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THE CANADA
EDUCATIONAL MONTHLY
AND SCHOOL MAGAZINE.

MAY, 1887.

ON THE ACQUISITION OF KNOWLEDGE.

BY PROFESSOR WILLIAM CLARKE, TRINITY COLLEGE, TORONTO.

(Continued from page 131).

HUMILITY is the foundation of all true knowledge of nature, of man, or of God. Except we become as little children, we cannot enter into the kingdom of heaven. God hides the truths of His kingdom from the wise and prudent, and reveals them unto babes. And it is the same with knowledge. "It is a point fit and necessary," says Lord Bacon, in his "Interpretation of Nature,"* "in the front and beginning of this work, without hesitation or reserve to be professed, that it is no less true in this human kingdom of knowledge than in God's kingdom of heaven, that no man shall enter it *except he become first as a little child.*"

There is nothing paradoxical or difficult in this statement. If men have associated the possession of human knowledge with high-mindedness, it has been because they have been influenced by prejudice or by

jealousy, or else because they have selected some isolated examples, and made them typical of the whole class. If we proceeded in this matter with careful and deliberate examination, we should speedily discover that conceit and self-sufficiency, wherever found, are powerful hindrances to the attaining of solid and accurate knowledge. It is the man who knows his ignorance, his small capacity, the boundlessness of knowledge, the extreme difficulty of perfect accuracy, the labour needed for the acquisition of any real knowledge—it is such an one who will always make the most successful student. And as a matter of fact, the greatest thinkers, scholars, discoverers, and inventors, have commonly been the men of the deepest humility. The story of Sir Isaac Newton is well known. Whatever he might seem to others, to himself he was but as the child upon the sea-shore, finding perhaps some pebbles more beautiful than those which

* Works, iii. 224.

others had discovered, but with the great ocean of truth lying all undiscovered before him.

"The sciences," says Pascal,* one of the master minds of the world, "have two extremities which touch each other; the first is that pure ignorance in which all men are born. The other extremity is that which is reached by those great souls who have traversed the whole extent of human knowledge, and return to the same sense of ignorance from which they set out. But this is that learned ignorance which knows itself." We have here the truth which corresponds with the statement of St. Paul: "If any man thinketh that he knoweth anything, he knoweth not yet as he ought to know." (1 Cor. viii. 2.)

But valuable as a humble mind is in the seeker after truth, it is but the first and only a kind of preliminary requirement for the pursuit of knowledge. In order to carry on the work effectually, we must conquer ourselves, we must overcome our sloth by the laborious concentration of the attention, and by continuous toil. It may seem but poor encouragement to the learner, but we must doubt whether any great enthusiasm will ever be kindled by the assurance that the work which is to be done will make no serious call upon the self-denial of him who is to be the doer of it.

The concentration of attention is indispensable in the acquisition of all knowledge which deserves the name. Attention is, in truth, the helm by which the mind of man is governed and directed. It is the explanation of most of the differences by which one man is distinguished from another. According to the direction and concentration of a man's attention, such is the man. In other words, according as a man gives his whole

mind, or a part of his mind, to this thing or to that thing, so is his intelligence informed, his will shaped, his whole character moulded.

"Attention," says Sir W. Hamilton,* "is to consciousness what the contraction of the pupil is to sight. . . . The greater capacity of continuous thinking that a man possesses, the longer and more steadily can he follow out the same train of thought, the stronger is his power of attention; and in proportion to his power of attention will be the success with which his labour is rewarded. All commencement is difficult, and this is more especially true of intellectual effort. But if we are vigorous enough to pursue our course in spite of obstacles, every step, as we advance, will be found easier, the mind becomes more animated and energetic; the distractions gradually diminish, the attention is more exclusively concentrated upon its object, the kindred ideas flow with greater freedom and abundance. The difference between an ordinary mind and the mind of a Newton consists principally in this, that the one is capable of the application of a more continuous attention than the other. This is, in fact, what Sir Isaac, with equal modesty and shrewdness, himself admitted. To one who complimented him on his genius, he replied that if he had made any discoveries it was owing more to patient attention than to any other talent. It is very much the judgment expressed by the late Mr. Carlyle, when he pronounced genius to be "a transcendent capacity for taking trouble."

And this is only one part of the general truth, that, in the pursuit of knowledge there must be devotion, labour, toil, the ardent devotion of a love which will never desist from

*"Pensées," Art. iii. 18. (Ed. of Havet.)

*Metaph. Lect. xiv., (vol. i., p. 248.) The whole lecture deserves study.

its pursuit until it has gained the object of its desire. "Jacob served seven years for Rachel, and they seemed unto him but a few days, for the love he had to her;" and such must be the ardent and self-sacrificing devotion of every one who aspires to the possession of knowledge. Truth will not yield herself to every chance-comer who seeks her hand. Before she surrenders herself she will demand, and must receive, the most unquestionable proofs of devotion.

There is no knowledge gained without labour; and, generally speaking, the value of the attainment will be in strict proportion to its cost. A motto, attributed to S. Francis of Assisi, which was early adopted by the great Italian Savonarola, and evidently cherished by him throughout his life, deserves to be inscribed upon the memory of every true student: "A man knows as much as he works."* It need not be said how widely this truth is forgotten or ignored. Many seem to forget that knowledge, like all other possessions, which are worth having, costs a great deal. It is a great mistake, one of the greatest, to imagine that it will fall into our laps while we sit below the tree of knowledge with folded hands. "If a man will not work, neither shall he eat," is a maxim as true in the world of mind as in the world of matter. In both departments alike, idleness and drowsiness will clothe a man with rags.

We have spoken of hindrances of two kinds, moral and intellectual, and we have indicated the remedies for those of the first class in deep humility and ardent toil. It is never quite easy to mark off these two spheres of human activity. We must, however, still make an effort to point out the intellectual hindrances to the acquisition of knowledge, and

thus furnish some rules and hints which may aid us in its pursuit. In a field so vast we must make selections, and in doing so we will follow some of the cautions offered by Lord Bacon in various works, and more especially in his invaluable book on the "Advancement of Learning," and in the "*Novum Organum*."

1. One of the notions against which he utters the most earnest warning is the opinion that because we have learnt to use *words*, therefore we have acquired knowledge. He calls it "The first distemper of learning, when men study words and not matter."* It is a danger which needs only to be pointed out. It was the evil which Dr. Johnson condemned when he told Boswell to "clear his mind of cant," and not go on using language which was utterly unreal, and which he believed, or thought he believed, only because he had given no serious attention to its meaning. It is an evil which gives no sign of diminution in our own days. We could hardly deceive ourselves more grossly than by supposing that the amount of our knowledge was in proportion to our power of using words.

2. Another caution which Bacon gives is against *precipitancy*. "Another error," he says, "is an impatience of doubt, and haste to assertion without due and mature suspension of judgment."† This warning covers very large ground. It rebukes our tendency to "jump to conclusions," to draw inferences from inadequate premises, to save ourselves the labour of thought by adopting the opinions of others, and many other such devices. It presses home upon us the great need of deliberation and discrimination in the acquisition of knowledge. This is a lesson which

*Tanto sa ciascuno quanto opera.

**Adv. of Learning*. Works iii., 284.

†*Adv. of Learning*. Works iii., 293.

it will be well for us to learn early in our education. In order to accurate and satisfactory knowledge there must be continual doubt, at any rate, continual hesitation and the suspension of assent. Here, too, we have evidently an application of those moral principles of humility and self-denial which we have laid down as primary requisites in order to the acquisition of knowledge. A humble inquirer, and one who is ready to undergo all needful labour in order to the attainment of the end which he has set before him, will seldom be hasty and precipitate in his conclusions and judgments.

We have here a subject which has engaged the attention of the greatest teachers of mankind. One chief aim of Socrates was to show men how *confused and inaccurate their thinking* was, to make them doubt before they were sure that they knew the meaning of the words which they uttered. To such a length did he go in fostering this state of mind that we can hardly wonder that his enemies called him the great sophist. Pascal also spoke so strongly on the need of hesitating, deliberating, discriminating, that he has been accused of favouring scepticism. But we must make our choice. If we would escape from thought which is false, confused, or imperfect, it must be by using our best efforts to obtain a complete induction of the facts upon which our judgment should be based, and by careful discrimination of the value to be attributed to the various elements of knowledge.

