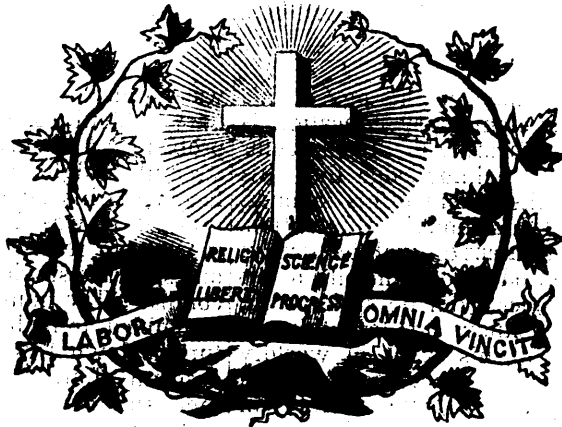


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Pestalozzi—The Influence of his Principles and Practice on Elementary Education.

By JOSEPH PAYNE, PROFESSOR TO THE COLLEGE OF PRECEPTORS.

Familiar as Pestalozzi's name is to our ears, it will hardly be pretended that he himself is well known amongst us. His life and personal character—the work he did himself, and that which he influenced others to do—his successes and failures as a teacher, form altogether a large subject, which requires, to do it justice, a thoughtful and lengthened study. Parts of the subject have been from time to time brought very prominently before the public, but often in such a way as to throw the rest into shadow, and hinder the appreciation of it as a whole. Though this has been done without any hostile intention, the general effect has been in England to misrepresent, and therefore to under-estimate, a very remarkable man—a man whose principles, slowly but surely operating on the public opinion of Germany, have sufficed, as one of his admirers (Krusi) phrases it, “to turn right round the car of Education, and set it in a completely new direction.”

One of the aspects in which he has been brought before

us—and it deserves every consideration—is that of an earnest, self-sacrificing, enthusiastic philanthropist, endowed with what Richter calls “an almighty love,” whose first and last thought was how he might raise the debased and suffering among his countrymen to a higher level of happiness and knowledge, by bestowing upon them the blessings of education. It is right that he should be thus exhibited to the world, for never did any man better deserve to be enrolled in the noble army of martyrs who have died that others might live, than Pestalozzi. To call him the Howard of educational philanthropists, is only doing scant justice to his devoted character, and under-estimates, rather than over-estimates, the man.

Another aspect in which Pestalozzi is sometimes presented to us is that of an unhandy, unpractical, dreamy theorist; whose views were ever extending beyond the compass of his control; who, like the djinor of the fable, called into being forces which mastered instead of obeying him; whose “unrivalled incapacity for governing” (this is his own confession) made him the victim of circumstances; who was utterly wanting in worldly wisdom; who, knowing man, did not know men; and who, therefore, is to be set down as one who promised much more than he performed. It is impossible to deny that there is substantial truth in such a representation; but this only increases the wonder that, in spite of his disqualifications, he accomplished so much. It is still true that his awakening voice, calling for reform in education, was responded to by hundreds of earnest and intelligent men, who placed themselves under his banner, and were proud to follow whither the Luther of educational reform wished to lead them.

A third view of Pestalozzi presents him to us as merely interested about elementary education—and this appears to many who are engaged in teaching what are called higher subjects a matter in which they have little or no concern. Those, however, who thus look down on Pestalozzi's work, only show, by their indifference, a profound want, both of self-knowledge, and of a knowledge of his principles and purpose. Elementary education, in the sense in which Pestalozzi understands it, is, or ought to be, the concern of every teacher, whatever may

be his especial subject, and whatever the age of his pupils; and when he sees that elementary education is only another expression for the forming of the character and mind of the child, he must acknowledge that this object comes properly within the sphere of his labours, and deserves, on every ground, his thoughtful attention.

In spite, then, of Pestalozzi's patent disqualifications in many respects for the task he undertook; in spite of his ignorance of even common subjects (for he spoke, read, wrote, and cyphered badly, and knew next to nothing of classics or science); in spite of his want of worldly wisdom, of any comprehensive and exact knowledge of men and of things; in spite of his being merely an elementary teacher,—through the force of his all-conquering love, the nobility of his heart, the resistless energy of his enthusiasm, his firm grasp of a few first principles, his eloquent exposition of them in words, his resolute manifestation of them in deeds,—he stands forth among educational reformers as the man whose influence on education is wider, deeper, more penetrating, than that of all the rest—the prophet and the sovereign of the domain in which he lived and laboured.

The fact that, with such a position, supersedes any argument for our giving earnest heed to what he was and to the consideration of them this Lecture is to be devoted.

It was late in life—he was fifty-two years of age—before Pestalozzi became a practical schoolmaster. He had even begun to despair of ever finding the career in which his loving heart and teeming brain had been brooding from his earliest youth. He feared that he should die, without reducing the ideal of his thought to the real of action (1).

Besides the advanced age at which Pestalozzi began his work, there was another disability in his case to which I have not referred. This was, that not only had he had no experience of school work, but he knew no eminent teacher whose example might have stimulated him to imitation; and he was entirely ignorant (with one notable exception) of all writings on the theory and practice of education. The exception I refer to is the "Emile" of Rousseau, a remarkably suggestive book, which made, as was to be expected, a strong impression on his mind. We know from his own account, that he had already endeavoured, with indifferent success, to make his own son another Emile. The diary in which he has recorded day by day the particulars of his experiment is extremely interesting and instructive.

At fifty two years of age, then, we find Pestalozzi utterly unacquainted with the science and the art of education, and very scantily furnished even with elementary knowledge, undertaking at Stanz, in the canton of Unterwalden, the charge of eighty children, whom the events of war had rendered homeless and destitute. Here he was at last in the position which, during years of sorrow and disappointment, he had eagerly desired to fill. He was now brought into immediate contact with ignorance, vice, and brutality, and had the opportunity for testing the power of his long-cherished theories. The man whose absorbing idea had been that the ennobling of the people, even of the lowest class, through education,

(1) As I cannot enter on the particulars of Pestalozzi's strangely chequered life, I refer those who desire to know them to Mr. Quick's valuable "Essays on Educational Reformers;" to "Pestalozzi," published by the Home and Colonial Society, containing Dr. Mayo's and Miss Mayo's Essays on the subject, capitally annotated by Mr. Dunning; to Von Raumer's History of Education; and to the recently published work of Roger de Guimp (Histoire de Pestalozzi, de sa Pensée, et de son Œuvre, Lausanne, 1874), in which is given a list of 150 Lives, Essays, and Disquisitions relating to the subject.

was no mere dream, was now, in the midst of extraordinary difficulties, to struggle with the solution of the problem. And surely if any man, consciously possessing strength to fight, and only desiring to be brought face to face with his adversary, ever had his utmost wishes granted, it was Pestalozzi at Stanz. Let us try for a moment to realize the circumstances—the forces of the one side, the single arm on the other, and the field of the combat. The house in which the eighty children were assembled, to be boarded, lodged, and taught, was an old tumble-down Ursuline convent, scarcely habitable, and destitute of all the conveniences of life. The only apartment suitable for a schoolroom was about twenty-four feet square, furnished with a few desks and forms; and into this were crowded the wretched children, noisy, dirty, diseased, and ignorant, with the manners and habits of barbarians. Pestalozzi's only helper in the management of the institution was an old woman, who cooked the food and swept the rooms, so that he was, as he tells us himself, not only the teacher but the paymaster, manservant, and almost the housemaid of the children.

Here, then, we see Pestalozzi surrounded by a "sea of troubles" against which he had not only "to take arms," but to forge the arms himself. And what was the single weapon on which he relied for conquest? It was his own loving heart. Hear his words:—"My wishes were now accomplished. I felt convinced that my heart would change the condition of my children as speedily as the springtide sun reanimates the earth frozen by the winter." "Nor," he adds, "was I mistaken. Before the springtide sun melted away the snow from our mountains, you could no longer recognize the same children."

But how was this wonderful transformation effected? What do Pestalozzi's words really mean? Let us pause for a moment to consider them. Here is a man who, in presence of ignorance, obstinacy, dirt, brutality, and vice—enemies that will destroy him unless he can destroy them—opposes to them the unresistible might of weakness, or what appears such, and fights them with his heart!

Let all teachers ponder over the fact, and remember that this weapon, too frequently forgotten, and therefore unforaged, in our training colleges, is an indispensable requisite to their equipment. Wanting this, all the paraphernalia of literary certificates, even the diplomas of the College of Preceptors, will be unavailing. With it, the teacher, poorly furnished in other respects, (think of Pestalozzi's literary qualifications!) may work wonders, compared with which the so-called magician's are mere child's play. The first lesson, then, that we learn from Pestalozzi is that the teacher must have a heart—an apparently simple but really profound discovery, to which we cannot attach too much importance.

But Pestalozzi's own heart was not merely a statical heart—a heart furnished with capabilities for action, but not acting; it was a dynamical heart—a heart which was constantly at work, and vitalized the system. Let us see how it worked.

"I was obliged," he says, "unceasingly to be everything to my children. I was alone with them from morning to night. It was from my hand they received whatever could be of service both to their bodies and minds. All succour, all consolation, all instruction came to them immediately from myself. Their hands were in my hand; my eyes were fixed on theirs, my tears mingled with theirs, my smiles encountered theirs, my soup was their soup, my drink was their drink. I had around me neither family, friends, nor servants; I had only them. I was with them when they were in health, by their side when they were ill. I slept in their midst. I was the last to go to bed, the first to rise in the morning. When we were in bed, I used to pray with them and talk to

them till they went to sleep. They wished me to do so."

This active, practical, self-sacrificing love, beaming on the frozen hearts of the children, by degrees melted and animated them. But it was only by degrees. Pestalozzi was at first disappointed. He had expected too much, and had formed no plan of action. He even rather prided himself upon his want of plan.

"I knew," he says, "no system, no method, no art but that which rested on the simple consequences of the firm belief of the children in my love towards them. I wished to know no other."

Before long, however, he began to see that the response which the movement of his heart towards theirs called forth was rather a response to his personal efforts, than one dictated by their own will and conscience. It excited action, but not spontaneous, independent action. This did not satisfy him. He wished to make them act from strictly moral motives.

Gradually, then, Pestalozzi advanced to the main principles of his system of moral education—that virtue, to be worth anything, must be practical; that it must consist not merely in knowing what is right, but in doing it; that even knowing what is right does not come from the exposition of dogmatic precepts, but from the convictions of the conscience; and that therefore both knowing and doing rest ultimately on the enlightenment of the conscience through the exercise of the intellect.

He endeavoured, in the first place, to awaken the moral sense—to make the children conscious of their moral powers, and to accomplish his object, not by preaching to them, though he sometimes did this, but by calling these powers into exercise. He gave them, as he tells us, few explanations. He taught them dogmatically neither morality nor religion. He wished them to be both moral and religious; but he conceived that it was not possible to make them so by verbal precept, by word of command, nor by forcing them to commit to memory formularies which did not represent their own convictions. He did not wish them to say they believed, before they believed. He appealed to what was divine in their hearts, implanted there by the Supreme Creator; and having brought it out into consciousness, called on them to exhibit it in action. "When," he says, "the children were perfectly still, so that you might hear a pin drop, I said to them, 'Don't you feel yourselves more reasonable and more happy now than when you are making a disorderly noise?' When they clung round my neck and called me their father, I would say, 'Children, could you deceive your father? Could you, after embracing me thus, do behind my back what you know I disapprove of? And when we were speaking about the misery of our country, and they felt the happiness of their own lot, I used to say, 'How good God is, to make the heart of man pitiful and compassionate.'" At other times, after telling them of the desolation of some family in the neighbourhood, he would ask them whether they were willing to sacrifice a portion of their own food to feed the starving children of that family?

