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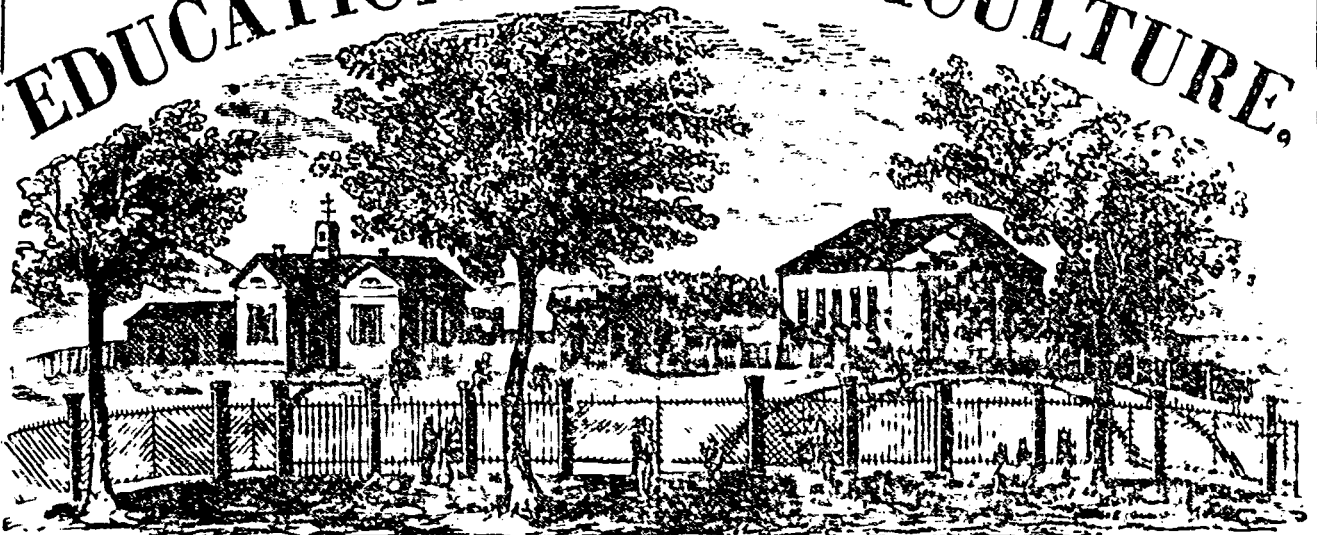
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# THE JOURNAL OF EDUCATION AND AGRICULTURE.



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

FOR THE PROVINCE OF NOVA SCOTIA.

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## EDUCATIONAL.

### I.—THEORY OF EDUCATION.

#### PHYSICAL EDUCATION—THE CUTANEOUS SYSTEM OF ORGANS OR THE SKIN—THE CLEANLINESS, TIDINESS, AND ORDER OF THE CHILDREN AT SCHOOL.

In our last we considered the supporting system of organs, or the bones. From the very nature of the composition of the bones in the young we saw the necessity of paying every possible attention to the grading of the seats and desks according to the age or size of their occupants. We said nothing about the arrangement of the seats or desks, inasmuch as this is a department that falls more appropriately under the organization of schools. In all our discussions respecting the functions and laws of the organs of our bodily frame, we have confined ourselves entirely to those points bearing directly on that branch of physical education under consideration. For example, in order to show the vast importance of the proper ventilation and temperature of the school-room, we presented an outline of the nutritive system of organs—the organs of digestion, circulation and respiration—the organs mainly involved in ven-

tilation and temperature. Again, in order to point out the benefit arising from the grading of the seats and desks, we expatiated on the bones, dwelling especially on their composition.—We take up in this number the subject of the cleanliness, the tidiness and the order of the children at school, and as this has mainly to do with the cutaneous system of organs, we proceed at once to discuss it in its varied functions and laws.

Proposition III. *That it is the duty of Parents, Educators and all interested in the rising generation to train up the young to habits of cleanliness, tidiness and order, not merely for the sake of common decency, but for the preservation of the health of the body, and the invigorating of the mental powers.*

Throughout the wide domain of nature there is going on an unceasing process of waste and repair, of decay and renovation, of degradation and elevation. This is apparent on a grand scale in the disintegration and consolidation of the material parts of creation that are continually taking place through the medium of aqueous and igneous agency. It is apparent too in the lowest organized existence, the vegetable kingdom. Every leaf is incessantly pouring out some of its fluids, and every flower forming its own fruit and seed speedily to be separated from and lost to its parent stem, thus causing, in a few months, an extent of waste many hundred times greater than what occurs in the same lapse of time after the tree is cut down and all its living operations are at a close. The same phenomenon is presented to us in the animal kingdom. As long as life con-

tinues, a copious exhalation without a moment's intermission, is going on, and not a movement can be performed which does not, in some degree, increase the circulation and add to the general waste. Now there is a set of organs exactly fitted for this object, just as there is one for supplying, secreting and preparing the raw materials. These organs pass under the general designation of excretory, or exhalants, and are evidently intended as outlets to those particles which are useless to the system. The liver, the kidneys, the bowels, the lungs and the skin may be all classified under this head.

The most important, however, of these, and the one which perhaps receives the least share of attention, is the skin, or the cutaneous system of organs.

Physiologists generally consider this system as composed of three parts—the cuticle or epidermis, the mucous membrane or rete mucosum, and the cutis vera or true skin. The first, or that part of the skin which is seen with the eye and which is raised by a blister, is insensible, and serves as a safeguard or sheath of protection to the whole of the cutaneous apparatus, impeding the evaporation of the fluids on the one hand, and the absorption of the poisonous vapours on the other. The *rete mucosum* is neither more nor less than the newly formed layer of the cuticle. In this membrane there exists a peculiar kind of paint which imparts colour to the complexion. This deposit of colouring matter varies in different individuals and in different races. In the Negro, it is black, in the Indian, it is copper coloured; and in the European, it is white. As a general rule, it is increased by the stimulus of light and heat; the complexion becoming dark in summer from its increased secretion, and relapsing into paleness on the approach of winter, when the stimulus of the solar light and heat is withdrawn. The next is the cutis vera, or true skin, which is a complicated network of fibres interlaced in every direction, possessed of great extensibility and elasticity, and is the outlet through which a large proportion of the waste of the body passes. The means by which it effectuates this end, is through the medium of innumerable glands called the sebaceous, or the oily, and the perspiratory glands. The former are spread over the parts of the skin most exposed to the changes of temperature and moisture, and are made up of that oily fluid with which the skin is bedewed and rendered soft. The latter separate from the blood the perspiration or sweat. They are exceedingly numerous, being about two thousand to every square inch of skin, or five millions, or, according to some, seven millions in the natural covering of the body. These discharge themselves either by sensible or insensible perspiration. Every one knows that when the body is overheated by exercise, a copious sweat breaks out, which by evaporation carries off the excess of heat, and produces an agreeable feeling of coldness and refreshment. This is called sensible perspiration, because it is apparent. Dr. Smith of London has made some interesting experiments on the subject of exhalation from the skin and lungs jointly. Eight persons in the Phoenix Gas Works were weighed before going to work and immediately afterwards. In one experiment in the month of November they continued to work for an hour and a quarter, and the loss they had sustained during that time was 2 lbs. 15 oz. In another experiment in the month of June, the same number of men lost 5 lbs. 2 oz. in about the same time. But in the ordinary state of the system, the skin is constantly giving out a large quantity of waste materials in the form of vapour, which, being carried off by the surrounding air, is invisible to the eye, and hence is called insensible perspiration. This cuta-

neous exhalation is of immense importance to the welfare of the system at large, and has led to many attempts to form an accurate estimate of its amount; but so many difficulties have stood in the way of obtaining precise results, and the difference in different constitutions, and even in the same person at different times, is so great that we must be satisfied with an approximation to the truth. "Among the first inquirers," says Combe, "whose accuracy can be in any degree relied on, Sanctorius deserves to be honourably mentioned. With a zeal and perseverance worthy of greater success, he carefully weighed himself, his food and his excretions, in a balance every day for thirty years, and came to the conclusion that *five* out of every eight pounds of substances taken into the system pass out of it again by the skin and lungs, leaving only three to pass off by the bowels and kidneys." The celebrated Lavoisier and Berthollet afterwards entered on the same field of inquiry, and with more satisfactory results. They discovered by experiment that the largest quantity of insensible perspiration from the lungs and skin together, amounted to 32 grains per minute, three ounces and a quarter per hour, or five pounds per day. Of this, the cutaneous consumed three-fourths, or sixty ounces in twenty-four hours. The smallest quantity observed amounted to eleven grains per minute, or one pound eleven and a half ounces in twenty-four hours, of which the skin furnished about twenty ounces. The *medium* or average amount was eighteen grains a minute, of which eleven were from the skin, making the cutaneous perspiration in twenty-four hours about thirty-three ounces. Whatever be the nature or the condition of the constitution at the time, it is now agreed by all eminent physicians that between 30 and 40 ounces of substance pass off through the skin of an adult in usual health, every 24 hours. And what is the nature of the material thus exhaled? It is composed partly of watery vapour and partly of animal and mineral substances—in the proportion per 1000 of 986 to 14—that is, there are 986 parts of watery vapour, consisting mainly of carbonic acid, to 14 of earthy and mineral substances, which consists mainly of concentrated animal substances,—a very energetic poison.

But the skin is not only a powerful exhalant, it is also an absorbent. By means of this function substances placed in contact with the skin are taken up and carried into the general circulation, either to be appropriated to some new purpose, or to be speedily thrown out of the body. This process is carried on by the blood-vessels, which are ramified in a close network immediately under the epidermis, and also by another class of vessels called the *absorbents*. Of the absorbing power of the skin we have a familiar example in the process of vaccination as a protection from smallpox. This process, as is well known, is the insertion of a small quantity of cowpox matter under the cuticle on the surface of the true skin and the leaving of it there. In a short time it is acted upon and taken into the system by the cutaneous vessels.