3. One of Bacon's most important counsels is that in which he cautions against the affecting of two extremes, or, as he expresses it, the "extreme affecting of two extremities, the one Antiquity, the other Novelty."* "Surely," he says, "the advice of the prophet is the true direction in this

matter, Stand ye in the old ways, and see which is the good way, and walk therein" (Jer. vi. 16). And he adds a true and admirable exposition of those words: "Antiquity deserveth that reverence, that men should make a stand thereupon, and discover what is the best way; but when the discovery is well taken, then to make progression. And," he goes on, "to speak truly, 'Antiquity is the world's youth.' These times are the ancient times, when the world is ancient, and not those which we account ancient *ordine retrogrado*, by a computation backward from ourselves." We may fairly suspect a theory which seems to start from the ground for the first time. At least we rightly demand that it shall give some account of its origin and some good reason why it should hold its place. On the other hand, the antiquity of an opinion can be no guarantee of its truth, if it has not stood the test of the fuller and riper knowledge of succeeding ages.

There has never been an age of the world, as far as we know, in which this caution has been unnecessary, and it is still needed among ourselves. The cry to stand upon the old ways is still taken up, sometimes reasonably and usefully, sometimes unreasonably and mischievously. By the old ways people commonly mean their own old ways, their own prejudices, interests, evil habits; and to all who would know the truth on this subject, the deep and suggestive words of Bacon may be recommended. Nor should the testimony of Pascal* to the same effect be forgotten. "Those," he says, "whom we call the ancients were truly new in all things, and formed properly the infancy of mankind; and as we have joined to their knowledge the experience of the ages which followed them,

* *Adv. of Learning.* Works, iii., 290.

* *Fragment d'un traité du vide.* *Pensées* (Havet), p. 519 c. p. 511.

it is among us that this antiquity is to be found which we revere in the others."

4. One other danger may here be pointed out, that, namely, of mere impractical speculative knowledge, sought after for the purposes of display or of mere captious controversy. And here we may well remember Bacon's caution,* that knowledge "must be subject to that use for which God hath granted it; which is the benefit and relief of the state and society of man; for otherwise all manner of knowledge becometh malign and serpentine." And, again, he says† that "all knowledge is to be limited by religion and to be referred to use and action." We must not imagine that Bacon meant that knowledge was not precious for its own sake, and that none was to be valued which could not be used for tangible, material ends. A passage from the *Advancement of Learning*‡ will show his real thoughts on this subject: "The greatest error of all the rest is the mistaking or the misplacing of the last or furthest end of knowledge. For men have entered into a desire of learning and knowledge, sometimes upon a natural curiosity and inquisitive appetite, sometimes to entertain their minds with variety and delight, sometimes for ornament and reputation, and sometimes to enable them to victory of wit and contradiction, and most times for lucre and profession, and seldom sincerely to give a true account of their gift of reason, to the benefit and use of men. . . . Howbeit I do not mean, when I speak of use and action, that end before mentioned of the applying of knowledge to lucre and profession; for I am not ignorant how much that diverteth and inter-

rupteth the prosecution and advancement of knowledge. . . . But as both heaven and earth do conspire and contribute to the use and benefit of man, so the end ought to be, from both philosophies to separate and reject vain speculations and whatsoever is empty and void, and to preserve and augment whatsoever is solid and fruitful."

It can hardly be said that we have at last escaped from the dangers of which we are here so powerfully warned. Now, as in the past, education is too often looked upon as a mere means of accumulating wealth, and, along with this, knowledge is made the stalking-horse of vain glory. We must never be weary of reminding ourselves that knowledge can lawfully be sought only for one of two reasons, either because it is in itself beautiful, good, elevating, or in order that we may fit ourselves for the better fulfilment of our work on earth, for the blessing of man and the glorifying of God.

"Art is long and time is fleeting." There is much to know and the time is short. Yet this time rightly used may suffice, if not for the attaining of all knowledge, even of all that we count needful, yet for the qualifying ourselves for our work here in the world, and, beyond this, for acquiring something of that general knowledge and culture which are involved in what we call a liberal education. It has been said that a man should know something of everything and everything of something. The language is exaggerated, but it has a truth at its foundation. Certainly we should do our best to understand our own business, whatever it may be; but the pursuit of any branch of study to the exclusion of every other has, of necessity, a narrowing effect, and we are injured morally as well as intellectually by allowing departments of our intellectual and sympathetic life

**Interp. of Nature*, Works, iii. 221, 222.

†*Ib.* p. 218.

‡Works, vol. iii. p. 294.

to lie barren and uncultivated. It must suffice, for the present, to have touched upon this point. Only one topic remains to be urged. With all our getting of knowledge we must not neglect the knowledge of ourselves or the knowledge of God; for this is the culminating point of all knowledge.

We should seek to know ourselves. In spite of all that has been said against it, there is yet much to be urged in favour of the "Heaven-descended *know thyself*." It is true that there is always a danger of excessive and morbid introspection; but we must not therefore neglect the duty of self-examination. Whether we wish to amend our errors or to discover what kind of work we may hopefully undertake and successfully perform, we must do our best to know ourselves.

And we shall never really know ourselves, or what man is or may become, without the knowledge of God. And it is the more necessary to dwell upon this subject, since it is by many declared in our own days that such knowledge is unattainable. We have knowledge only of phenomena, it is said. The facts of the material world around us we may test in many different ways, and upon the knowledge which we thus obtain we may place a certain amount of reliance. But we have, and can have, no such knowledge of the spiritual world and of God, and therefore, whilst sentiment and imagination may go forth into those regions, knowledge and the action which depends upon knowledge must be restricted to the sphere of the seen and the tangible.

These are bold assertions, and their very boldness may win them acceptance with many minds; but for all that they are as unreasonable as we hold them to be untrue. Of course, if we are quite determined to do so, we may doubt the existence of

anything, or the possibility of our attaining to any certain knowledge on any subject. We may declare that we have no positive knowledge of an external world. All that we really know is our own sensations, and these have been explained by different persons in different ways. But however they may be explained, it is at least certain that all men live and act upon the presumption that there is an external world, something besides ourselves with which we are continually in contact, and of which we have an amount of knowledge sufficient for all practical purposes.

Now, it is so far from being true that we have a knowledge of matter, but no knowledge of mind, that the very reverse would be nearer the truth. Our knowledge of mind is immediate and direct, it is revealed in our own consciousness; our knowledge of matter is mediate and indirect, it comes to us through the contents of our consciousness. Whatever may be our theory of perception, this is true. We begin with mind. But for this we should never really know anything; and it is absurd, as has been well remarked, to subordinate the knowledge of mind to the knowledge of nature, seeing that we can know nature only by means of that very mind whose existence we are denying.*

But it is not only within ourselves that the existence of mind is revealed to us. Nature is unintelligible except as the expression of mind. Everywhere we behold the prevalence of order and the reign of law. And so

* "Among all the errors of the human mind it has always seemed to me the strangest, that it could come to doubt its own existence, of which alone it has direct experience, or to take it at second-hand as the product of an external Nature which we know only indirectly, only by means of the knowledge of the very mind to which we would fain deny existence." Lotze, *Microcosmus*, Bk. ii., ch. 5.

everywhere we behold the existence of mind, and of mind which is not our own or ourselves. For we do not create the order of nature when we gaze upon it: we only recognize its existence. It is there independently of our thoughts and perceptions. In other words, there is mind as basis of nature and of existence.

And this truth is recognized by men in general, in all ages, and it comes out alike in the sense of responsibility and in the craving for the infinite by which mankind, as a race, is distinguished. That sense of responsibility of which we are individually conscious, belongs, in greater or less degree, to our fellow men. It is shared by all, or almost all, who have not destroyed their moral faculties, which, like our other powers, intellectual and physical, are certainly capable of being destroyed. It is assumed and acted upon in all the relations of life. We are conscious of its authority in ourselves, and we assume that others are under the same guidance.

And so our cravings for the help and guidance of a Higher and Greater than ourselves lead us to seek for Divine light and love, just as other impulses urge us to the attainment of other knowledge and other means of satisfaction. And how can we explain these longings but by the theory of a Divine origin and a kinship with God. Yes, it is He that hath made us, made us for Himself, made us like Himself, and there is no full and abiding satisfaction for such a creature, but that which is found in

his Creator. "This is life eternal that they should know Thee, the only true God."