These instances will suffice to show generally what Pestalozzi meant by moral education, and how he operated on the hearts and consciences of the children. We see that, instead of feeding their sphere, he called on them to exercise those within their reach. He knew what their ordinary family life had been, and he wished to prepare them for something better and nobler; but he felt that this could only be accomplished by making them, while members of *his* family, consciously appreciate what was right, and desire to do it.

Here then, in moral, and, as we shall presently see, in intellectual education, Pestalozzi proceeded from the near, the practical, the actual—to the remote, the abstract,

the ideal. It was on the foundation of what the children were, and could become, in the sphere they occupied, that he built up their moral education.

But he conceived—and, I think, justly—that their intellectual training was to be looked on as part of their moral training. Whatever increases our knowledge of things as they are, leads to the appreciation of truth; for truth, in the widest sense of the term, is this knowledge. But the acquisition of knowledge, as requiring mental effort, and therefore exercising the active powers, necessarily increases the capacity to form judgments on moral questions; so that, in proportion as you cultivate the will, the affections, and the conscience, with a view to independent action, you must cultivate the intellect, which is to impose the proper limits on that independence; and on the other hand, in proportion as you cultivate the intellect, you must train the moral powers which are to carry its decisions into effect. Moral and intellectual education must consequently, in the formation of the human being, proceed together, the one stimulating and maintaining the action of the other. Pestalozzi, therefore, instructed as well as educated; and indeed educated by means of instruction. In carrying out this object, he adopted the general principle I before stated. He proceeded from the near, the practical, the actual, to the remote, the abstract, and the ideal.

We shall see his theoretical views on this point in a few quotations from a work which he wrote some years before, entitled "The Evening Hour of a Hermit." He says:—

"Nature develops all the human faculties by practice, and their growth depends on their exercise."

"The circle of knowledge commences close around a man, and thence extends concentrically."

"Force not the faculties of children into the remote paths of knowledge, until they have gained strength by exercise on things that are near them."

"There is in Nature an order and march of development. If you disturb or interfere with it, you mar the peace and harmony of the mind. And this you do, if, before you have formed the mind by the progressive knowledge of the realities of life, you fling it into the labyrinth of words, and make them the basis of development."

"The artificial march of the ordinary school, anticipating the order of Nature, which proceeds without anxiety and without haste, inverts this order by placing words first, and thus secures a deceitful appearance of success at the expense of natural and safe development."

In these few sentences we recognise all that is most characteristic in the educational principles of Pestalozzi.

I will put them into another form:—

1. There is a natural order in which the powers of the human being develop or unfold themselves.

2. We must study and understand this order of nature, if we would aid, and not disturb, the development.

3. We aid the development, and consequently promote the growth of the faculties concerned in it, when we call them into exercise.

4. Nature exercises the faculties of children on the realities of life—on the near, the present, the actual.

5. If we would promote that exercise of the faculties which constitutes development and ends in growth, we also, as teachers, must, in the case of children, direct them to the realities of life—to the realities of life—to the things which come in contact with them, which concern their immediate interests, feelings, and thoughts.

6. Within this area of personal experience we must confine them, until, by assiduous, practical exercise in it, their powers are strengthened, and they are prepared to advance to the next concentric circle, and then to the next, and so on, in unbroken succession.

7. In the order of nature, things go before words, the realities before the symbols, the substance before the shadow. We cannot, without disturbing the harmonious order of the development, invert this order. If we do so we take the traveller out of the open sunlit high road, and plunge him into an obscure labyrinth, where he gets entangled and bewildered, and loses his way.

These are the fundamental principles of Pestalozzi's theory of intellectual as well as moral education, and I need hardly say that they resolve themselves into the principles of human nature.

But we next enquire, How did he apply them? What was his method? These questions are somewhat embarrassing, and, if strictly pressed, must be answered by saying that he often applied them very imperfectly and inconsistently, and that his method for the most part consisted in having none at all. The fact is, that the unrivalled incapacity for governing men and external things, to which he confessed, extended itself also to the inner region of his understanding. He could no more govern his conceptions than the circumstances around him. The resulting action, then, was wanting in order and proportion. It was the action of a man set upon bringing out the powers of those he influenced, but apparently almost indifferent to what became of the results. His notion of education as development was clear, but he scarcely conceived of it as also training and discipline. Provided that he could secure a vivid interest in his lesson, and see the response to his efforts in the kindling eyes and animated countenances of his pupils, he was satisfied. He took it for granted that what was so eagerly received would be certainly retained, and therefore never thought of repeating the lesson, nor of examining the product. He was so earnestly intent upon going ahead, that he scarcely looked back to see who were following; and to his enormous zeal for the good of the whole, often sacrificed the interests of individuals. This zeal was without discretion. He forgot what he might have learned from Rousseau—that a teacher who is master of his art frequently advances most surely by standing still, and does most by doing nothing. In the matter of words, moreover, his practice was often directly opposed to his principles. He would give lists of words to be repeated after him, or learnt by heart, which represented nothing real in the experience of the pupils. In various other ways he manifested a strange inconsistency.

Yet, in spite of all these drawbacks, if we look upon the teacher as a man whose especial function it is, to use an illustration from Socrates, to be, as it were, the accoucheur of the mind, to bring it out into the sunlight of life, to rouse its dormant powers, and make it conscious of their possession, we must assign to Pestalozzi a very high rank among teachers.

It was this remarkable instinct for developing the faculties of his pupils that formed his main characteristic as a teacher. Herein lay his great strength. To set the intellectual machinery in motion—to make it work, and keep it working; that was the sole object at which he aimed: of all the rest he took little account. If he had any method, this was its most important element. But, in carrying it out, he relied upon a principle which must be insisted on as cardinal and essential education. He secured the thorough interest of his pupils in the lesson, and mainly through their own direct share in it. By his influence upon them he got them to concentrate all their powers upon it; and this concentration, involving self-exercise, in turn, by reaction, augmented the interest; and the result was an inseparable association of the act of learning with pleasure in learning. Whatever else, then, Pestalozzi's teaching lacked, it was intensely

interesting to the children, and made them love learning.

Consistently with the principles quoted from the "Evening Hours of a Hermit," and with the practice just described, we see that Pestalozzi's conception of the teacher's function made it consist pre-eminently in rousing the pupil's native energies, and bringing about their self-development. This self-development is the consequence of the self activity of the pupil's own mind—of the experience which his mind goes through in dealing with the matter to be learned. This experience must be his own; by no other experience than his own can he be educated at all. The education, therefore, that he gains is self education; and the teacher is constituted as the stimulator and director of the intellectual processes by which the learner educates himself. This I hold to be the central principle of all education—of all teaching; and although not formally enunciated in these words by Pestalozzi, it is clearly deducible from his theory.

We are now prepared to estimate the great and special service which Pestalozzi did for education. It is not his speculative theories, nor his practice (especially the latter), which have given him his reputation—it is that he, beyond all who preceded him, demanded that paramount importance should be attached to the elementary stages of teaching. "His *differentia*," as Mr. Quick justly remarks, "is rather his aim than his method." He saw more clearly than all his predecessors, not only what was needed, but how the need was to be supplied. Elementary education, in his views, means, not definite instruction in special subjects, but the eliciting of the powers of the child as preparatory to definite instruction.—it means that course of cultivation which the mind of every child ought to go through, in order to secure the all-sided development of its powers. It does not mean learning to read, write, and cypher, which are matters of instruction, but the exercises which should precede them. Viewed more generally, it is that assiduous work of the pupil's mind upon facts, as the building materials of knowledge, by which they are to be shaped and prepared for their place in the edifice. After this is done, but not before, instruction proper commences its systematic work.

This principle may find its most general expression as a precept for the teacher thus:—*Always make your pupil begin his education by dealing with concrete things and facts, never with abstractions and generalisations—such as definitions, rules, and propositions couched in words.* Things first, afterwards words—particular facts first, afterwards general facts or principles. He has eyes, ears, and fingers, which he can employ on things and facts, and gain ideas—that is, knowledge—from them. Let him, then, thus employ them. This employment constitutes his elementary education—the education which makes him conscious of his powers, forms the mind, and prepares it for its after work.

We now see what Pestalozzi meant by elementary education. The next question is, how he proposed to secure it. Let us hear what he himself says. "If I look back and ask myself what I have really done towards the improvement of elementary education, I find that in recognising *Observation (Anschauung)* as the absolute basis of all knowledge, I have established the first and most important principle of instruction; and that, setting aside all particular systems, I have endeavoured to discover what ought to be the character of instruction itself, and what are the fundamental laws according to which the natural education of the human race must be conducted." In another place he says, "Observation is the absolute basis of all knowledge must proceed from observation, and must admit of being traced to that source."

The word *Anschauung*, which we translate generally and somewhat vaguely by Observation, corresponds rather more closely to our word Perception. It is the mind's looking into or intellectual grasping of a thing, which is due to the reaction of its powers, after the passive reception of impressions or sensations from it. We see a thing which merely flits before our eyes, but we perceive it only when we have exhausted the action of our senses upon it, when we have dealt with it by the whole mind. The act of perception, then, is the act by which we know the object. If we use the term Observation in this comprehensive sense, it may be taken as equivalent to *Anschauung*.

Observation, then, according to Pestalozzi (and Bacon had said the same thing before him) is the absolute basis of all knowledge, and is therefore the prime agent in elementary education. It is around this theory, as a centre of gravity, that Pestalozzi's system revolves.

The demands of this theory can only be satisfied by educating the learner's senses, and making him, by their use, an accurate observer—and this not merely for the purpose of quickening the senses, but of securing clear and definite perceptions, and this again with a view to lay firmly the foundation of all knowledge. The habit of accurate observation, as I have strictly defined it, is not taught by Nature. It must be acquired by experience. Miss Martineau remarks,—“A child does not catch a gold fish in water at the first trial, however good his eyes may be, and however clear the water. Knowledge and method are necessary to enable him to take what is actually before his eyes and under his hand;” and she adds, “The powers of observation must be trained, and habits of method in arranging the materials presented to the eye [and the other sense-organs] must be acquired before the student possesses the requisites for understanding what he contemplates.”

It is scarcely necessary to show in detail what is meant by the education of the senses. This education consists in their exercise—an exercise which involves the development of all the elementary powers of the learner. Any one may see this education going on in the games and employments of the Kindergarten, and indeed in the occupations of every little child left to himself. It is therefore, in the strictest sense of the term, self-education. But it should also be made an object of direct attention and study, and lessons should be given for the express purpose of securing it. The materials for such lessons are of course abundant on every hand. Earth, sky, and sea, the dwelling house, the fields, the gardens, the streets, the river, the forest, supply them by thousands. All things within the area of the visible, the audible, and the tangible, supply the matter for such object lessons, and upon these concrete realities the senses may be educated. Drawing, again, and moulding in clay, the cutting out of paper forms, building with wooden bricks of cubes to a pattern, are all parts of the education of the senses, and, at the same time, exercises for the improvement of the observing powers. Then, again, measuring objects with a foot measure, weighing them in scales with real weights, gaining the power of estimating the dimensions of bodies by the eye, and their weight by poising them in the hand, and then verifying the guesses by actual trial—these, too, are valuable exercises for the education of the senses. It is needless to particularize further, but who does not see that such exercises involve, not merely the training of the senses, but also the culture of the observing powers as well as the exercise of

judgment, reasoning, and invention, and all as parts of elementary education? † It is impossible to exaggerate their value and importance.

