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THE JOURNAL OF EDUCATION AND AGRICULTURE,



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

FOR THE PROVINCE OF NOVA SCOTIA.

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No. 9.

EDUCATIONAL.

THE EXTERNALS OF EDUCATION.

DR. GUTHRIE'S SPEECH AT THE ANNUAL MEETING OF THE EDINBURGH RAGGED SCHOOLS.

We have much pleasure in giving insertion to the following speech. In our last article on the Externals of Education we endeavoured to show the utter inadequacy of any party in the State, by voluntary effort, to educate all the children of the State, and insisted on the point that this can only be accomplished by the State itself; that it is not only its bounden duty, but its wisest policy, and that on the simple ground of economy, to see that a suitable education is provided for every child within its territory. It would seem that the Committee of the Council of Education of the Imperial Parliament have withdrawn a certain amount of the Grants made to Ragged Schools, and Dr Guthrie in his speech, with his usual power and eloquence, exposes the miserable economy of such a procedure, and shows to a demonstration the force of the principle, "Prevention is better than cure."

Dr GUTHRIE, who was received with loud cheers, seconded

the resolution. It is necessary (he said) that the public should understand, in the first place, that this school is established and managed on catholic principles. I don't mean Roman Catholic—(cheers) because I don't think that Roman Catholic is catholic: it is catholic with an addition, or rather a subtraction. (Hear, hear.) The Directors of this school comprise members of every evangelical Christian body in the community. Some people at first suspected that it was to be a Free Church job. There was a distinguished man, who had now left this world, who called upon a friend of mine when I took it upon myself to summon the community of Edinburgh on behalf of those poor children, and said to him—"I've got a summons from Guthrie to attend a meeting. I don't think I'll go." "Oh!" said my friend, "I think you should go—the object is good." "But" he replied, "I'm afraid it's a Free Church job." (Laughter.) If the public are satisfied of anything now, they are satisfied of this—that it is neither a Free Church, nor Established Church, nor U. P. Church, nor Baptist, nor Episcopalian Church affair, but it's all these Churches working together in one great and good cause. (Cheers.) Then, in the second place, I wish the public to bear in mind that the most marked peculiarity of this school is, that the Directors and supporters of it place themselves *in loco parentis* to the children; and being in place of a parent to them, I therefore feel myself as much bound to give these children that education which has been so admirably described by Mr Orde,—physical, intellectual, moral, and religious. It may not be convenient for me to get hold of a child on the streets and take it to my own house, and perhaps it would not exactly suit the child; but, instead of taking it to my own house in Salisbury Road, I lodged it at

Ramsay Lane, in the Ragged School; and I feel myself before God as much bound to give that child what I believe to be God's truth as I feel myself bound to give to my own children. (Cheers.) The longer I live the more satisfied I am that that great battle which was fought in this hall some dozen years ago around the Word of God, and for that Word being taught in this school, it was a well fought battle. The longer I live the more am I satisfied of this, that if you wish to bring up these children to be valuable members of society, to love the British Constitution, to love our Queen, to set none before the Queen—(hear, hear, and cheers)—and, instead of being prepared to welcome Louis Napoleon and the Frenchmen on our shores, to meet them with the bayonet and the rifle in defence of our privileges,—the longer I live, if these are our objects, if we wish a religious people, a loyal people, a people that would repel invaders instead of welcoming them, and die, like our forefathers, for our civil and religious privileges,—the longer I live, I am the more satisfied, if these are our objects, that the day we fought the battle for the Bible was one of the best days I ever saw. (Cheers.) These being the principles on which our school is established, I rejoice at the success which has attended our efforts during the last twelve years that it has been in operation. Dr Guthrie then said that they had heard much about the Government to-day. He did not wish to speak evil of dignities, but there were some things in respect of which it was difficult to keep one's temper, and this was one of them. He should endeavour in anything he should say, to speak with all respect. He could honestly say that he believed Government was not to blame in this matter—he meant the heads of Government. This deed was done under the Palmerston Administration, and not under Lord Derby's—(hear hear, from Mr Orde)—Lord Derby's Government, however, did not undo it, and that was nearly as bad. (Laughter and applause.) He was, however, bound to say that the heads of Government knew nothing of it; for when he went up to London, along with a deputation, on the subject, he found that the heads of the Government repudiated it, one and all of them. They held up their hands in perfect astonishment, and were as ignorant and as innocent as sucking doves on the subject. (Laughter and cheers.) He believed that the whole matter was managed by one gentleman in the Education Office—(hear, hear)—a man of distinguished ability, but then ability was sometimes used to do ill as well as to do good. That gentleman sat in the Education Office, and the Government were mere tools in his hands. He was as great a despot in educational matters as Louis Napoleon himself; and he believed it was absolutely necessary that we should have a Minister for Education in this country, who should be answerable on the floor of the House of Commons for everything done in the matter of education. (Loud applause.) Some ten years ago he went along with Mr Duncan, Dr Bell, and Mr Smith, and through the kindness of Lord Palmerston—(applause)—who had always been a steady friend to their cause—they had an interview with Sir G. Grey, Lord Carlisle, Lord Lansdowne. They met with a courteous reception, but then the Government did not consider this such an important question, and there were many people in the country who treated it as the Government treated John Knox and his schemes at the Reformation—they thought it was a "devout imagination"—this of saving those wretched children. He did not at that time blame the Government for not committing themselves, as the movement was then a novel thing. There were some people had got so much accustomed to see the ragged children about the streets, that they did not think that Edinburgh was as well without them as with them. They were like the woman who got good water conveyed into her house from the Pentlands or some other place, in place of the bad water she had been accustomed to use all her days. When she was asked what she thought of the new supply, she said—"It's no worth drinkin'—it has neither taste nor smell." (Loud laughter and cheers.) There were people who seemed to be rather pleased with the miserable objects they had going about the streets. Others said they would never reduce crime by Ragged Schools, adding what they thought was a very clever

saying, that "as long as there are pockets to pick there will be pickpockets." Now, they did not see how far that argument could go; because he might just as well say, "What is the use of the Lords of Justice to prevent murder? As long as there are throats to cut, there will be cut-throats." (Laughter and applause.) "Or what is the use of lighthouses on the shore? As long as there are ships there will be shipwrecks." "Or what is the use of rifle corps?"—which he supported as a defensive army—"as long as the French remember Waterloo, there will be danger of an invasion." Such a mode of reasoning was arrant nonsense. It was about as logical as the idea that there was no use in providing good food, and clean cells, and wholesome atmosphere in our jails, because people would become ragues in order to enjoy the privileges of a lodging in the prison. To put that to the proof, they had only to proclaim liberty to the captive, and there would not remain one who would not to-morrow morning abandon the wholesome diet of the prison for the liberty of the High Street. It was said that workmen would become dissipated, and neglect their children, because they knew that they would be attended to, and educated in the Ragged Schools. But that was an equally false idea, for it was not the Ragged Schools that made ragged children, any more than it was the paper mills that made rags. It was through the public-house and the dram-shop that people went down to perdition. Well, had this state of feeling been the condition of matters now, he could have excused the Government for treating the Ragged Schools as they had done. But it was not so. The Edinburgh deputation who went up to Government last winter, were accompanied on that occasion by deputations from Carlisle, Newcastle, York, Liverpool, Manchester, and Aberdeen comprising men of all ranks and all conditions. They were under great obligation to Mr Black, their excellent representative, to Mr Dunlop, and to various English Members, who entered heart and soul into their case. They stated their case to Mr Adderley, complaining of this change, the effect of which was to land this institution in debt to the extent of £600, and he saw from the Report of the York Institution that it was in debt £500, and he had no doubt that it was the same in Manchester and other places to which he had referred, so that the whole Ragged School cause was at this moment thrown into great confusion. They discussed the matter with Mr Adderley, and told him what the Ragged Schools had done. The Ragged Schools in this city had (said Dr Guthrie), in the first instance, cleared off the whole race of juvenile beggars who used to infest our streets, and ply trade with great mendacity and dexterity. He had not seen a young ragged beggar in Edinburgh for six months, though, having been very lately in Manchester and Liverpool, he had plenty of them there. And what he would say was that, what with Mr Robertson's school, and the West Church school, and he would also say the other school, though he did not approve of its principles, they had swept the streets of Edinburgh of juvenile beggars, and they had swept them into their Ragged Schools. With regard to their prisons, they had heard what the Lord Provost had stated; and he would ask had any other cause existed to account for that effect but the Ragged Schools? As his friend Mr McLaren well knew, if it had not been for these schools, they would have had greatly to enlarge their prison—a step at one time contemplated, and which that gentleman, to his credit, had been the means of preventing. The same effects had followed in Aberdeen, Dundee, Glasgow, York, and in other places where Ragged Schools had been established; and they were therefore not only entitled to say that they had put down juvenile mendicancy, but they had found out the real cure for juvenile crime. This school had returned to society as valuable members of it 530 individuals, at an expense of from £20 to £25 each; whereas, if Government had had to deal with any of them as criminals, it would have cost them at least £300 for each. He maintained that, if there was an institution in the land worthy of the liberal countenance and support of an enlightened Christian Government, it was this institution, which they had sent to the door with such a wretched pittance, that he was almost disposed to propose that it should be flung back in

their face. (Hear, and applause.) Dr Guthrie then referred to Lord Palmerston's Reformatory Act, and to the folly of the provision that no one should be entitled to its benefits until he had passed fourteen days in prison. Lord Palmerston's act said to them, "Don't take a child and send him to a Ragged School, where you may prevent him from becoming a criminal. Don't take him while he is on the edge of the precipice, but wait till he has fallen down,—wait till he has become a criminal; if you attempt to save a child from becoming a criminal, I will help you with a penny a week, but if you allow the child to become a criminal through your neglect, and then try to rub out the prison brand you will get seven shillings a week." Did ever any man hear of such folly as this was? Dr Guthrie also related a very gratifying incident connected with his visit to the Akhbar reformatory ship at Liverpool, in which boys are trained for the mercantile navy,—for in consequence of their having come under the jurisdiction of the police magistrates before being sent there, could not be admitted into the royal navy. When he went to visit this interesting floating reformatory, the boys manned the yards, and gave him the reception usually accorded to an admiral. (Loud cheers.) The boys on board the Akhbar had the advantage of a training which fitted them to perform as well as any other class of boys the duties required of boys on board men-of-war; but owing to Lord Palmerston's act, the royal navy—which, to its honour, would not receive any who had the brand of the jail upon his brow—would not receive him. However, the boys were much sought after for the mercantile navy, and indeed, more of them were wanted than could be had. Dr Guthrie then stated that the proposal he had made to Mr Adderley was, that Government should pay the cost of education, leaving the public to be at the expense of housing, clothing, and feeding the children; and he believed that Government, laying down 10s for their 20s, they, as Scotchmen, knew the two sides of a sixpence too well to lay down any money that was not to be wisely and profitably expended, and Government had a perfect security for the proper expenditure of the money given by them. Why, he asked, should it be that institutions like the Ragged Schools should be the last called on to receive Government aid? Government had to meet the claims of the Universities and the common schools of the country, but all these were for the education of classes who could afford, by retrenchment in some department of domestic or personal expenditure, to educate their own children. Three-fourths of the children attending the schools of the Churches that at present got grants were the children of parents who were able to educate them. A large amount of money at present went to pay pupil-teachers, many of whom became clerks and shop keepers, and went to other departments of life. He thought the party who had the highest claim upon Government was the institution that sought to educate and clothe the ragged, wretched, miserable children, for whom no one else cared. Why was it, he asked, that Government money should be withdrawn from them, and yet a grant of £100 a-year given for the discreditable and disgraceful purpose of paying for a nude woman in the Royal Institution in this city? (Cries of "Shame.") They were not corrupting but improving the morals of the people. They were raising the fallen and saving immortal souls, and yet the Government only gave one-half the sum to 300 of these poor children that it gave for this shame and disgrace to this country, although he was happy to find that they could not get a woman in Scotland for two years to receive that £100. (Applause.) What was given to the children in these schools was a sum so small that there was no coin in her Majesty's dominions to represent it, and he had had to revive his knowledge of fractions to find out the sum. The whole amount that Government gave for each of these poor children whom they were saving from the prison, penal settlements, and the gallows, and turning into useful members of society, was two-thirds of a farthing per diem. What he would propose was, that they should say to the Government, if they would not increase the allowance, "We won't have your money—your money perish," not "with you," as he did not want the Government to perish; but unless the Government came for-