And this knowledge of God is not only possible, is not only the secret of true life, it is the completion of all the knowledge of which man is capable. All other knowledge is incomplete without the knowledge of God; for that which all knowledge reveals to us is but a part of His ways. Until a man knows God he cannot really know himself, he cannot know his privileges, responsibilities, duties. "In Thy light shall we see light." It is in God that we know ourselves, our fellow-men, our place on earth and all the duties connected with it. This knowledge alone casts light down upon the path which we tread on earth, and forward upon the unknown way which we must take when this life is over.

All knowledge has its worth, and we ought not to depreciate any field of human investigation; but we shall be neglecting the highest and the best, if we do not seek to acquaint ourselves with God. And this knowledge is now, by God's mercy, brought near to us all. It is no longer necessary to ask: "Who shall ascend up into Heaven?" to bring us this knowledge? since Christ has come down from Heaven to reveal the Most High. The only begotten of the Father, full of grace and truth, we have seen His glory, the glory of the Father; and He alone can reveal the Father. In His light we shall see light, and walk in light, the light of truth, of knowledge, and of love.

REMEMBER that in teaching, as in everything else, you must have a good deal of capital invested to obtain large proceeds.

To forget often means to remember
 What we had forgotten too long—
 The fragrance is not the bright flower,
 The echo is not the sweet song.

WE depend more upon enthusiasm for school work to prevent tardiness than any other means.

LIFE's loveliest sky hides the thunder,
 Whose bolt in a moment may fall;
 And our path may be flowery, but under
 The flowers there are thorns for us all.

ROYAL SOCIETY OF CANADA.

ADDRESS OF THE PRESIDENT, DR. DANIEL WILSON.

OUR NATIVE LANGUAGES.

WE meet to-day after another year of work as a Society, to report progress, and to submit, in the various Sections, the contributions of the year to the departments of letters and science embraced within our comprehensive organization. In fulfilling the duty that now devolves on me, I might be tempted to follow the example of some who, in analogous positions, have surveyed the whole field of work, with its possibilities and opportunities: I might aim at a *résumé* not only of the actual achievements of Canadian science and letters, but of all that lies within the compass of its most ambitious aims. But such an attempt would involve a review of the intellectual life of the age. Physics and metaphysics, palæontology, archæology, history and *belles-lettres*, all alike claim our attention; but amid the wide diversity of intellectual activity which marks the era, a disposition is increasingly manifested to give the foremost place to questions which directly affect humanity. The speculations of science more and more converge towards one centre; and along with this it is impossible to overlook the growing tendency among one class of enquirers to translate hypothesis into scientific dogma. It is well that we should ever bear in remembrance that "Evolution," which is the magic word assumed for the present to solve all difficulties, necessarily implies progressive change; and so points to a beginning—a Creator. This novel hypothesis of the great English naturalist of our century, which offers for its acceptance a new science of life, has revolutionized the whole course

of scientific speculation. The geologist, responding to its appeal, undertakes, on strictly scientific evidence, the significant problem of the antiquity of man. The biologist unites with the palæontologist, in a renewed search for his pedigree. The psychologist has embraced within the sphere of his philosophic speculations the evolution of the intellectual powers, the conscience and the will; and assumes no less dogmatically to determine the descent of mind.

With so vast a range of speculation thus comprehended within the field of scientific research, the most gifted student might well hesitate to cope with the theme, in this its revolutionary stage. For me, the attempt would be altogether presumptuous; and I shall best fulfil the duty now devolving on me by limiting myself mainly to one department of research, which, as I conceive, has special and urgent claims on the attention of this Society at the present time.

The Science of Language, itself among the youngest of the sciences, has not escaped the influence of the new revolution; and novel theories of the evolution of language itself supersede earlier enquiries into the origin of letters. In one respect the Royal Society of Canada differs in its constitution from older kindred societies of the mother country, in so far as it includes, within the recognized work of its Sections, both French and English literature. Here, accordingly, language finds its legitimate place; and without embarking on the seemingly shoreless sea of speculation and hypothesis that I have indicated, there are certain aspects of comparative philology

which are full of interest and value to ourselves as Canadians. This department of study will not hamper in any degree the legitimate operations of other Sections; though it may influence enquiry in certain allied directions. But here, it seems to me that, without limiting the freedom of individual members in their choice of subject, much work of great practical value may be accomplished by a judicious selection of themes specially necessitating prompt consideration. The literature of France, with its "Chanson de Roland," its Froissart, its Molière, Corneille, Racine; and all its brilliant creations, to the latest productions of De Musset or Mérimée, pertains, like contemporary English literature, to European classics. Canadians may emulate the great masters in letters, as they have already done in more than one department; but the republic of letters is free to all without the fostering aid of a Society such as this. It is, indeed, a matter of just interest to watch the growth of a native Canadian literature in the languages both of France and England; and to trace the influence of novel environments moulding and fashioning our intellectual, no less than our physical development. But without slighting this attractive branch of work, it appears to me that more important results may be anticipated from a class of communications that have already received some attention in the past, and which I hope to see making greater demands on our space in the future. They are exemplified in the volume of Transactions now issued, in such papers for example, as "La race française en Amérique," "L'élément étranger aux Etats-Unis;" etc., as in previous volumes, we had "Les races indigènes de l'Amérique devant l'Histoire," "Les aborigènes d'Amérique, leurs rites mortuaires;" and in another, but not less interesting

aspect: "La province de Québec et la langue française." In like manner, in both the present and the past volumes, papers on "The Half-Breed," "The Huron-Iroquois," and others of the aboriginal races of the continent have been contributed to Section II. Thus the ethnology and comparative philology, not of Canada only, but of America, have, to some partial extent at least, been brought under review. It is a small portion of the wide field mapped out for our joint labours; but in this direction, as it seems to me, valuable results may be anticipated, marked by such local character as will naturally be looked for from our Canadian Royal Society, and constitute a special feature of its Transactions. The polished language of cultured France, though here transferred to a region beyond the Atlantic, is kept *en rapport* with the Parisian centre of refinement, and fed from the perennial fount of French literature. But here also are the peasants of Normandy and Brittany, transplanted to "la Nouvelle France," under the old régime, bringing with them to their new home a provincial patois, embodying elements peculiar to those scenes of Scandinavian colonization and Celtic institutions. Here, unaffected by revolutions that have so largely influenced the more recent history of France and of Europe, they have dwelt for generations, intermingling to some extent with the aborigines, and brought into novel relations with other intrusive races of the New World. To the modern Frenchman, they cannot fail to present in many ways a singularly attractive study; but it is in their philological aspect that the widest value lies; and the changes already noticeable in idiom and vocabulary, have awakened an intelligent interest among many students of language. The cultivated Frenchman not only

brought with him to his new home, a written language, and a literature rich and varied in its attractions, but the intervening ocean has scarcely impeded his enjoyment of its latest triumphs. But the *habitant* has stood in very different relations to the language. It was to him from the first an unwritten local dialect; and now illustrates, in some singularly striking aspects, the beginning anew of a process of evolution akin to that to which we owe the whole Romance languages. This is a branch of comparative philology, of interest to all Canadians, and which has a special claim on the attention of Section I.

But a wider interest pertains to the native languages, and to the indigenous races of this continent. Their approximation in physical characteristics to the Asiatic Mongol renders all the more remarkable the wide diversity of speech between the two continents. On both, indeed, an agglutinate character predominates in large groups of languages; but beyond this, any affinities thus far traced out are remote and uncertain. Here, therefore, is a problem in comparative philology, of which a solution may not unreasonably be looked for from us. In this direction unquestionably lies the determination of questions relating to the origin of the American race; the ethnographic key to the earliest migrations; the prehistoric chronicle of this western hemisphere; the interpretation, it may be, of the venerable myth of the lost Atlantis, which vainly excited the interest of the disciples of Socrates, as even then a tradition from old times before that era to which they belonged, when the world was two thousand three hundred years younger than it is now.