But elementary education, rightly understood, applies also to the initiatory stage of all definite instruction. If we accept Pestalozzi's doctrine, that all education must begin with the near, the actual, the real, the concrete, we must not begin any subject whatever in the case of children with the remote, the abstract, and the ideal—that is, never with definitions, generalities, or rules; which as far as their experience is concerned, all belong to this category. In teaching Physics, then, we must begin with the phenomena themselves; in teaching Magnetism, for instance, with the child's actual experience of the mutual attraction of the magnet and the steel bar; Arithmetic must begin with counting and grouping marbles, peas, &c., not with abstract numbers; Geometry, not with propositions and theorems, but with observing the forms of cubes, spheres, &c.; Geography, not with excursions into unknown regions, but with the schoolroom, the house, &c., then proceeding concentrically; Language, too, with observing words and sentences as facts to be compared together, classified and generalized by the learner himself. In all these cases the same principle applies. The learner must first gain personal experience in the area of the near and the real, in which he can exercise his own powers; this area thus becomes the known which is to interpret the unknown, and thus the principle is established that the learner educates himself under the stimulation and direction of the educator.

You are now, I presume, aware of what Pestalozzi means by elementary education; and you see that it resolves itself into the education which the learner gives himself by exercising his own powers of observation and experiment. The method of elementary education is therefore the child's own natural method of gaining knowledge, guided and superintended by the formal teacher.

This method has been, by Diesterweg, an eminent German disciple of Pestalozzi, strongly distinguished from what he calls the Scientific method—that which is employed in higher instruction, in universities and colleges, and is suitable for learners whose minds are already trained and developed. I can only very briefly summarize his remark. The Elementary method, he says, is inductive, analytical, regressive, inventive, developing. It begins with individual things or facts, lays these as the foundation, and proceeds afterwards to general facts or principles. The Scientific method, on the other hand, is deductive, synthetic, progressive, logical, dogmatic, and didactic. It begins with definitions, general propositions, and axioms, and proceeds downwards to the individual facts on which they are founded.

I cannot, for want of time, illustrate or explain these remarks. I can only observe that the great mistake, the discovery of which we owe to Pestalozzi is, that in our ordinary traditional teaching the Scientific method has, unfortunately, come to be employed in our schools for children where the Elementary method alone is natural and suited to the circumstances. Pestalozzi's great claim to our gratitude consists in the service he has done to education by “turning the traditional car of school routine quite round, and setting it in a new direction.”

I conclude the exposition I have given of Pestalozzi's fundamental principles, by appending a summary of them.

† I beg very strongly to recommend to all teachers, and to mothers who teach their children, a most valuable little book, written by the late Horace Grant, “Exercises for the Improvement of the Senses.” (Bell and Daldy.)

* See some valuable remarks on this subject in Miss Youmans's Essay on the Culture of the Observing Powers of Children. Edited by Joseph Payne. (King & Co., Cornhill, 1872.)

I. The principles of education are not to be devised *ab extra*; they are to be sought for in human nature.

II. This nature is an organic nature—a plexus of bodily intellectual, and moral capabilities, ready for development, and struggling to develop themselves.

III. The education conducted by the formal educator has both a negative and a positive side. The negative and a positive side. The negative function of the educator consists in removing impediments, so as to afford free scope for the learner's self-development: His positive function is to stimulate the learner to the exercise of his powers, to furnish materials and occasions for the exercise, and to superintend and maintain the action of the machinery.

IV. Self-development begins with the impressions received by the mind from external objects. The impressions (called sensations), when the mind becomes conscious of them, group themselves into perceptions. These are registered in the mind as conceptions or ideas, and constitute that elementary knowledge which is the basis of all knowledge.

V. Spontaneity and self-activity are the necessary conditions under which the mind educates itself, and gains power and independence.

VI. Practical aptness, or faculty, depends more on habits gained by the assiduous oft-repeated exercise of the learner's active powers, than on knowledge alone. Knowing and doing (*wissen und können*) must, however, proceed together. The chief aim of all education (including instruction) is the development of the learner's powers.

VII. All education (including instruction) must be grounded on the learner's own observation (*Anschauung*) at first hand—on his own personal experience. This is the true basis of all his knowledge. The opposite proceeding leads to empty, hollow, delusive word-knowledge. First the reality, then the symbol: first the thing, then the word; not *vice versa*.

VIII. What the learner has gained by his own observation (*Anschauung*), and, as a part of his personal experience, is incorporated with his mind, he *knows*, and can describe or explain in his own words. His competency to do this is the measure of the accuracy of his observation, and consequently of his knowledge.

IX. Personal experience necessitates the advancement of the learner's mind from the near and actual, with which he is in contact, and which he can deal with himself, to the more remote; therefore from the concrete to the abstract, from particulars to generals, from the known to the unknown. This is the method of elementary education; the opposite proceeding—the usual proceeding of our traditional teaching—leads the mind from the abstract to the concrete, from generals to particulars, from the unknown to the known. This latter is Scientific method—a method suited only to the advanced learner, who, it assumes, is already trained by the Elementary method.

These principles, though never thus formulated by Pestalozzi, are logically deduced from his theory. With some qualifications, they form the basis of the Lectures which I have been delivering here to large classes, for the last two years, on the Science and Art of Education, and will be expounded and illustrated in the Course which is now beginning. (*London Educational Times*.)

Culture of Teachers Outside of their Professional Work.

PROF. AUSTIN GEORGE.

[From a paper read before the Michigan State Teachers' Association.]

Teaching is as much of a business as any other occupation, and much more of a science than most. A careful attention to the principles which underlie it, and a study of the laws of mental growth of which it furnishes so many and varied illustrations, are certainly ennobling and expansive, and are in themselves a true culture. But here are two evils belonging to the profession, and they belong to the highest as well as the lowest positions. What is the remedy? Will the cure be found in the business itself or outside of it? I think *outside*. I hold that a teacher may legitimately follow his business. The teacher should do the work of the school-room, as the merchant does his work, and as conscientiously and faithfully, and as cheerfully in one grade as another. Do it as a business, and not rely upon the school for culture; but along with the school-work keep up some systematic, outside effort. The merchant or banker who devotes his entire energies, time, and thought, to the details of his business, sinks the man in the business, and so will the teacher.

The need of culture outside of the profession may be further shown by continuing the comparison and considering the consequences of narrowness. The merchant may be as narrow and contracted as possible, and the influence of his narrowness, confined to a small circle, affects chiefly himself, and the harm, to a great extent, is negative. But a teacher who is a small pattern of manhood exerts an influence on youth at its most impressible time, and the damage is positive. That the community at large do not always see this when they hire teachers of low culture at low wages does not affect the truth, nor should it lessen the desire of teachers to advance their culture.

Again, the teacher with outside culture, who knows more than is contained in books, and more than examinations require, is by this much a better teacher. Culture is never lost; it fertilizes the teaching power; it adds to mere instruction a wealth of illustration that illuminates obscurities and clears up difficulties; it tells on the character of pupils, and in the long run, depend upon it, will tell on the worldly prospects of the teacher.

The need of the culture of teachers outside of their professional work is two fold. First, the schools need it, that pupils may have the benefit of soul-full instruction, and not the mere humdrum of the text books. Second, the teachers need it, that they may stand before schools and communities, not as mere pedagogues and pedants, but with the trained intellects and rounded characters of cultivated men and women.

The two great hindrances to outside culture are lack of time and lack of inclination. It seems to me that our graded system, if properly understood and worked by the teacher, gives the needed time. I am aware of the demands made upon teachers for reports and preparation for classes, and, on the part of our lady teachers, for the making and repairing of the modern wardrobe; yet making all allowances, I know there is time for outside culture. It has been well said that "an earnest purpose finds time or makes time. It seizes on spare moments and turns larger fragments of leisure to golden account."

Disinclination may spring from two causes. The importance and desirability of this culture may not be appreciated, or the nervous system of the teacher may be so prostrated by the work of the school as to reduce the vital energies to such low ebb that ambition for im-

provement is smothered by the necessities for repairs. In such cases the needed rest may be found in change of occupation as well as in cessation from toil, and with this advantage, that the culture gained lightens the regular work by increasing the capabilities of the worker.

Having considered somewhat the need and possibility of outside culture, I pass to a consideration of its character. In schools and colleges the excitement which contact with numbers produces, the spirit of pride and emulation which is developed, and the mild coercion of teachings, act as a stimulant and pressure to drive the pupil forward. In after life, the pursuit of any branch of study will generally, from the nature of circumstances, be by *ourselves alone*. Hence, outside culture will, as a rule, be *self-culture*. This requires much more effort on the part of the learner than class-study, and is on that account more valuable to those who pursue it. True advancement in scholarship, and nearly all scientific research, come as an *after-culture*, and not while accomplishing the curriculum of the schools. The highest culture schools can give is such preparatory training as will enable pupils rightly to instruct themselves. This is the vital principle, and because there is failure here, there is failure in after-life in undertaking and carrying forward any system of self-culture.

Those whom we call self-educated men are illustrations in point. They have progressed along certain channels, few and narrow ones they may be, with independent habits of thought and study. They have not been stimulated by class excitement nor urged to effort by instructors, but have been held to their work by a thirst for knowledge and the force of their individual wills. As a result of this manner of culture there is no break in the method when they step from merely scholastic studies to the field of after-culture. They were their own masters before: they are their master now.

On the other hand, many who have been subjected to the discipline of the best schools and have received the broadest culture they can give, fail in after life to undertake and keep up any system of culture, or lose precious time in accommodating themselves to the new conditions of growth. They miss the superintendence of masters and the inspiration of the classroom.

It is important to those attempting any branch of outside culture to understand that the battle begins not in nature or in books, but in their own minds, and unless they win victory here, their culture will be a house built upon the sand. While self-culture is not self-discipline, it is closely related to it; it has its root there, and will produce its brightest flower and choicest fruit when rooted in strong soil. Self-discipline is the cultivation of the will. The various faculties of the intellect may be cultivated to a comparatively high state and the memory stored with useful truths and varied facts, and still, if the possessor be unable to use his faculties when he desires, he is constantly at a disadvantage, and is unduly weighted in the race. Mental discipline means such training of the faculties that we command their full powers at pleasure.

The chief obstacles to this discipline are bad habits of life and work, and an indolent temperament which is generally the child of the other two.

I have considered culture that pertains to the intellect; it is worthy of remark, however, that moral culture hinges even more directly on the proper development and training of the will. One may have never so fine moral perceptions, and understand never so clearly duty to self, neighbor, State, and God, and if the will lack strength and proper discipline, the day of trial will show moral weakness and cowardice. While the enlightened culture of the will is very needful to the culture of the intellect, it is *absolutely essential* to moral culture. True moral

culture begins here; it is the bed-rock of moral excellence.

Supposing a strong purpose for outside culture to exist, the question arises—where shall we begin? Says Herbert Spencer: "If we consider it, we shall find that exhaustive observation is an element in all great success." Our methods of education from text-books, with their definitions, statements, and descriptions appealing almost wholly to the intellect, and the very rare use of the senses which pupils are called upon to make, have the effect of dulling rather than developing the powers of observation.

Intercourse with teachers has shown me that right here is a grave defect, and that, next to the will, there should be cultivated a power of close and accurate observation.

Observation cultivates the perceptive faculties, and has this great advantage, that it makes the acquisition of knowledge an active pursuit. The mind reaches out for facts, they are not poured into us as in text-book instruction; it revels in being an active discoverer rather than a passive recipient.

Accurate observation of special properties should be combined with a broad view of the general effect, and from this result classification and generalization. Culture consists not merely in storing up information, but in arranging and harmonizing it according to some principle of classification, and thus, as Channing expresses it, "building up a force of thought which may be turned at will on any subject on which we are called to pass judgment." Or to quote one of Herbert Spencer's pithy sentences: "It is not the knowledge stored up as intellectual fat which is of value, but that which is turned into intellectual muscle." Right here is the dividing line between knowledge and wisdom; or, perhaps I should say, is where knowledge blossoms into wisdom.