ward and gave with a liberality worthy of the cause he believed they were injured by their help, as some people reduced their subscriptions in consequence of their getting help from Government. By this change in the policy of the Government they were now £600 in debt. He did not quite despair of getting more liberal aid from Government, for he had talked with some of the heads of the Government, and they thought the case an extremely hard one; and at all events, he trusted there were men in the House of Commons as well as in the House of Lords who would bring the case before the country, and insist on justice being done to this and other institutions of the kind. (Applause.) He might go once more to Government, but no more. He would not go dangling at their tail, but in hand, as if he were a beggar asking for some wretched pittance. (Applause.) If (said Dr Guthrie, in conclusion) the Government knew what the Directors of these institutions are doing, and what they themselves should do, instead of dealing with us in this manner, they would give us thanks and liberal support; but in the meantime we must trust to you the public. I tell you, good ladies, that I have far more faith to put in you than in any Government I ever saw—(loud cheers)—because you are the most potent of all Governments;—you have the heart to plan nobly; and then you govern your husbands and your fathers—(laughter and applause)—and command the purse; and now I tell you, in one word, that we have no others, under God, to trust to than you; and I am confident I shall not trust in vain. I got a letter two days ago, and I shall just lay it before you as an example. I am not going to say where it came from; but the writer says—

"I feel a great deal ashamed in writing you, as I am in a humble sphere of life, and you are so high; but I have been reading your book of late, "The City: its Sins and its Sorrows;" and I was so much struck with the misery of its inhabitants, and the evils of its shocking customs, that I send you 10s for the help of the church building"—that is in reference to the Pleasance Territorial Church;—"or you may give it to the Ragged School; bestow it upon which you think the most needful. I am a poor farm-servant; and it's all I can spare at present, as I have a widowed mother to support, and I am the only son." (Cheers.)

In reading this letter Dr Guthrie was deeply affected. He then said—There is a letter worth a thousand speeches. I will close with that letter. I have resolved myself, that rather than one of those children whom you saw on those benches (pointing to the orchestra) shall go to the street, I'll double my own subscription. If I can get the Government to give the money, I'll button up one pocket; but those children shall not be cast upon the street. (Cheers.) They shall not perish, if that arm (elevating his own) can keep them up. With the example of that one son of a widowed mother, and that son a common ploughman, who has to work with his hands to keep himself and to support the widow, with that example before us, is there a man or a woman in this assembly who won't come forward to save those who are ready to perish? (Loud and prolonged cheers.)

EDUCATION IN ICELAND.—Iceland, which has a population of about seventy thousand, is under the government of Denmark. "The language spoken in Iceland is the old Scandinavian, closely akin to the Saxon, with no admixture of Greek or Latin roots. It has, singularly enough, a literature 900 years old. There are four presses on the island, and four newspapers. About sixty volumes are published in a year, but most of them are published in Copenhagen. There are colleges and academies of medicine there, and common schools. But most of the education is domestic in its character. The fathers teach the children so effectually, that a young Iceland boy or girl of eight years old cannot be found who cannot read and write."

SPECIMENS OF NATIVE TALENT AND ATTAINMENT.

TOWARDS the close of every Term of the Normal School we are in the habit of presenting our readers with a few specimens of the powers and acquirements of the Students in attendance. These specimens are not got up for the occasion, or composed with the slightest intention of being printed.—They are part of the regular stated exercises of the Institution, and appear just as they were handed to the Principal. The following are all written by Young Ladies. We shall give a few specimens of the Young Gentlemen's capabilities in our next No.

PHYSICAL EDUCATION.

BY MISS E. B., YARMOUTH COUNTY.

Physical education is that branch of education which relates to the strengthening and developing of all the constituent parts of our physical nature. And as in practical education the teacher should adapt himself to the nature of the children he is about to educate, it is obvious that, in order to do justice to their physical nature, he should have an intimate acquaintance with Animal Physiology.

Physical education may be viewed both as a means and as an end, more especially as a means. In itself it imparts gracefulness of attitude, gives vigor and strength, and is a powerful preservative and supporter, or, rather, promoter of health. It is of immense consequence to the educationist, it arrests and keeps up the attention of the young, and thereby secures a greater amount of intellectual labor. The body may be viewed, concretely, as a whole; abstractedly, as composed of various parts or organs, so called because they perform certain functions or offices. These organs have been arranged as follows:—the nutritive, the supporting, the cutaneous, the muscular, and the nervous. We shall, as briefly as possible, consider each of these in its relation to education, and endeavor to show the connection between body and mind.

1st. *The nutritive system.*—Upon this system depends the ventilation and temperature of the school room, and is divided into the digestive, circulatory, and respiratory processes. By the digestive, the food we eat is converted into blood; by the circulatory, the blood is carried to every part of the system.—Now this blood is impure, and if not purified would carry disease and destruction with it; by the respiratory process, we inhale atmospheric air, which, coming in contact with the blood in the lungs, immediately a chemical change takes place, and that which before was a poisonous fluid is now converted into a source of life and health. How important, then, is it that provision be made for a proper supply of pure atmospheric air, which may be called our life; for we might live three weeks without eating, but life could not be sustained three minutes without breathing. The result of imperfect ventilation is but too apparent in its effects, mentally and physically, on teacher and taught. The children become mischievous and inattentive, the teacher fretful and exacting, and in many a one are sown the seeds of disease and premature death.

2nd. *The supporting system* consists of the bones, and the strengthening of these depends on the grading of the seats and desks. The bones are composed of earthy and animal matter. In children the animal preponderates, therefore the bones are more flexible and likely to be distorted than those of older persons. The great object is to keep them straight; in order to do this, the children should be made to sit and stand erect. The seats should be graded according to the size of the children, so that the feet may rest firmly upon the floor, and furnished with a support for the back. The desks should be made to correspond with the seats; if too high, one shoulder will be elevated and the other depressed, if too low, a stooping posture will be induced.

3rd. *The cutaneous system* has mainly to do with the cleanliness and order of the children at school. The human body

is subject to an unceasing process of waste and repair. The organs fitted for this especial work pass under the general designation of excretory or exhalants. The most important of these is the skin. The skin is composed of three parts. The first serves to protect the others, preventing too copious perspiration on the one hand and the absorption of poisonous vapors on the other. The second contains a peculiar kind of paint, which imparts color to the complexion. The third is the outlet through which a large proportion of the waste of the body passes through innumerable glands. In order to the preservation of health it is necessary that an equal perspiration be kept up in every part. The means to be employed for obtaining this end are bodily exercise, suitable clothing, bathing, and friction.

4th. *Muscular system.*—The exercise of the muscular system affects the nervous, and that the brain—the seat of thought. The muscles are made up of three parts;—the two ends called the origin and insertion, and the middle or fleshy part. As regards their working, they are divided into the voluntary and involuntary. The great law by which they are regulated is contraction and relaxation. For instance, when I stretch out my arm one set of muscles is in a state of motion, the other, of repose. A professional teacher will take advantage of this law to gain the attention of the children, and thus reach their intellect, for he may rest assured, if he do not make provision for the observance of this law, the children will take it themselves. Each muscle is furnished with a corresponding set of nerves, which are connected with the brain, and that with the mind, and the mind is affected by the will. This leads us to the last system.

5th. *The nervous system.*—The nerves have been divided into two classes; those by which our will shows itself, called *efferens*, and those by which the brain is affected by outward objects, called *afferens*. We have seen that the nerves and muscles are connected, therefore the same law regulates both. Then the strengthening of the muscles has the *anno-effect* on the nerves; this is done by physical exercise, and this exercise not only exerts a powerful influence over the muscles, but over every other system of organs. The greater the variety the more beneficial will be this exercise.

We have seen that all the organs of the body work in harmony, that each does its own work, and thus furnishes us with a good example of doing one thing at a time, and that there is an intimate connection between body and mind.

In concluding this vague and imperfect sketch of physical education, we would remark that, if any one has doubts on the importance of ventilation, &c. as regards education, he has only to contrast an old-fashioned school-house in which presides an old-fashioned teacher with the *Model Schools* of Truro.

We enter unperceived the first-mentioned school. After we have got inside, the first sensation is an alarming feeling of oppression which affects our heart as we contemplate the scene before us. Look at the children in all imaginable positions. See that poor little unfortunate who, because he is further advanced than others of his own age, is perched beside a boy as tall as his father, his brow contracted as if with pain, his little hand trembling with the effort to do the sum at which he has been puzzling the last hour, every moment getting more and more confused; presently the pencil drops and he bursts into tears. This arouses the teacher, who has been reclining in his easy chair in a state of dreamy unconsciousness except when disturbed by an unusual noise, he starts up and in a quick imperative tone demands the reason for all this noise; getting no answer he procures a large ruler and dents blows thick and hard indiscriminately upon innocent and guilty. We can scarcely repress a smile as we observe the mingled expression of terror and mischief in the faces of those three little urchins in the corner, who have been practising the art of carving on their desks. We hope they will escape, but no, they are *little boys*, and therefore must be whipped, however they content themselves with making faces at the teacher as soon as his back is turned. This uproar is succeeded by a calm; the teacher now calls up a reading class, we glance at the little creatures who slowly advance as

if they were going to prison; here we leave them and with a sigh of relief seek the pure air.

We then pass on to the Model Schools. We pause a moment to admire the neatness which pervades even the exterior; this admiration is increased when we enter. The children have just come in from recess, happiness beaming in their faces and delight sparkling in their eyes. The teacher is explaining a lesson in Arithmetic; all eyes are on him; no listlessness is there, no blistered hands, and, what is still better, no kindly feelings checked. The children evidently look upon their teacher as their friend. But we cannot do this subject justice; to be appreciated those who desire to hear it fully explained should visit the Normal School and listen to Dr Forrester.

INTELLECTUAL EDUCATION.

BY MISS L. M. P., ANNAPOLIS COUNTY.

In a former exercise it was shown that man is a compound being, made up of a body, intellect and conscience; the former of these was discussed under the head of Physical Education; at present we shall confine ourselves to the *Intellect*, leaving the Conscience or moral part for our future consideration.

The Intellect is composed of several faculties variously classified by different authors; we shall adopt Wayland's on account of its being the most simple and comprehensive. The following is his classification:—Perception, Consciousness, Original Suggestion, Abstraction, Memory, Reason, Imagination, and, pervading all, Taste. We will endeavour to speak of each of these as briefly as possible.