Such is a brief exposition of the structure and functions of the skin; and brief though that exposition be, it is, we trust sufficient to show the important practical bearing of this system of organs on the whole subject of physical education, and, especially, on that department referred to in the proposition now under consideration. If the healthy action of the skin depend on the free and equal circulation over every part of its surface; or a free and equal perspiration being kept up in every part, and on the scrupulous and timeous removal of the residuum or remains of the perspired matter, and all external impurities ac-

identally deposited on the surface of the body, then must the obligation involved in the third proposition be plain and palpable. The means to be used for securing this important end—the healthful circulation of the skin—are bodily exercise, suitable clothing, bathing and friction. As to the first of these we shall at present say nothing, as it will receive our full consideration when we come to treat of the muscular system of organs. Respecting the matter of suitable clothing, its necessity from the very nature of the case is abundantly obvious. If man lives in an atmosphere generally many degrees colder than his own body, the means of preventing his being cooled down too rapidly are forcibly pressed on his attention, and as the skin is the most exposed part, these means must apply chiefly to its protection. Hence the necessity for clothing, especially in temperate and cold climates; and hence the influence of unsuitable or inadequate clothing in impairing, and of suitable clothing in protecting and restoring the functions of the skin, at all ages, in all ranks of society, and in all seasons. The principal requisites are that the dress shall be—1st. As light as possible, 2nd. A bad conductor of heat, so as to afford protection against sudden changes of temperature; 3rd. Of so porous a nature as to admit of the easy passage of the insensible perspiration. Of the various kinds of clothing in common use, none presents these advantages combined in so high a degree as flannel; and, consequently, as a general rule no other material can equal it in suitableness for being worn in contact with the skin, which it is our chief object to protect. But whatever is worn should be frequently changed, ventilated and washed to free it from the impurity necessarily arising from so constant and extensive an exhalation from the skin. In the case of flannel, for example, it is an excellent plan, instead of wearing the same garment for several successive days, either to change it very frequently, or to make use of two sets of flannels, each being worn and aired by turns on every alternate day. A frequent change, however, is certainly the preferable arrangement.

But, if the frequent change and washing of clothes are essential to the health of the skin, by removing the saline and animal impurities deposited upon them by the perspiration, it is equally certain, that frequent bathing or washing of the skin is not less indispensable to remove the impurities adhering to its surface, and, which, if allowed to accumulate, would tend to obstruct its pores, impede its functions and disturb its health.—For general use, the tepid or warm bath seems much more suitable than the cold bath, especially in winter, and for those who are not robust and full of animal heat. When the constitution is not vigorous enough to receive reaction after the cold bath, as indicated by a warm glow over the surface, its use inevitably does harm. A vast number of persons, especially, of those leading a sedentary life, are in this condition; while, on the contrary, there are few indeed who do not derive evident advantage from the regular use of the tepid bath, and still fewer who are hurt by it. When the health is good and the bodily powers are sufficiently vigorous, the cold bath during summer, and the shower bath in winter, may serve every purpose required from them. But it should never be forgotten that they are too powerful in their agency, to be used with safety by every one, especially in cold weather. In proportion as cold bathing is influential in restoring health when judiciously used, it is hurtful when resorted to without discrimination; and invalids, therefore, should never have recourse to it without the sanction of their professional advisers.

Another valuable means of keeping up an equal circulation,

and a due degree of perspiration over the whole surface of the skin, and, at the same time, of aiding in the removal of the impurities which attach to it, consists in the diligent and daily use of friction by means of a flesh-brush, or horse-hair glove, or coarse towel. But to derive due advantage from friction, it should be steadily continued every night and morning, till a glow is excited over the whole surface, and the skin acquires a soft velvety feeling. It should also be practised by the individual himself, and not by an assistant. It then serves partly for exercise, and, to a sedentary person, becomes its most invaluable substitute when perseveringly persisted in for months. In delicate states of the constitution, when a great susceptibility of cold exists, and in all varieties of nervous depression with a dry cold skin, its usefulness can scarcely be overrated. But, then, it is one of those preservatives or remedies which require time to produce their effects.

That friction is useful also in removing impurities from the surface, will be evident to every one who chooses to apply a hair-glove to his own skin, after passing a day or two without either friction or ablation. He will then speedily find the glove become whitened from the small powdery scales which it detaches from the epidermis, and experience a very perceptible increase of comfort. From the equalizing action by friction on the circulation and nerves of the skin, it acts farther as a pleasing sedative after mental excitement or anxiety, and thus favours quiet and refreshing sleep, where otherwise none might be obtained.

#### INTELLECTUAL EDUCATION—PERCEPTIVE FACULTIES—CULTIVATION OF THE SENSES.

In our general observations on these faculties we saw that through them we are made acquainted with five classes of external qualities; viz., odours, tastes, sounds, tactual and visible qualities. For the special purpose of cognizing these qualities, we are endowed with a particular organization which are called senses, and these are five in number,—the senses of smell, taste, hearing, touch and sight. These senses, which are neither more nor less than the attenuated extremities of nerves, grouped together in particular seats or localities, are generally classified under two heads. Those which convey a simple knowledge, such as smelling, tasting and hearing. Those again which, along with this knowledge, also convey the belief that there exists some external object by which this knowledge is produced, and these are the senses of touch and sight.

Now that these senses are susceptible of great improvement, especially in the young, is what no one doubts or calls in question. We see this every day in the case of those whose business leads them to depend upon any one of their senses, and which, in consequence, is constantly exercised and strengthened. How distinctly, for example, does the sailor descry in the distance the particular kind of vessel that is speeding its way on the wide waste of waters, while the landsman scarcely perceives an object at all. But the extent of the capability of the improvement of our senses by culture is still more forcibly presented to us in the case of those who have been deprived of one or more of their senses. Who has visited a Blind or a Deaf and Dumb Asylum without being struck with the proficiency with which the former read the embossed characters of any book that may be put into their hand, or the latter carry on their intercourse with their fellow creatures through external signs?—Perhaps the most extraordinary case on record is that of Laura

Bridgeman, the deaf, dumb and blind girl. This young girl was thus entirely dependent on her sense of touch, and yet to such an extent has this sense been cultivated, that she has been taught to read, write and hold intercourse with her fellow creatures entirely through it. "When I was at the Institution at Boston a few months ago," says Mayhew in his practical Treatise on Education, "she was told a person was present whom she had never met, and who wished an introduction to her. She reached her hand expecting to meet a stranger. By mistake she took the hand of another gentleman, whom she recognized immediately, though she had never met him but twice before. She recognizes her acquaintances in an instant by touching their hands or their dress, and there are probably hundreds of individuals who, if they were to stand in a row, and hold out each a hand to her, would be recognized by that alone. The memory of these sensations is very vivid, and she will readily recognize a person whom she has once thus touched. Many cases of this kind have been noticed; such as a person shaking hands with her, and making a peculiar pressure with a finger, and repeating this on his second visit, after a lapse of many months, being instantly known by her. She has been known to recognize persons with whom she had thus simply shaken hands but once after a lapse of six months."

But enough has been said to show the immense susceptibility of the improvement of our senses, and the call thereby addressed to parents, teachers and others to ply every means for this end; and that not merely because of the direct gratification it yields, but because of its relation to mind, the more clear and accurate the perception, the more vivid and impressive the conception or the image thereof in the mind. But there are some of these senses more intellectual in their character than others, possess a more direct bearing upon mind than others; such as the senses of hearing and of seeing, and to these we would now more especially call attention, as falling more directly under the cognizance of the educator.

#### SENSE OF HEARING.

"The organ of this sense," says Wayland, "is the ear. It is composed of two parts, the external and internal ear. The external ear is intended merely to collect and concentrate the vibrations of the air, and conduct them to the *membrana tympani*, which separates the two portions of this organ. The external ear thus performs the functions of an ear-trumpet. The *membrana tympani* is a thin membrane stretched across the lower extremity of the tube in which the outward ear terminates. The vibrations of the air, thus produced upon the tympanum, are, by a series of small bones occupying its inner chamber, transmitted to certain cells filled with fluid, in which the extremity of the auditory nerve terminates. From these cells the nerve proceeds directly to the brain.

The medium by which the auditory nerve is affected is the atmospheric air. Sonorous bodies of all kinds produce vibrations in the air, which strike upon the tympanum, and are, by the apparatus above alluded to, conveyed to the auditory nerve. The effect produced upon the nerve is simply that of mechanical vibration, and this vibration, so far as we can discover, is the cause of the sensation of sound. A mere fluctuation in the extremities of the nerve is the occasion of all the delight which we experience in listening to the sublimest compositions of a Handel or a Mozart. No more convincing proof can be afforded that there is no conceivable resemblance between the change in the organ of sense and the delightful cognition of the soul which it occasions."

We dwell not here on the number of sounds which the human ear is capable of distinguishing, or on our power of determining the direction from which sounds proceed by the ears being separated, at some distance from each other. Neither do we stop to consider whether hearing is a sensation or perception, that is, whether it furnishes us with a simple knowledge, without giving us any cognition of an external world. It is more to our purpose that we attend to the influence which sounds exert over the tone of the human mind. Not only are the sounds of the human voice universally understood, whether they indicate kindness, authority, pity, rage, sarcasm, encouragement or contempt, but they have the power of awakening an emotion, similar to that which produced them, in the mind of the hearer. A shriek of horror will convulse a whole assembly. It is said that Garrick once went to hear Whitefield preach, and was much impressed with the power of that remarkable pulpit orator.—Speaking afterwards of the preacher's eloquence, he is reported to have said, "I would give a hundred pounds to utter the word Oh! as Whitefield utters it." It is probable that it is in the power of expressing our emotions by the tones of the voice more than in any thing else, that the gift of eloquence consists.—And what are the practical inferences deducible from all this in so far as the public instructor is concerned? 1st. He ought to be exceedingly careful in modulating the tones of his own voice in all his intercourse with his scholars. Does he wish to convey to them a sense of his authority? Then he ought to speak in a calm decided tone. Does he desire to stimulate them to redoubled diligence in the prosecution of their studies? He ought to address them in an encouraging tone. Does he wish to convey to them a sense of his sorrow and disappointment because of their general misconduct, or because of any particular act of moral delinquency? He should then give utterance to his sentiments in broken, faltering accents. For the accomplishment of all these objects the teacher's voice ought in general to be rather on a low than on a high pitch. Then he will, at all times, have a much greater control of his voice, and be able at once to modulate it according to circumstances. There cannot be a greater mistake than that which seems to be entertained by some teachers that order and government are best preserved by a loud, imperious tone of voice,—and, accordingly, from the commencement to the close of their school, they indulge in a bawling, stentorian vociferation. We believe that such conduct produces quite an opposite effect, and that wherever it is practised, disorder, confusion and anarchy will reign.