A great feature in successful self-culture is to study the things we can comprehend. As the power and habit of observation and generalization increase, so will the ability to comprehend, and also the love of this method of pursuit.

Goethe remarked, "It is always good to know something." We may add, that next to knowing something, is the ability to tell what you know. The power of expressing one's ideas in oral and written speech is of such prime utility to teachers that they cannot afford to neglect culture in this direction. The majority of teachers, it is true, have no occasion for platform eloquence, but they have abundant opportunity for talk in the classroom and social circle. Too little attention is paid to the art of conversation, and a mention of it almost brings a sneer, as if it were beneath the dignity of those engaged in the serious pursuits of life. But the ability to converse well, and the ease and freedom from awkwardness which the consciousness of this ability gives, are all the apparent distinctions between the boor and the cultured gentleman.

To write the English language with ease and facility so as to express our ideas with force and exactness, is no mean accomplishment. Those who achieve moderate culture in other directions but have not been required to practice composition, usually find that their literary taste is beyond their capacity to execute; and so, when called upon to wield the pen, they boggle at every step. Such will do well to remember Pope's lines—

"True ease in writing comes from art, not chance."

and apply themselves to correct their defect, remembering also Montaigne's advice to "write what they know."

Any rhetoric furnishes the proper advice and necessary rules for the formation of style. To acquire a proper vocabulary is, however, of greater importance; and it may be safely said that if one has something to say and

the exact words in which to say it, his style will take care of itself.

Another element of culture is intercourse with superior minds. This may be association with persons or by books. The society of the intellectually gifted has peculiar charms and exerts an influence wide-felt and deep-reaching. This is beneficial and ennobling when it stimulates thought, but when it encourages a passive following it does not conduce to true culture.

Intercourse with superior minds will be had chiefly in books. Here we may meet the wise and the good of all ages; the great thoughts of the master minds of the world lie open before us. But not every great thought or great truth is of worth to the reader; it must be *felt* to be such. It has been truly said that "books are useful only as they help us to interpret what we see and experience." This is their legitimate province, and unless they do this they had better be unread; for they contain only intellectual chaff.

In this paper I have aimed to portray some features of general culture which concern us all. I have endeavored to develop somewhat the philosophy of culture, rather than to bring forward specific branches of knowledge and recommend their special study. I have sought to call attention to the general principles underlying all culture, without attention to which, efforts in particular directions will not yield the best results. The particular thing we shall study is not, of so much consequence, as that we study something. Here, if not *all* lies the *chief* honor.

Ten business rules.

TO SECURE SUCCESS IN LIFE.

Motto.—"Call on business men on business, during business hours; transact your business, and go about your business, that others may attend to *their* business."

Offices, stores, and other places of business are established for business purposes. It costs time, care and money to maintain and conduct them. The results are in proportion to the talent, industry, and attention bestowed on the business. A concern which is run without business rules or order, will not only fail, but will spoil young employes, who become irregular, inattentive, slovenly, indolent, and shiftless.

1st. PROMPTNESS is indispensable. Each employe should always make it a rule to be "on time," so as not to deprive his employer or others who may require attention, of his presence and services when needed. If he be ten minutes behind time, it may cause loss of time to ten others. Ten times ten minutes are a hundred.

2nd. DILIGENCE is not only a duty to employers, but it secures promotion and increased remuneration. One may not always be pushed with work, in which case he should push the work, and fill up his time as best he may.

3rd. LOSING TIME.—One may be disposed to talk and gossip about matters not connected with the duties of the office, which not only consumes their own time, their employer's, but that also of listeners. How indignant would he feel if charged with robbing; and, as "time is money," is he not a robber who wastes another's time? One has no right thus to "fool" away time for which he is paid to work or to attend to business.

4th. VIGILANCE.—To be vigilant in business, not slothful, is a Divine command. It is the duty of an employe to be watchful, wide-awake, and mindful of his employer's interests. Mere "killing time" till the clock strikes the hour to quit, won't do; such indifference and neglect will neither secure more pay nor promotion.

5th. ECONOMY.—Each is in duty bound to see that nothing be wasted, paper, twine, tools, books, etc. He is also expected to exercise his *mind* as well as his *hands* in the interest of the business.

6th. A shirk or an eye-servant watches the clock impatiently to have the time arrive for lunch or to quit, and is sure to be ready to drop any duty the moment the clock strikes. He is not so careful to be on hand in the morning. Then, he is "in

the drag." Such persons are seldom up with their work, and often fail to keep their promises. They are always unfortunate, and never rise in life.

7th. INTEGRITY PAYS.—Let it be understood that "*this* office aims to do an *honest* business." Everything must be on the square. Should a customer over pay when making a purchase, return him the amount. Should the cash receipts be over, or under, continue the investigation till the error is found.

8th. POLITENESS.—A rough, rude, uncouth, ill-tempered cur, boy, curmudgeon, or man, is a nuisance in any business concern, and the sooner he be set about something to which he is adapted, the better. He will drive away customers. One who stinks of whisky, beer, or tobacco, is unfit to stand behind a counter and wait on customers. One who is polite, patient, kindly, neat, tidy, talkative, honest, friendly, and capable of reading character, to know who wants to purchase, and who simply wants to look at the goods, is the best adapted to the place, and will soon make his services indispensable.

9th. A GOOD PENMAN AND QUICK IN FIGURES.—To excel and turn off work well, and with dispatch, one must write a handsome hand, and be able to compute figures rapidly; also to make change quickly and correctly. Bungling or delay in these is inexcusable.

10th. AIM HIGH.—Honourable aspiration in any calling is laudable. No useful work is menial. A true lady will grace the kitchen no less than the drawing-room. It is just as honourable to sweep and dust an office as it is to wear laces, or count coppers, or keep accounts. The boy who runs on errands, or carries parcels, may, if he does his whole duty, work up through all the grades of porter, shipping-clerk, to book-keeper, cashier, partner, and principal. Many of our leading newspaper editors and publishers were once newsboys; and most of our leading merchants were once Office-boys and clerks. To rise to the highest position one needs experience in all departments of the business. A sailor must study navigation and serve before the mast ere he is fit for captain or mate.

We need not moralize here, though we will suggest that the chances of the boy who abstains from the use of tobacco and alcoholic stimulants will always be the best. If he goes to Sunday-school, takes an active part in religious devotions, he will be better fortified against yielding to ordinary temptations, and will grow in grace, and in a knowledge of God and His righteousness. He will rise.

EDUCATIONAL.

Meeting of Ladies' Educational Association.

Yesterday afternoon 13th May, a large number of ladies assembled in Synod Hall for the purposes of receiving reports and electing officers for the ensuing year. There were present, on the platform, Hon. Judge Dunkin in the chair, Principal Dawson, Dr. Wilkes, Professor Murray, W. Lunn, Esq., Dr. Kelley, and the Rev. Mr. Lobleby.

Professor Murray having opened the meeting with prayer, Principal Dawson read the minutes of the previous meeting, which being approved, a ballot was taken for the officers for the ensuing year, and Mrs. M. P. Murray and Mrs. B. Lyman being appointed scrutineers, retired to prepare their report.

The Chairman then read the report, which set forth at great length the work done by the Association during the past year. The report alluded to the success of the various lectures by Professor Johnson, Dr. Wilson of Toronto, the Rev. T. Lafleur, Dr. Kelley, and Dr. Roddick; announced that lectures will be given by Principal McVicker on "Applied Logic;" Professor Armstrong on "Architecture—Historical and Descriptive;" Dr. Kelley Literature, "History, Ancient and Modern," "Philology and Rhetoric," and "Zoology and Botany" are suggested for the course of 1876-77. During the past year 34 ladies had registered their names as students, and of that

number 25 presented themselves for examination, the result of which was the placing of 8 in the first class, 4 in the second class and 10 in the third. Letters accompanying the report from Dr. Kelley, Professor Johnson and Theodore Lafleur, speaking in the highest terms of the proficiency attained by the young ladies in their several departments. The Hannah Willard Lyman memorial prizes were awarded to Miss Amy F. Murray, whose papers on "English Literature" and "Hygiene" received the maximum number of marks. Miss Julia Parker receives honorable mention. The principal statement shows a small balance on hand after meeting the year's expenses. The report speaks hopefully of the work to be done by the association, and closes by looking forward to a time when there would be in Montreal some greater facilities for the higher education of women.

It was then moved by Dr. Wilkes, seconded by Mr. Lunn, and carried unanimously, "That the report now read be received, adopted and printed for circulation."

In making the motion the rev. gentleman complimented the Association on the work they had done in furthering the education of women; he could not see why the gates of our Universities were closed to ladies; he would like to see the ladies take their places in the classes, and was certain they would be found side by side with the male students when the degrees were to be given. He hoped that the ladies would keep on in the good work.

It was then moved by the Rev. Mr. Lobley, seconded by Prof. Murray, and carried, "That the success which has attended the efforts of this Association to procure a higher education for the women of Montreal is an evidence of its necessity and value, and entitles it to the support of all friends of education."

The Rev. Mr. Lobley then spoke in support of the motion, testifying from personal knowledge to the good work done by the Association.

Professor Murray also bore testimony to the utility and, in fact, necessity for the Association of procuring a higher grade of education for women, and said if he had his way the gates of all colleges would be thrown open, and ladies would stand on the same footing with gentlemen. One thing had been said recently which he would most emphatically deny, and that was with regard to the statement that the laborious study required in attaining a knowledge of the higher branches of education had an injurious effect on the health of lady students. It was true he said, but this must be borne in mind, that there was not a session in a college course in which the laborious effect of study did not break down some of the gentlemen engaged in study. He contended that the labor of study did not do any more harm to the constitution of ladies than the fashionable dissipation which was too often indulged in during their every day life. He was in favor of the same class of studies for both sexes, and also the same examinations at the end of the sessions.

The scrutineers having finished their labors, now entered the room and reported as follows:—President, J. H. R. Molson; Vice-Presidents, Mrs. Mrs. Anderson and Mrs. Dawson; Secretary, Mrs. Mercer. Committee—Mrs. Allen, Mrs. Atwater, Mrs. Baldwin, Mrs. C. Brown, Mrs. Brydges, Miss Campbell, Mrs. Cramp, Mrs. Durford, Mrs. Jas. Ferrier, jr., Mrs. J. Frazer, Mrs. Frothingham, Mrs. Reddy, Mrs. E. K. Greene, Mrs. Greenshields, Mrs. Howard, Mrs. Lawford, Mrs. Lay, Mrs. Lewis, Miss Lunn, Mrs. H. Lyman, Miss Mackintosh, Mrs. M. McCulloch, Mrs. Hugh McLennan, Mrs. Major, Mrs. J. C. Murray, Mrs. Papineau, Mrs. Redpath, Mrs. H. Scott, Mrs. G. W. Simpson, Mrs. Symmers, Mrs. Jos. Tiffin, jr., Miss Trotter, Mrs. R. M. Watson and Mrs. Workman.

The Chairman, the Hon. Mr. Dunkin, said he supposed some few words were expected from him on the subject.

He did not oppose the higher education of women, but held that they should be educated for their sphere; he did not believe in rivalry between men and women in the matter of education, but he thought it ought rather to be co-operation, and if they went on each sex assisting the other, they were certain of arriving at that state of proficiency in education for which they were intended. They desired neither masculine women nor effeminate men. He opposed any movement to place the work hitherto carried on by the ladies in the hands of gentlemen, who, he said, would be sure to make it a young men's college. In conclusion, he expressed the hope that the Protestant School Commissioners would at an early day be in a position to erect a High School for ladies, where they could procure the necessary branches required; and hoped that the ladies would prosecute the good work which they had so effectually carried on thus far.