PERCEPTION is that faculty by which we obtain a knowledge of the objects existing in the external world. This is done by means of the five senses, the most important of which are sight and hearing, as they are the most closely connected with the Intellect. It is by means of this faculty that young children obtain all their knowledge, hence, it is the most exercised and consequently the earliest developed. One of the best means for cultivating the sense of Vision, is linear drawing; allowing the child to judge of height or distance, and then to ascertain by actual measurement whether or not he is correct, will give the eye a degree of accuracy in the observance of these things, which scarcely anything else will do. The ear may be cultivated by observing the intonations of the voice, and more especially by *music*. This should form a part of the exercises in every school, its place can be supplied by nothing else. Not only does it form an important means for the cultivation of the sense of hearing, but it has an elevating and refining effect upon the character. There are few so obstinate that they may not be softened and subdued by suitable music; it seems to have almost a magic effect in calming the mind, when agitated by energy and conflicting passions. This is why we so earnestly recommend its use.

CONSCIOUSNESS is the power by which we become cognizant of the operations of our own minds. It manifests itself in two ways; when the mind is contemplating external objects it is called attention, but when it considers its own conditions or operations, it is called reflection. This faculty is under the controlling influence of the will; or although ordinarily we are not conscious of any effort of the will, either, in attention or reflection, yet sometimes we may wish to call up and retain some mental state or train of thought, or to turn our attention to some particular object, this is done by a direct act of the will. The greater the power we have over this faculty, the greater will be our usefulness; for the brightest talents will be of but little benefit to us if we allow our minds to range from one thing to another as men's fancy may dictate. The best means that the teacher can use for the cultivation of this power, is to see that whatever lessons the children may have to learn, that they learn them thoroughly; they will thus acquire habits of close application.

ORIGINAL SUGGESTION is the power by which we form new ideas occasioned by the perceptive faculties or consciousness. For example if a child sees a certain effect produced

he will immediately ask why was it so? what was the cause which produced that effect? This spirit of inquiry should be encouraged; but instead of always giving the information desired, he should be led to think for himself, patiently to investigate the subject. Now ideas will thus arise in his mind, and the more attention he pays them the more abundant will they be.

ABSTRACTION. By this faculty we arrange and classify the knowledge which we have received. From the conceptions of individuals, we form conceptions of genera and species. This is done by three distinct acts of the mind; *Analysis* which separates the parts or qualities of the concrete object; *Generalization* which considers these parts or qualities as also belonging to their objects, and thus forming classes; and *Combination* by which when these qualities are considered in themselves, without reference to the objects to which they originally belonged, we may combine them with others. The subjects best adapted to this faculty are Grammar, Geology, or any science requiring classification.

MEMORY is the faculty by which we retain and recall the knowledge before acquired. The memory may be either susceptible, retentive, or ready in furnishing the required knowledge at the time when it is needed. A good memory possesses all these characteristics. There are also different kinds of memory, that is some will acquire one thing, with much greater ease than another, as for instance one person can remember every thing connected with numbers, while another, whose memory as regards numbers is comparatively weak, will acquire languages with facility. This faculty is very easily strengthened. We have but to exercise it, but in doing this we should see that we thoroughly understand the subject so that it be not a memory merely of words but of ideas.

REASON is the power by which we are enabled from the use of the knowledge obtained by the other faculties, we obtain other and original knowledge; from certain premises we draw certain conclusions, and by a series of mental acts, prove that if the premises be true, the conclusions to which we have arrived must be equally so. This is one of the highest powers possessed by the human mind, as we thus obtain knowledge which could be learned in no other way. It may be much improved by the study of Mathematics, that is, if this study is pursued in a proper manner; we should reason for ourselves, draw our own conclusions, and not merely follow the track which others have marked out. One thing is to be observed in the exercise of this faculty, never to attempt to reason without we have something to prove, a point to make out. This point should always be kept in view.

IMAGINATION is the power which we have of forming from the materials already existing in the mind, complicated mental images according to our fancy. By this faculty scenes of beauty and grandeur are found such as are rarely seen in actual existence. The imagination may be improved by the study of poetry, painting, or any of the fine arts, and especially by meditating upon the beautiful and sublime in nature.

TASTE is that sensibility by which we judge of the beauties and deformities, existing either in nature or in art, deriving pleasure from the one, and pain from the other. This differs greatly in different persons and depends much upon the degree of cultivation it has received. The above faculties are divided into two classes, those by which we receive our knowledge, and those by which that knowledge is modified, and rendered subservient to practical purposes. The first class is called the *Receptive* faculties and includes Perception, Consciousness and Original Suggestion; the latter is called the *Combinative* embracing Abstraction, Memory, Reason, Imagination and Taste. We have now given a description of the various intellectual faculties, the developing and strengthening of which is called Intellectual Education. This has been thought by many to consist merely in what is called the explanatory process, that is in so simplifying the subject, by means of the analysis of words and sentences, as to render it perfectly clear to the understanding. This undoubtedly forms a part, but it is not all. Intellectual Education is more than this, it not only conveys instruction, but it strengthens the powers of the mind, directs its energies aright, and fits us for

the performance of the duties devolving upon us. We shall now consider the *mode* in which this is to be effected which consists of two things presenting the proper food or the subjects suitable to the various faculties; and presenting them in the proper manner; what those subjects are we have already shown. The manner in which they are to be presented, includes the *theory* and the *practice*. The *theory* consists in coming down to a level with the understandings of the children, by means of illustrations borrowed from objects with which they are perfectly familiar; the *practice* consists in the mechanical process of Questioning and Replies. The former enables the teacher to ascertain the amount of knowledge possessed by his pupils, and thus is a guide to him as to what he has yet to communicate; the latter leads them to think for themselves, to exercise their own powers, and by this means they are led on from simple subjects to those which are more difficult, from the "known to the unknown," until their faculties are developed, and they are fitted for the prosecution of any study to which they may turn their attention.

We have thus given an imperfect sketch of Intellectual Education, according to the system adopted in this Institution; a system we hope soon to see adopted throughout the country, not because it is *ours*, but because it is the only one which adapts itself to the nature of the children to be educated. Already is the public mind awakening to the importance of this subject, the standard of education is gradually being raised, higher and higher, the qualifications which a few years since were considered sufficient for any teacher, will not satisfy the people now. This we consider an omen for good and attribute it in a great measure to the Normal School; and if its influence has already been felt, at so early a period of its existence, what may we not hope for and expect in the future, when thoroughly trained teachers, earnestly, enthusiastically devoted to their work shall have been scattered throughout the length and breadth of the land. No doubt the difficulties in the way are great and many, but patient perseverance will overcome all, and we yet expect to see our little Province ranked among the first countries in the world, as regards the education and intelligence of its inhabitants.

MORAL EDUCATION.

BY MISS J. H., COLCHESTER COUNTY.

In directing our attention for a few moments to this subject, which forms by far the most important part of the education of the young, it will be unnecessary to attempt to prove that every person is in the possession of a conscience; this being an acknowledged fact, and the foundation upon which Moral Education depends. Still the possession of anything is of little or no benefit, unless it be used, so is it with this portion of our compound nature, consequently, it is our duty to do all in our power to cultivate and improve the moral sense, which can only be accomplished by exercise. Moral Education then is the drawing out, unfolding, developing, and strengthening of CONSCIENCE, and its importance may be seen when we view it as soaring far above and beyond either Physical or Intellectual, as the helm by which these are regulated and controlled, and as bringing us into contact with divinity, as well as being the connecting tie between our present and future destiny. But in order to accomplish all this there must be something more than mere instruction in what is right and proper. This is necessary and is an instrument placed in the hands of the Educator, who must not only use it, but set before those placed under his charge, a good and consistent example. He must also insist upon the performance of what is right, and continuing thus until it has become by the force of habit, a second nature as it were. The value of such training properly conducted, and attended by the blessing of the Most High, cannot be over-estimated, and will exert a powerful influence over generations yet unborn, the welfare of which in a great measure depends upon the Teachers; this, then, should stimulate and encourage them in the performance of their duty. To them belong the privilege of sowing the precious seed, which, although it may not in the

mean time show any signs of germination, will retain this power and perhaps after the lapse of many years, if placed under congenial influence, will show that the seed has not been planted in vain.

Let us now glance at the nature of conscience, which is made up of various parts; these are three in number, and may be termed sensibilities—viz., Discriminative, Impulsive, and Emotional. By the first mentioned we are enabled to judge of an action, whether performed by ourselves or others, and perceive it to be either right or wrong. This sensibility is strengthened by reflecting on the moral character of our actions. An action may be said to be composed of four elements, 1st. The conception or thought of the thing to be performed. 2d. The resolution or act of the will in carrying this into effect. 3rd. The performance of the thing, and lastly, the motive by which we are actuated. It is the last of these that constitutes the morality of an act, and in the examination of our own actions it is from this point that we are to view them, and by this that they are to be tested. We should also meditate upon character of pre-eminent excellence, such as may be found in History, Biography, but more especially in the Bible. The second power of conscience is the impulsive, by which we are prompted to do that which we believe to be right, and to leave undone what we conceive to be wrong. This we strengthen by obeying its admonitions, and listening to its dictates. The third is the emotional, by this we experience a sensation of pleasure or pain when we do or refuse to do what conscience bids us. These mutually assist and operate upon each other. Conscience in order to be strengthened, must be used, and although it is susceptible of vast improvement, does not of itself constitute an infallible guide to our moral nature. This is in consequence of its having shared in the downfall of mankind, and thereby become enfeebled. It requires to be enlightened and directed, and although in this it is assisted by its own efforts, as well as the works of nature and Providence, these are of themselves insufficient, inasmuch as the first is not to be depended upon, and by the second we can form no correct idea of our relationship to a Moral Governor, and the last often comes too late. Thus we see that something more is necessary; and here comes in the aid of the Bible, the blessed word of God. It is this, and this alone, that can accomplish the desired end. Let us now show how the Bible should be used in Moral Education. It should be introduced into every school and used daily as a devotional book. As a text book under certain conditions, such as, That the children first be pretty good readers. It should not be imposed as a task, as this will have a tendency to give them a distaste for it. They should be taught to use it as the word of God, the teacher must use it as such himself, this may be indicated by the tone of his voice, his demeanour, &c. It is a valuable school book, in as much as it contains a greater variety than any other, and can be obtained at a lower price. It should also be used as it is given, its emblems and parables should be explained by the teacher; this he can do by borrowing pictorial illustrations from objects and things with which his pupils are perfectly familiar, and in this he has a perfect example set before him in the person and teaching of our blessed Lord, who in all his intercourse came down to a level with his audience, and made himself thoroughly understood by them. Its principles should be reduced to practice, we must not only show the children that such and such things are right, but we must train them to the performance of the right and to avoid the wrong. It should also be used as a standard of appeal, in order to deter from crime, as well as stimulate to duty, diligence, and good conduct.

For the carrying out of this an enclosed playground is necessary, for while the children are in the school-room they are under restraint, and it is only when they are set free, that their natural tempers and dispositions exhibit themselves. A gallery too should be provided, and Moral Education made to pervade the whole establishment. It is the most powerful instrument a teacher can wield in the securing of good order and obedience, as well as application and diligence, on the part of his scholars.

ATTRACTION—MODES OF DEVELOPMENT.

BY MISS L. E. K., TARMOUTH COUNTY.

The subject of *attraction* is one which presents to the mind of man an extensive field for observation and reflection: and its modes of development are so frequently illustrated that we are constantly reminded of its existence as a law pervading the material world.