But we would deduce a still more important inference from the position we have already laid down, and urge the immense benefit of Music in the whole management of a school establishment. Musical sounds have an acknowledged power over the tone of the mind. Not only do they harmonize and elevate a particular tone of mind, in many cases they alter and control it. Every one knows the difference between a sportive and a melancholy air, between a dirge and a quickstep; and every one knows how readily his tone of mind assimilates with the character of the music which he chances to hear. Sacred music, well performed, renders deeper the spirit of devotion. The hilarity of a ballroom would instantly cease if the music were withdrawn. It is questionable if the martial spirit of a nation could be sustained for a single year, if music were banished from its armies, and military evolutions, whether on parade or in combat, were performed under no other excitement than the mere word of command. And it is equally, if not more, influential, with the youth in attendance at our schools. Music,

when introduced by a skillful and judicious teacher, will not only operate powerfully in arousing the energies and in securing the attention of the pupils to the business in hand, but it will alter the whole tone and character of the school for the time being, diffusing a gravity and sobriety where nought but sportiveness and frivolity prevailed,—spreading a calmness and a serenity where all was one scene of perturbation and confusion,—and establishing good order and obedience where nought but confusion and misrule obtained. Surely an instrument so powerful in the management of a school cannot be too frequently called into requisition, or have too much time and pains given to it so as to render it still more efficient, still more extensively useful. And what does all this imply? It implies, in the first place, the diligent culture of music on the part of the teacher, and, in the second place, the constituting of music a distinct branch of study in a Common School education. And all this we plead for not merely because it is a high and refined accomplishment, not merely because it is a becoming thing to be able to sing Jehovah's praises in melodious strains; but mainly because of the power it possesses, not only in the management and government of a school, but in the securing of a far larger amount of intellectual labour and a far closer application to study. Every teacher, then, ought to devote at least half an hour every day to the teaching of music; and we feel satisfied that no time would be better spent whether we regard his own personal comfort and happiness, or the profit of the scholars.

#### SENSE OF SEEING.

The senses generally serve as interpreters between the material universe without and the spirit within. But it is more especially by the sense of sight that we are enabled to hold converse with the external world. Without it we should not only be deprived of a large portion of the pleasures of life, but even of the means of maintaining our existence. It is through the sense of vision that the wisdom, power and benevolence of the Deity are chiefly manifested.

The eye, which is the organ of this sense, is an optical instrument of the most perfect construction. It is surrounded by coats, which contain refracting mediums, called *humours*.—There are three coats, called the *sclerotic*, the *choroid*, and the *retina*; and three humours, called the *aqueous*, the *crystalline*, and the *vitreous*. These three humours have been compared to the glasses of a telescope, and the coats to the tube which keeps them in their places,—thereby rendering the eye a perfect optical instrument infinitely surpassing all specimens of human skill. This is true, view it in what light we may. It not only possesses the power of so adjusting its parts, as to adapt it to the examination of objects at different distances and in light of different degrees of intensity, but we are enabled to direct it at will to objects above, beneath or around us.

But we have no intention of discussing the anatomy of this sense. It is more to our purpose that we consider the means of preserving and improving it, and of rendering it subservient to the promotion of our intellectual and moral culture. And how, it may now be asked, is this sense to be preserved and improved? Here, as elsewhere, exercise is the grand specific, and this exercise administered in such a way as that action shall alternate with rest. Whenever the eye is fixed for any length of time upon an object which it distinguishes with difficulty, it experiences a painful sensation, which is a sure indication that it has been overtaxed. The sight is also impaired when the eye is too little used, or when its natural stimulus is shut out, as is

strikingly illustrated in the case of persons confined to dungeons. It is clear then that the strength of the light should be regulated according to the powers of the eye. This is a general, though a very important rule. Both the amount and the distribution of light should be such as to produce no unpleasant sensations. The eye possesses a certain degree of adaptation to light, according as it is intense or feeble. Some eyes require a stronger light than others, but all eyes are injured by being used in light that is too intense or too feeble. Reading by a strong sunlight, and by moon or star-light may be adduced as illustrations which are alike painful and injurious. For this end rooms should be well and evenly lighted, and the use of side lights as well as all oblique positions of the eye avoided.—Such are a few plain principles essential for the preservation of the health and vigour of this organ;—and now it may be asked, What is to be done for its improvement?

1. We should accustom the eye to view objects at different distances. Persons become near or long sighted as the objects to which they are accustomed to direct the eye are near or remote. This is illustrated in the case of students, watchmakers and engravers, who are accustomed to examine minute objects near the eye, and as a consequence become near-sighted; and of surveyors, hunters and sailors, who, being accustomed to view objects at a distance, become long sighted. By a proper discipline of the eye, persons may attain and retain the power of viewing objects near by and at a distance.

2. No who would secure clear and distinct vision, must observe all those rules which are necessary to keep the body in health. The sympathy of the eyes with all the other organs of the body is wonderful and intimate. There is no other organ whose strength depends so much on the general vigour of the system. Strict temperance in eating and drinking may be regarded as an indispensable requisite for the preservation of healthy eyes. To this may be attributed the clear heads of the ancient philosophers, who, unlike most students of the present day, exercised their bodies and limbs as well as their minds.—They studied and thought and exercised both body and mind in the open air, and thus observed the laws of health.

3. For the farther improvement of this sense every means should be employed for the purpose of imparting an idea of distance; and for this end every school should be furnished with appropriate apparatus, with a set of linear measurements. The following account is given by Mayhew of the plan to which he resorted:—"For the benefit of the primary department connected with a seminary of learning that was formerly for several years under my supervision, I constructed a set of rules for linear measurement. Their breadth and thickness were uniform, each being an inch wide and half an inch thick. The set consisted of nine rules, whose lengths were as follows: four were each one foot long; one a foot and a half long; two, two feet; one, two and a half feet; and one, three feet. Every rule had a small hole bored through each end. I had also a number of small pins turned just the right size to fit these holes. I first tried the experiment ten years ago, with a class of about twenty children from four to seven years of age. Several of these could not read, and some of them had not learned the Alphabet. The children were first led to observe carefully the length of these several rules, until they could determine at sight the length of each. For several of the first lessons some of them would misjudge. They would, for instance, call a two foot rule one and a half or two and a half feet long. In such cases their judgments were immediately corrected by the application of

two one foot rules. They were then led to observe with care, tables, desks, &c., and to estimate their length, and were afterwards permitted to measure them, and discover the degree of accuracy in their decisions. After obtaining the opinions of the children in relation to the length or height of an object, I would measure it myself in the presence of the class. When the class became a little experienced, we examined the length, breadth and height of rooms, of houses and of churches; and then the distance of objects less or more remote, correcting or confirming their estimates by the application of the rule or measure, which gave a permanent interest to the exercise. By exercising the class in this manner, not to exceed half an hour a day, they would at the end of the first quarter judge of each other's height, of the height of persons generally, of the length of various objects, of the size of buildings, and of the dimensions of yards, gardens and fields, with greater accuracy than the average of adult persons, as was tested by actual measurement in some instances where there was a disagreement in opinion. . . .

By holding these rules in different positions the children readily became familiar with the meaning and practical application of the terms perpendicular, horizontal and oblique. . . . By pinning two rules together, one resting upon the other, and then turning one of them round, the class will readily gain a correct idea of the use of the term angle; also of the terms acute angle, right angle and obtuse angle. By pinning three of these rules together at their ends, the children not only see, but can handle the simplest form of geometrical figures. When this figure is defined they are enabled permanently to possess themselves of the meaning of the word triangle, by the simultaneous exercise of *three senses*. By combining rules of the same and different lengths, they become familiar with equilateral, isosceles, scalene, right and obtuse angled triangles. By these means the child's interest in the school is increased; his senses are cultivated; he is enabled better to fix his attention; he progresses more rapidly and thoroughly in his juvenile studies, and at the same time lays the foundation for future excellence in penmanship and drawing, and other useful arts.

The children may also be taught to discriminate the varieties of green in leaves and other things; of yellow, red and blue, in flowers and plants; and to distinguish not only the shades of all the colours, but their respective proportions in mixtures of two or more.

Drawing, whether of maps, the shape of objects, or of landscapes, is admirably adapted to discipline the sight. Children should be encouraged carefully to survey and accurately to describe the prominent points of a landscape, both in nature and in picture. Let them point out the elevations and depressions, the mowing, the pasture, the wood and the tillage land; the trees, the houses and the streams. Listen to their accounts of their plays, walks and journeys, and of any events of which they have been witnesses. In these and all other exercises of the sight children should be encouraged to be strictly accurate; and, whenever it is practicable, the judgment they pronounce and the descriptions they give should, if erroneous, be corrected by the truth. Children cannot fail to be interested in such exercises; and even where they have been careless and inaccurate observers they will soon become more watchful and exact.

It is by the benign influences of education only that the senses can be improved. It is not impossible, nor perhaps improbable, that he who has these two senses properly cultivated will derive more unalloyed pleasure in spending a brief

hour in gazing upon a beautiful landscape, in examining for the same length of time a simple flower or in listening to the sweet melody of the linnæus, as it warbles its song of praise, than those who have neglected the cultivation of the senses experience during their whole lives!

This subject commends itself to all who regard their individual happiness, or who desire to render their usefulness as extensive as possible. Upon parents, teachers and clergymen, who are more immediately concerned in the correct education of the rising generation, its claims are imperative. Let them be not in connection with other appropriate means now in use, and our schools cannot fail to become increasingly attractive; truancy, hence, will be less frequent, and the benign influences resulting from the correct education of the whole man will inspire the benevolent and philanthropic to renewed and increased efforts to secure the right education of all men, a condition upon which the maximum of human happiness depends.

## II.—PRACTICE OF EDUCATION.

### HOW TO TEACH LANGUAGES.

"In learning a language our chief aim should be to proceed rapidly, and acquire thorough familiarity with the words and idioms. A language should be taught, not like a system of philosophy, which requires deep meditation and abstract thought, but rather like a manual art, which requires practical dexterity. The teachers of ancient languages are prone to trust too much to rule and too little to habit. Instead of continually dunning into the pupil's memory some rule about construction, it is better to familiarize his ear with the correct construction by numerous examples, and practice him in the instant detection of any violation of it. Our knowledge of the words and idioms of a foreign language should become second nature, so that it is always ready to be applied with the utmost ease, and without the necessity for a moment's hesitation, or falling back upon a rule. The knowledge, whenever the occasion for it occurs, should spring up by immediate suggestion,—no middle term should be requisite to bring it up, no process of ratiocination. There is always a practical deficiency when the mind is obliged to fall back upon a rule. Rules should become incorporated in our habits by abundant and rapid exercise; for rapid exercise is absolutely essential in producing thorough familiarity. The brief space of time in which a language may be learnt by conversation, and the ready command of it thus obtained, is the best illustration of the truth of these remarks."—*Escrett's Philosophy of Teaching.*

### SINGING IN SCHOOLS.

Resolutions passed at a crowded conference of National, British, and Endowed School teachers of the Metropolis (called by the Tonic Sol-fa Association, but attended by the friends of various singing methods, and open to the freest discussion), which met at the rooms of the Young Men's Christian Association, Aldersgate Street, on the evenings of October 20th, and November 3rd, 1858.

1. That, in the opinion of this Conference, Vocal Music, when truly adapted to the capacity and natural tastes of childhood, is admirably fitted to promote the healthy development of the organs of the voice, and the attainment of a correct pronunciation; and that it supplies a means of brief recreation in the course of the school studies, which is of the greatest importance for relieving the attention, for soothing the nerves, and for elevating the feelings.