Dr. Wilkes then closed the meeting with the Benediction.—*Montreal Herald*.

Montreal Teacher's Association.

The last quarterly meeting of this Society was held last evening, 21st May 1875, Professor Murray in the Chair. The attendance was large, and a very pleasant evening was passed in listening to the musical performances of a number of the members, and an instructive lecture by Dr. J. Baker Edwards on "Microscopic Botany." He explained that although all Botany may be looked upon from a microscopic point of view, the title was intended to designate the more minute species. This study contrary to what is generally supposed as an inexpensive one, a good microscope of two lens, suitable for all ordinary purposes, being obtainable for \$2.50; and is similar to the common ones by which all the great discoveries in the science have been made. In commencing the study of botany he recommended to begin with ferns which, enclosed in a glass case, afforded great delight because their very decay caused other species of plants to grow up, and so a continued succession of vegetation resulted with but little trouble on the part of the student. The organs of fructification in ferns and mosses be described as very beautiful, the latter extremely so, as also the fungi of both ferns and mosses. This class of vegetation only thrives when there is vegetable decay and in tropical climates where decaying vegetation is abundant, and consequently, the species of fungi being very large, it assumes a very serious aspect in the promulgation of leprosy and other skin diseases by throwing of millions of spores which carry disease wherever they are wafted. This fact was proved in northern Europe during the time of the war between the English and the French, a dense blue cloud was observed to pass over one half the English fleet anchored near the shore, leaving the remaining half in clear atmosphere. The men in the former were, almost to a man, struck down with sickness, while the latter continued in excellent health. "Red snow," as it is called by travellers, is of like origin, and grows exceedingly rapidly. The lecturer then described the structure of various kinds of water plants, concluding with the minute species Desmidiacee and Diatomacee. Both these species are continually in action. The former, somewhat resembling the foliage of a tree, promulgates its species by the continuous throwing off of small particles or globules, which in turn grow as large as the plant from which it sprung. The latter also possesses very wonderful local powers. They are very frequently of a boat or canoe like form; but one also contorted into

all manner of ways to the number of 800, and, as microscopic objects, are very beautiful. In their outside structure they very much resemble files, and the lecturer stated that the water, as supplied to this city, is full of them. At the conclusion of the lecture the various kinds referred to were exhibited through microscopes, a slide of the last named, containing 400 species of all shapes and sizes, commanding much attention. A vote of thanks was accorded the lecturer, and the meeting adjourned to Saturday, the 29th May, at 10 a. m., when the annual report would be read and officers elected for the ensuing year.

Preparatory High School.

On Tuesday 18th May forenoon, at the invitation of the Chairman of the Protestant Board of School Commissioners, a number of parents and friends of the children in attendance at this institution assembled to witness an examination of the classes in the work done during the past few months. Among the Commissioners present were Dr. Jenkins, Chairman; W. Lunn, Esq., Secretary-Treasurer; Dr. Dawson, and the Rev. Canon Bancroft.

About 140 boys, divided into four classes, or forms, were examined by their teachers, Misses Swallow, Watson, Henderson, Bell and Hargrave; and Mr. Andrew (teacher of elocution), in reading, writing, arithmetic, dictation, grammar, geography, Scripture history, French and in the highest class Latin. Some interesting object lessons were given in the lower classes. The good order, cheerfulness and progress of the children were commendable, and seemed to give great and general satisfaction to the parents, several applications for admission to vacancies next year being made at the close of the proceedings. Among subjects in which the progress made appears to us deserving of special approval were reading, arithmetic, spelling, French and Latin. Grammar chiefly, and geography wholly, are taught conversationally, it being thought of utmost importance as a preparation for subsequent business life that children should be taught to hear attentively, and retain accurately, what is said to them. At the close of the examination, Dr. Bancroft expressed his entire satisfaction with the results exhibited, results which he had observed with great care, and in which he had the more interest that his own son was one of the pupils. He congratulated the parents present on having access to such a school. He then called for a few remarks from the head master, Prof. Robins, who simply said that the gratifying progress made was due chiefly to the self-sacrificing labors of the lady teachers, as the failure of his own health had precluded his laboring in the school during the past year as he had formerly done. Dr. Bancroft then announced, to the unmixed delight of the boys, that he gave them holiday for a day and a half, and dismissed the audience with the benediction.

HIGH SCHOOLS.—At 10 a. m. yesterday, 7th June, the annual oral examinations of the pupils in the High Schools of Montreal were commenced before the Protestant Board of School Commissioners, Dr. Bancroft presiding. A large number of the friends and relatives of the scholars were present. In the morning the pupils of the second form, some 40 in number, were examined by Mr. Jenkins in History, Geography, English Grammar and Spelling; in writing and arithmetic by Mr. White; Elocution and Analysis of sentences by Mr. Andrew; French by Mr. Howe, and in Latin by Mr. Kelly. In the afternoon the pupils of the third form were examined in Arithmetic by Messrs. Kelly and Jenkins; French by Mr. Murray; His-

tory, Geography, Elocution and Analysis of Sentences by Mr. Andrew. Mr. W. Lunn presided. With reference to the project for establishing a girls High School in Montreal, we are informed that Nos. 131 and 133 Metcalf street have been leased for the School, and Mrs. Scott has been engaged as Principal by the Protestant Board of School Commissioners, under whose auspices the institution will be opened.

McGill University.

SCHOOL EXAMINATIONS.

Yesterday afternoon 8th June, the certificates as Associates in Arts were presented to the successful candidates, eight in number and pupils of various city schools. The Hon. James Ferrier occupied the chair, and seated around him on the platform were the examiners, Principal Dawson, Ven. Archdeacon Lynch, Rev. Dr. Murray, Rev. Professor Libbey, and Dr. Kelly; several principals of city schools and friends of the Institute including Rev. Dr. Bancroft of the Protestant Board of School Commissioners.

Principal Dawson opened the proceedings by stating that these examinations had been instituted by the University as far back as 1859, following the three recent examples of the Oxford middle-class examinations, which had been so successful and useful in England. The necessity for such examinations seemed to be quite as great here; and it was hoped that a uniform and high standard might be secured for these schools which train students for the university and for the higher departments of business and professional life. Practically, however, the benefits of the examinations had been confined to the pupils of the Montreal High School. At first the regulations had been nearly the same with those in England; but various modifications were introduced with the view of better adapting them to this country. At length, when the high school was removed from the management of the University, the examinations had been suspended. Quite recently, however, the subject had been revived and an arrangement had been entered into between the Protestant commissioners of schools for the city and the University, whereby the examinations, with some slight modifications of the regulation, were to be renewed; and it was thought best, notwithstanding the disadvantages of want of due notice, to resume them in the present year. Eleven candidates had presented themselves from four schools, and eight had passed. The number was small, but it was to be regarded as an earnest of greater things. He hoped for 40 or 50 candidates next year; and, as full and timely notice would be given of the subjects, he hoped that even a larger proportion would pass. Inquiries had already been made as to local centres out of Montreal, and it was to be hoped that the system would soon embrace all the schools capable of reaching the standard required; that the certificate would be recognized by all public bodies, and would be held to be a guarantee that its holder had received a good liberal education. He further hoped that many of those who received the certificate as associates would go on to pursue their studies in the University, that those who had taken the junior certificate would come up for the senior, and those who had failed would try again next year. The carrying out of these examinations involved a considerable amount of labor an expense to the University, and the Commissioners of Schools, which the fees of candidates would for some years be quite inadequate to repay. But should the system become general, the educational benefits would

far exceed the expense and trouble, and he hoped that both parents and teachers would feel that the hands of the University, and of the commissioners, were to be sustained in the matter. He then read the names of the examiners, as affording a warrant for the thoroughness of the examinations; and the names of the successful candidates, who were then called up to receive their certificates.

The professor also announced that the subjects and regulations for next year would be published in full in College Calendar now in the press.

Principal Dawson then announced the results of the examination as follows :

PASSED AS ASSOCIATES IN ARTS.

William D. Lighthall—(High School.) Latin,* Greek,* French,* Geometry,* Algebra, Mensuration, English Language and Literature,* History,* Scripture.*

W. A. Farwell—(Braeside Academy) Latin,* French,* Geometry,* Algebra,* Natural Philosophy, English Composition,* History,* Chemistry,* Scripture.*

R. J. B. Howard—(High School.) Latin,* Greek,* French,* Geometry,* Algebra, Natural Philosophy, English Composition,* English Language and Literature,* History,* Scripture.*

C. A. Molson—(Mr. Dydenhams's School,) Latin,* French, Geometry, Algebra, English Composition,* History, Geography, Scripture.

PASSED FOR JUNIOR CERTIFICATES.

C. F. Dawson—(High School.) Latin,* Geometry,* Algebra, English Language and Literature,* Geography,* Scripture.

W. C. Norris—(Mr. Nicholl's School) Latin,* French, English Composition,* History, Geography,* Scripture.*

W. S. Kerry—(High School.) Latin,* Geometry, Algebra, History,* Geography,* Scripture.*

F. D. Adams—(High School.) Latin, Geometry, Algebra, Botany,* Chemistry,* Scripture.*

*Creditable answering.

The pupils were then called up and presented with their certificates by the Chairman.

The Rev. Dr. Bancroft said the School Commissioners felt it a kind of obligation to stand by the University in every way possible; receiving as they did the High School from the University, they endeavoured to raise it and all other schools to the highest point possible with the means at their disposal, looking up to the University as their head, and he was glad to mention that they had Dr. Dawson on the board to confer and advise with them. It was, therefore, reasonable they should agree with a plan of this kind. He had often been asked to recommend schools by parents, but he thought that these examinations would answer for the future, as to which schools parents should send their children. As a native of the country, he was rejoiced to see the present high standard of education to what it was within his own recollection, and that of others present. He enjoined the scholars to apply themselves vigorously to their studies and trusted that the numbers of pupils attending these examinations from all schools, both in town and country, would continue to increase. In conclusion, he hoped that the wealthy residents of the city would come forward and help this institution in its work of progress and by so doing assist in enabling the Dominion to gain distinction among the countries of the world, for such distinction could only be obtained by a sound basis of education as taught in this and kindred institutions throughout the land.

Rev. Professor Lobley expressed the great pleasure it

had been to him to be permitted to take part in the examinations during the past two weeks, and to find the same system of education that had been so successful in the old land extending to other countries, and especially to the British Colonies. These examinations had given a new zest to schoolboys that had become somewhat dull in their studies, and was, therefore, a great boon; because by this means they were enabled to send forward into the world young men with a really good education, and among them many who would go to the University, there to carry on their course of education much further than they otherwise would. The whole school work, in nearly all the institutions of any standing in the country, have been very much improved thereby, the masters having felt it their duty and to their interest to educate as many as they possibly could to pass these examinations, in order to keep up the reputation of their schools. This scheme had been so successful in England that it had been extended to girls, who pass at Oxford or Cambridge, very much the same examination as the boys. He hoped the time would come when such would be the case in Montreal. With reference to the recent examination the Mathematical papers had been very satisfactory, but the standard of the Euclid papers was considerably higher than those in Algebra. He hoped next year would find the pupils taking subjects in Natural Philosophy, and also a little higher in Algebra. With reference to the examinations next year, he recommended the setting of more questions in the elementary part of the subject of Algebra, and also urged upon the teachers present to inculcate in the minds of their scholars, the meaning of the rules of any subject they were to be examined in at the very outset.