The word attraction is derived from the Latin root *traho*, to draw and is modified by the prefix *ad* to, which becomes an euphony, and affix for, the act of: hence its signification—the act of drawing to.

There are various kinds of attraction, distinguished by different names according to the circumstances in which they act. The principal of these are, gravitation, combination, cohesion, adhesion, electricity, magnetic and capillary attraction, each illustrating itself by different modes of development.

The attraction of *gravitation*, which causes bodies to attract each other is regulated by density and distance. This is illustrated in all falling bodies; the greater their density the more strongly are they attracted to the earth, and as they approach its surface their velocity increases in geometrical proportion. The motions of the heavenly bodies also furnish us with striking examples of the law of gravitation, as they move harmoniously on, pursuing their path around the great centre of attraction: never intercepting each others course but marvellously executing the designs of Him who sets the bright procession on its way, and calls each starry world by name, though countless as the drops of morning dew.

The attraction of *combination* takes place between heterogeneous substances; and always produces a distinct result, different from either of its components. It has four modes of development, namely, the combination of *mixture* which causes substances to mingle in various proportions, and form a distinct result without any chemical action; the combination of *diffusion* which also causes substances to unite indefinitely, but which is accompanied by chemical action; the combination *solution* definite and not attended with chemical action, and last of all, but not least *chemical affinity*; which is not only a definite combination, but corpuscular action takes place between the particles.

We have familiar illustrations of these different forms of combining attraction in the mixing of paints, the diffusion of alloys in coining. The solution of solid matter by liquids, and the manufacture of soap, glass, salt &c.

The process of chemical combination is regulated by certain laws, such as follows: the union takes place between two or more different substances—these unite their smallest atoms, and in certain definite proportions *viz constant reciprocal multiple and compound*—a change of temperature takes place and a distinct body is formed; possessing attraction in proportion to the force required for the separation of its particles.

The attraction of *cohesion* takes place between bodies of the same nature, whose particles unite and form a mass or aggregate. This law is developed in the formation of minerals, and each body thus formed assumes a certain definite shape or crystal: its forces and angles being regulated by the nature of the substance in process of consolidation.

Bodies besides taking a certain form become specially dense, porous, hard, elastic, ductile and brittle according to the nature and form of their particles, the circumstances in which they combine &c.

The attraction of *adhesion* takes place between heterogeneous substances, either before or after combination and cohesion. We see it illustrated in solids adhering to solids, liquids to liquids, airs to airs, liquids to solids, solids to airs, and airs to liquids. Solids adhere to solids in the structure of rocks, liquids to liquids in the formation of the ocean, airs to airs in the composition of the atmosphere, liquids to solids in capillary attraction, solids to airs in the mixture of poisonous matter, resulting from vegetable decomposition, with the surrounding atmosphere, and airs to liquids in the distribution of the vital fluid throughout oceans, seas, rivers &c., by which the tribes of the deep are sustained.

Electrical attraction is that excited by friction in certain substances; *magnetic*, that which inclines bodies to point constantly towards the poles of the earth, and *capillary attraction* is that which causes fluids when in confined situations, to rise above their level in *capillary tubes*.

Thus whether we survey the starry sky, the rolling billows, the rock-bound coast, the sparkling diamond, the falling rain, or the pearly dew-drop—we are constantly reminded of that law which "moulds a tear, and bids it trickle from its source;—which still preserves the earth a sphere, and guides the planets in their course."

III.—OFFICIAL NOTICES.

The Winter Term of the Normal School will close on Thursday, the 29th instant, and the next, or Summer Term, will commence on Wednesday, the 9th of May. None can be admitted after Wednesday, the 16th. As we are still receiving letters of enquiry regarding our arrangements in Normal School, we publish below the statement that has appeared more than once in our columns. We commend it again to the perusal of those who wish for information on this subject.

STATEMENT RESPECTING THE PROVINCIAL NORMAL SCHOOL.

Notwithstanding all the efforts we have made to diffuse information regarding the proceedings and workings of this Institution it appears from the notes of enquiry we are almost every week receiving, that no small amount of ignorance still prevails. On this account we have felt it to be our duty to draw out a sort of programme of its more prominent features and operations, which we purpose inserting in several numbers of this *Journal*, in the hope that we shall thereby save ourselves much time and labour in correspondence.

OBJECT OF NORMAL SCHOOL.

The object of this Institution is to qualify those who intend to devote their time and energies to the education of the young for a more efficient discharge of their duties; and this is done in two ways, first, by more accurate and extensive attainment in all the branches of a common and more advanced education, and secondly, by an acquaintance both theoretical and practical with that system of education generally designated the Natural or Training System.

SUMMER AND WINTER TERMS.

There are two Terms in the year, the Summer and Winter, the former commencing on the Second Wednesday of May and finishing on the last Thursday of September, the latter commencing on the second Wednesday of November and finishing on the last Thursday of March. In Summer the School meets at 8 o'clock A. M. and closes at 3 o'clock P. M., and in Winter at 9 o'clock A. M. and closes at 4 o'clock P. M., with an hour's interval. None are admitted later than a week after the commencement of each Term. Licensed Teachers may attend as spectators, but they cannot graduate unless they enrol as regular pupils, and attend the whole Term.

ADMISSION OF PUPIL TEACHERS

Each Board of School Commissioners has the right of sending to the Normal School, at the commencement of any of its Terms, one pupil, either male or female, for every one hundred pounds received by the Board from the Provincial Treasury. The Principal may admit twenty additional Pupil Teachers on their being examined and taking the necessary pledge. All licensed Teachers are admitted. The Principal may admit ten pupils, not intending to teach in this Province, at such rate of fees as he may think proper, (£2 per Term is the fee charged.) None are admitted save those above sixteen years of age, and who are able to stand a satisfactory examination in Reading, Spelling, the simple rules of Arithmetic, the elements of Geography and of English Grammar.

All regular Pupil-Teachers, when enrolled, declare it to be their intention to devote themselves to the profession of teaching within the Province for three years at least.

COST OF ATTENDANCE AT NORMAL SCHOOLS.

Instruction and the use of Text-Books are free to all Pupil Teachers.

Boards of School Commissioners are required to pay the traveling expenses of the Pupil Teachers they recommend, to and from the Normal School, at the rate of 2d. per mile.

The Pupil Teachers have nothing to pay save Board and Lodging, which they may obtain in and around the village of Truro from 8s. to 12s. per week. The whole actual cost of Term will thus be about £10.

TEACHERS OF NORMAL SCHOOL.

Principal and Lecturer on Professional Department and Natural Science, Rev. A. Forrester, D. D.; English and Classical Department, C. D. Randall, Esq.; Mathematics, Natural Philosophy, &c., W. R. Mulholland, Esq.; Theory and Practice of Music, Professor Williams.

COURSE OF STUDY PURSUED.

English and Classical Departments.—All the Branches of an English Education commencing with the very elements and proceeding to the more advanced,—such as Reading, Spelling, English Grammar, Composition, Geography in all its branches, History, Astronomy—Classics, from Grammar up to the highest Classical Authors, according to the nature of the Diploma for which the Pupil Teachers intend to compete. French is also taught. Books used in English—Irish National Series, Reid's Composition, MSS. Lectures by Master—Classics, Latin and Greek Grammar of Edinburgh Academy, with Delectus—Anthon's Edition of Classics—Ain's French Grammar.

Mathematical Department. Drawing and Penmanship—Mental and Slate Arithmetic, Geometry, Algebra, Use of Globes—Outline Lectures on Natural Philosophy. Books used—National Series, Thomson's Arithmetic, Euclid's Geometry, Chambers' Algebra—MSS. Lectures by Master.

Professional Department.—Course of Lectures on Teaching as a Calling or Profession, embracing the What, the How, the Who and the Wherewithal, or the Science, the Practice, the School-Master, and the whole support of this branch of the public service.

Under the Science of Education, after presenting an outline of the whole, the Physical, Intellectual and Moral Education of the young is discussed in all its aspects and bearings, in connection with a regular Course of Lectures on Animal Physiology, on Intellectual and Moral Philosophy.

The How embraces everything appertaining to the Practice of Education;—such as School Premises, School Organization, School Government—Different Systems of Education—Different Branches taught in Common and more advanced Schools—System adopted, its distinctive features and its application to the various branches taught.

Under the Who comes everything belonging to the Living Agent, the Schoolmaster;—such as the Office of Teacher—his Qualifications and means of obtaining them—his Duties—his Difficulties and his Rewards.

Under the Wherewithal falls to be considered whatever belongs to the External System;—such as the Party on which devolve the responsibility of this branch of the Public service—The mode of raising the Adequate Support—External Systems of National Education, with an examination of the system pursued in this Province.

From the connection subsisting between one prominent feature of the Training System and Natural Science, Dr. Forrester also delivers an Outline Course of Lectures on Chemistry, Mineralogy, Botany, Zoology and Geology, all which are applied to the scientific cultivation of the soil.

Music.—Instruction is given twice in the week on the Theory and Practice of Music,—the great aim being to make the Pupil Teachers acquainted with ten or a dozen tunes, so as to enable them the better to carry out the various physical exercises, &c. of the system.

CONNECTION BETWEEN NORMAL COLLEGE AND MODEL SCHOOLS.

Six weeks after the commencement of a Term, the students of first section are required to go into the Model Schools, first as spectators, and then as practitioners,—at least, for two or three hours every week. For example they have received, in course, instruction in the way in which Mental Arithmetic should be taught in accordance with the Training System. But they require to see that mode exemplified; nay more, they require to practice it themselves, ere they can teach it with efficiency. And all this they do, first, in the Primary, then in its more advanced stage, in the Intermediate, and more advanced still, in the High School department,—and so on with the other branches. The other sections of Pupil Teachers pass through the same ordeal though, in consequence of their deficiencies in scholarship, they cannot afford to give the same time to the Model Schools.

MODEL SCHOOLS.

These schools are erected within a few yards of the Normal College and are intended to furnish the best exemplification of the Training System, as well as to afford a favorable opportunity for the Pupil Teacher to Practice the same.

They consist of three departments, Primary, Intermediate, and High, with Female Industrial, and embrace all the branches of a Common and Grammar School education, including the higher branches of Mathematics, Greek and Latin, with French and German.

Teachers—Miss S. CHRISTIE, Primary.

Mrs JANE GREAVES, Female Industrial.

Mr J. B. MILLER, Intermediate.

Mr J. B. GALVIN, Head-Master.

The fees paid in advance are, per quarter, for Primary, 6s. 3d.; for Intermediate, 8s. 9d.; and for High School, 11s. 3d. The commencement of Quarterly Terms is the first of May, August, November, February, and none are afterwards admitted without paying the full fee. Holidays from the 15th July to 15th of August.

The Books used are the Irish National Series, with Edinburgh Academy Greek and Latin Grammars—Ain's French and German Grammar.

In consequence of reports that have reached Dr Forrester regarding the state of the Roads and Bridges in Cape Breton at this season, he has been reluctantly induced to postpone his proposed visit to that Island, till the month of September, and to proceed on his Western tour soon after the termination of the Winter Session of the Normal School.