2. That, in the opinion of this Conference, the principal and most important advantage of Singing in Schools must arise from its power of cultivating right emotion in connexion with moral and religious subjects; the charms of good Poetry combining with those of good Music to fix just sentiments on the memory, and the frequent repetition of those sentiments aiding the development of true sympathies. Great care should therefore be taken that the Songs used in Schools be thoroughly adapted, on the one hand, to the simple, joyous character of childhood, and on the other, to the elevation of moral feeling.

3. That, in the opinion of this Conference, whatever other musical attainments may be required from young Teachers leaving our Training Schools, the principal requirements should always be these:—The knowledge, without book, of a small though well chosen selection of School Songs; the capacity of singing them correctly and expressively; and the power of teaching them by whatsoever method the Teacher likes best. These primary qualifications the Conference consider to be far more important than the most correct mastery of musical notation, of the science of harmony, or even of the mere methods of teaching to sing, could possibly be without them. But this Conference think it very important that all Students of Normal Institutions should leave those Institutions able to read music at sight, and to teach others to do so.

4. That in the opinion of this Conference, all methods which aim at usefulness in Schools should possess the following qualifications:—

They should be scientifically truthful. They should be progressive; always proceeding from the less to the more difficult, and introducing new topics in such a manner as to sustain a freshness of interest. The lessons and exercises should be in themselves attractive; such as will, for their own sake, be loved and remembered by a child. Such methods should also be easy to teach,—making small demands upon either the physical powers of the Teacher, or the invaluable time of the Schools.

5. That, in accordance with the opinions just approved by the Conference, no system of Teaching to Sing can be a good one which does not accustom its pupils to measure interval from the Tonic, or Key-note.

6. That the chief difficulty of carrying out this Tonic principle arises from the frequency of Modulation, or change of key, in the higher styles of music;—that this difficulty appears sometimes insuperable when the pupil of such methods as Mr Hatley's of Edinburgh, Mr Jackson's of Bradford, or Mr Turner's of London (which are all confined to the established notation), wishes to sing Classic Music at first sight,—such a pupil being obliged, then, to leave Tonic sol-faing and have recourse to what may be called Chromatic sol-faing;—that the Tonic Sol-fa system of interpreting the keys (in this kind of music), and expressing them in a new notation, is to be regarded, at present, as an experiment;—but that this difficulty of a Tonic method is confined to the higher style of music, and need not give any anxiety to the School Teacher.

7. That, as in all good teaching the sign should be regarded as entirely subordinate to that which it signifies (the object of the instructor being to teach the thing itself, and only subordinately the marks of names by which it is known), it is not "teacher-like" to object to the methods of Nageli, Natorp, Waldman, Muller, Schade, Auberlin, Gall, Bryce, Jeu de Berneval, Cheve, or Miss Glover, that they have employed some new notation (of figures, symbols, or letters) in order to attract the exclusive attention of their pupils to the great principle of key-relationship in their early lessons on interval;—if it can be shown that the pupils do learn the thing Music more truthfully or more quickly, or obtain music at a very much cheaper rate, and therefore more abundantly, by the help of these new notations than without them. This Conference, however, recommends that those School Teachers who adopt new notations for this purpose, should not neglect to introduce the pupils of their higher classes to that notation of music which is now established in general use throughout the world.

### III.—OFFICIAL NOTICES.

Dr. FORTSTEN intends to hold Teachers' Institutes, and address public meetings, at the following places in the month of April—viz: Halifax, Chester, Bridgewater, Lunenburg, Liverpool, Shelburne, Barrington, Tusket, Yarmouth, Clare, Digby, Annapolis, Bridgetown, Kentville. The particular day and hour will be intimated in the next number of the *Journal*.

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

The present Term of the Normal School will close on Thursday, the last day of March. Wednesday and Thursday will be devoted to a public Review of all the work done during the Term. All interested in the cause of Education are invited to attend.

### IV.—EDUCATIONAL INTELLIGENCE.

#### COLONIAL.

#### NOVA SCOTIA.

We have much pleasure in giving insertion to the following communication from Tatamagouche. It presents a plain unvarnished statement of the result of an experiment of nine months' duration, and amply corroborates what we have been advancing in almost every succeeding number of the *Journal* as to the benefits arising from graded or classified Schools wherever an hundred children can be collected:—

"REV. SIR,—

"Knowing the deep interest you take in the progress of Education in every section of our Province, and feeling satisfied that a short account of educational matters in this place for the last nine months might contribute interest to yourself and to the readers of your valuable journal, I propose to send you the same.

"For about six years previous to the above-mentioned period, no school had been in operation for a longer period than six months. Owing to the irregularity and the constant changing of Teachers, the progress of the scholars was small, and a feeling of indifference seemed to reign among the proprietors generally.

"But all were not thus. Some who are ever watching the improvements of the day, and for opportunities to do good, having made themselves acquainted with the essence of that noble System which you have had the honor of introducing and propagating in our own land, determined to see its practical workings in their midst. Accordingly, they engaged two of your graduated pupils from the Normal School, one with a *first*, and the other with a *second* class Diploma, to take charge of said school, feeling confident that the system only wanted a fair trial to recommend itself to the minds of all. The results have proved more cheering than were anticipated. Notwithstanding the extremely hard season, owing



to the failure in ship-building, (the chief employment of the inhabitants,) the responsible parties have been relieved. I believe that all have paid willingly, for the simple reason that they have got value for their money. Parents have shown their interest in the school by embracing every opportunity to visit it. And here let me say, there can be no better index of their good will and no greater encouragement to the teacher. It is their hearty co-operation that can best lighten his cares, and sustain him in his arduous duties.

"Owing to depressing circumstances, it was agreed at a meeting held at the expiration of six months, that the higher department only should be sustained through the winter, with the firm intention of resuming the lower as spring advances.

"I cannot say too much in favour of the Model System of school organization, both in its relation to scholars and teachers. It gives each child a greater share of the teacher's time, by reducing the number of classes; hence the drudgery to the teacher, consequent in a mixed school, is avoided, and his profession rendered comparatively easy.

"Now, if the praiseworthy efforts of this community, in organizing and sustaining such a school, will be the means of encouraging other communities to do likewise, the object of the writer will be won. It is only by such organizations well established and successfully controlled that the real beauty and excellence of the "Training System" can be made manifest; and from present indications as the result of earnest effort already put forth, we hope the time will come when small schools shall be broken up, and a Model School established in every village of our Province.

"Respectfully submitted.

"Tatamngouche, January 31st, 1859."

#### CANADA.

It is an encouraging evidence of the progressive advancement of education in Upper Canada that the Council of Public Instruction has deemed it necessary to revise and elevate the standard of teaching qualification:—

#### I. REVISED PROGRAMME FOR THE EXAMINATION AND CLASSIFICATION OF TEACHERS OF COMMON SCHOOLS, BY THE COUNTY BOARDS, PRESCRIBED BY THE COUNCIL OF PUBLIC INSTRUCTION FOR UPPER CANADA.

To be in full force until repealed or revised by the Council.

*N.B.*—Candidates are not eligible to be admitted to examination until they shall have furnished the Examiners with satisfactory evidence of their strictly temperate habits and good moral character.

##### (1.) Minimum Qualification of Third Class Teachers.

Candidates for certificates are required:

1. To be able to read intelligibly and correctly any passage from any common reading book.
2. To be able to spell correctly the words of an ordinary sentence dictated by the Examiners.
3. To be able to write a plain hand.
4. To be able to work readily questions in the simple and compound rules of arithmetic, and in reduction and proportion, and to be familiar with the principles on which these rules depend.
5. To know the elements of English grammar, and to be able to parse any easy sentence in prose.
6. To be acquainted with the relative positions of the principal countries of the world, with the principal cities, physical features, boundaries of continents, &c.
7. To have some knowledge of school organization and the classification of pupils.
8. In regard to teachers of French or German, a knowledge of the French or German grammar may be substituted for a knowledge of the English grammar, and the certificates to the teachers expressly limited accordingly.

##### (2.) Minimum Qualifications of Second Class Teachers.

Candidates for certificates as second class teachers, in addi-

tion to what is required of candidates for third class certificates, are required:

1. To be able to read with ease, intelligence, and expression, and to be familiar with the principles of reading and pronunciation.
2. To write a bold free hand, and to be acquainted with the rules of teaching writing.
3. To know fractions, vulgar and decimal, involution, evolution, and commercial and mental arithmetic, and to be familiar with the principles on which the rules depend.
4. To be acquainted with the elements of book-keeping.
5. To know the common rules of orthography, and to be able to parse any sentence in prose or poetry which may be submitted; to write grammatically, with correct spelling and punctuation, the substance of any passages which may be read, or any topics which may be suggested.
6. To be familiar with the elements of mathematical and physical geography, and the particular geography of Canada.
7. To be familiar with the outlines of general history.

##### (3.) Minimum Qualifications of First Class Teachers.

Candidates for certificates as first class teachers, in addition to what is required of candidates for third and second class certificates, are required:

1. To be familiar with the remaining rules of common arithmetic.
2. To be acquainted with the rules for the mensuration of superficies and solids.
3. To be familiar with the simple rules of algebra, and to be able to solve problems in simple and quadratic equations. (Colenso's.)
4. To know the first four books of Euclid. (Potts's.)
5. To be familiar with the outlines of Canadian and English history.
6. To have some acquaintance with the elements of vegetable and animal physiology, and natural philosophy, as far as taught in the fifth book of national readers.
7. To understand the proper organization and management of schools, and the improved methods of teaching.
8. To be acquainted with the principal Greek and Latin roots in the English language, with the prefixes and affixes; to be able to describe and exemplify the principal changes of construction.

*Female candidates for first class certificates will not be examined in the subjects mentioned in the second, third and fourth paragraphs under this head.*

Originally adopted the 3rd day of October, 1850, and revised on the 17th day of December, 1858.