Looking to the subject in its narrowest aspect, the native languages of this continent are deserving of careful study; and those of our own Dominion have a claim on our attention, as

a Society, which we cannot ignore without discredit to ourselves. We owe not a little of the knowledge of them, thus far secured, as one—and not the least valuable—of the results due to the devoted labours of French missionaries for upwards of two centuries among the Indians of Canada and the North-West. The Huron version of the Lord's Prayer, reproduced in the second volume of the Society's Transactions, was derived from a MS. of the seventeenth century, ascribed to the Rev. Father Chaumonot; and is of value as an example of the language of that race, when first brought into intimate intercourse with Europeans. The vocabulary of the language, prepared by the same zealous Jesuit missionary, is still in existence; but its present custodian, M. Paul Picard, son of the late Huron Chief, Tahourenche, has hitherto repelled all applications for its purchase, and even for permission to have it printed. Its genuineness is placed beyond dispute by the date of the water-mark on the paper, and its interest and value are unquestionable. Our earliest knowledge of the native vocabulary of the Province of Quebec is derived from the two brief lists furnished by Cartier as the result of his visit in 1535; and a comparison of them with the Huron vocabulary leaves no doubt of their affinity. We have also the dictionary of the Recollet Father, Gabriel Sagard, printed at Paris in 1632. But the recovery of the vocabulary of Father Chaumonot, and its printing by the Royal Society, will furnish an important addition for the study of the language of a people interestingly associated with the early history of Canada, and will be a creditable work for either of the Literary Sections. I regret that my own efforts to obtain access to the MS., with a view to laying it before the Section of English Literature and of History, have thus far failed.

We already owe to the "Lexique de langue iroquoise," and to the "Etude philologique sur quelques langues sauvage de l'Amérique," of Abbé Cuoq, valuable help to the study of the Iroquois and Algonquin tongues. We are no less indebted to the Rev. Father Lacombe for the like aid in his "Dictionnaire et grammaire de la langue des Cris." But the frontiers of Quebec are still occupied by native tribes little affected by the civilization of European intruders, and beyond this, the Eskimo of Labrador are easily accessible. In Ontario, the Huron-Iroquois are being transformed into an industrious, civilized people. In the Maritime Provinces, the Micmacs and Micentcs are in process of like transformation; and on many Canadian reserves the representatives of Algonquin and other tribes are now settled, and gradually learning to conform to the usages of their supplanters. But in such a process language, and much else which is invaluable to the ethnologist, must disappear; and still more is this the case in the great wilderness of the North-West. There, in very recent years, the buffalo roamed in vast herds, furnishing an unfailling supply, not only of food, but of furs and skins, from which the tents, robes, and couches of Crees and Blackfeet were fashioned, and on which the Hudson Bay factors largely depended for like supplies. The Indian tribes lived around the Hudson Bay forts much after the fashion of their fathers, bartering the produce of the chase for other needful supplies. But now all this is at an end. a revolution of the most radical character has supervened. The inevitable disappearance of the wild hunter tribes of the North-West, at no distant date, can no longer be questioned. Some memorial of the native races will, doubtless, survive in civilized tribes settling down to

cultivate the soil over which their fathers roamed as nomad hunters. But such a process cannot fail to involve the extinction of the native languages, from which alone the ethnical affinities and the history of the race are to be recovered.

Nor must we overlook the significance of the fact that the Province of Manitoba began its independent career with a population of some ten thousand half-breeds. In that old historic past, when the gifted Roman annalist followed on the steps of imperial conquest in the British Islands, the dark type of the Silurian Britons was noted by Tacitus, and assigned by him to an Iberian source. In the latest classification of anthropologists, the modern representatives of this persistent type are designated "Melanochroi," the assumed representatives of the *metis* of Europe's prehistoric dawn, when the first wave of Aryan immigration came in contact with their Turanian or Allophylian precursors. Here, in our own Dominion, the same great Aryan wave, which reached the shores of the New World before the close of the fifteenth century, and, with ever added volume, has driven before it the native tribes, moves westward with irresistible aggression; and on our North-West frontier, the same results are everywhere apparent. The ethnological history of Europe repeats itself here; and this phenomenon of the rise of a race of mixed blood settling down among the intruding colonists is replete with interest to the student of ethnology.

I bring this subject under your special notice now, because it is one that demands immediate attention, one indeed that will not brook delay. The Indian may survive for a time. The interblended elements due to the contact of native and intruded races, I doubt not, will remain as a permanent factor in our future popula-

tion. But the aboriginal arts must vanish; the native traditions, in which so much history lies embodied, will scarcely survive to another generation; and as for their languages, if not recovered from the lips of the living generation, they will ere long be as utterly beyond recall as the snows of the past winter. Yet it is to comparative philology that we have to look for the solution of problems of highest interest and value to ourselves. If we are ever to recover any reliable clue to the ancient history of this continent, and the source and affinities of the nations to whose inheritance we have succeeded, this can only be done by means of comparative philology; and for this, the materials must be gathered ere it be too late. "The Comparative Vocabularies of the Indian Tribes of British Columbia," the work of one of our own members, in conjunction with Dr. Fraser Tolmie, which was published in connection with the Geological and Natural History Survey of Canada, in 1864, is a timely and valuable contribution to the desired materials. But the reception which it met with from those in authority was not greatly calculated to encourage the repetition of such disinterested labours.

It is in work of this kind, at once of great practical value, and yet essentially unremunerative, if judged by the test of mere profitable pecuniary results, that Canada has to look for the most beneficial labours of its Royal Society. The history of the Geological Survey, both here and in the United States, is well calculated to guide us in this respect. Geology has long enjoyed the fostering care of the Government in both countries, though rather in its economic than in its scientific aspect. Large sums have been expended, and an efficient staff employed, in surveying and mapping out the geological structure

of the continent. The sister sciences, and especially those of mineralogy and chemistry, have been enlisted in its service; and palæontology has necessarily been largely elucidated in the combined research. But the urgent demand is ever for what are called practical results. True, it is to the disinterested study of pure science, to the love of abstract truth, that we owe all the grand, practical fruits by which science is revolutionizing the world. But Canada has been, till recently, sufficiently indifferent to this; and as for the United States—after doing splendid work in geology, ethnology, hydrography, geodesy and meteorology, and publishing works of no less scientific than practical value—a commission recently appointed by Congress to investigate the operations of the various scientific bureaux, has drafted a bill restricting the work and publications of the Geological Survey, and absolutely forbidding the expenditure of any portion of the Government appropriation for the publication of palæontological material, or for the discussion of geological theories. In other words, there shall be no seed-time for science. Henceforth it must be harvest through all the seasons. This, I doubt not, is a mere passing phase of misapplied thrift, which will speedily give place to a wiser recognition of the economic value of all scientific research. But I refer to such experience elsewhere, rather than to any action in our own Dominion, because we may the more impartially estimate the probable results. The scientific value of the labours, and of the published results, of the United States Geological Survey has been widely recognized; and the restrictions suggested by the recent commission will be felt throughout the scientific world even more keenly than would the withdrawal of American specie and all

its equivalents by the commercial world. It will not only be a great discouragement to American science, but, if persisted in, would enormously diminish the practical usefulness of the Survey. It is impossible to neglect pure science, and yet hope to reach those results which are but its latest fruitage. Palæontology, with all its marvellous disclosures relative to ancient life; chemistry, with its determination of the origin of crystalline rocks, or its wondrous spectrum analysis, revealing to us the physical structure of the heavens; or physics, with its more comprehensive discoveries of the correlation of forces—all alike present themselves to the "practical" mind as mere sports of scientific speculation, with no possible bearing on the economic needs, or the industrial interests of the community. What can it benefit the miner to learn of Tertiary vertebrates; or the farmer to be assured of the verification of the *Hesperornis*, the *Ichthyornis*, or other toothed birds of the Cretaceous strata of our North American continent? It is not indeed a matter of wonder that, to the man of "advanced views" in political and social science, who claims above all things to be "practical," it should seem a matter of equal indifference whether the dawn of life has been discovered in the *Eozoön Canadense* of our Laurentian rocks; or the existence of palæolithic man in America has been demonstrated by the recovery of the turtle-back celts in the drift of New Jersey. Nevertheless, to note only one familiar instance, the determination of the relative age of the strata of the Earth's crust has been of scarcely less economic value in the Provinces of Quebec and Ontario, in saving the useless expenditure of many thousands of dollars in a vain search for coal, than in guiding the geologists of Nova Scotia in the development of

their rich coal fields. It is the same in every department of science. Amber (*ἤλεκτρον*) furnished the first hint of latent Electricity, which perpetuates in its name the seemingly insignificant beginnings of that branch of science to which we now owe the telegraph, the telephone, electric light, the ocean cable; which have annihilated space, and outstripped time in their winged messages over land and sea. Yet such is the world's inheritance, won for her in the ardent search for abstract truth, in the unselfish devotion to pure science. We can no more look for the practical fruits of science without such preliminary labour, than for the reaping of the harvest where there has been no seed-time.