Dr Forrester intends to be at the following places, to hold Teachers' Institutes, and to address public meetings, at the time below stated:—

Chester—Friday,	6th April.
Launenburg—Saturday,	7th “
Bridgewater—Monday,	9th “
Brookfield—Tuesday,	10th “
Milton—Thursday,	12th “
Liverpool—Friday,	13th “
Shelburne—Saturday,	14th “
Clyde River—Monday,	16th “
Barrington—Tuesday,	17th “
Argyle—Wednesday,	18th “
Yarmouth—Thursday,	19th “
Beaver River—Saturday,	21st “
Clare—Monday,	23rd “
Weymouth—Tuesday,	24th “
Digby Neck—Wednesday,	25th “
Digby—Saturday,	28th “
Annapolis—Monday,	30th “
Bridgetown—Wednesday,	2nd May.
Lawrencetown—Thursday,	3rd “
Wilmot—Friday,	4th “
Kentville—Saturday,	5th “
Lower Horton—Monday,	7th “

IV—EDUCATIONAL INTELLIGENCE.

EDUCATION IN UPPER CANADA.

Dr Ryerson's Report of 1858 exhibits, on the whole, the healthy progress of the common school system. Although the presence of “hard times” makes itself manifest in the falling off of the aggregate sum raised for their support to the extent of \$19,927, the average duration of school teaching shows a slight increase. The diminution of trustee school

rates, so far from involving lessened efficiency; was felt in the decrease of the amount expended upon school sites, and the erection and rent of school-houses. The number of Common Schools open was 3,866—an increase of 135; of children attending, 293,683—an increase of 21,046. The municipal assessments for school purposes show an advance of \$22,687; and the aggregate amount paid to teachers an advance of \$60,402.

The total receipts for Common-School purposes during the year, were \$1,244,488—a decrease, as we have said of nearly \$50,000. The total amount paid to teachers \$920,683. The total expenditure for the purchase of school sites and the erection of school houses, \$173,625; for books and other incidentals \$102,838. The Legislative school grant apportioned to the municipalities was \$133,000; the municipalities having contributed \$270,503—not less than \$137,503 in excess of the sum required by the law, and \$22,687 more than that raised in 1857.

The "school population," technically so termed—that is, children from 5 to 16 years of age—is set down at 360,678; though under the amended law the right to attend the school extends to all under 12. The boys attending Common Schools numbered 160,033; the girls, 122,050; an increase of more than 10,000 in each item. Of first class Common School teachers there were 856; of second class, 2,364; of third class 883; the decrease being only on this the lowest class, in each of the two better classes, there was increase. An infinitesimal reduction in the average salaries paid to teachers is noticed—those on males having been reduced \$7 on the year, those of females \$12. The average as it stood was \$154 to the former \$242 to the latter.

An addition of 250 was made to the number of school sections; the total being 4,267.—Schools actually open are stated at 3,866—an increase of 135. A gratifying growth of public feeling in favour of free schools is observable. The total number of these schools, all told, now deriving succour from rates-bills, levied upon the parents of pupils in attendance.—Throughout Upper Canada, the average period of keeping open schools was ten months and 12 days. 169 school houses were built during the year; "a large number considering the times," remarked Dr Ryerson, "but a decrease of 43 as compared with the number built the preceeding year." In 1,708 schools the daily exercises are opened and closed with prayer, in 2,510 the scriptures only are read.

In reference to Roman Catholic Separate Schools again, public opinion is quietly and slowly, but surely, making itself felt. Whilst despite all difficulties, non-sectarian common schools increased in the year, 1858, there was a decrease of 6 in the number of separate schools. The total number of these schools was 94, of which 6 are in Toronto, 8 in Ottawa, and 2, respectively, in Hamilton, Guelph, London, and Kingston. The whole number of pupils was 9,991, an increase of 27. Besides falling off 6 in number, these schools evidently decreased in efficiency. Thus, the average time during which they were open was 10 months—a decrease of nine per cent, as compared with 1857. The amount raised and paid to teachers showed a decrease of eleven per cent; the expenditures upon sites, buildings, and repairs, a decrease of twenty per cent; the aggregate revenue from all sources a decrease of fifteen per cent. The comparative costliness to the Province of these separate schools is very apparent. The apportionment of the Legislative grant to public, unsectarian schools was on the average less than forty-four cents for each pupil; whilst to the separate sectarian schools it was more than eighty-six per pupil. "Thus," remarks the Chief Superintendent, "just twice as much has been paid to the separate schools according to the reported aggregate attendance of pupils, at the public schools, and fifty cents more per pupil according to the reported average attendance. This ought not so to be. The reason of this difference is," he adds, "that the returns from the trustees of separate schools show a larger average attendance of pupils than do the return from local superintendents in regard to the public schools; and the benefit of every doubt and of every doubtful return has been given to the separate schools." Another circumstance renders

the injustice to the general public yet more clear. The amount paid to separate schools from the Legislative grant was \$8,531; the amount paid by their supporters was \$19,599, or less than two and a half times the amount paid from the public chest. On the other hand the amount paid from the grant to non-sectarian schools was \$123,993, and the amount contributed by their supporters, \$1,083,836—nearly nine times the amount of the grant. So that to borrow the words of the Report, "while one hundred per cent more has been paid out of the Legislative School Grant to separate schools than to the public schools in proportion to the whole number of pupils taught in both, the former have done only one fourth as much as the latter for the support of their schools in proportion to the amount of Legislative aid granted to them."

Turning to Grammar Schools, we learn that they numbered 75, including 31 Senior County Schools. The total receipts in the year were \$75,617—a decrease of \$10,631, chiefly under heads not lessening the immediate working of the institutions. \$61,073 were paid as salaries to masters—an increase of \$3,620. An increase of nearly ten per cent is noticeable in the number of pupils, which is stated to have been 4,459; of whom 1,724 were learning Latin, 378 Greek; and 851 French. The Report of the Rev W. Ormiston, the Inspector of Grammar Schools, does not convey a very lofty idea of their management, the qualifications of their masters or the progress of their pupils. He speaks indeed, of "the steady onward progress of these schools in character and efficiency;" but the details of his statement scarcely sustain the remark in any other than a limited and relative sense. Comparatively they may exhibit improvement. Absolutely they are far from satisfactory. Dr Ryerson maintains with great reasonableness that before any considerable improvement can be effected, Grammar Schools must be "made the schools of the cities, towns, or incorporated villages within the limits of which they are situated, and the trustees invested with the powers of the trustees of Common Schools, and the Grammar School fund distributed upon the same condition as the Legislative school grant—namely, that of the municipality raising a sum equal to that apportioned from the Parliamentary grant. If Grammar Schools exist at all, they ought to be made as efficient as possible." The justice of the remark, and the urgent need of this or some equally efficacious remedy, cannot be better exemplified than by the present condition of the Toronto Grammar School. With highly qualified masters, and with a body of pupils whose progress will bear advantageous comparison with that of more pretentious institutions, the school is conducted in a building which is a disgrace to the city, and its efficiency is crippled by a parsimony that is unknown in the management of Common School affairs.

In the first session of 1858, the students admitted to the Normal School numbered 162; in the second session 196.—The whole number admitted since 1847 reached 2,463, of whom more than one half had previously been teachers.

The sum expended for free public libraries was \$3,982; of which one half was raised locally, chiefly from rates. From the commencement of the system to the end of 1858, not less than 178,367 volumes were forwarded to these libraries. In addition, sundry Mechanics' Institutes have received libraries from the Depository; Guelph taking the lead in the number of volumes, followed by Cobourg, Chatham, Thorold, Oakville, Whitby, and so on. Of the 42 counties which have been supplied with the free public libraries by the department, York stands highest, having received books to the value of \$7,510; Oxford comes next, with \$4,899; Peel, \$1,520; Northumberland, \$1,140; Huron, \$3,519 Ontario, \$3,940; Lanark, \$3,354 Middlesex, \$3,292. Of the cities Toronto received in value \$1,823; Hamilton \$1,580. Of the towns, Cobourg stands first, \$531 being assigned to it; Collingwood second, \$394. Amongst incorporated villages Flora has the largest share—\$482; Ingersoll \$105; Smith's Falls, \$113; Oshawa, \$400.—*Toronto Globe*.

EDUCATION IN FRANCE.

Before 1789, religious zeal, the spirit of association, the desire of living honorably in the recollection of mankind as the founder of pious or learned institutions, individual enterprise, and to some extent government endowment, had covered France with establishments of higher education, and with men consecrated to their service.

These institutions were, however, for the most part, devoted to the study of classical literature and were neither intended, nor adapted to impart instruction to the masses.

Up to this time, no provision had been made for the education of that vast majority of the community, who for want of means, were unable to avail themselves of the advantages of a collegiate course.

In 1789, France was as well provided with Grammar schools and colleges, as it was in 1849.

The revolution which ended in 1794 was in a great measure caused by the want of education among the common people; and at that time many of the public institutions of learning, some of which had existed for centuries, were deprived of their endowments, and were never again re-established.

In 1791-1794 the Convention first projected a system of public schools, in which primary education was to be free to all, at the expense of the State.

At the same time the first Normal School in France was instituted, but the confusion which followed the revolution interfered to prevent the country from reaping its legitimate fruits. After a brief existence of one year it was overthrown.

In 1802 a fruitless attempt was made to resuscitate it, but amid the din of arms and the struggle of nations the interests of education were overlooked.

It was not until 1808 that a complete system of national education was established in France. In that year Napoleon organized the Imperial University, which comprised all the public educational institutions in France, from the highest Colleges to the most elementary Primary Schools.

The head of this Institution, comprising almost all the highest Colleges, was located in Paris, but its ramifications extended over all the Empire, and hence the term Imperial University must be regarded as synonymous with the National System of Education.

It is worthy of remark that the Emperor Napoleon, in one of his decrees respecting this very Institution, ordained that primary instruction, which was intended for the masses, should consist only of Reading, Writing and Arithmetic, and the legal authorities were commanded to see that the teachers should not overstep these limits.

With views little if at all extended, the system of public education continued to be administered until 1830.

In the following year the French Ministry, with the consent of the King and Chambers, sent one of their ablest and wisest citizens, M. Victor Cousin, to Prussia, to take lessons in the art of teaching youth; this is the more remarkable, as the French and Prussians, in the recent wars, had mutually inflicted the most bitter humiliation, and might therefore be supposed to entertain for each other feelings far from amicable.

It is cheering to see that a people, so proud and jealous of their honor as the French, could manifest so noble an example of high moral courage, and it is equally so to know that they enjoyed a rich harvest of reward.

It has been asserted, with truth, "there is nothing in the history of modern civilization more truly sublime than the establishment of the present law of Primary Education in France."

This law passed into force in 1833; it was framed upon the system of Prussia, as a basis, without, however, ignoring the existing system, established by Napoleon in 1808.

This Imperial University then, for it still retains the name, consists of 26 Academies, each of which comprehends two or more of the departments into which the kingdom is divided, and contains one or more Royal Colleges.

The head of the whole is the Minister of Public Instruction, an officer first appointed by Napoleon in 1808. In

1824 this officer was exalted to a seat at the Cabinet Council of the Monarch, which consists of nine members.

The presiding officer of each Academy is a Rector, who is appointed by the Minister of public Instruction, and is assisted by two Inspectors and a Council. The governing body of each Academy Superintends all Communal Colleges, Institutions, Boarding Schools, Normal Schools, and Primary Schools within the district which the Academy comprehends.

In 1841, a law was passed rendering it obligatory upon parents to send their children to School until 12 years of age, and only releasing them then, upon the certificate of the Mayor of the district, that they had received the course of primary instruction.

One distinguishing feature of the French National System of Education, is the appointment of all professors, above Primary Schools, by public competition.

This trial includes both the amount of knowledge possessed, and the capacity for imparting it.

For each department, there is an Inspector, and when necessary, he is furnished with one or more assistants. The Inspector must visit every School in the department at least once a year, and enquire into the state of the School-house, the classification of the School, its moral character, and its discipline.