#### POPULAR EDUCATION IN BRITAIN AND IRELAND—NORTH BRITISH REVIEW FOR NOVEMBER.

We have already referred to this article as furnishing the most recent Educational Statistics and as propounding a National System of Education adapted to the present mixed condition of professing Christians, not only in the parent country, but throughout all her colonies. Founding the necessity of legislation on the incompleteness of the Parish Schools in Scotland and the National System of Education in Ireland to meet the exigencies of the case, the able author of this article is naturally led to take a review of the past history and present condition of the one and the other of these. Hear what he says in reference to the Parochial System in Scotland:—

"In the midst of the strictly denominational agencies, fostered by the Committee of Privy Council, and of almost innumerable minor experiments, we have two well-defined exemplifications of a professedly National System, to assist us in our difficulties—the *Scottish Parochial*, and the *Irish National*—the one from Reformation times, the other of recent ori-

gin. To leave out of view the results which these histories present, is to extinguish the light of a distinct experience.— In examining the influence of National Systems, we instinctively turn first to the Scottish Parochial Schools. We envy the Scot neither his Educational enlightenment nor his patriotism who can sincerely cast out of view, in planning modern arrangements, a system remarkable alike for the wise policy which laid its foundation, and for the benefits which it has long conferred. The outline, drawn by the master-hand of John Knox, might, with modifications to meet our altered social and commercial condition, be easily made the basis of a model National System. We need scarcely remind the reader that the Reformers, though beset with almost insuperable difficulties, stipulated in the Third Book of Discipline, "that every several kirk shall have a schoolmaster," such a one as is able "to teach grammar and the Latin tongue," and made provision that the young be instructed in religious doctrine and duty.— They further required, apart from the universities "in the three towns accustomed," that "in every notable town there be erected a college, in which the arts, at least logic and rhetoric together with the tongues, be read by sufficient masters, and for whom honest stipends must be appointed." After many a struggle, whose issues give no blazonry to the aristocracy of the time, but that of unblushing rapacity, the Privy Council directed, in 1616, "that in every parish of this kingdom, where convenient means may be had for establishing a school, a school shall be erected, and a fit person appointed to teach the same, upon the expense of the parochianes, according to the quality and quantity of the parish." This Act of Council was ratified in 1635.

"We have thus, in the bold and comprehensive legislation of a period comparatively dark, an example for the present: we have a National System, recognising the value of a universally diffused education, which should unite with thorough intellectual culture, sound moral and religious instruction, meet all the necessities of the community by suitable schools, and the wants of the schoolmaster by an adequate salary, and provide for the efficient maintenance of the whole by compulsory local taxation.

"But, unfortunately, the system was stereotyped. it made no provision for growth. Based chiefly on agricultural economy, and embracing the small towns of that time, if as perpetually fixed in the number of their population as was the physical outline of every parish, its goodly proportions were destroyed by the populous cities which commerce created.— Wanting elasticity and expansiveness, it had neither power to appropriate improvements, nor cast off accumulating corruptions. As the church and the civil court's become jealous of each other's authority, unseemly contentions followed, and in their wake, change and abuse. The chief gainer was the teacher; the church lost influence, and the Educational interests of the country suffered. The teacher's position became so strengthened, that the Presbytery cannot dislodge him because of incompetency and inefficiency however manifestly detrimental to the interests of the parish. The most incompetent, though for years with scarcely a pupil, can retain the school, the dwelling-house, and the stipend. In short, on the concurrent testimony of the witnesses examined before the Select Committee of the House of Lords in the Session 1845, it is evident that the authority of the Presbytery "to remove masters for neglect of duty, cruelty, or immorality, has become inoperative."

"But, apart from the anomalies produced by commercial and other external changes, and by internal abuses, alterations have taken place, perhaps still more seriously affecting the nationality and efficiency of the parish school. The Established Church is much weakened. Repeated secessions have left only about one-third of the population within her pale. Presbytery is still national, as embracing the religious communions of Scotland, but as embracing the Established Church, is merely sectional or fragmentary. The parochial economy is still national as to its territorial divisions, but as to its con-

nection with the Established Church, it is thoroughly denominational; and as to its schools being open only to members or adherents of the Established Church, while deliberately shut against the teachers of other Presbyterian bodies, it must be held sectarian. As educationists, and apart from all ecclesiastical controversies, we deeply regret this policy, as most injurious to the interests of public instruction, unjust to the eminently qualified teachers of the other Presbyterian communions, and subversive of the original design of its institution as a parochial system under Presbyterian superintendence.

"In so far as the public management and the internal economy of the parochial system are concerned, it is becoming more hopelessly exclusive than ever: the last vestige of nationality is being rapidly effaced, inasmuch as its schools are being placed by the Established Church and the Committee of Council on Education on the same denominational footing as the schools of other religious communions. On analysing the lists given in the Government minutes, we find that last year 173 parish schools were aided by Privy Council Grants, and this year 197. We do not grudge to see the teacher's salary increased, but we do regret to see thus disintegrated and broken up the last fragment of that massive educational fabric long the glory of our land: we do regret to see the Established Church herself, reducing within the limit of a narrow denominationalism, that which was originally national, and which might still be so expanded and so adapted to the altered conditions of the country, as to preserve for Scotland what she once had, a national system worthy of her early education and character."

Hear what he says in reference to the National System in Ireland.

"Although holding decided conclusions on the subject, we shall not, at this stage, discuss the rightness or wrongness of this theory in its moral and religious bearings, but shall confine ourselves to a close examination of the results which its history has distinctly evolved. Whatever differences of opinion may exist among our readers as to educational questions generally, there can be none as to the results of this experiment: the facts are so broadly marked and outstanding, that no ambiguities whatever stand in the way of clear and unembarrassed conclusions. While the instructive historical outline of educational effort in Ireland—legislative, associational, and individual—from 1580 to 1856, given by the Commissioners in their Report recently issued, and which we have prefixed in our list, indicates not only the deep interest long taken in the extension of popular education in Ireland, but the difficulties in its way arising from the peculiar political and religious conditions of the country, and is suggestive of many important inquiries, we must limit our investigation to the present experiment alone, and its results. We can do this with the greater ease, as its history is so distinct and of such recent origin. Its germ lies in the recommendation given by the Commissioners of Education in 1812, to introduce a system "from which should be banished even the suspicion of proselytism, and which, admitting children of all religious persuasions, should not interfere with the religious tenets of any."—The Kildare Place Society was intrusted with the distribution of the National Grants, and faithfully carried out the principle on which they were bestowed. The religious instruction was meagre enough, being limited to the reading of the Scriptures, without note or comment, but sufficient to arouse the active opposition of the Romish priesthood. Although there were, according to the Second Report of the Government Commissioners, a large number of schools—2607—under Roman Catholic teachers, in which the Scriptures were read; and although in no fewer than 4179 adventure schools, conducted by teachers on their own responsibility, and adapted to the demands of the people, the Bible was read,—there was no vigorous opposition by the priesthood until it was found that the reading of the Scriptures was being systematised, and likely to awaken on religious questions the slumbering energies of the people. This opposition became so violent and so tho-

roughly organised, that statesmen grappled in vain with its power; and Englishmen and Scotchmen, alarmed by the volcanic upheavings of a nation whose millions were in conflict, eagerly sympathized with every proposal apparently tuted to pacify the people, and gave a ready acquiescence, therefore, to the proposal which Lord Stanley, now Earl Derby, submitted for the establishment of a national system, which was advocated as fitted to foster the kindliness of a common brotherhood. The general value and plan of the theory may be gathered from the following sentences in his well-known letter to the Duke of Leinster. Referring to the mere reading of the Word of God in school, he says:—"But it seems to have been overlooked that the principles of the Roman Catholic Church were totally at variance with this principle, and that the indiscriminate reading of the Holy Scriptures, without note or comment, by children, must be peculiarly obnoxious to the Church which denies, even to adults, the right of unaided private interpretation of the sacred volume with respect to articles of religious belief." Noticing the many schemes proposed to meet the difficulty of the case, he adds:—"But it was soon found that these schemes were impracticable; and in 1828, a Committee of the House of Commons, to which were referred the various reports of the Commissioners of Education, recommended a system to be adopted which should afford, if possible, a combined literary and separate religious education, and should be capable of being so far adapted to the religious persuasions which prevail in Ireland, as to render it in truth a national system for the poorer classes of the community." Again, "In the success of this undertaking, much must depend on the character of the individuals who compose the Board, and the security afforded thereby to the country, that while the interests of religion are not overlooked, the most scrupulous care should be taken not to interfere with the peculiar tenets of any description of Christian pupils." To carry out this theory, we have in the same letter such practical suggestions as the following:—"But, as one of the main objects must be to unite in one system children of different creeds, and as much must depend on the co-operation of the resident clergy," he recommends that "applications be made by, *first*, the Protestant and Roman Catholic clergy of the parish; or, *secondly*, one of the clergy and a certain number of parishioners professing the opposite creed; or, *third*, the parishioners of both denominations," and further, that, "for the proper support of the school, they (the Board) will invariably require, as a condition not to be departed from, that local funds shall be raised upon which any aid from the public will be dependent."

"The theory thus distinctly enunciated, and carrying with its general aims and its details of practical application so much that is feasible and praiseworthy, was hailed by many as having the very power needed to draw gradually, yet surely, the conflicting elements of Irish factions into all the beauty and strength of national harmony,—as a balmy charm, in short, which should soothe into repose the surge and surf of those political and religious agitations amid which so many governments had found themselves helpless. The statesmen of successive cabinets, sincerely desirous to promote through this system the best interests of the country, and hoping to lay in the common school the foundations of peace from Ireland, to legislate, gave the full measure of their resources to secure its complete success. And what are now the issues? Has it established a united local patronage for the support of schools? Has it brought children of different creeds to sit on the same benches, and compete for the same distinctions, even in purely secular instruction? Has it lessened party animosities, and made the schoolmaster the common friend of all? Let results speak. With the history of concessions and changes we do not at present deal: we care not to show the concessions made separately to Presbyterian or Roman Catholic; enough that these have been made, and are working out distinct results.—The simple question is, What is the fruit of our twenty-five years' expense and toil, and what light does this history shed over our difficulties in Scotland?

"There is in this country a prevailing indefiniteness of thought

as to the whole bearing of the system. We hear of some 5000 schools and 500,000 scholars, and infer that there is here a truly national system, resting on common principles, and pervaded by a common spirit. Although the channel separating this country from Ireland is not remarkably broad, the distance seems sufficient to lend enchantment to the view, and few are prepared for the facts which a close and deliberate investigation brings to light. We ask, therefore, the serious attention of educationists to a few incontrovertible statements as to matters of fact, proving the utter failure of this system in every one of its fundamental principles.

"It was originally required that, with a view to the co-operative local management of each school, joint application for aid should be made by representatives of different religious denominations. No marvel that the Earl of Derby, startled by the answer of the Secretary of the Irish Board to the Select Committee of the House of Lords appointed in 1851, when he announced, through a tabular statement, that out of 4602 schools, only FORTY-EIGHT were under joint management, asked again, "Do I rightly understand the return which you have now read, as showing that the whole number of schools under joint management is only 48 of persons of different religious denominations?"\* Nothing can be more conclusive of failure. United management can scarcely be said to exist; applications for aid are almost invariably from one denomination.