In Algebra the examination had been very satisfactory, and he had not found so many instances of merely getting it by rote as had expected, although there were more than he considered desirable, and therefore he would again urge upon all teachers not to press the boys to learn so many rules, but to get them to thoroughly understand the meaning of the arguments used. With respect the examinations he thought the professors and parents had good reason to be satisfied. To those students who had not passed he would say that they were very nearly so, and he had little doubt did they present themselves next year they would be successful.

Principal Dawson, in closing the meeting, hoped a far larger number of young people would present themselves next year, and also that by-and-bye a number of girls would also come up from the High School for girls which is now being projected by the Protestant Board of School Commissioners.

The meeting adjourned.—*Montreal Herald.*

School Examinations in England.

The first annual report of the Oxford and Cambridge Schools' Examination Board, which has just been issued in England, contains some particulars which are of interest in view of the attempt to establish similar examinations in connection with McGill University. The report states that the work which the Universities have set themselves is rapidly extending; numerous fresh applications are coming in from the larger schools, while most of those who have already availed themselves of the system will continue to do so. The Board has two distinct functions, the one to superintend the inspection and examination of schools, and the other to grant certificates to boys examined under its authority. It is only with the latter that we are now concerned. These who

receive certificates become entitled to various privileges, such, for example, as exemption from the entrance examinations of the Colleges, and from the first University examination. For the sake of uniformity, therefore, the same papers are set to all the candidates in most of the subjects, and their work is submitted to a central board of examiners. With respect to the attainments of candidates, the report remarks great deficiency in the grammar of the Latin and Greek tongues, even when there was apparently considerable knowledge of the language. The same remark applies to the examination in French, the candidates showing a readiness in making out the sense, while almost universally ignorant of the grammar and idioms. It is not surprising to those acquainted with the usual curriculum of an English school to be told that the candidates showed no facility in English composition. Mathematical attainments were generally respectable, but in physical science there was frequently too much trust in mere book-work and learning by rote. The result of the competition for certificates showed that the failures to attain them were, in Latin, 75 out of 252; in Greek, 77 out of 241; in French, 7 out of 13; in German, 3 out of 5; in elementary mathematics, 43 out of 254; in English, 6 out of 16, &c., the total number of candidates being 259, and the number of certificates awarded 155. In all, 104 candidates out of 259 failed. The statement of accounts gives the receipts at £2,327, made up by fees for school examinations, £1,793, and fees of candidates for certificates, £534. The principal payments were—To examiners, £1,430; for printing, £318; secretarie's salaries, £400, leaving a balance in hand of £24. The total number of boys being educated at all the schools under examination was 9,095, and of examiners employed 61.

SCIENCE.

Discoveries at Ephesus.

The excavations made by Mr. Wood for the British Government—The first of two lectures on the discoveries at Ephesus was given last night in the hall of the Cooper Union by Mr. John F. Wood, the director of the excavations. The rear of the platform was hung with maps and diagrams of localities and places of note in and adjacent to the city. The lecturer opened his discourse with a short account of the history of Ephesus from its early settlement down to A. D. 1500. He said his discoveries were the result of eleven years' labor, undertaken and carried out under the auspices of the British Government. During this time there had been exhumed 462 inscriptions, and the accounts of ancient historians were fully verified by these data. The earliest tradition names Ephesus as the birth place of Diana. The first historical account is given by Herodotus, who says that Ephesus was founded by Hercules, 1240 B. C. From 1140 B. C. to 560 B. C. the government was republican. Alexander came to Ephesus and offered to complete the great temple which was then building, but his offer was refused. In 187 B. C. it fell into the power of the Kings of Pergamos who held it until 41 B. C., when it was besieged and captured by the Romans under Antony. Christianity had its earliest followers among the Ephesians through the notable work of the Apostle Paul. In A. D. 262 it was taken and sacked by the Goths, and the great temple was burned. Among the legends connected with it at this time is that of the Seven Sleepers. This legend has obtained such a hold that the names of the sleepers are engraved by the Turks to-day on amulets, and believed to be a potent charm. The history of Ephesus is then lost for many centuries. In the thirteenth century it was taken by the Turks, and in A. D. 1465 fell into the hands of the Knights of St. John. In 1402 Timour the Tartar took possession of the city. Over two hundred years ago the place was abandoned by the inhabitants for a more healthy

location, and at the present time there is no village on the spot. Ephesus is situated on the sides of two hills. It is fortified by walls intersected by tower about one hundred feet apart. These walls are reached by easy flights of steps, up which it is possible to ride a horse. The walls are about six thousand feet in length, and enclose an area of about eleven hundred acres. Mr. Wood, at this stage of the lecture, explained the diagrams, pointing out the position of the two temples, the Gymnasium, the tomb of St. Luke, the Odeum and other points of interest. Among the curiosities in the neighborhood of the city is a church cut out of the solid rock at a short distance from the cave of the Seven Sleepers.

The Temple of Diana.—In May, 1863, the work of excavating for the side of the Temple of Diana was begun. The first spot chosen was a mound outside the city. Nothing was found here but fragments of monuments. The "trial holes" were continued, and the Great Gymnasium was thoroughly explored. On digging in the low ground a column was found with an inscription indicative of the glory of Ephesus as the chief city of Asia Minor. In the Forum Mr. Wood laid upon a huge baptismal font about four feet high and fifteen feet in diameter, having a pedestal in the centre, on which it is supposed the priest stood while administering the rite. The work was continued until March 1864, when an application to the English Government procured enough funds to follow up the work. This part of the lecture was interspersed with views of the sally-ports, the Mosque of Ayaslouk, the rock-cut altar in the church and the arch of the Stadium. Work was begun on the Odeum in April, 1864. On the stage were found slabs giving names of the builder of that and other edifices. In the Woolfactor's hall, opened at the same time, were discovered a femal head of colossal size. The Odeum itself is about one hundred and fifty feet in diameter, with narrow stage. It has five entrances, and was capable of seating 2,300 people.

The Tomb of St. Luke.—Shortly after the Odeum had been laid open Mr. Wood by accident came upon the tomb of St. Luke, the remains consisting of a part of doorway, on the jamb of which was engraved a cross and bull, the latter being the emblem of the apostle. In the month of February, 1865, the exploration of the Great Theatre was begun. It was found to be about 490 feet in diameter, with a seating capacity of 24,500 people, and was undoubtedly the largest theatre in Asia Minor. The orchestra is 100 feet in diameter, while the proscenium, two stories in height, is built in the most massive manner, the second story being supported by numerous columns of pure marble. In theatre were found six blocks covered with inscriptions portions of which denoted that they were taken from the Temple of Diana. Among these inscriptions were decrees conferring citizenship on different persons. On turning over these stones other inscriptions were brought to light which gave a sure clue to the finding of the temple. The latter inscription, known as the Salutarian, made mention of certain gold and silver statues presented to the goddess, which at certain times of the year were to be carried in state from the temple to the Magnesian Gate; from there back to the temple and thence back to the Coresian Gate, returning again to the temple, thus indicating that a direct way led from either of these gates to the temple. On either side of the road tombs marked with Christian emblems were discovered. The tombs were vaulted chambers, stuccoed and painted. In the sarcophagi, found inside, were large numbers of skeletons. In, May, 1868, Mr. Wood went to England, and in October of that year went again to work laying open the Magnesian road. After progressing 1,400 feet from the gate they came to the tomb of Androclus, which is described by ancient authors as standing in the centre of the Magnesian road, and visible from the temple. At this point Mr. Wood brought his lecture to a close.—*N. Y. World April 23.*

—A paper was read before the Manchester Statistical Society a short time ago calling attention to the researches of the German statisticians, Beham and Wagner, with respect to the population of the world; Of the many estimates on the number of inhabitants of our globe, none are accounted trustworthy. In 1685 Vorsius estimated that there were 500,000,000 Beham and Wagner set down the number at the present time at 1,391,030,000. The subjects of Victoria are rated at 300,000,000. Russia has a population of 82,000,000. India, supposed to be the most populous country on the globe, has probably 300,000,000 inhabitants; China is said to have 400,000,000 inhabitants; but the estimate is undoubtedly grossly exaggerated: The population of South America has been checked by internal

discord; In Paraguay there is said to have been an actual loss of 337,000. An estimate based upon the past growth of Great Britain and the United States gives to the former country in the year 2,000 a population of 91,000,000, and to the latter of 546,000,000.

The Early History of America—According to the telegrams which appeared in the papers recently, an international congress on the subject of the history of America before its discovery by Columbus, is to sit in Nancy, France, during the month of July. The meetings of this congress will be of unusual interest to archæologists and savants, it matters not on which side of the Atlantic they may live, but as inhabitants of Canada and of the United States, we have an interest even greater than that of these learned men. We are informed of the discovery of this continent by Americus Vesputius, that the Cabots, John and Sebastian, reported to the world of Europe that they had found a new land in the west, and that Christopher Columbus had realized the idea with which he had been for years inspired, that there were lands beyond the sea. We know, too, for history tells us, of the landing of Cortes in the country to the south of us. We have read of the enslavement of Montezuma and of the horrors of Spanish rule in those somewhat warmer climes, and are also well acquainted with the incidents which have made Plymouth Rock famous in the annals of the U. S. We cannot too be ignorant of the circumstances attending the settlement of several of the present states of the Union, which still bear names that connect them with those who ruled what was not then so great a Britain. The discoveries of Vasquez de Nunez and Hernandez are not forgotten. Coming nearer home it would be an indication of an uncommon ignorance if the Canadian knew nothing of the circumstances attending the advent of Jacques Cartier, or of the noble deeds of those heroic clergymen who in the days of the long buried past carried the banner of the cross and planted it in the wilds of this country, whose stillness, instead of being broken by the shrill whistle of the steam engine or the thud of the woodman's axe, was only relieved by the shrill whoop of the warrior or the whining of the wolf. We are more or less familiar with what were the conditions under which the early settlers prosecuted their difficult task of subduing the earth and placing it under tillage, but we are totally ignorant of the occurrences anterior to the earliest of the events to which we have referred. De Salle, Champlain, Marquette are amongst a long catalogue of names yet remembered with pride by Canadians. Although all these pages of history are of comparatively modern date, we cannot go beyond them; and there are few of us who have not sought to penetrate that mystery and to all appearance impervious veil. People on this continent have many a time been taunted with the fact that they had no history, no traditions and none of those recollections of which so many Europeans and Asiatics pride themselves. The stories of the aborigines go back probably years beyond the period of which we have spoken, but what are these years compared with the ages of which we, in common with more eastern people, are the proud inheritors. We speculate, but little more, on the days when the transmigration occurred from Asia into America; we have endeavoured, but unsuccessfully, to find the route by which the passage was effected. Ice land, Ireland and Wales, each claims to have first discovered North America long before other Europeans. Lives and treasure have been exhausted in this vain attempt; the icy Dominions of the monarch of the North Pole have been invaded, but little has been done except, it may be, to give a keener zest to the prosecution of the enquiry. Doubtless, we have a record reaching far back into the buried past, but at present we are ignorant of its details; we have legends, beautiful and attractive, of the doings of the great Manitou with the redmen; we have the testimony of the earth, of the rocks, of the hills, and of the valleys, as to what God and nature have done—which has been so well interpreted to us; but we know not of those scenes in which undiscovered man has been the prime actor. The old Aztec and other ruins tell us that the deeds forming history have been enacted, but we can get no further, and hence anything which may tend to the unravelling of the mysteries which have preceded us, should be hailed with universal gladness, and no effort should be left unused to bring out a satisfactory issue. The primeval lords of the soil are rapidly diminishing in numbers; they seem to disappear before the advancing European; their race is more or less quickly dying out; and yet associated with them for several centuries, they are as strange to use as if we had never known them. Totally extinguished, or entirely absorbed among the white races, the chances of

obtaining their unwritten history will be continually getting more remote, and we shall be no gainers by their having existed except by reason of the territories which the sword and civilization have wrested from their grasp. As to the origin of the aborigines of North and South America, various speculations have been indulged in. The natives of the western coast of Mexico and South America, it has been contended, are manifestly of the same race as the Japanese and Chinese, whilst the North American tribes are considered of different origin, and it has been insisted by an ingenious Jesuit Father that they have sprung from the two lost tribes of Israel, who wandered back of China down to the River Amaratli, thence crossed by the Alutian Isles to North West America. Whether Israelites or Tartars is, however, a fair topic for controversy.—*Montreal Herald*.

