a determination to avoid all personal conflicts and disputes which is sometimes not an accompaniment of philosophy, combined with a rare talent for conducting business, and in making his colleagues and subordinates do their best. In private life he was one of the most amiable of men, with a pleasant mixture of gravity and cheerfulness.

Sir W. Reid was married to a daughter of the late Mr Bolland, of Clapham. His wife died a few months before him, and he has left five daughters. The deceased General was the eldest son of the Rev James Reid, minister of the parish of Kinglassie, Fifeshire, where Sir William was born in 1791. He was educated at Musselburgh, and subsequently in the military academy at Woolwich.

ORIGINAL HISTORICAL CONTRIBUTIONS.

When one has made out a full genealogical table of the Saxon line of English kings, he will find two things very plainly indicated by it: First. He will find that *the trouble of the line* began with the circumstance of Edward the Elders' supplanting Ethelbald, the son of his uncle king Ethelred. His father Alfred had succeeded Ethelred merely because the Danes were infesting England when that monarch died, and his son Ethelbald was in his infancy or childhood. If Ethelred had bequeathed him the kingdom (as some allege), he must have done so only on this account—hence it was not unnatural in Ethelbald, on Alfred's death, to desire that the royal succession should revert to the house of the elder brother.

Now, although the first consequence of Edward's refusing to give place to Ethelbald, was the death of his opponent (who fell in battle contending for his imaginary rights), yet, history does not speak as though the circumstance of Ethelbald's death tended much to the comfort of Edward's house.

As years rolled on, disturbance after disturbance broke out among Edward's offspring, and his male representatives became fewer and more wretched.

Out of fourteen children, he had only four sons himself, and all of these but one died childless. Edmund the Elder, (the one referred to,) who, by the way, was stabbed by a robber in his own house, left but one son that had posterity; and he was none other than *the hateful* king Edgar, called by the monks *the peaceful*, because of his submission to their authority. It was this prince, that, at the instigation of Dunstan and his followers, rebelled against his brother king Edwy the fair, whose wife had been so savagely murdered, (on the pretence of her being too nearly related to her husband), and, driving that unhappy monarch from his dominions, occasioned his death of a broken heart.

Edgar had but two sons, one of whom, whilst but a youth, (viz., Edward the martyr), was stabbed, like his grandfather, by an assassin, and died unmarried; whilst the other (viz., king Ethelred the unready), had the misfortune to have three of his sons murdered, and no posterity by the fourth. This fourth son was Edward the Confessor, the last of the Saxon kings of England. The crown therefore endured in the family of Edward the elder only for four generations; whilst in three out of four of these generations a king was put to death by violence, in the remaining one, a king died of a broken heart.

The second thing that a genealogical table of the Saxon kings of England evidently shows, is, that "the name of the wicked shall rot," even though he be a monarch. King Edgar, not content with getting a kingdom, must also get a wife by violence; wherefore a nobleman is murdered, and his wife wedded. But what are the consequences?

First, the wife (Elfrida) thus iniquitously got, after her husband's death causes Edward the martyr, *his son by a former marriage*, to be treacherously stabbed, that her own son Ethelred may supplant him.

Secondly. Her son Ethelred (who is a simpleton) thinks to secure his kingdom against the Danes by treacherously murdering all of that people resident in it at a certain time: but instead of profiting by his villany, only brings by it Sweyn the king of Denmark to England to expel him from his throne.

Thirdly. In course of time three of Ethelred's sons are put to death, one of them by the order of Sweyn's son Canute; and

Fourthly. The only one of all his sons who leaves family has but two sons, of whom the one dies issueless, and the other without a male representative in the second generation. Thus in the fourth generation the name of Edgar's house is blotted from the list of the families of the earth. "The works of the Lord are great, sought out of all them that have pleasure therein." Psalm cxi. 2.

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