"But another step in the investigation reveals concessions still more remarkable, and completely destroying the unity of the system as national: we refer to the establishment of non-vested schools. Vested schools are those to the building of which the Commissioners have contributed, which are consequently vested in trustees, or in the Commissioners in their corporate capacity, and in which provision must be made for separate religious instruction. Non-vested schools, on the other hand, are those to the building of which the Commissioners are not permitted to contribute, and which are under the absolute control of the local patrons or committees. The teachers receive salaries, and the schools grants of books; but it remains with the patrons to decide whether or not there shall be any religious teaching, and what it shall be. The vested are obviously the only schools which can be described as in any sense national, and as even partially carrying out the original purposes of the Earl of Derby. Their number is comparatively small: according to last Report, there were only 1116 separate school houses, or, including distinct schools in the same buildings, 1655. The non-vested schools, in almost every sense denominational, and in spirit and management utterly subversive of the primary purposes of the National System, number, on the other hand, no fewer than 3680. So, after the pressure and manifold anxieties of a quarter of a century, we have but a most fragmentary and discordant national system, showing little more than a thousand school-houses under the regulative and permanent control of the Board; while there are more than three thousand, not at all contemplated in the original plan, and positively antagonistic to its spirit, which patrons and committees control with absolute independence.

"But this is not all. There is a class of schools still more intensely denominational in spirit and practice,—Convent and Monastic schools,—taught by nuns or monks, and for whose public support, in connection with a national system whose distinguishing aim was to avoid "even the suspicion of proselytism," there can be no satisfactory vindication. In these schools by a special rule, there are permitted, during the day, intermediate religious services. Special legislation also admits nuns and monks to be teachers, while it positively prohibits the Episcopalian curate or Presbyterian minister from engaging in precisely the same work. The education may be good,—we do not question the effectiveness and devoted-

\* Report, pp. 20, 28.

ness with which the Sisters of various orders toil for the young,—but is it not most incongruous to mark these schools as *national*, and as having “banished from them even the suspicion of proselytism?” It is impossible to visit them, and note the quiet power of the Sisters, as they move gracefully and with intense earnestness through their classes, each with her suspended crucifix, peculiar head-dress, and flowing veil, without perceiving that although not a syllable may directly tamper with the religious belief of any Protestant children attending for merely literary or industrial instruction, there are shed around them the silent, yet most effective, influences of a perpetual proselytism. It cannot be otherwise. No one for a moment doubts it who has carefully examined the working of this system. We do not object to the assistance given to promote the literary and industrial interests of these schools, but we aver that they are strictly and unequivocally denominational, and to mark over them the description “National School” is a very mockery. As we turn from this section of our review, the question forces itself upon us, On what principle of justice or honourable policy is money lavished on schools like these, so utterly subversive of all the original purposes of the National System, and not a single farthing on Protestant schools, because the condition is that through them the Bible shall daily shed its hallowing and authoritative influences?

“In closely examining this experiment, we find, further, that the spirit which has made joint management impracticable *outside* the school, works disastrously to the system as aiming at united education, *within*. Parents naturally prefer teachers for their children of their own religious persuasion. It is common to find in immediate proximity two national schools,—the one under Roman Catholic patronage, taught by a Roman Catholic teacher, and attended by Roman Catholic children; the other being as exclusively Protestant in its character. To such an extent do these very natural preferences influence the schools, that, although there are some gratifying exceptions, united education has become an utterly hopeless aim. Recent reports give us no means of judging of the relative numbers of children of different religious persuasions in each school at present. Indeed, on this part of the working of the system the country was kept in the dark, until Returns, which had been obstinately refused for years, were peremptorily ordered by the Earl of Eglinton, during his first viceroyalty. These returns exhibit the state of the schools for the half-year ending March 1852, and completely dissipate, when closely examined, the delusion which we were long fain to cherish as to the general diffusion of the advantages of this National System. In the provinces of Leinster, Munster, and Connaught, the most ardent supporters of this system can find scarcely a trace of united education; and in Ulster, where religious parties are more nearly balanced, we find the children of Episcopalian or Presbyterian parents sent to Protestant in preference to Roman Catholic teachers. Throughout all Ireland the Roman Catholics in national schools are to Protestants (Established Church and Presbyterian), on the average, as to 6.35 to 1. Dr. Carlile, who, it is well known, was a cordial supporter of the experiment, calculated in 1837 the ratio to be 5 to 2.\* If his calculation be admitted—and there was no higher authority at the time on the subject—the difference is worth noticing, as showing that the ratio has become 2½ times as great in favour of Roman Catholics as it was fifteen years before, and, consequently, that instead of nearing, we are receding from a healthier and better balanced state of parties.

“The last annual blue-book enables us to test the system still more closely by the light of the teachers’ religious persuasion. We have carefully analysed a list extending over 200 closely printed pages. We found several inaccuracies, even in simple addition, in the Government list,—a thing to be the less expected, inasmuch as the Report just issued is for 1856, and is fully two years behind time. This, however,

by the way: the results are interesting, as showing the extent to which each denomination is taking advantage of public assistance. This tabular analysis represents all the schools under the Board, Ordinary and Special (Special including convent, workhouse, and agricultural schools).

ORDINARY SCHOOLS.

PROVINCES.	Pres.*	R. C.	E. C.	Dist.	Not Named in Report.	Total.
Ulster,	779	1170	229	37	9	2224
Munster,	1	1606	14	..	..	1621
Leinster,	3	1447	53	..	2	1505
Connaught,	7	859	16	..	2	884
	790	5082	312	37	13	6234

SPECIAL SCHOOLS.

Ulster,	73	70	45	2	..	190
Munster,	2	400	9	1	22	434
Leinster,	8	375	25	..	..	408
Connaught,	..	108	8	1	..	117
	83	953	87	4	22	1149

ORDINARY AND SPECIAL SCHOOLS.

Ulster,	852	1240	274	39	9	2414
Munster,	3	2006	23	1	22	2055
Leinster,	11	1822	78	..	2	1913
Connaught,	7	967	24	1	2	1001
	873	6035	399	41	35	7383

“Thus, when we exhaust every variety of National School—ordinary, agricultural, workhouse, convent, and monastic—we have as the result—

873 Presbyterian Teachers,  
399 Episcopalian do.,  
6035 Roman Catholic do.

“Out of 7383 Teachers, only 1348 are Protestant, including Episcopals, Presbyterians, Dissenters, and those also for whom the Board have found no name. These results are such as few anticipated. But may not these, after all, be generally fair proportions? What are the relative numbers of Roman Catholics and Protestants in Ireland? Strange to say, the Census Returns for Ireland are silent as the grave on this subject. Under the curse of concession, the Returns came forth with no response to questions which were at once filled up in Britain. For the credit of British statesmanship, and the interests of social science, we trust such tampering with National Statistics will never again be tolerated. Apart from this, we have striking supplementary evidence, in the Reports of the Church Education Society, that the above numbers do not at all adequately represent the Protestants of Ireland. We find that there are actually under the Church Education Society more Protestant Teachers than under the National Board.—The numbers stand thus—1348 Protestant Teachers under the National Board; 1800 Protestant Teachers under the Church Education Society. The unexpected fact thus suddenly starts up before us, that there are more Protestant Schools supplying primary instruction to the poor of Ireland under the Church Education Society than are under the National Board. When we find that out of 2020 of the clergy of the Irish Church, not 90 give this system their support; when we look over the General Annual Reports of the Society, and the smaller District Reports, and, testing the character of associations by the names of their subscribers and supporters, we find to what an overwhelming extent the intellect, rank, wealth, and moral and religious power of Protestant Ireland are set dead against the system, because it excludes

\* For a singularly calm and masterly discussion of the whole question, see Charge to the Clergy of his Diocese by the Bishop of Ossory.

P\* pres., Presbyterian; R. C., Roman Catholic; E. C., Episcopal Church; Diss., Dissenter.

from the public school the word of God, we have no hesitation in affirming that *the System is not National*, and the difficulties of the Education question are yet unsolved. It is not our purpose to debate the questions raised between the Church Education Society and Government, but, we affirm, there is something grossly impolitic and harsh in the legislation which deliberately confers public assistance on Convent and Monastic Schools, while it continuously refuses to adopt such arrangements as would draw at once into the National System that vast accession of life and power which the support of the Established Church would give. They are not the friends of Educational progress who exclude these Schools and the additional power they could bring for the social and professional elevation of the Teachers. We venture to affirm, that the legislation, which for a quarter of a century has disregarded and trampled on the conscientious opinions of 2000 clergy, and of the laity whom they collectively represent, is unworthy of the statesmanship of Britain, and will assuredly be regarded in a generation or two hence as intolerant and persecuting."

He then proposes his remedy:—

"What is to be done? The time has come when there must be renewed efforts to frame and establish a National System on a broad and liberal basis, not an implantation from Ireland or England, but an evolution from amid our own National experiences, and adapted to the altered condition of society. The difficulty hitherto has been to legislate so as to preserve the Bible in the common school, and secure the support of the "Voluntary party." Solutions have been attempted again and again, so earnest and liberal, as to give promise, though they failed, of success, to repeated and modified trials. Now that the dust of agitation and controversy has been carried past us, we may profit by our mistakes, and relay our foundations. In the resolutions agreed to at the public meeting of the National Education Society held in Edinburgh in 1850, religious instruction in the Common School was left altogether to the haphazard deliverances of School Committees, chosen from amid masses of the community. The Church was ignored as an educating power; and the resolutions, though influentially supported and advocated with consummate ability, proved generally unacceptable. In the "Proposal for a System of National Education," signed by Dr. Cunningham, Dr. Candlish, and others, there was provision made that the Government inspectors "satisfy themselves as to the moral and religious character of candidates" for teacherships, "but without imposing any test of conformity;" and, further, that "the religious instruction be given exclusively from the authorised version of the Holy Scriptures and the Shorter Catechism." The Church was so far recognised, that the ministers of different denominations might have liberty of visiting. The proposal was very unacceptable to a large class, because it legislated at all as to religious instruction in the school; and to another class, because it left to the decision of inspectors the religious character of the teacher; and, further, because, if the teacher proved incompetent or immoral, there was no local management or control provided. The Sheriff was to have the incongruous task of settling all difficulties, disputes, and delinquencies. It provided for religious instruction, but swept from those most interested in the school, every trace of religious control; and while it recognised the Established Church and other Presbyterian bodies, as entitled to take an interest in schools and watch over their efficiency, it denied them any jurisdiction, and transferred to the Sheriff-court the functions of a court of conscience. For these and similar reasons, the "Proposal," though closer in its tone and arrangements to the general wishes of the people than the resolutions already noticed, did not carry with it sufficient support.

"The difficulty may be obviated by a legislation which deals in this country, not with the Education in the School, but with the Local Managers or Board out of it: Let the legislation give such constitution to the Local Boards as will be a guarantee, that the best instruction, secular and religious, will be efficiently imparted: Let them be constituted on the tacit recognition of the threefold responsibility of the parent, the Church,

and the State: Let the Town-Councils elect three of their members,—and let the Presbyteries,—Established, Free, and United Presbyterian—elect each a representative, as the Local Educational Board, with power to add to their number three others, if they see necessary. This would enable the Board to obtain the co-operation of clergymen and laymen of other denominations, distinguished for their interest and influence in local education. Each school district might have also its commissioner, chosen by resident heads of families, to take part in the deliberations of the Board. But we omit details, and refer to the admirable work by Sir James Kay Shuttleworth, as having many valuable hints on this view of the subject.\* This is the only course, we think, likely to extricate conflicting parties from the disgraceful dead-lock in which, for many years, they have been lying, and to give the country a satisfactory guarantee, without statutory obligations, that the Education shall unite the thoroughly intellectual with the moral and religious. With this start, and free from the incumbrances of ecclesiastical and political antagonisms, it will be comparatively easy to carry improvements upward through all our intermediate institutions.