The plague of flies.—I have not seen a bed-bug or flea in my house for many years. If an army of them were to be brought in, mercury would speedily exterminate them, but I think cleanliness the best and perhaps the only preventive. The common house fly I do not molest, believing that it more than compensates for its trouble by clearing the atmosphere of effluvia and the animalcules which always arise from the putrefaction of decaying substances during warm weather. So, also with the birds, which are quite numerous here during the summer; instead of shooting them, or setting up scarecrows to frighten them away, I throw out every possible inducement for them to build their nests in my fruit trees. The birds capture a large share of the insects in the larval state, and thus the millers are prevented from depositing eggs for a future crop of worms. As to the loss of fruit by the birds, the latter are always sure to be on hand in force in the season of ripe fruit, whether they come early enough to take the worms or not. For the residue of insects which infest my vegetable garden, I find that the laboratory of the chemist furnishes material fatal to them all, among which white hellebore and cayenne pepper are of the most utility; the bug or worm which cannot find vegetation unflavoured with these articles will seek its breakfast elsewhere, and leave my garden unmolested. A few drops of carbonic acid in a pint of water will clean house plants from lice in a very short time. If mosquitoes or other bloodsuckers infest our sleeping rooms at night, we uncork a bottle of the oil of penny-royal, and these insects leave in great haste nor will return as long as the air in the room is loaded with the fumes of that aromatic herb. If rats enter the cellar, a little powdered potash thrown into their holes or mixed with meal and scattered in their runways, never fails to drive them away. Cayenne pepper will keep the buttery and storeroom free from ants and cockroaches. If a mouse makes an entrance into any part of your dwellings, saturate a rag with cayenne in a solution and stuff it into a hole, which can then be repaired with either wood or mortar. No rat or mouse will eat that rag for the purpose of opening communications with a depot of supplies.—*Charles Thompson, in Scientific American*.

English and Newspaper English.—Mr. E. A. Freeman, on May 7, gave the last of a set of six lectures on the "Use of the English Language" at the London Institution. The part of the subject which was treated of was the present state of the language. After pointing out the leaning toward the use of French and Latin words which showed itself in every column of certain daily newspapers, Mr. Freeman brought forward many examples of foreign words which had supplanted good English words, and of words which had slipped into daily use in a sense very different from their real meaning. Among these were "ritualist," which originally meant a scholar versed in the rites of sundry nations or religions, but which had within the last ten years come to mean exclusively one who belonged to an extreme party in the Church. "Ovation," again, was one of those words which had become popular in the penny papers, and was used by every one without the slightest heed to its fitness. What the word really meant could be gathered from its history. When a Roman General returned victorious to Rome a "triumph" was granted to him. He was drawn in a chariot to the Capitol, and a bull was sacrificed in his honour. If his deeds did not merit a triumph he walked and sacrificed a sheep. (ovis.) That was an "ovation;" but the sense in which the world was now used had no connection whatever with a sacrifice or a sheep. During the course of the Tichborne trial a man was brought up before the Magistrate for making a disturbance. The excuse he brought forward was that he was only helping to receive the claimant with the customary "ovation," and when asked to explain what that was, he defined it

as "hooting and yelling." There was another Latin word from which ovation might also be derived, in which the *o* was long instead of short; but that word meant an egg, and that sort of ovation was commonly kept for candidates at contested elections. "Transpire," which once meant to come out gradually, as steam might come out of a kettle spout, was now applied to any piece of news that had got abroad. It was even not uncommon to hear people say that an "event had transpired," when they meant to say that something had happened. So "to allude to," though a word perfectly good enough in itself, when used in the sense of drawing attention to some person or circumstance, without directly naming it or him, was now so turned from its real meaning that one might find people talking of "the gentleman alluded to by name." The Houses of Parliament were the only places where gentlemen could only be alluded to, as there it was not allowed to name a member. All this misuse of words came from a notion that it was fine to use words not understood either by the speaker or those who heard him. There was no such thing now as an "inn." All the inns had become hotels or establishments, while the landlord of the inn had disappeared to make way for the "lessee of the establishment." Where could one find a waiter nowadays who could ask for or "find out" anything? they must all now "enquire" or "ascertain." Some years ago it was customary for a tradesman to "send in his bill;" but now he "rendered his account." At the same time, if one read any notice of a musical service one would find that the "psalms had been beautifully rendered." By this it was probably meant that the psalms were sung, though it was hard to understand how the same word could mean sending in a bill and singing psalms. "Inauguration" was another of these misused words. It was put in the place of the good English word "beginning." But sometimes it meant more than that, it was used for uncovering, as when people talked or wrote of the "inauguration of a statue." It would be just as rational to say that when a man took his hat off he "inaugurated his head." Mr. Freeman in conclusion, said that our language had few friends and many foes. Chief among these were the writers in certain daily newspapers and school-masters. He feared its only friends were plough-boys and a few scholars; but he hoped that he had enlisted among its friends some at least from the intelligent and attentive hearers who had given him so hearty and cheering a reception. The great use of lectures was to set people thinking for themselves, and if each one would think for themselves, and if each one would think what he ought to do for the English language, a reform would soon be wrought. One great use of speaking in plain English was that every one must then know what it was that he meant to say, and that if the speaker meant nothing at all this was soon found out, while, if he used high-flown foreign words, people were not sure of what they meant, or whether they really had any meaning.—*N. Y. Times*.

Chinese astronomy.—China furnishes us with the most ancient observations of which we can make use astronomically. The earliest eclipses of which we have any mention can only serve the purposes of chronology, on account of the vague manner in which they are reported. But these eclipses prove that the epoch of the Emperor Yao was more than two thousand years before our era. Astronomy was cultivated in China as a basis of religious ceremonies. The calendar and the announcement of eclipses were important objects for which they had created a tribunal of mathematics. They observed the meridian shadow of the gnomon at the solstices, and the passage of the stars over the meridian. They measured the time by clepsydras, or water-clocks. They determined the position of the moon with reference to the stars at its eclipses, by which they determined the position of the sun and the solstices with reference to the stars. They had even some instruments suitable for measuring angular distances between the stars. By these means united they discovered that a solar year exceeds by about a quarter of a day three hundred and sixty-five days. Their year began at the winter solstice; their civil year was lunar; and to make a correspondence between the civil and solar years, equivalent to two hundred and thirty-five lunations, the same period which Callippus introduced into the Greek calendar more than sixteen centuries later.

Their months were alternately twenty-nine and thirty days; their lunar year three hundred and fifty-four days, consequently too short by eleven and one fourth days; in the year when the number of days exceeded a lunation they intercalated one month. They had divided the equator into twelve immovable

signs and into twenty-eight constellations, in which they determined the position of the solstices. The Chinese had instead of a century a cycle of sixty years, and a cycle of sixty days instead of a week; the small cycle of a week or seven days was known to them in the earliest ages; as to all other nations of the East. The division of the circumference in China was always subordinated to the length of a year, so that the sun described exactly one degree per day; but the divisions of the degree, of the day, and of all weights and measures were decimal; and this example, set by a great nation and in use for four thousand years, shows its advantage over all other methods of enumeration, and accounts for its extreme popularity.—*From May "Home and School," Louisville, Ky.*

A Secret of Public Speaking.—An admirer of Mr. Bright writes to a Manchester paper that he has discovered the secret of the power this great speaker possesses of rivetting the attention of his audience. This he believes to lie in the fact that he uses monosyllables very largely. The grand passage in Mr. Bright's speech on the Burials Bill describing a Quaker funeral begins "I will take the case of my own sect," and on counting the words of that remarkable oration it will be found that out of 190 words 149, more than 75 per cent., were monosyllables. An American journal lately mentioned a school where such pains had been taken to instruct the boys in the art of public speaking that if they had learned nothing else they had acquired the greatest contempt for all the devices of stump oratory. The course of study prescribed is left to the imagination, but doubtless includes the translation into monosyllables of the ponderous verbiage which passes current in most political assemblies as genuine eloquence. It would, however, be cruel to insist on the introduction of such teaching into any of the "standards." Many are obliged to speak who have less to say than Mr. Bright, and to them the *sesquipedalia verba* are indispensable.—*Fall-mall Gazette.*

—It will be gratifying to those who are interested in science to learn that although the late Prof. Agassiz is no more, the work to which his life was devoted is still going forward, as evidenced by the following from the *N. Y. Times* of the 21st:—"About twenty packages of Peruvian antiquities for the Agassiz Museum of Natural History, at Cambridge, Mass., were received from the steamer *Acapulco*, at the Appraiser's office, Second Division. The collection consists of skel tons, stone carvings, pottery, stone idols, and weapons, from the old burial places and mounds of nearly forgotten race; reptiles and insects from the Cuzco Valley, fossils, skulls, fish, and geological specimens from Lake Zexaca; antique implements of war and agriculture, robes and baskets, skeletons and llamas and alpacas, bird skins, and countless other specimens of interest. The collection gives evidence of rough handling and careless packing. These rare curiosities were obtained for the museum at the request of Prof. Alex. Agassiz, who is now in charge."

MISCELLANY

Education.—To read the English language well, to write with despatch a neat, legible hand, and be master of the first four rules in arithmetic, so as to dispose of at once, with accuracy, every question of figures which comes up in practice—I call this a good education. And if you add the ability to write pure grammatical English, I regard it as an excellent education.—These are the tools.—You can do much with them, but you are helpless without them.—They are the foundation; and unless you begin with these, all your flashy attainments, a little geology, and all otherologies andosophies, are ostentatious rubbish.—*Edward Everett.*

Apitudes in Men.—It is very certain that no man is fit for everything; but it is almost as certain, too, that there is scarcely any one man who is not fit for something, which something nature plainly points out to him by giving him a tendency and propensity to it. Every man finds in himself, either from nature or education (for they are hard to distinguish), a peculiar bent and disposition to some peculiar character; and his struggling against it is the fruitless and endless labor of Sisyphus. Let him follow and cultivate that vocation, he will succeed in it, and be considerable in one way at least; whereas if he departs from it he will at best, be inconsiderable, probably ridiculous.—*Lord Chesterfield.*

Verbal Vices.—Indulgence in verbal vice soon encourages corresponding vices in conduct. Let any one of you come to talk about any mean or vile practice with a familiar tone, and do you suppose, when the opportunity occurs for committing the mean or vile act, he will be as strong against it as before? It is by no means an unknown thing that men of correct lives talk themselves into sensuality, crime and perdition. Bad language easily runs into bad deeds. Select any iniquity you please; suffer yourself to converse in its dialect, to use its slang, to speak in the character of one who relishes it, and I need not tell how soon your moral sense will lower down to its level. Becoming intimate with it, you lose your horror of it. To be too much with bad men and in bad places, is not only unwholesome to a man's morality, but unfavorable to his faith and trust in God. It is not every man who could live as Lot did in Sodom, and then be fit to go out of it under God's convoy. This obvious principal of itself, furnishes a reason not only for watching the tongue, but for keeping ourselves as much as possible out of the company of bad associates.—*Indian Arcana.*

—A schoolboy being asked by the teacher how he should flog him, replied: "If you please, sir, I should like to have it on the Italian system—the heavy strokes upwards, and the down ones light."