The institution of this Royal Society by the Canadian Legislature is in itself a recognition of the value thus assigned to pure science. By our constitution it is provided "that the advice and assistance of the Society shall at all times be at the disposal of the Government;" and in no way can this be more legitimately rendered than by interposing to prevent a premature demand for economic results arresting the researches of science. We are not likely to forget that Canada is still a young country—favoured in many ways on that very account, by reason of the unimpeded course that thus lies before us; but also with some of the difficulties incident to national youth. The learned societies of Europe have, in many cases, endowments at their disposal, which enable them to render efficient aid to science, and to issue costly works dealing with subjects such as no publisher would view with favour. No such endowments as yet exist in Canada; and occasions will occur when it may be our duty—looking to the true interests of the Dominion—to recommend to the Legislature a liberal encouragement

of the higher work of pure science in various departments, without neglecting those immediate practical results which the country reasonably looks for as evidence of the enlistment of science in the service of the people.

The volume of Transactions now issuing from the press will, I believe, be found in some respects in advance of its predecessors, and do no discredit to the representatives of Canadian letters and science. I have already referred to some of the contributions embodied in the work of Sections I. and II., when inviting to a line of research, in which the biologist, no less than the philologist and the *littérateur*, will find a legitimate field. The contribution to Section III. will also be found to include valuable work, alike in pure physics and mathematics, and in their practical application. The council of the society had occasion during the past year to press on the Government the desirableness, in the interest of our commercial navy, of carrying out a systematic hydrographic survey, not only in the Gulf of the St. Lawrence, but along our whole Atlantic and Pacific coasts, so as to follow up the work already so efficiently executed by the United States Geodetic and Coast Survey. In connection with this, attention may be fitly directed now to a valuable paper on "Tidal Observations in Canadian Waters." I may also be permitted, without invidious distinction, to note in Section IV. the continuance, by Mr. Matthew of St. John, of his description of the Cambrian fossils, adding considerably to our knowledge, and keeping Canada in advance of other parts of the continent on this subject. A contribution by Prof. Ramsay Wright on the anatomy of an interesting group of fishes, will, I believe, be found to introduce a style of work of which little has hitherto been done in

Canada. The catalogue of Canadian butterflies, by Mr. Saunders, renders our knowledge more complete and systematic; and gives information as to their local distribution, which may be of practical significance in relation to a branch of animal life, which, however beautiful, is regarded with well-grounded disfavour by the agriculturist. Sir William Dawson's paper on the latest Cretaceous discoveries of fossil plants in the North-West, adds to North American geology a new horizon of Lower Cretaceous plants not previously known, including a number of novel and interesting species. I may also refer here to the contribution by Professor Chapman of a piece of local economic geology in his account of the Wallbridge hematite mine, in order to note in passing that this was, I believe, one of the deposits resorted to by the aborigines, and used as a pigment. Among the primitive native implements in the Redpath Museum, at Montreal, may be seen the antler picks and shells used by the Indians in collecting the hematite for their own purposes.

In this slight and very partial glance at some among the subjects treated of in the new volume, my notice is necessarily meagre, as I have only had access to some of its detached sheets; and therefore cannot pretend to aim at any exhaustive review of the work embraced in its varied contents. By our very constitution, as a Society, alike scientific and literary, the range of themes is necessarily comprehensive and diversified. In all alike, we shall ever, I trust, set before ourselves a lofty standard; finding in literature a stimulus to the highest culture, and in science the motive to a reverent, yet fearless search for all truth.—*From advance sheets of Proceedings of Canadian Royal Society.*

PATHOS AND HUMOR IN LITERATURE.

BY A. H. MORRISON, C. I., BRANTFORD.

HUMOR and pathos are the light and shade of literature. Not the brightest light nor the deepest shade, but something between the extremes. The brightest light is undoubtedly the lightning flash of wit; the deepest shade, the black, repellent terror of tragedy. True humor never flashes, it flickers and plays with lambent flame, like the faint sheet lightning of summer, intermittently illuminating the horizon of being. So pathos never repels or terrifies. It is attractive even in its sadness. Tragedy strikes like wit, in sudden blows; 'tis the uplifted knife, the descending axe, the rushing flood, the martyr's stake. Pathos, like humor, lingers through clauses, paragraphs and chapters, yet, shocking no sense, leaves us the better and the wiser for its discipline. What would our literature—what would any literature—be without pathos, without humor? Wisdom it might enshrine, eloquence and wit; yet it would not be life, and not being life it would not be appreciated by the masses who live, and who delight to hear themselves and their virtues and weaknesses portrayed.

“Man is the animal that laughs,” a sufficiently good definition I opine. The ape may grin and mow and gibber; the parrot may shout and shriek and squall; but man alone in animated nature can shake his sides in unrestrained merriment, to feel benefited by the exercise. What is it then that makes man laugh? It is his innate sense of the ridiculous, *i. e.*, the humorous. Satire, however enjoyable in itself, seldom appeals to the risible faculties. Wit and repartee, however clever and appropriate, need wrinkle no visage with the ripple of mirth.

'Tis the intellect that appreciates in either case, not the sense. But broad humor tickles the whole individual, and the whole individual must respond to the prompting. Like honest Pluto, the retriever, when pleased he must wag all over. In this capability of appreciating the absurd man is unique. Suppose that mongrel No. 1 meets mongrel No. 2 in headlong flight with a frying pan rattling in his wake, does mongrel No. 1 show his appreciation of the joke by a grin? Not he. If No. 2 stays in his Ixion-like course for a moment, No. 1 may possibly sniff the pan in hopes of catching some faint aroma, relic of juicy steak or savoury chop, but grin? No. It is more likely a snarl or a snap. But let young Hopeful No. 1 meet young Hopeful No. 2 with a big chalk face outlined on the back of his jacket, and what is the result? Instantaneous explosions, to which the might of a torpedo were nothing. The pointed finger, the expansive mouth, the eye “in a fine frenzy rolling,” and the inevitable “Ha! ha! ha!” of unrestrained merriment. Happy mortal that man is, that can kill grief with a gibe, and lay the ghost of despondency with a guffaw!

No, we cannot do without humor. We could dispense, perhaps, with satire, which cuts oftener than it amuses; with wit, which blinds as often as it pleases. But obliterate humor, and we consign to forgetfulness some of the best and kindest and truest things that have ever been spoken or written. Nor could we do without pathos in life or fiction. An eternal simper would soon become monotonous; our aching sides must rest for very rest's sake. In life, as

in compositions, antithesis is beauty. The sunbeam shines brightest in the tear, lurking, iris-like, in its depths, with sevenfold splendour. I think one of the loveliest sights in this fair earth is a winsome child smiling through tears. It is the pathos and the humor of life abstract, personified. It is Dickens and Lamb copy-righted on the face of infancy. There is something fascinating in pathos, even the pathos of the grave, if natural and inevitable; in the white face we loved so well; in the crossed hands and the meek repose; in the flowers we strew and in the thought of the long, cold night, the first of absolute separation, that follows the infilling of the damp, new-turned mould, the solitude and the slumber.

Undoubtedly the pathetic appeals strongly to the spiritual in man's nature. It is a sort of neutral ground, an oasis lying midway between the desert of eternal gloom and the region of everlasting light; the gloaming of life's reminiscence, perhaps, with something of the daylight left, and angel eyes shining, like stars above the horizon which has merely hidden temporarily, not altogether whelmed, the sunbeams. I never read true pathos, but a better self rises and stands by me, assuring me that through all the tearful throbbings of the text a spirit hand has been tracing messages that only the second-sight of sympathy can translate, a promise of something better beyond the longing and the plaint. It is good sometimes to feel sad, nay, it is imperative to the men of letters. Strike out the pathos of life, and we obliterate the better half of literature proper, nearly all of the tenderest poetry and much of the noblest prose.