The Inspectors are required to pay particular attention to the Normal Schools. In 1843, there were 87 Inspectors, and 114 sub-inspectors.

The general inspection of the Schools of each arrondissement is assigned to a Committee of the arrondissement, consisting of the Mayor, the Justice of the Peace, and a Pastor of each religious denomination recognized by law, a professor of a College, or of a School of secondary instruction, a Primary Schoolmaster, three members of the Council of the arrondissement, and such members of the Council general of the department as reside in the arrondissement.

The local management of a Primary School is entrusted to a Committee of the commune, consisting of the Mayor, the president of the Council, the Cure, or Pastor, and one person appointed by the Committee of the arrondissement in which the commune is situated.

Each department must for itself or in conjunction with a neighbouring department support a Normal School; the salary of the Director of this institution is borne, in part by the department, and in part by the state; the salaries of the assistant teachers are borne by the department.

The expense of the Normal pupils for board is borne by themselves, unless they enjoy the scholarship.

In 1846, there were 92 Normal Schools, 96 of them for educating male teachers, and 16 for females, of these 52 have land attached, for affording instruction in Agriculture or Horticulture.

While a large part of the salaries of Primary Teachers is paid by the State, School fees are also demanded from those who are able to pay them.

If the commune be able to furnish the fees—they must be promised by the department.

In 1838, the grant paid by the State amounted to \$3,800,354.

In 1837, the University of France or National System of Education consisted of

- 41 Royal Colleges,
- 318 Commercial Colleges,
- 146 Institutions,
- 1114 Boarding Schools,
- 54 Normal Schools,
- 42,318 Primary Schools.

These numbers have probably doubled since that time.

The foregoing does not include some institutions recognized by law, such as the College of France, the Museum of Natural History, Ecole des Chartes, School of Oriental Languages, the French Institute, and other Societies for the advancement of knowledge.

AGRICULTURAL.



OFFICIAL NOTICES.

Dr Forrester intends to visit the Western parts of the Province during the month of April, and is desirous to confer with the office-bearers of the different Agricultural Societies as he passes along. He will correspond with the Secretaries of these Societies, apprizing them of the time when he will be in the different districts.

ANSWERS TO CIRCULAR.

QUERY IV.

What is the average quality of Arable Land cultivated by each Farmer in your district, and what the proportion of Grain and Root Crops?

This query is made up of two members, first the average quantity of arable land cultivated by each farmer, and, secondly, the proportion of that land under grain and root crops; and these we shall briefly advert to in order.

In reference to the first of these points, there is the greatest possible diversity of answers given, some saying that the average number of acres under cultivation in their locality is 20, others 25, others 30, and others 40, and a few as high as 50. Perhaps the average amount of the whole may be between 25 and 30 acres, a full third more, we believe, than the greater proportion of our farmers can do justice to, either in the way of cultivation or fertilizing.

The common objection brought against farming in this country, as an investment of capital, is the expense attendant on manual labour. We have made diligent enquiry into this subject, and find that the wages of good farm servants are as low, if not lower, in Nova Scotia than they are either in Canada or the Northern States. Neither is the difference of the value of manual labour in this and the mother country so great as many seem to imagine. In Scotland, where Agriculture is, perhaps, in a more advanced state than in any other country in the world, good farm servants can be had at from £30 to £36 sterling per annum.—In Nova Scotia the best farm servants do not cost more than from £45 to £50 currency, and when engaged a whole year they may be obtained for a considerably less amount. The greatest drawback in this country, is not so much the cost as the scarcity of thoroughly trained farm servants. This,

in a great measure, is to be ascribed to the present condition of farming operations, the services of such being required only for six weeks or so in Spring, and the same time in Harvest, and the consequence is that no regular class in the community give themselves up to such an employment, and of course there can be but little proficiency arrived at. We lay the blame of all this state of things at the doors of the farmers themselves. We ascribe it entirely to a want of system in their farming operations, their making their Agricultural pursuits more a matter of convenience than a regular systematic business, demanding all their time and energies in Winter as well as in Summer.

But what in the mean time is the farmer to do, so as to render his occupation profitable? How is he to make up for the deficiency and expense of farm servants? First, he may do much by the aid of improved Agricultural implements, and by the employment of the labour of horses instead of oxen. A man with two horses and improved implements, on land under thorough cultivation, will do more in one day, and that a great deal more thoroughly, than in the old fashioned style, with his team of oxen, he would do in two.

But the most effectual of all remedies to this evil, as it is reckoned by not a few, is by the farmers diminishing by one half the quantity of their arable land. We have already stated, and we reiterate the statement, that the great majority of our farmers cultivate, or rather attempt to cultivate, at least a third more than they ought to do. They can neither cultivate the soil to one half the extent it requires, nor have they the means of supplying anything like an adequate quantity of proper manure. And the result is, they have not above half the return of what they might and ought to have. Let them reduce their cultivated land one half, let them expend all their skill and energies in its cultivation, and let them give their soil just about double the quantity of manure they have been in the habit of doing, and let them do it judiciously; and their produce will not only be equal to, but double to, that yielded by the old breadth of land, and what is produced will be of much richer and superior character. Thus, with the same amount of manual labour and the same quantity of manure, double the return will be made; and the greater the skill and the science brought to bear on the cultivation of the soil the greater and more valuable will be the return. And this remark is of universal application, to roots as well as to grain, to the pasture as well as to the hay crop.

Another saving of labour will arise from the systematic alternation of cropping, but on this we cannot again enlarge.

The other member of the query, the proportion of grain and green crops, is of equal, if not greater, importance.—The majority of returns go to show that a comparatively small portion of the arable ground is devoted to green cropping or root crops. A considerable breadth of potato is no doubt planted in some districts, especially in those where the rot has proved less destructive, but independently of the still precarious character of this crop, it is not so generally useful in the feeding of stock as the turnip, or mangold wurtzel, or carrot. Of these last mentioned roots there is nothing like a fair proportion grown even in the best farming districts in the Province. It is true that in some localities we see on one farm the breadth of one acre of turnips, and about the half of carrots, but even such a quantity is

but rarely witnessed, and, so long as matters remain in this state, we unhesitatingly predict no great advancement in the cause of Agriculture in this Province. It is now, we believe, universally admitted that the large growth of the turnip in England and Scotland has been the main cause of the revolution in Agriculture which these countries have undergone within the last twenty-five years, and we have no hesitation in saying that an equal, if not a greater, revolution would take place in this country were the same means resorted to.

One of the most common and formidable objections brought against Agricultural pursuits in Nova Scotia is the length and severity of our winters, the expense thereby incurred in the keep of the stock, and the necessary short time allowed for spring labour. There may be some ground for this objection, though, when we compare the number of real working days with that of countries that have reached the highest celebrity in Agricultural pursuits, we are persuaded there is no small amount of exaggeration connected with it. But be this as it may, the real question is, Do the farmers make the provision they ought to meet our protracted and severe winters, do they avail themselves of the suitableness of the climate for the growth of those articles that are adapted to this state of things? We are persuaded they do not. And here we cannot help noticing, generally, the very remarkable adaptation of the vegetable to the animal kingdom. Why, for example, do the watery and juicy and luscious fruits grow most luxuriantly in tropical climates?—For the plain and obvious reason that they contribute more to the comfort and nutriment of the animal kingdom, and, especially, of man. In these climates there is an unceasing exhaustive process going on by the drainage of the fluids through an over copious exhalation—and hence the supply furnished by the infinitely wise and good Creator for the purpose of meeting this state of things. For the very same reason is it that biennial plants grow in this country with such exuberance. This class of culinary plants, such as the turnip, carrot, &c., deposit all the nourishment they have absorbed and assimilated during the season in the root, as in a common storehouse. And for what? That the animal kingdom may be supplied with cellular tissue in a fresh and nutritive condition. Nowhere in the world, we believe, do biennial plants grow more luxuriantly than they do in Nova Scotia. And is not this of itself a sufficient evidence of the provision that the Creator has made for the sustenance of the animal kingdom during our protracted winters, and the solemn responsibility thereby imposed upon the farming population to grow even a larger proportion of such crops than is done in other countries, that instead of requiring to depend almost entirely on the dry insipid hay, they may have an abundant supply of one or other of these roots fresh and nutritive. Let, then, every farmer who has twenty-five acres of land under the plough sow five of these with turnips and cultivate them thoroughly, so that there shall not be less than five hundred bushels per acre, and the whole of our Agricultural state would undergo a radical change, would enter on a high and glorious career of extension.—Among others the following effects would inevitably follow.

1. It would render the farmer in a great measure independent of his hay crop, so that in a year of scarcity he would not be under the necessity of disposing of his cattle at a heavy loss.

2. It would improve more than anything else the breed

of cattle. It would soon be found that the same quantity of turnips would add more to the weight of one animal than another. Attention would thus be more generally drawn to distinctions of breeds,—to the value of family and individual constitution among our domestic animals.

3. It would vastly increase the bulk and fertilizing qualities of the stable manure, and thus produce a revolution in the growth of his grain crops.

4. It would attach a far greater importance to the growth of artificial grasses and clovers; giving thereby a richer and earlier bite of grass in spring and a larger crop of hay.

5. It would inevitably lead to a systematic rotation in cropping.

6. It would demand a more constant and careful working of the soil, both in drainage and subsoil ploughing.

7. It would improve the whole matter of Agricultural machinery and farm labour.

This is the place, did our time and space admit, for offering some practical remarks on the growth of these green crops. I should have liked, for example, to have enlarged on what appears to me to constitute the originating cause of the failure of the potato crop, the innumerable benefits that have flowed therefrom, physically, socially and morally, and the mode that should now be pursued both in reference to the nature of the soil, of the fertilizing media, and of the set or plant most likely to secure the return that will prove most beneficial to the animal kingdom. I should have liked, too, to have discussed various topics connected with the growth of the other root crops, such, for example, as the difference in their chemical ingredients between the potato, the turnip, the carrot and the mangold wurtzel, and, by consequence, the most appropriate use of them all, and the superior claim of the one to the other for this or that object, and still more the treatment that each should receive so as to secure the best and largest return, whether that appertains to the nature and cultivation of the soil, the kind and application of the manure, the different sorts of each, and the selection of the seed, the management of the young plant both in thinning and cleaning, and lastly the storage. But all these points we purpose to discuss *seriatim* in the *Journal of Education and Agriculture*, and in the mean time must refer those interested in these themes to Dawson's *Agriculture in Nova Scotia*, to Judge Peters' *Treatise on the Growth of the Turnip*, or still more elaborately to Johnston's and Norton's *Lectures on Agriculture*.

For the Journal of Education and Agriculture.

CULTURE OF TURNIPS.