"But difficulties, dark and almost overwhelmingly saddening, meet us when we look outward and downward on the simmering masses, out of which our Ragged-Schools and Reformatories are ever filling. Oppressive revelations of the social dis-organisation and disease of the sinking and sunken, are spread before us in the calmly written and invaluable work by Mr. Thomson of Banchoy, "*Punishment and Prevention*." It exhibits the more effective methods yet attempted for prevention and reformation. But what avail they all? Ragged Schools and Reformatories are but skirting the borders of the sinking and the sunken, without permanently lessening the mass. Our manifold appliances yet scratch the surface, and gather in a few floating particles for improvement. Were there no reproducing, nor rapid filling up of the empty space, the whole mass might ultimately yield to the play of benevolence and philanthropy, as the solid rock moulders into pliability and fruitfulness under the gentle influences of the air, the glistening dewdrop and the silent sunbeam. But such result is here improbable. Nor, will a National System avail. The most perfectly equipped network of National Schools, spread over the whole country, and lowered to encircle the most sunken, will assuredly not avail. All experience attests, that to raise the sunken, or to arrest the sinking, something more direct and stringent is needed,—in short, that compulsory Education is now a National necessity.

"The claims of the labour market must no longer triumph over the rights of children.—covetous employers and parents must be no longer permitted to lay the body, heart, intellect, and spirit of the helpless young a sacrifice on the altar of Traffic, and to raise imposing structures out of finest sensibilities, while they crush hopeful intellects which they keep for ever dark, and consciences which they too often touch only to deaden. Britain has already broken in upon the sacredness of the labour-market by smiting off the fetters of the slave; and why not, by regulative legislation, lighten for her own children the burden of premature toil? The difficulties are not insuperable in the way of extending to all employments the principle of the Factory Act, and of applying Educational tests as the condition both of half and of full time labour,—For the hundreds of thousands who are growing up untaught, a source of misery to themselves, and of weakness to the state, increasing our taxation, multiplying our reformatories, and exhausting public benevolence, nothing short of direct compulsion will suffice. The Educational condition of our sinking and sunken population, demands extraordinary remedial measures. We pity the imbecility which for generations leaves untouched the Pontine Marshes while they diffuse the elements of disease and death; but wherein is Britain better, so long as she allows her moral jungles to send abroad freely, on the breeze of every passing influence, the seeds of idleness, vagrancy, and crime?"

\* "Public Education," pp. 396-409.

## THE EXAMPLE OF THOMAS ARNOLD.

Men are more readily taught by example than by precept. The dead are sometimes more powerful than the living, nor is it strictly true that the only evil which men do lives after them. Astronomers tell us that if one of the fixed stars should be blotted from the firmament, years must roll on ere its last ray would reach our earth. It is so when the good die. Long after dust has claimed its native dust, nations are swayed by their influence, and the light of their example becomes the beacon guide of kindred minds, through succeeding generations. Among those who, being dead yet live, and from whose labors the world is now reaping a plentiful harvest, the name of Thomas Arnold stands pre-eminent, especially in whatever concerns the interest of education. It is not our present purpose to attempt his biography, nor to comment upon his writings, but to view his life as furnishing an example, which the humblest teacher in the land may fittingly strive to imitate. It is a characteristic of a great mind to know how to condescend to things of low estate, and in a good teacher it is indispensable to know how to so unite dignity with kindness, that pupils, while they preserve all due respect, may also be drawn into perfect freedom of expression.

In the relations existing between Arnold and his scholars, this freedom was peculiarly marked. There was, on his part, no haughty reserve so chilling to the heart of a generous boy. There was no fictitious dignity inspired by the name of teacher; neither did he single himself out from among his pupils as a being worthy of their regard, but too exalted for their love. He mingled in their sports, and of its effect upon himself let him be his own witness. "I should say, have your pupils a good deal with you, and be as familiar with them as possible. I did this continually, more and more, before I left Laleham, going to bathe with them, leaping and performing all other gymnastic exercises within my capacity, and sometimes sailing or rowing with them. They, I believe, always liked it, and I enjoyed it like a boy and found myself constantly the better for it."

What was the feeling of his pupils towards him? They possessed for him the deepest reverence, inspired by his innate goodness of heart, as well as by his superior knowledge. They were attached by the love of right, the supreme regard for truth, the unfeigned humility, which were such conspicuous traits in his character, and, while in a degree they were influenced to cultivate the same traits, they also looked for his approval, a thing most worthy to be sought for next to that of God and the conscience. The master was supreme, yet they were not slaves. They feared him, but a deeper feeling than fear pervaded the mass, and led them captives at his will.

There was a recognition of the mutual dependence, which, in a healthfully regulated school, must exist between teacher and pupils, whereby they perceived that his approval was a thing essential to their happiness, and that they in turn, by their good or bad actions, seriously affected his comfort.—Again, his control over them was never inspired by his life. "His interest and sympathy with boys," says one, "far exceeded any outward manifestations of it." The boys knew this, felt it, believed it with the whole soul, and this belief was strengthened "by the general influence of his whole character, displayed consistently whenever he appeared before them."

Besides the relations he sustained to his pupils, those which he sustained to his profession and to the world about him are instructive. His was not a life full of selfishness and sloth, cold and insulated, but one characterized in every department of increasing activity. Neither was this the jealous activity of one seeking his own preferment, merely making teaching, and the seeming love of it, the means by which he might accomplish certain ends. He was known as a lecturer, as a writer, and as an ardent friend of whatever had a tendency to elevate his profession, or to promote the diffusion of knowledge among the people. It was his aim to awaken and draw out

thought, and to in 'uce discussion. Upon a certain subject he says, "feeling sincerely that my own information is limited, I should be very glad to be the means of inducing others to write upon it who may be far better acquainted with its details than I am." Again he writes, "I cannot tell of myself how to mend the existing evil, but I wish to call attention to its magnitude."

In this respect the example of Arnold is particularly worthy of note by American educators. There is much of ignorance and prejudice to be overcome in the minds of teachers, many old dogmas to be exploded—many new theories to be examined. When Themistocles would build again the walls of Athens, he spared neither the temples of the gods, nor the tombs of his ancestors. Nothing was too sacred, nothing too profane. He invaded all places, both public and private, and enlisted the services of bondsmen and freemen, that he might speedily accomplish his end. We live in an age of seeming progress, and if we would keep pace with the demands of the times, we ought not only to avail ourselves of all present resources, but to increase them by every means in our power, remembering that "every man is a debtor to his profession, from which, as men do, of course, seek to receive countenance and profit, so ought they, of duty, to endeavour themselves, by way of amends, to be both a help and an ornament thereto." There is no great merit in reading, yet never writing; in thinking, yet never talking; in accumulating knowledge, if we hoard, as a miser does his gold, or hide it, as the slothful servant hid his talent in the earth.

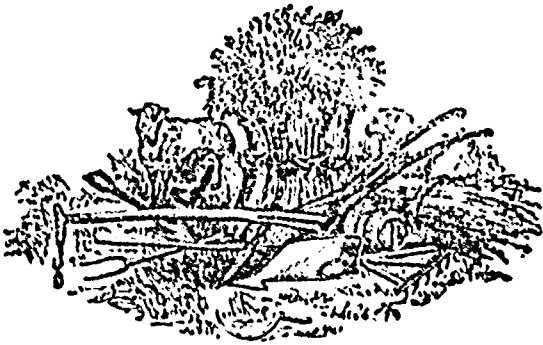
But there is one view in which the life of Arnold rises into still higher significance. He was a christian teacher. "Above all," he writes "let me mind my own personal work,—to keep myself pure, and zealous, and believing,—laboring to do God's work, yet not anxious that it should be done by me rather than by others, if God disapproves of my doing it." "What we must look for here, first," he says, "is moral and religious principle." Ought it not to be so in every school?

What would Arnold have said had he taught in some of our American cities, and been told that, not only must the voice of prayer be silenced, but that even the Word of God could not be tolerated in the school-room? All over our land are men to be found, and their number is not few, who advocate the total prohibition of every kind of religious influence in our common schools. They may err through ignorance, but their error is none the less great and alarming, and ought to meet the firm, unyielding remonstrance of every Christian teacher in the land.

From the religious life of Arnold, there is space to inculcate only the lesson that a teacher's religion should not be merely the foundation of his life, covered from sight by worldly cares, but his life itself. Permeating and penetrating every thought, speaking in every action, giving life and meaning to every expression, it is as necessary to his success as the warmth of the sun to the germination of spring.—*Connecticut Common School Journal.*

[Noble, broad-minded, christian-hearted Thomas Arnold! Right glad are we to see your gifted mind, and the great thoughts and goodly deeds it engrafted on many a fruitful English heart, thus honoured among the great American people, and held up by their most forward men as a guiding light among the educators of this most mindful age! Would that his pious and yet right practical and manly example of a sound English Churchman were still among us to invigorate and cheer those whom he instructed by his life-like Christianity, even more than by his masterly power in moulding minds, and forming the moral character of youth after his own lofty model. Would that his stalwart spirit were yet here, to give battle to the Romish taint, and the still more pernicious, narrow, ignorant, and puritanical bigotry which is so busily warping many of the worthiest sons of England to excesses and heresies.—*Ed. Eng. J. L.*]

# AGRICULTURAL.



## I.—THEORY OF AGRICULTURE.

We continue a few more extracts on the subject of Organic Manures:—

A third class is formed of those manures of animal and vegetable origin which, though highly fertilizing, are not liable to rapid decay; and are, therefore, permanent in their effects, and may be kept for application in a dry state. Such are bones, hair, hoofs, hen manure, guano, wood ashes, and soot.

*Bones* are of great value, as they afford that rare and important substance, phosphate of lime, along with a rich animal matter; ground bones, or "bone dust" are now an important article of traffic as manure, and are cheap to the farmer even at the rate of a dollar and a half to two dollars per barrel;—as five bushels are considered to be sufficient manure for an acre of turnips, especially if mixed with a little wood ashes. Every farmer should collect and apply bones. They are very valuable, even after being burned or boiled with potash for soap; because they still contain their phosphate of lime, though deprived of their animal matter. Where means for grinding bones cannot be obtained, they may be broken into small pieces by the hammer; they may then be mixed with an equal quantity of earth or ashes, moistened, and left to heat before being put into the drills. For practical illustrations of the value of bones, I may refer to Jackson's Agriculture. Among other instances, he mentions, that a dressing of 600 bushels on 24 acres of poor pasture, had so improved the grass, as to double the yield of butter; and this effect endured for many years. In this case, the pasture had been laid down for ten years, and, no doubt, much of its natural phosphate of lime had been exhausted, to form a constituent in the milk and bones of the cattle that had fed on it. In another case, he mentions a ten-fold yield of turnips, and a great improvement in succeeding grain crops, as resulting from its application.