It is often difficult to tell where pathos ends and where humor begins. In some of the gems of written thought the two elements are so intimately blended as to be inseparable. Names

that cannot be disassociated from this type of literary art will occur at once to every earnest reader—Dickens, Lamb, Hood, Hawthorne, Holmes, Burdette, Clemens, Shaw, the inimitable Josh Billings. There is, indeed, something of pathos in much of good humor; something of humor in much of good pathos: the smile and the tear of Nature blended in an April-tide of feeling, and reflecting in prose and verse the iris tints of a sympathetic genius.

I have spoken of Dickens and Lamb—"Boz" and "Elia"—both, alas! now shades in that realm of pathos they loved so well, that charmed land in which so many have lingered and wept, yet lingered on and smiled, and lingered yet to weep and smile again. Who has not read the death of Paul Dombey? Who has not formed the acquaintance of Mr. Samivel Weller? Who has not felt sad over *Dream Children*? Who has not chuckled inwardly over a Dissertation upon Roast Pig? They who have not, I unhesitatingly say, have missed one of life's pleasures, and had better make their peace with literature at once. Lamb and Dickens are both humorists—genial, kindly, mirth-provoking spirits. They are also both masters of pathos. I may be wrong, but I conscientiously believe that "David Copperfield" has dimmed more eyes with holy, salutary moisture than the sum total of dogmatic fulminations that hurl the invectives of anathema at a poor, fainting, sorrowing humanity.

Yet, though in some respects alike, "Boz" and "Elia" are essentially different. They coincide in their tastes; they differ slightly in their mode of treatment. "Elia" is the deeper, the more scholarly of the two, and the sadder. In him there is a secondary or deeper echo of pathos, welling up from the pathetic, that is wanting in Dickens.

The latter is always hopeful in his pathos, the former sometimes not. Then again as to humor, like his pathos, "Elia's" sense of the ludicrous belongs to a higher plane of spiritual insight than does that of Dickens. The humor of the one is broad, well-fed, middle-class, robustious, English merriment; that of the other resembles rather the scintillating ray of the Aurora Borealis, it is colder and more polished. And especially in "Elia" is to be seen the grim humor blended with the spirit of a deep pathos, as instance his "New Year's Eve." Was this the result of his hereditary misfortune, or was it his keener appreciation of the narrow line which separates the sublime from the ridiculous? It is sometimes the toss of a penny whether he cause you to laugh or cry.

I deem that one of the finest bits of pathos in the English, indeed in any language, is the death of the child-wife Dora in "David Copperfield." The master-stroke of inventive genius which conceived the death of the pet dog at the exact moment of his mistress's demise is unique in modern English romance. It is a perfect picture of pathos—sad, exquisitely tender and artistic, yet natural in all its parts: the young husband who answers to the pet name of Doady; the still younger wife so loving, yet so reconciled; the dear, faithful, trusted friend Agnes, than whom no nobler creature adorns the page of fiction; and lastly, the favourite dog Jip, once so inimical to every one save his beloved mistress, now grown old and blind and feeble. Were it not an assured fact, we should hardly credit the author of such a masterpiece of the pathetic, with anything so simply ludicrous as some of the pen vignettes, say from "Pickwick," where Mr. Samuel Weller, as factolum, revels in a very Elysium of quaint drollery and mutilated Queen's "Hinglish."

Now contrast the pathos of Dickens with that of Lamb, as exemplified for instance in the latter's "New Year's Eve," and we shall at once perceive that, though there is an exquisite and tender sadness in the reverie of Elia, yet there is something of a smile, too, lurking in its depths, as fascinating in its way as is the sob upon the surface. It is a sort of dalliance with both, and eminently suggestive of the doggerel:

How happy could I be with either
Were t'other dear charmer away.

Lamb's humor, that is, humor pure and simple, devoid of pathos, is pre-eminently quaint like himself, while the subject is not unusually as quaint as the treatment, "The Praise of Chimney-Sweepers," "A Complaint of the Decay of Beggars in the Metropolis," "A Dissertation upon Roast Pig," etc., etc. We observe too, that whereas Dickens' humor is for the most part objective, the outcome of some personal peculiarity of alien individual temperament, much of Lamb's is subjective or evolved from his own inner consciousness. In Dickens' vignettes the author is lost sight of for the nonce in the personalities portrayed; in Lamb's best passages the writer is himself ever present with the motive of his text.

Of an altogether different type from either of the authors named are the humorists of the American school. I have said elsewhere that there is a something in American poetry which distinguishes it essentially from the poetry of Europe, and that this something is perhaps attributable to the mellow influence of the Indian Summer, the departing trail of golden scarlet splendour shimmering through the pines. I may be permitted another metaphor with regard to Western humor. It, too, is different from that of that old world. It has something of the ruggedness and expansiveness of the primeval wilderness

and the rolling prairie; the *abandon* and swirl of the cataract and the rapid. Humor, pathos and wisdom are not seldom combined in a paragraph, and so inimitably, that in spite, oftentimes, of a somewhat nondescript and perchance rugged dress, one cannot fail to detect underneath the disguise the unerring instincts and inspired utterances of genius. Burdette is a master workman in this department, so is Mark Twain, so is Bret Harte. I shall instance but one other name, that of the late lamented Henry W. Shaw, who under the pseudonym of Josh Billings, achieved more fame by his quaint and irregular doctrines, and enshrined more wisdom in bad orthography than have all the so-called spelling reformers of the modern school of English-made-easy put together. With a few examples of his style, inimitable in its way, I shall conclude, first calling attention to the admirable commingling of humor, pathos and sound common sense embodied in the text.

“SAYINGS.”

“A man with one idee alwus put me in mind of an old goose a tryin to hatch out a pavin stun.”

“A man running for offiss puts me in minde ov a dog that’s lost—he smells ov everybody he meets, and wags himself all over.”

“Moral swashun consis in askin a raan tu do what he ought tu do without askin, and then beggin hiz pardon if he refuses to do it.”

“ANSWERS TO CORRESPONDENTS.”

“Gertrude,” “Yure inquiry stumps me. The more i think on it the more i kant tell. Az near az i kan rekolek now, i think i don’t kno. Much mite be ced both ways, and neither wa be write. Upon the whole i reckon i wud, or i wuddent, jist az i thought best, or otherwise.”

PROVERBS.

“When a man diés the fust thing we talk about iz hiz welth, the nex thing hiz failings, and the last thing hiz vartues.”

“There is sum disseazes that kant be kured even by deth, for we often see them brake out in a man’s tombstun more violent than ever.”

FROM “A SHORT AND VERY AFFEKT-
ING ESSA ON MAN.”

“Man wuz created tew govern a world ov ruggedness, and he couldn’t dew it by being as harmless as a dove; he must have a touch ov a good sized sarpent in him, or he would have lived, he and hiz wife, growing butiful and useless, forever, in the Garden of Eden, he waz only put thare tew see its buty, but not to enjoy it till he had arnt it; not tew live thare until a weary round had been paced. . . . We awl kno the wa back tew the kradle ov Eden. We awl long tew be thare asleep, but if God don’t take us in Hiz arms, as froward children are taken, how few thare will be, who will git hum. Man is the problem, God iz the solution.

THE SEVERN TUNNEL.—The following particulars with regard to the Severn Tunnel, which shortens the distance between the South Wales coal-field and the South and West of England, and which was recently opened for passenger traffic, may be of interest. The first sod was turned in March, 1873. The length of the Tunnel is 7,664 yards, or 4½ miles, of which 2½ miles are

under the river-bed, with a minimum “cover” of 45 feet, and a maximum of 100; all this portion being bored through hard sandstone, conglomerate and red marl, and costing roughly £100 per yard. The works have been flooded by land-springs four times, and the total cost is about two millions sterling. The tunnel is lined throughout with vitrified brick, set in about three feet thickness of cement.—*Swiss Cross.*

NOTES FOR TEACHERS.

THE BRITISH ARMY.—The latest returns of the British Army show an effective force of 207,500 men, of these 9,000 are in Egypt (soon to be much reduced) 71,000 in India and a few in the Colonies. The government of Ireland demands the presence of 25,000 men.