Among the many varieties and sub-varieties of turnips in use, both in Great Britain and in this country, there are but two or three kinds that deserve the attention of the farmer in Nova Scotia and Cape Breton. Among these the Swedish Turnips deservedly claims our first attention, as they possess many advantages to the farmer in this country over any other variety now in use; in the first place, they are not subject to the ravages of the caterpillar, as the different varieties of the White and Yellow Turnips; secondly, they are more nutritious, yield more weight of crop per acre, and keep longer and better in the spring for feeding stock than any other kinds of turnips now in use. The next to the Swede is the Aberdeen Sugar Yellow. This is a very handsome turnip—it buries itself considerably in the ground, is highly nutritious, and one of the most approved of the va-

rieties lately introduced of the yellow kind. The Border Imperial Purple Topped Yellow. The following particulars respecting this variety are given by Mr Hogg:—"This turnip possesses all the qualities of the Swedish, with the advantage of being a much freer grower—it produces a larger crop than the White Globe, is a good feeder, and stands the winter better than any of the common Yellow—it is in full perfection for using in February, and continues for as long a period as the Swedes, and, should the latter fail, the Border Imperial, being sown as late as the month of June, yield a crop equal, if not superior, to what might have been expected from Swedes had they succeeded. The writer of this article has had nine years experience in raising turnips in this Island, and during that period had an average of from two to three acres under turnips, and I may truly say that I never failed in raising a fair crop of that useful root, and from the lowest to the highest yield, obtained during the above named period, was from 350 to 750 bushels per acre, producing an average of about 500 bushels to the acre annually. And if my simple mode of raising a fair crop of turnips should be the means of communicating to my countrymen some useful hints on that head, I shall be extremely happy to suggest the following:—In October I generally plough the field intended for turnips. Stubble land, where oats had been the previous summer, and is left in that condition until the latter end of May following, when the field is first harrowed and the stones gathered and taken away if needed, and immediately the ground is cross-ploughed and harrowed, the stones taken away if any appear—the ground then being well pulverized is ready to open the drills, which is generally done between the 1st and the 10th of June, according to the forwardness of the season. So soon as the whole field intended for turnips is drilled I employ two carts with two men, and a girl, who fills along with the men at the manure heap, and two other girls are employed in spreading the manure in the drills, until about 4 o'clock P. M., at which time they knock off carting out, and yoke one horse in the plough, by which means the drills is split open, and all the manure carted out in the fore part of the day is covered in, and the sowing of the seed immediately follows. This mode of proceeding I find to answer very well. As the earth is freshly turned, and the seed put in right after the plough, the young plants are seen about the fifth day. In sowing the seed the general principle to be attended to is, to get the seed into the nearest possible connection with the manure, so that it may have all the advantage of its fertilizing influence in the earliest stage. I use about 2 lb. of seed to the acre, and, if the seed is good, let the fly do its best, there will be still sufficient healthy plants left and to spare for any vacant space that needs transplanting. As soon as I find the plants between two or three inches long I employ all the spare hands to thin them about four inches apart, by hand pulling out of the roots all the weeds around the young plants along the tops of the drills, at the same time leaving between the drills undisturbed in the meantime—as the plough can do that part of the work in a shorter time. As soon as they are all weeded and thinned as above, I immediately run a one-horse plough between the drills, as close to the turnips as possible without disturbing the young plants, on each side of the drill. This will form a little drill in the centre and cover up all the weeds, which is left undisturbed about a week or ten days, when the plough again is run through the centre of the little ridgelet, throwing the earth back into its original position. This mode stands twofold purposes, in keeping the weeds under and loosening the earth around the plants. At this stage of the proceedings, and when the young plant is between five and six inches long, I set five hands to work to pull up every second plant, leaving the distance between each plant eight or nine inches, and transplanting at same time any vacant space that may be found. About two weeks after this I give them another hoeing and weeding by hand, and the work is complete. As regards manure for turnips, I have tried various kinds of compost, kelp, &c., &c., but as a general fertilizer I find the barn-yard manure the best, and,

when judiciously employed, I am satisfied, for a general crop, it never will, and never can, be superseded. The sum total of the culture of turnips with success may be told in a few words. Let the farmer plough his field in the fall and spring, pulverize the soil well, clean the ground of roots and stones, make straight drills thirty inches apart, give your field a liberal dressing of good stable manure, sow two lb. of good seed to the acre, thin them early, keep the weeds down by two or three good hoeings, and you will likely have a fair crop of turnips. As regards the raising of root crops, such as cabbages, carrots, beets, parsnips, turnips, &c., I am satisfied that this Island will produce as good a crop of these useful and wholesome vegetables as any other part on the shores of America, if the people would only learn to put the soil in proper tillage. I have had in this farm Swedish Turnips to weigh from 12 to 14 lb. mostly every summer since I have been here. J. R.

St. Ann's, Cape Breton, January 24, 1860.

To the Editor of the Journal of Education and Agriculture.

MR. EDITOR,—

My Farm is a small one, only containing twenty-five acres, chiefly under cultivation with the exception of a swamp in the centre of about one and a half acres, and I am well aware that this swamp, if effectually drained, would be the most valuable spot on my little Farm. But how to accomplish this, from its very peculiar position, I am greatly at a loss. The swamp is perfectly level, and on the north and south is a rising ground, on the east and west the lands of my two adjoining neighbours, still under wood. So that in no direction, east, west, north or south, can I find an outlet for a main drain to carry off the water, without a great expense in following out my main drain through the lands of my neighbours, even if permitted to do so. I am, however, satisfied that this swamp could be drained on some scientific principles, just as it is, without encroaching upon my neighbours' land. But of the manner and the process I am entirely ignorant. I have asked the opinion of several Farmers, and they all declare it cannot be done without an outlet for the main drain.

Perhaps you, Mr Editor, or any of your numerous correspondents, would be kind enough to enlighten me on the subject. The question is of no small importance, and its solution might benefit many others similarly situated. The question is, How a square, level piece of wet land, without an outlet for the water in any direction, can be drained so as to bring it under proper cultivation? Hoping to see a satisfactory solution, through the columns of your very valuable Journal, I remain,

Yours respectfully,

T. D.

Sydney, January 27th, 1860.

[We shall be glad to receive a reply to the above. If not, we shall in a subsequent number express our own views on the subject.—ED.]

THE ECONOMY OF FARM YARD MANURES.

In a country like Canada the farmer must look chiefly to his own farm-yard for keeping up the fertility of his fields, and the increase of his crops. He is not in a condition to go largely into the market for purchasing foreign manures; and if he were so, it is doubtful whether such importations would prove profitable. There are two vital points which should ever command his attention; first, to pursue such a system of cropping as will not unnecessarily weaken the stamina of the soil, and secondly, carefully to collect all sorts of organic substances on the farm, with earthy and mineral matters, to form a mineral compost, and to pay constant attention to the preservation of the manure made in the stables and yards of the homestead. It is too much the fashion now a-days to look abroad for the means of manuring the land, while materials close at home are neglected,—and which are sometimes a positive nuisance,—that may with a little care and trouble, and without much expense, be made into a compost, and thus largely minister to the growth of future crops.

On farms that have not been exhausted by a scouring system of

cropping, purchased manures ought not to be necessary, except, perhaps, for the raising of root crops, a department of Canadian agriculture that profitably admits of both improvement and extension. When guano, crushed bones, superphosphate of lime, can be got of good quality at a moderate price, every improving farmer should more or less avail himself of them for this purpose. And here quality of culture, rather than extent, should be the primary consideration. By a liberal and judicious system of management, as many turnips, for instance, may be grown upon a single acre, as under a contrary course will be ordinarily produced from two or three. The cost per bushel, therefore, will be found much in favor of high culture. The chief value of root crops consists in their enabling the farmer to sustain a large number of animals in better condition than he otherwise could, and thus adding to his manure heap, on which he must mainly depend for increased returns of hay and grain.

The dung heap, therefore, must be considered the Canadian Farmer's sheet anchor, and nothing should be left undone to increase its quantity and improve its quality. The former can only be accomplished by keeping the arable portion of the farm in good heart, thereby producing not only more grain, but a greater amount of hay and straw,—which with a liberal supply of roots, will enable the farmer to keep a larger number of animals, which are to be regarded as manufacturers of manure.

But it is of the latter condition, the quality of the manure, that we designed more particularly to speak. In this respect also, there is indeed much room for improvement. During our cold, dry weather in winter, farm-yard manure is not exposed to much waste or deterioration, and it may be put out into the field in separate cart loads, without much risk of loss. Even animal substances we find under these conditions of temperature and moisture run but very slowly into decomposition, and consequently the escape of ammonia into the atmosphere is prevented. The amount of rain too, in our winter months, is not generally so large as to cause much waste of the manure exposed in our yards and heaps, by washing away its saline and soluble portions. The great danger from this cause is in the spring, or the first breaking-up of winter, when the rapid thawing of the frozen ground and the sudden conversion of snow into water, accompanied often by heavy rains, may be seen to convert the more valuable portions of farm-yard dung into stagnant pools or running streams, the water of which is so strongly impregnated with saline and organic matter, as to assume a dark brown, and sometimes even an absolutely black color. Now what a lamentable waste is here going on, under our daily observation, and at our very doors! By this repeated drenching of the farm yard and dung heaps, the manure, before it is applied to the crops, is often denuded of one half of its fertilizing power. Now we ask our farmers to prevent this. How is it to be done, some may ask? Much of this waste is owing no doubt to defective arrangements in the farm buildings, which are generally erected, with little regard to any high degree, of not only preserving the manure, but even of the comfort and health of the animals, and the proper economy of their food.

Without asking our farmers to do, what perhaps the majority have neither the means nor inclination of doing—to erase their old buildings, and put up new ones on a better system, (a most desirable and practicable object, however, in some cases,) much can be done towards mitigating the evil complained of, by the exercise of a little ingenuity and forethought. By collecting all refuse matter about the homestead and on the farm, in connection with the bedding of animals, and the litter in the yards, all of which is more or less impregnated and intermixed with the solid and fluid excrements of the cattle; and putting these materials into a heap, so as to ensure a moderate degree of fermentation, covered by absorbing substances, such as half rotted straw or leaves, liberally sprinkled with plaster or charcoal powder; a much larger quantity of superior manure of home production, can be obtained on the spot where it is required for application, than is now the case on ninety nine farms out of every hundred. The principal thing is to prevent the heavy rains washing away into the swales and streams the liquid or best portion of the manure. By furnishing buildings with evertroughs, and making a cheap tank or two, and especially by absorbing with porous substances the liquid matter as it exudes from the heap or yards, thereby preventing its absolute waste; these and other expedients that will naturally suggest themselves to every thoughtful mind, as adapted to special circumstances, would in a few years do wonders in effecting the increase of our crops and herds, and consequently the profits and improvement of Canadian farming.—*Canadian Agriculturist*.

PRODUCTS OF GOOD COWS.

At the last exhibition of the Hampshire Franklin and Hampden (Mass) Agricultural Society, nine milch cows were entered, for

prizes. We condense from the Transactions of the Society a portion of the statement furnished by the owners of the cows, relative to their products.

1. A. J. Lincoln, Northampton. Cow supposed to be grade Durham. Calved about the middle of March—during month of May, 1869, was fed on cut hay and six quarts corn meal and rye bran, equal parts per day. She gave of milk during this month, 1178½ lbs, equal to 38 lbs per day. June 1st, she was turned out to pasture, and no extra feed, given—and for the month of June gave 1220½ lbs, equal to 40 2/3 lbs per day. For seven successive days in June, viz., from 10th to 17th, she gave 287 lbs, or 41 lbs per day. For the month of July, she gave 1130 lbs, equal to 36½ lbs, per day. For three months ending July 31st, she gave 3528½ lbs, equal to 88 1/3 lbs. per day. Milk was sold and no butter made.

2. W. B. Hale, Northampton. Grade Durham cow, eight years old. Mr Hale bought her November 25, 1857, two weeks after calving. From this time till June 21, 1859, (when she again calved,) a period of 572 days, she gave 13,056 pounds 3 ounces of uncommonly rich milk, an average daily for the whole time (including 24 days in which she was dry) of 22 lbs. 13 oz., over nine beer quarts or eleven wine quarts. No butter was made—milk sold.