Habit.—"I trust everything under God," said Lord Brougham, "to habit, upon which, in all ages, the lawgiver, as well as the schoolmaster, has mainly placed his reliance; habit, which makes everything easy, and casts all difficulties upon the deviation from a wonted course. Make sobriety a habit, and intemperance will be hateful; make prudence a habit, and reckless profligacy will be as contrary to the nature of the child, grown or adult, as the most atrocious crimes are to any of your lordships. Give a child the habit of sacredly regarding the truth; of carefully respecting the property of others; of scrupulously abstaining from all acts of improvidence which can involve him in distress, and he will just as likely think of rushing into an element in which he cannot breathe, as of lying or cheating, or swearing."

Profanity—We are emphatically in the age of profanity, and it seems to us that we are on the topmost current. One cannot go on the streets anywhere without having his ears offended with the vilest words, and his reverence shocked by the most profane use of sacred names. Nor does it come from the old or middle-aged alone, for it is a fact, as alarming as true, that the younger portion of the community are most proficient in degrading language. Boys have an idea it is smart to swear; that it makes them manly; but there never was a greater mistake in the world. Men, even those who swear themselves, are disgusted with profanity in a young man, because they know how, of all bad habits, this clings the most closely, and increases with years. It is the most insidious of habits, growing on so invisibly that almost before one is aware he becomes an accomplished curser.

—All gentleman from Canada who may be staying in London, or passing through it, should understand that a room has been specially fitted up for their convenience in the Canada Government-offices, King-street, Westminster. They may have their letters addressed to them there, and make such temporary use of the library—which is supplied with directories, the Canadian papers, and the London daily journals, which are duly filed—as could only be enjoyed at a well regulated club. No fees are charged; it is enough that the person desirous of such accommodation as is here provided be a Canadian to ensure a cordial reception. A visitor's book is kept for names and addresses, and friends from the Dominion may thus always be able to trace or communicate with each other when they come to the old country or visit the metropolis.

The following names were added this week to the visitor's book:—John L. Stewart, B. A., Toronto; George R. Rowley, St. John, N. B.; Hon. J. J. C. Abbott; Harry Abbott; H. M. Blain, Québec; Frédéric Gautier, Québec; Thomas Ballantyne, M. P. P. for South Perth; J. L. Grant, Ingersoll, Ont.; Henry Adams, Whitby, Ont.; John L. Ritchie, Halifax, N. S.; E. G. Henderson, M. D., Belleville, Ont.—(*Canadian News*).

Books received.

We acknowledge receipt with thanks of the following:
PUBLIC HEALTH.—A new magazine edited by Geo. A. Baynes, Esq., M. D., Montreal, and issued monthly: will be very valuable in a hygienic point of view if properly supported as it deserves to be.
TWENTY SEVENTH REPORT OF THE BOARD OF TRUSTEES OF PUBLIC SCHOOLS.—Washington, D. C.
TWENTY FIRST REPORT ON COMMON SCHOOLS.—State of Ohio.
ANNUAL REPORT OF STATE SUPERINTENDENT OF EDUCATION.—State of Mississippi.
BOSTON UNIVERSITY.—School of Law Catalogue and Circular.

Meteorology.

Observations taken at Halifax, Nova Scotia, during the month of May, 1875; Lat: 44° 39' North; Long. 63° 36' West; height above the Sea, 130 feet, by 2nd Corporal J. T. Thompson, A. H. Corps.
 Barometer, Highest reading, on the 18th..... 30.334 inches.
 Lowest " 20th..... 29.564
 Range of pressure..... .770
 Mean for month (reduced to 32 F)..... 29.915
 Thermometer, Highest reading on the 24th..... 76.6 degrees.
 Lowest " 21st..... 23.1
 Range in month..... 53.5
 Mean of all highest..... 60.8
 " lowest..... 34.4
 " daily range..... 26.4
 " for month..... 47.6
 Highest reading in sun's rays..... 123.6
 Lowest reading on the grass..... 20.0
 Hygrometer, Mean of dry bulb..... 52.0
 " wet "..... 46.9
 " dew point..... 41.9
 Elastic force of vapour..... .266 grains.
 Vapour in a cubic foot of air..... 3.0
 " required to saturate air..... 1.4
 The figure of humidity (Sat. 100)..... .68
 Average weight of a cubic foot of air..... 541.4
 Wind, Mean direction of North..... 3.0 days.
 " North East..... 4.5
 " East..... 1.5
 " South East..... 4.0
 " South..... 3.0
 " South West..... 4.0
 " West..... 3.5
 " North West..... 7.5
 " Calm..... 0.0
 Daily force..... 3.0
 " horizontal movement..... Out of repair miles.
 Cloud, Mean amount of (0 to 10)..... 6.1
 Rain, Number of days it fell..... .13
 Snow, " 0
 Amount collected on ground..... 3.72 inches.
 Fog, Number of days..... 2

THE JOURNAL OF EDUCATION.

(FOR THE PROVINCE OF QUEBEC.)

The *Journal of Education*,—published under the direction of the Hon. the Minister of Public Instruction, and Edited by H. H. MILES, Esq., LL. D., D. C. L., and G. W. COLFER, Esq.,—offers an advantageous medium for advertising on matters appertaining exclusively to Education or the Arts and Sciences.

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All communications relating to the *Journal* to be addressed to the editors.

ABSTRACT FOR THE MONTH OF MAY 1875.

OF TRI-HOURLY METEOROLOGICAL OBSERVATIONS TAKEN AT MCGILL COLLEGE OBSERVATORY. HEIGHT ABOVE SEA LEVEL 187 FT.

Day.	THERMOMETER.				BAROMETER.				† Mean Pressure of Vapour.	‡ Mean Relative Humidity.	WIND.		SKY CLOUDED IN TENTHS.			* Rain and Snow Melted.	Day.
	Mean.	Max.	Min.	Range.	Mean.	‡ Max.	‡ Min.	Range.			General direction	Mean Velocity in N. P. hours.	Mean.	Max.	Min.		
Sunday 1	41.89	50.0	33.9	16.1	29.7975	29.892	29.593	.299	.1750	62.2	N.	11.3	8.5	10	8	0.08	1
2		42.0	33.1	8.9							S. W.	22.5				0.79	2 Sunday
3	35.32	41.0	30.0	11.0	29.5845	29.698	29.492	.206	.1699	82.0	W.	21.5	9.2	10	5	0.18	3
4	41.36	50.3	33.0	17.3	29.7204	29.749	29.685	.064	.1876	72.2	N. W.	8.0	6.6	10	3		4
5	48.00	56.5	38.8	17.7	29.8362	29.875	29.761	.114	.1995	61.0	W.	5.6	5.6	10	13		5
6	46.87	53.0	31.5	21.5	29.8182	29.884	29.765	.119	.2589	79.6	S. E.	4.1	10.0	10	0	0.17	6
7	50.31	58.7	40.5	18.2	30.0271	30.078	29.906	.172	.2595	72.0	N. E.	4.4	7.6	10	4		7
8	46.87	49.8	45.0	4.8	29.9237	30.052	29.763	.289	.2552	79.6	S.	10.6	9.4	10	7	0.17	8
Sunday 9		66.2	44.7	21.5							S.	23.3				0.40	9 Sunday
10	56.22	61.5	50.2	11.3	29.5237	29.781	29.322	.459	.3622	78.9	W.	6.7	7.2	10	1	0.68	10
11	54.86	63.9	46.7	17.2	29.8856	29.927	29.790	.137	.2675	63.6	W.	16.7	2.1	6	0		11
12	49.75	58.5	42.1	16.4	29.6410	29.863	29.446	.417	.2855	78.7	S. W.	12.7	7.9	10	2	0.47	12
13	45.96	54.7	37.7	17.0	30.0049	30.133	29.820	.313	.2010	65.5	W.	16.0	4.5	10	0	Inappreciable	13
14	49.07	56.0	45.0	11.0	30.1759	30.259	30.084	.175	.2481	71.5	N. E.	8.4	8.6	10	4	0.17	14
15	41.14	46.7	36.1	10.6	30.0185	30.172	29.911	.261	.2432	93.2	N. E.	10.4	9.6	10	7	0.56	15
Sunday 16		47.8	33.9	13.9							N. E.	10.4				0.35	16 Sunday
17	51.22	62.3	40.7	21.6	30.1970	30.237	30.143	.094	.1785	77.0	N.	8.7	1.2	6	0		17
18	53.00	62.5	42.5	20.0	30.2290	30.299	30.139	.160	.2139	54.1	N. E.	6.9	2.2	10	0		18
19	45.14	52.0	42.8	9.2	29.9637	30.109	29.840	.269	.2487	83.2	N. E.	7.5	9.6	10	8	0.61	19
20	49.51	57.5	43.3	14.2	29.7701	29.838	29.709	.129	.2974	84.4	S. W.	10.4	8.7	10	8	0.24	20
21	58.51	70.0	47.3	22.7	29.8780	29.945	29.814	.131	.3155	61.7	S. W.	6.6	3.9	10	0		21
22	70.15	82.0	57.1	24.9	29.7734	29.824	29.716	.108	.4354	59.5	S. W.	11.4	3.7	10	1		22
Sunday 23		70.2	52.0	18.2							S. W.	6.5					23 Sunday
24	69.81	82.2	56.0	26.2	19.8089	29.910	29.703	.207	.4691	64.0	S. W.	8.6	3.7	10	0		24
25	68.44	78.2	62.6	15.6	29.6841	29.743	29.625	.118	.5631	81.5	S. W.	12.5	6.7	10	0	0.13	25
26	62.09	70.2	55.2	15.0	29.9581	30.120	29.748	.372	.2914	52.6	N.	7.7	0.1	1	0		26
27	57.72	67.8	50.0	17.8	30.2357	30.320	30.166	.154	.2740	57.5	S.	7.7	1.1	4	0		27
28	62.20	72.0	51.0	21.0	30.1056	30.218	29.944	.274	.3619	64.7	N. E.	1.9	3.6	7	0		28
29	63.90	74.8	52.1	22.7	29.8124	29.944	29.744	.200	.4272	72.0	N. E.	6.3	6.5	10	0	0.18	29
Sunday 30		69.7	51.2	18.5							N.	9.9					30 Sunday
31	61.44	69.8	52.1	17.7	30.1096	30.137	30.074	.063	.2992	55.2	N. E.	5.0	0.4	2	0		31
Means	56.106	61.22	44.45	16.74	29.9043			.2635	.09893	69.40		10.1	5.7				

* Barometer readings reduced to Sea level and to temperature 32° Fah. † Pressure of Vapor in inches of Mercury. ‡ Humidity relative, saturation, 100.

Mean temperature of month, 53.106. Mean of maxima and minima temperature, 52.83. Maximum temperature on the 24th was 82.2. Minimum temperature on the 3rd, 30.0, giving a range of temperature for the month of 52.2 degrees. Greatest range in one day was 26.2, on the 24th; least range was 4.8, on the 8th. Mean height of the barometer was 29.9043. Highest reading was 30.320, on the 27th; lowest, 29.322, was on the 10th, giving a range of .998 inches. Mean elastic force of vapor was equal to .2830 of an inch of mercury. Mean relative humidity, 69.4. Maximum relative humidity was 98, on the 10th, during rain; minimum was 36.0 on the 18th, during clear weather. Mean velocity of wind for month, 10.1 miles per hour. Maximum velocity, 32 miles per hour, on the 2nd; prevailing wind from the N. E. Mean of sky clouded in tenths, 5.7. Rain fell on 16 days. Total precipitation in inches of water, 5.13 inches. Number of auroras, 4.