THE Council of the College of Preceptors propose to start a fund for the purpose of establishing a training college, or of promoting some other scheme for the training of teachers; and in the mean time it is intended to set apart £300 a year, to be awarded in the shape of scholarships for intending teachers.—*English Exchange.*

EDUCATION may be, instead of a great blessing, a great curse. We are training boys and girls too rapidly. We have a thousand candidates for one place. The 999 live, then, by their wits, and the wits are turned to fraud and sensationalism. This is not an argument against education, but a warning. Make it healthy and safe.—*Earl of Shaftesbury.*

THE Prince of Wales has undertaken at an early date to open the new buildings of the College of Preceptors in Bloomsbury Square, recently erected at a cost of over £16,000. The Council hope in their new quarters to carry on with increased efficiency the manifold work of the institution, the importance of which may be measured by the fact that more than fifteen thousand pupils, representing nearly four thousand schools, were examined by the College during the past twelve months.

No system of self-culture, however elaborate, can ever give that vigour and tone to the system, or that sense of power to the mind, which comes from regular, well-performed labour. To work with a purpose, whether it be at the forge or the shop, in the factory or the office, in the field or the studio, in the kitchen or the schoolroom, gives a conscious ability that nothing else can produce, and that goes far to make the manly or the womanly character.—*Ex.*

THE WARRIORS OF THE CRIMEA.—Mer. M. De Vagüé in a recent article, in a French paper, states that outside Sebastopol, beyond the fortifications, another city, that of death, crowns the hills.

The city of the living is very small compared to this vast necropolis, where in their respective quarters 250,000 men of all nations are sleeping. This vanished multitude is distributed all about, in small groups and large masses, over ground consecrated and unconsecrated, and under pyramids indicating the battle-fields of Balaklava, Inkerman and Alma.

WHERE IT IS REALLY COLD.—Bishop Clut, the Arctic regions missionary now in Montreal, furnishes the following interesting statistics of temperature observed at Good Hope during the years 1885 and 1886:—From Oct. 1, 1885, to May 1, 1886, the thermometer was never above zero. In February, 1886, it went down to 52° below, and was as low as 18° on May 11 of the same year, while on Oct. 24 preceding it was down to 27°.

Fourteen years ago Bishop Clut

left the ice on the Great Slave Lake on July 3, and afterward found ice again on the Mackenzie River beyond the polar circle as early as September 17.—*Montreal Witness.*

THE KINGDOM OF ITALY.—On the 9th of January, the 9th anniversary of the death of Victor Emmanuel, the first King of United Italy, was observed in that country.

The Italians do well not to forget the brave, honest, patriotic monarch; under whom they received the liberty they now enjoy.

In recent years the career of this still youthful kingdom has been one of quiet progress. It has a free constitutional monarchy, with a Parliament freely elected by the people, and responsible ministers, the country enjoying as large a degree of political liberty and self-government as England.

MR. BAKER, one of the chief engineers of the Forth Bridge, lecturing the other night, gave a very graphic and interesting account of that stupendous work. The men who reared the great Pyramid must have possessed no little engineering skill, but the modern engineer looks on the Pyramid as a very little thing. Mr. Baker said he had sometimes looked at the Pyramids from a contractor's point of view, and he would be glad to take a contract to build the great Pyramid in six years, for the sum of £3,000,000 sterling. It contained about 7,000,000 tons of stone. If, with steam Titans and cranes that can handle and set blocks of concrete of a hundred tons weight as easily as a bricklayer sets a, small brick, six years would be necessary to rear the great Pyramid, how long did its construction occupy the ancient Egyptians? Their work was designed to last for ever, and it will doubtless exist when

many of our marvellous combinations of girders will shrivel into a heap of rust.—*School Newspaper.*

LORD DUFFERIN IN INDIA.—Lord Dufferin has been very skilful and successful in the management of Indian affairs, fully as much so as when he was a constitutional ruler in Canada, or a diplomat at St. Petersburg or Constantinople. He has reformed the zemindar or landlord system, made a considerable reduction in the expense of the civil service, and made it much easier for natives to enter it, defined the boundary between India and Afghanistan, annexed Burmah, pushed forward with vigour the railroad system, one of the most important roads being that into Afghanistan, and through these roads an important influence has been brought to bear upon the trade of the country. He has also been remarkably successful in his management of the native Princes, who pay great attention to the due observance of formality, but those who remember how deferential Lord Dufferin could be to a Canadian Deputy Reeve, when occasion required, will understand that in his conferences with the Indian Princes there will be no lack of courtesy or good management.

DISCOVERY OF A BRONZE-AGE BURIAL PLACE.—The *Ausland* reports a peculiarly interesting "find" in Sweden. In the course of the researches going on under the conduct of the archæologist G. J. Carlin, at the cost of the Royal Swedish Academy of Antiquaries, a burial-place of the bronze age has been opened. A stone coffin, 11ft. in length, and containing two corpses, was discovered. One of the corpses had been burnt, and was wrapped in wollen cloths; while the other, which bore no sign of having been exposed to a fire process, was enclosed in an

oak coffin. Portions of the woollen garments and the beast-skins in which the bodies were dressed, are well preserved. A bronze sword, also found there, has suffered much from oxidation; but its wooden sheath, covered with leather, is in excellent preservation. The writer spoke of it as 2500 years (?) old. The discovery is important in two respects—first,

only once before in Sweden (in the province of Halland) has any woven material been found belonging to the bronze age, while no oak coffin of that period in such a perfect condition has hitherto come to light; next it is certainly unique to find in one and the same grave, and of the same period, examples of two different species of burial.—*Athenæum*.

WHAT TO DO WITH ONE'S FAILURES.

THERE is more than one way of dealing with one's failures. We may, for instance, simply forget all about them as quickly as possible, and go on to do the work that remains to be done; or we may accept the fact of failure as final, and quietly cease striving; or we may even make a single failure the excuse for a course of reckless license which can only end in irretrievable disaster. But none of these is the true way in which we should deal with our failures.

When the physicist in his laboratory makes an experiment, and fails to obtain the result which he expected, he does not, therefore, conclude that the experiment has been fruitless. He recognizes, on the contrary, that he may, perhaps, learn more from his unexpected failure than if the experiment had been successful. For the failure had its cause; some unrecognized factor has been at work in the chain of cause and effect set in motion by the experiment; and to find and to define that unrecognized factor may be to lay hold of a clue which will lead to a great discovery. The day has gone past when men could attribute their mischances to ill luck or to the wandering spirits of the air, and we moderns have learned last that if our milk sours, or our stable-door is found unlocked in the morning, it is not Puck who is to blame.

And to find out who is to blame, or what is to blame, is a great step taken to prevent such occurrences in the future.

An excellent example of how much may be won from a failure is seen in the case of Römer, the astronomer. At one time he was engaged in a series of observations to determine the period of the revolution of one of Jupiter's moons. To do this, he noted the interval between the successive disappearances of the moon in the shadow of its planet; and, having found this, he proceeded to verify it by constructing tables of the satellite's motions, and by comparing these tables with the actual motion as observed through the telescope. But, to Römer's astonishment, he found that his tables were all wrong. Somehow or other, the moon failed to appear at its predicted time. At first it always came late, and with a lateness which gradually increased until it reached the amount of twenty-two minutes; then a change came, and it began to show the same regular increase in the earliness of its appearances. Here, apparently, was a total failure of the result which Römer had aimed at. But Römer knew that if he had failed, his failure had a cause, and he set himself to find it. He had noticed that the variations in the apparent motion of the moon which

was under observation corresponded with the changing position of the earth in her annual course around the sun, and the suggestion came to him that the apparent variation in the motion of the satellite was due, not to any actual variation on its part, but to the difference in time occupied by the light from the satellite in travelling to the earth, according as the earth was near to Jupiter, or far from it. Here was a clue to a great discovery — no less than the discovery of the velocity of light, with which Romer's name is now indissolubly connected.