3. E. Fitts, Northampton. Cow seven-eighths Durham, 7 years old. Calved January 20, 1859. From 1st to the 10th June, she averaged 21½ quarts milk per day, weighing 53 lbs. Ford—the best of hay and 1 peck of roots per day. From the 10th to the 20th of September she averaged 35 lbs per day—fed, poor pasture and 4 quarts of shorts per day. From the 10th to the 20th of September, was made from her milk 17½ lbs of nice butter.—*Country Gentleman*.

SCIENTIFIC.

ARCHAIA.*

"It is a philosophy which never rests—its law is progress: a point which yesterday was invisible is its goal to day and will be its starting point to-morrow."—*Edinburgh Review*, No. 132.

Geology, unlike the fabled Minerva, has not sprang forth in her full proportions at her birth. Half a century has elapsed since Werner, in Germany, and Hutton, in Britain, bent their energies to the reduction of the immense stores of geological facts in their possession to a system. Ridicule, opposition, and persecution attended all their efforts to establish as a true science that which is now regarded as the beautiful twin-sister of Astronomy, and the most fascinating of all scientific studies. But the proportions and harmonies of truth are so certainly discoverable, that where from want of time, and lack of apparatus, one student of nature fails in revealing her beauties, others are invariably found, to conduct the process to its successful termination. Where Copernicus relaxes his studies, Galileo begins his; and where Galileo tires, Newton and La Placé with unbridled ardor, begin the scientific race. The dim outlines of the first serve to furnish material for the elaborate systems of the last—"and the goal of yesterday becomes the starting point of to-day." The science of Geology has met with a similar fate as that of Astronomy. A succession of highly intellectual and learned men, have followed each other consecutively—the outermost edge of the circle swept by the hand of a Hutton, was the point at which a Lyall, places his compass,—he forms a new circumference,—a semi-diameter in advance of his predecessor. Miller stands upon that further circumference, and compels his soul to enter the *ne plus ultra* beyond. At that beyond Dawson takes his stand; with the errors and successes of his predecessors he perceives his path radiant so far as he has advanced, but all is dark in front. Whether Mr Dawson has continued to increase the light which shines in his rear, or whether he has made the circumference of Miller's discoveries the point of a new circle, it will be our business in this paper to discuss.

That the work now before us is one required by the times, no one acquainted with the position now occupied by the science

*Archæia; or studies of the Cosmogony and Natural History of the Hebrew Scriptures. Professor Dawson, L.L.D., F. G. S. Montreal; Dawson & Son: 1860.

of Geology will for a moment question. Though not *professedly* becoming the champion for Christianity—though rather declining such an attempt—Mr Dawson has accomplished so well the great end, which he denies us being the sole purpose of his work, that we cannot regard the admirable harmony displayed by *Archæia* as existing between the Bible and nature, as a more incidental thing; but rather impute the non-intervention statement of the author as resulting from his modesty. The reader, however, will have no fears in pronouncing a verdict—even should the author hesitate.

The work is of its *kind*, perfect—and actualizes the requirements of that class of readers who wished to see this subject dealt with by one combining the qualifications of a firm belief in Christianity, an extensive acquaintance with Hebrew literature, with a profound knowledge of the present state of the geological question. Such a want *Archæia* has supplied.

It is not possible to condense the geological controversy within very small compass—but it is here needful to advert to the subject by way of explanation, before proceeding to the analysis of the work before us. The Eternal Son of the Father from the deep eternity of his being, had spoken to man. He demanded a universal and unquestioning faith in his revelations. That faith the Infidel refused. On being interrogated as to his reasons—the reply was at hand—“The so-called divine teacher has committed himself hopelessly to statements made by Moses, with whose false cosmogony the science of the earth has made us acquainted. Moses and Jesus stand or fall together? The Christian confesses that the Great Teacher has committed himself to the Mosaic cosmogony—but asks—and has Moses committed himself to false statements? He puts the question fearfully and anxiously.

“Without question,” answers the scientific infidel. “The unequivocal testimony of the fossiliferous deposits nullifies the crude assertion of Moses that in six days God made the heavens and the earth.”

There exists no doubt that, perplexed by so sounding an assertion, the Christian was silenced, though not convinced—whilst a momentary semblance of triumph was enjoyed by the infidel. Then followed the discoveries of the Huttons and Cuviers—discoveries made irrespective of the controversy, but apparently inimical to the christian view of the question: myriads of shells, vegetable organisms—nay, whole animals were exhumed from the depths—and the infidel cried to the still more perplexed believer in Revelation—“is not this array of proof incontestable!” In such a dilemma Christian divines were called upon for an explanation. They could not refuse offering their different solutions—as the orthodox creed appeared for the time to depend upon the controversy. But how different their replies. Some repudiated the evidence of the collected *phenomena*—and asserted these to be unsubstantial and delusive. And we all remember the shout of wonder with which Chalmers's celebrated solution was received—*between the Berashith (beginning) and the creation of organisms many ages may have elapsed*. Then appeared Richard Watson's “Institutes”; admittedly great as a theologian and reasoner, even he staggered under this question, and for the first and last time, writes as if he were at sea without a compass below or a star above. He repudiated the various theories then existing, excepting those which were *pruned* down and *mude* to agree with the scriptural cosmogony, but which nevertheless were manifestly artificial and unnatural. Daubison's scheme he regarded as extravagant and impossible. “No system of Geology” quotes Watson from Granville Penn—“can be founded in true philosophy unless the principle of Newton be the *basis*, and the narrative of Moses, the *working plan*.” This was to actually reject the phenomena presented for examination, by asserting *a priori* “I know the received views of the Mosaic cosmogony to be correct”—a line of argument, which though it is said is employed by Father Cullen when dealing with Galileo's scheme, is utterly unworthy of a christian and philosopher. Why then did such great thinkers as Dr Chalmers resort to it? The answer is easy—simply because they had no *better* mode of discussion. We do not think Chalmers altogether ingenuous: he admitted so much of the assembled phenomena as formed the web and woof of his solution, and reflected the residue. In

this doing, he committed himself to the new school without extricating the christian view of the question from its obscurity. More cautious and logical, Mr Watson does *not* commit himself in any wise. He rather says—“I receive no geological theory as established—and I make no concessions in their favor. I regard the Mosaic narrative as literally and simply true—and I rather resort to the belief of the creation of fossils *in situ*, than admit the existence of pro-adamite organisms—if extending beyond the sixth day backward. I know nothing of the slow deposits of ages—and the geologist knows nothing of first formations. God who made the first man perfect, without the preceding stages of childhood and youth, may have created the world as it is—organisms and all—in six days. We know nothing of the laws of rock-making—who then can assert with confidence that laws *now* in operation acted during the six days of creation?—I wait for a reply.” The reply has since been given. He would be no friend of the Bible, who at this day, would deny the operation of agencies, which ascertainedly began at the dawn of the Permian day and still continue to influence our planet. *Logically* Mr Watson may be right—but his argument is *a priori*—God could have thus created. The geologist's argument is *a posteriori*—God has thus created. One thing may be said of the former—it was the best that divine ever gave. It conceded nothing: it defended all: but as might have been expected, it failed to satisfy any mind which had been equally impressed by the Mosaic writing and the unarranged phenomena of Geology.

In this condition do we find the science, when suddenly a new school of interpreters appears; and presents claims on the public attention of no mean order. Of this school, Hugh Miller and the Author of *Archæia* stand forth assuredly the proper representatives. It may be asked—why not name Lyall, or Agassiz, or Hitchcock. We reply because the two first lack the moral courage to attempt the elucidation of the reconciliation scheme, and are therefore *not* proper specimens of the class described and the last has not yet arrived at a fixed theory; but vibrates between the accommodation scheme of Chalmers and the system, hewn in outline by Miller, and rounded and elaborated by the Author of *Archæia*.

We said that it remained for us to show whether Mr Dawson, standing on the outermost circle of Miller's “Two Records,” had made *that* point the centre of another circle, which last embraced the skord of regions untraversed and unknown? We think he has not done this. A wonderful collector of facts and principles is Mr D.—a profound analyst—a patient and accurate thinker, when he has before his eye the assembled phenomena of which he treats—but a theorizer Mr Dawson is *not*. Whether he has declined advancing a theory, lest he should compromise his Geological reputation, or whether he is content with an existing system to which he is partially committed, does not appear. He follows Hugh Miller with a torch—and wherever the giant hand of the latter shattered a rock to pieces at a blow, and then proceeded onward to other discoveries, Mr D. has paused, and collecting the fragments has turned upon them the light of his investigations. But let it not be from hence inferred that Mr D. is but a satellite revolving in the light of a superior orb. On the contrary we should greatly err to regard him as a second rate geologist—or, in his own way, any wise inferior, even to Miller. In fact the latter could not have done Dawson's work. The knowledge of the Hebrew Scriptures—the acuteness of a mind, deficient, indeed, in imagination, but presenting a mirror surface to facts, and powerful in analysis—the unwearied energies of a thinker whose enthusiasm for his study carries him, by *induction* as high as *imagination* ever soared—unite to constitute Mr Dawson that which Hugh Miller—“Scotland's greatest man, says Walter Scott,” though he be—could not have become, unless new-modelled and re-created. Greater in *strength* of intellect—vividness of imagination—and poetical intuitions—the author of the “Old Red Sandstone” certainly was—but we draw the comparison no further—suffice that we regard Mr Dawson as inferior to no living geologist.

In *Archæia* we find eighteen chapters, with an appendix—and which might have been expanded into eighteen chapters more, and the interest still retained. The first chapter is intro-

ductory, and very beautifully written; indeed, it would, as far as style is concerned, bear no unfavorable comparison with Macaulay's. It forms an apology for his exploration of subjects which to many would be found "now and startling." The second chapter is devoted to the consideration of the question, how was the order of creation revealed?—and, with Krutz and Miller, he regards a series of prophetic visions, as beyond discussion, the most simple solution of all difficulties respecting the origin of the book of Genesis. The third chapter may be regarded as still introductory, and designed to induce a favorable opinion in the reader's mind concerning the character of the Mosaic narrative. The fourth chapter is entitled "the Beginning." It is here that the Author originates that logical chain of argumentation and analysis which does not end but with the book. That true religion and sound philosophy unite in proving "the production from non-existence of the material universe, by the agency of an eternal, self-existing God"—is admirably demonstrated on the soundest principles of philological interpretation.

"The author of Creation is Elohim, or God in his general aspect to nature, and not in that special aspect to the Jewish Commonwealth indicated by the name Yaveh (Jehovah). We need not enter into the doubtful etymology of the word, but may content ourselves, with that supported by many, perhaps the majority of commentators, which gives it the meaning of 'object of adoration', or with that professed by Gesenius, 'Strong or Mighty One'. Its plural form has also greatly tried the ingenuity of critics. After carefully considering the various hypotheses, such as that of the plural of Majesty of the Rabbins, and the primitive polytheism supposed by certain rationalists—I can see no better reason than an attempt to give a grammatical expression to that plurality in unity, indicated by the appearance of the Spirit, as a distinct actor in the next verse, and probably always held by the Hebrews in a general form; and which our Saviour and his Apostles specialized in that trinitarian doctrine which enables both John and Paul explicitly to assert the agency of the second person of the Trinity in the creative work. I rather wonder at the squeamishness which induced even Calvin to make light of this manifest correspondence between Moses and the Apostles."—*Archæia*, p. 70.

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