*Hair and Hoofs* are rich manures, though they decay slowly. Such substances from tanneries, etc., should be saved and applied to the land. At the rate of twenty or thirty bushels per acre, they produce marked effects.

*Hen's Manure and Guano* are very rich in nitrogen and phosphates, and may hence be regarded as the most concentrated form in which the most rare and expensive parts of the food of plants can be supplied. They contain, in the solid form, all the substances which are present in liquid manure, in a state of solution. From two to four cwt. of guano are sufficient on most soils to raise a good crop of turnips, and a succeeding grain crop; but as guano does not contain much of the ruder and more common organic matters useful in the soil, it is best to use one or two cwt. of guano, with half the usual quantity of other manure. To render the guano more easily applied, it should be mixed with sand or dry soil before sowing it.

The great value of *Wood Ashes* may be estimated from the

remarkable effects produced by them in new land, where the ashes of forests,—the growth of centuries—are at once applied to the surface. The substances which they afford may be learned from the following analysis of the ashes of beech wood:—

Potash, . . . . .	15.83 per cent.
Soda, . . . . .	9.79
Common Salt, . . . . .	0.23
Lime, . . . . .	62.37
Gypsum, . . . . .	2.31
Magnesia, . . . . .	11.29
Oxide of Iron, . . . . .	0.79
Phosphoric Acid, . . . . .	3.07
Silica, . . . . .	1.32

These are the principal substances on which new land depends for its fertility; and the loss of which, either by wasteful cultivation or by repeated burnings followed by rain, causes its exhaustion. These ashes produce the best effects, when a considerable proportion of the vegetable matter of the soil remains unconsumed; both because this vegetable matter serves to retain the ashes, and because it prevents their caustic effects from being too strongly felt. On the other hand, when the vegetable matter is entirely consumed the ashes are rapidly wasted, and the crops suffer from deficiency of organic manure. Leached ashes, having lost their potash and soda, are of less value than recent ashes, but are still of great utility.

Ashes may be applied with any crop; but not in very large quantity, as they not only act powerfully as a manure, but exert a caustic or decomposing influence on organic manures and the roots of plants. Fifty bushels per acre is the largest quantity that can be safely applied to heavy soils, rich in vegetable matter. Lighter soils should have a much smaller quantity; and on light soils even a few bushels will produce marked benefits. *Kelp*—or the ashes of sea weed—and peat ashes, are similar in their effects to wood ashes, but less powerful.

*Soot* contains ammonia, and sulphates, carbonates, muriates, and phosphates of lime, potash, soda, magnesia, &c. It is, therefore, a very powerful manure, and, like guano, need be applied, but in small quantity.

To this class of manures, I may add the heads and back bones of codfish, which may be obtained in large quantity in some of the fishing districts. If dried, and packed in old barrels or crates, they might be preserved, and conveyed into the interior districts. As they consist entirely of phosphate of lime, and rich animal matter, they are nearly as valuable as guano, and would be well worth 5s. or 6s. per cwt. They should be cut up, or crushed, and mixed with soil, to ferment before being applied. They should be used in drills with potatoes or turnips.

It may also be of service to add here, that night soil, urine, and other offensive animal substances, may be converted into a manure of great power, and quite inoffensive, by mixing them with powdered charcoal, or charcoal and gypsum.—They may then be sown like guano, and will produce similar effects. Artificial manures, called *pondrettes*, are often prepared in this way. Farmers would find it profitable, to have constantly at hand a quantity of charcoal and powdered gypsum, for such purposes.

## II.—PRACTICE OF AGRICULTURE.

### CARROTS FOR HORSES.

In Great Britain, many of the most successful agriculturists, and cattle breeders, feed their horses liberally, and, indeed, in some instances, quite exclusively on roots. The carrot they hold in high estimation for this purpose, and

vast quantities are annually raised and consumed. It has been estimated by some writers on domestic economy, that a bushel of carrots is equal to half a bushel of grain; but although this is doubtless a somewhat extravagant appreciation, we have no doubt that three bushels of carrots will prove, in all cases, fully equivalent to one of oats. It was stated not long since in one of the papers, that the proprietor of one of the most extensive livery stables in Connecticut "considers carrots the most valuable article of winter feed he has ever raised." Raped, and mixed with chopped straw, or refuse hay, they answer a double purpose of economy, and render the expense of wintering animals far less than it would be were we to employ only English hay and grain. Hogs winter admirably, and even fatten on these roots. We advise every farmer who can command a piece of old, well worked, rich and deep soil, to put in a few square rods, and try them. The seed may be sown in this climate as late as the twentieth of June. The ground should be finely pulverized by harrowing or some other equally efficient disintegrating process, and thoroughly rolled after sowing the seed. Guano and bone dust are efficacious and salutary stimuli for the crop. Ashes, also, and gypsum, have a decidedly favorable and energizing effect. But plenty of good barn manure is best.

#### KIND OF CARROTS FOR CULTURE.

I wish to inquire which is the most productive variety of field carrots, and which the best for feeding neat cattle and swine?

I have cultivated the Orange carrot on a small scale for two years past with good success.

Clements, N. S., Dec. 1858.

ISRAEL BALCOMB.

REMARKS.—The long *Orange carrot* we consider the sweetest and most nutritious, but perhaps will not produce quite as many pounds per acre, under the same circumstances, as the *Alteringham carrot*.

#### LIGHT IN STABLES.

Stables should be so constructed, by the insertion of win dows in various parts of the building, that they should be "light as day." A "dark" stable is only a suitable *black hole*,—prison-house for such a vicious specimen of the equine race as the notorious "*Cruiser*," it is also the very worst location for any kind of animal. Sir A Nylie (who was long at the head of the medical staff in the Russian army) states that cases of disease on the dark side of an extensive barrack at St. Petersburg, have been uniformly, for many years, in the proportion of three to one, to those on the side exposed to a strong and uniform light. Humboldt has also remarked that, among lipeds, the residents of South America, who wear very little clothing—thus allowing the cutaneous, as well as the orbital surfaces, to receive a free ray of light—enjoyed immunity from various diseases which prevailed extensively among the inhabitants of dark rooms and underground locations, and so excellent an authority as Linnæus contends that the constant exposure to solar light, is one of the causes which render a summer journey through high northern latitudes so peculiarly healthful and invigorating. Dr Edwards has also remarked that persons who live in caves or cellars, or in very dark or narrow streets, are apt to produce deformed children; and that men who work in mines are liable to disease and deformity.

Light, therefore, is a condition of vital activity, and, in view only of preserving the sight of a horse, it is absolutely necessary that while he be the habitant of the stable, his optics shall have free access to the sun's rays.

If a horse was in the same condition as a polype, with no organ of vision, who shuns light, a dark stable might prove to be his earthly paradise, but as the horse has special organs of vision, evidently susceptible to the influence of light,

and the integrity of his organism, or a part of the same depending entirely on the admission of light, it is absolutely necessary that stables should be constructed accordingly.—*American Veterinary Journal*.

#### THE MILK BUSINESS.

The *Springfield (Mass.) Republican* furnishes the following facts in relation to the supply of milk for that city:—

We have made an effort to learn some of the aggregates of this industry—to compare the average quantity of milk per cow in each herd; and to learn the different methods of feeding; all points of curious interest and suggestive value. For this purpose circulars have been addressed to most of the milkmen of this city, of course, with varying success. All have not answered, but enough have done so to give a near-or estimate than otherwise would be possible. There are from twelve to fourteen regular dealers of milk in this city. Not far from 2,000 quarts, or \$100 worth, are sold daily through the year. The highest quantity, sold by any one milkman, in the best of the season, so far as known, is 400 quarts daily, and this man, in the average for the year, is put down at 250 quarts. Taking all the milkmen, the average is 166 2-3 quarts each daily. To raise this milk requires a herd of about 300 cows, which give, on an average about seven quarts. The force requisite to carry on this business equals one man for every six cows, or an aggregate of fifty men, summer and winter. The best milkers, generally, are crosses of Short-Horn with Ayrshire and Natives, but good milkers can be found of almost every breed.

The feed that produces the most milk is yet a vexed question. In the opinions received, cotton seed meal, corn, rye and buckwheat ground together, and roots, with rowen hay, have equal prominence. The order of feeding cows varies with different individuals. Some feed roots the first thing in the morning, and others late at night. Some give hay the first thing, and others reserve it till noon. Each feeder gives his practice and reasons with equal freedom—which is a very hopeful system in any debate. Our conclusion is, that the best order is as follows: Wet cut feed mixed with meal after each milking, with hay and roots between. Neither roots nor grain should be fed upon an empty stomach. In the first case, the milk is more likely to receive the odor of the roots. In the latter the appetite is greatly impaired for other food. No fact is more clearly established than that the flavor and quality of the milk and flesh depend in part upon the quality of the food. Various expedients have been resorted to counteract bad flavors. The English heat their milk, and then add saltpetre to it to prevent the taste of cabbages. The Virginians slice and salt rutabagas, twelve hours before feeding, in order to escape that odor. In this region, regularity in feeding, as to quantity and time, by some is considered sufficient remedy for common turnips.—Experience proves that corn and carrots make first quality pork. Cows that give milk require more food in proportion to their bulk than either oxen or horses; twenty-five to thirty pounds of dry hay daily is the usual consumption of farm animals. Of course, if roots or meal are added the consumption will be less.

#### BOOKS FOR FARMERS IN SCHOOL LIBRARIES.

For libraries in the rural districts, there should be some works selected which will instil a love for Agricultural and Horticultural pursuits, and all such books as have a tendency to render the children of the farmer discontented with their lot in life, should be discarded at once. Instil into the minds of the young ruralists a proper love for their avocation, and all the tinsel and glitter of the artificial life of cities will have no attraction to them. What a world of misery, wretchedness, and criminality, would be blotted out of exist-



tence, could all the youth of the land be taught to love labor, or the study of those sciences which insure the acquirement of a fund of useful knowledge, instead of the idleness, dissipation, and the frivolous accomplishments of fashionable society! How many farmers' sons, who, by improper associations, became indoctrinated with the idea that farm labor is menial and degrading, have left the 'Old Farm at Home,' and after a round of dissipation, are now reaping the reward of these evil influences in the Penitentiary. Had there been School Libraries, composed of judiciously selected books, these same felons or criminals would undoubtedly have been honest intelligent, and industrious members of society. —Ohio Farmer.

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