The first thing, then, to do with a failure is to find out the reason of it. In this matter men may sometimes learn from boys. Readers of *Tom Brown's School Days* will remember how Tom gained his skill in wrestling. It was in the school of hard experience. Tom was at first a poor wrestler, and had to work his way up from the very bottom, but after every fall he set himself to find out the particular thrust or trip that had sent him on his back, and when he was apparently foiled he did not give up, but "thought about that fall at his meals, in his walks, when he lay awake in bed, in his dreams." Such study of one's failures can never be fruitless, but, unfortunately, such study is not so common as it ought to be. Not many days ago a lady, whose work of years had been overthrown by lack of ordinary caution, said to a visitor: "I will never try again. I tried my best and failed, and now I have decided just to take life as it comes and enjoy it as well as I can." The lady spoke as if she were proud of the new worldly wisdom which she had gained from her recent experience; to the hearer her words sounded rather like worldly foolishness. It was as if a sea-captain, who, after years of skilful seamanship, had been driven on the rocks, should say: "I tried my best for twenty years

to keep my ship afloat, and she went on the rocks at last. And, now, that I am sailing again, I intend just to take my ease. What is the use of trying to stop a leak now, when I was wrecked once before?" No sane captain would talk in such a way. On the contrary, if his ship struck on a hidden rock, his first impulse, after he had done his best for the safety of the ship, and the men she carried, would be to mark the cause of his disaster, and to put down the rock upon his chart, so that neither he nor others would ever strike there again.

There is little use in studying the causes of one's failures, if one is not willing to apply the lessons which he learns from that study. There is many a man to-day who knows that the partial wreck which has come upon his life is due to indulgence in stimulants or opiates, to social dissipation, to gambling, or to reckless and guilty operations on the stock exchange. But the number of those who have learned so much is far greater than the number of those who are willing to act upon the warning involved in that knowledge. "When shall I awake? I will seek it yet again," is the cry of multitudes who wait only for the renewal of former opportunities that they may renew their old disastrous course. Knowledge of peril alone will never save, any more than the danger-signal will save the skater who disregards its friendly warning and pushes on to the thin ice.

To learn and to apply the lessons of failure is to gather the materials of victory out of defeat. It has been said that Russia owes much of her present strength to former disaster. She has been defeated often, but she never has been defeated without learning the lesson of defeat, and doing her best to make similar failure impossible in the future. That is the secret of Russia's strength. She never

recognizes failure as final. The same secret is just as valuable for the individual life. If a man fails in his first speech through inadequate preparation, that is no reason why he should remain forever silent, but it is a reason why he should make better preparation next time. The young Disraeli gained more than he lost by being laughed down in the House of

Commons: a man less wise than he would have lost all by never opening his mouth again. And so, in all the phases of human action, wherever failure occurs, a cause for such failure exists. The cause can be found if it is one which falls within the range of human experience, and when it is found, it can generally be removed. —*Sunday School Times.*

CORRESPONDENCE.

THE BOOK AND THE SCHOOL.

To the Editor of THE MONTHLY:

SIR,—The interesting letter on "An Experiment in Religious Instruction," which appeared in the March MONTHLY, has stirred me up to state some views and ask some questions that have been much in my thoughts for a good while.

The "Experiment" is well enough for the present necessity, and seems to have succeeded in a way; but why should there be need of such an experiment, and why should the Bible, of all books, in a Province where "Christianity is recognized by common consent as an essential element of education" (Regulations Ed. Dep. Sec. 7, 1878) be under any ban? Why should Christian ministers have to consult and combine and petition for time and leave to teach the fundamental truths of Christianity in the Public School? Why should the last half-hour of the whole week be thought long enough time to explain and apply the truths of the extracts from the latest expurgated edition of the Bible read by the teacher to the fagged out, restless children in the last five minutes of each school day?

It were better that the Bible should be decently dismissed from the school altogether than that it should be thus crowded into a corner. How

can children be expected to revere the Book which is of so much less account than the grammar or the arithmetic? Are they likely to give much heed to what they are taught of its truth when they know before hand that "it doesn't count"; that though they could "pass" on any part of it, it wouldn't help them with their examinations? How much weight will they attach to the admonitions and exhortations of a teacher who is not permitted even to explain a word of the manual of morals from which he is required to read them a lesson each day, whether they understand it or not? What must be the frame of mind of an earnest, intelligent, self-respecting, Christian teacher, as he stands aside, at the stern command of the law, to allow another to take his proper place and do his legitimate work?

And why should there be such difficulties about teaching the Bible in our schools? If we were heathen, one could understand it, though even the heathen in many places now wish to have their children taught the Bible, and send them by preference to Mission Schools with that object. Or if we were generally infidel or agnostic, the opposition to the Bible would be intelligible. But surely we are still a Christian people. Is the fear that the teacher might give sectarian bias to the child? It is not

impossible that a minister might do the same, and yet any minister may give religious instruction with the permission of the trustees? Is it not possible to select a course of readings which would omit all passages that have been battlefields for contending sects—a course to which even Rome could offer no fair objection? The school could read through this course—the primary classes taking first the easier lessons. The books of the Bible in their order, select portions from the Psalms, the Proverbs, the Gospels and the Epistles could be committed to memory, and in the entire school course the whole of Scripture history could be mastered. A due proportion of Bible knowledge should be necessary to every promotion, even from the first book to the second. The Entrance Examination and every succeeding stage in the scholar's course, should call for at least as familiar acquaintance with the Bible as with any other text book. There should of course be a "conscience clause" in the regulations for the sake of parents who would rather their children should be biassed in favour of Atheism or Agnosticism than any kind of Sectarianism, or even our "Common Christianity"; but the children who are exempt from Bible study should be required to make at least as many extra marks on other subjects as were allotted to the papers on the Bible. In the case of teachers trained under such a system trustees could tell at a glance from their certificates whether they

were Bible scholars or not, and accept or decline their application accordingly.

Some such course would put a premium on knowledge of the Bible, would soon produce a generation of Bible scholars, would introduce the Bible into many a home where it is never read, would make the work of the Sunday school teacher and the preacher easier and far more effective, and would in time make its mark upon social and Church life, and even upon public affairs. And why should we not have such a course of Bible readings? If there is not room for The Book with all the other books, why not make room? If there are many things in the Bible beyond school children, omit them from the course, and confine it to what is within their reach, grading the lessons according to classes. If there is much on which there is difference of opinion, then either omit the passages which have become the shibboleths of sects, or let them stand and trust to the survival of the fittest. If the Roman Catholics object, let them take advantage of the "conscience clause," and let the Bible lesson be all over during the first hour of the school day, so that their children could miss the best element of their education by coming an hour later than the others. "Where there's a will there's a way," and it is to be hoped this matter will not be allowed to rest till the Bible has the place it ought to have in our School System.

Leith, Ont.

J. B. FRASER.

NEVER speak in a scolding, fretful manner.

HE that knows himself knows others; and he that is ignorant of himself cannot write a very perfect lecture on other men's heads.—*Colton.*

BE understood in thy teaching; instruct to the measure of capacity. Precepts and rules are responsive to the child, but happy illustration winneth him.—*Tupper.*

REMEMBER that your capital is your health, your education, your liberty, your determination to brighten and improve yourself, and your power to teach others.

HOW is it, then? the part of men

Is part of our Eternity—

The days of yore we so deplore,

They are not dead—they are not fled,
They live and live forever more.

EDITORIAL NOTES.

MAY.

MAY! the merry month of May! The rested earth putting on her fresh covering to the delight of the thoughtful and to the inspiring of the careless. Preparation must now be under way for the usual summer vacation. The earnest teacher, the wise teacher, will be taking a thought how best to meet the responsibility of spending with profit the few weeks at his disposal in summer, away from the immediate neighbourhood of his school work. A change of activity is necessary, and, if possible, the schoolmaster should, if it were only by a few miles, change his land surroundings. Happily for us, Canada, Ontario even, abounds in suitable places inviting the attention of the "Army of light." Teachers should be good eaters and good sleepers; for generally these make good teachers. Good beefsteak, sound sleep and pure air give good healthy blood; without healthy blood there will be a poverty of ideas. Teachers, if at all practicable for you, have freedom during your coming vacation. Be not confined by the walls of the class-room, nor fretted by recitations. Be not entangled by the threads of routine. Make ready for the incoming breathing spell; make preparation for the new academic year, enjoy yourselves to the full: run, row, ramble, discard the fashionable dress, rusticate, laugh and grow, give scope to your fancy in reading; digest the strong meat; lay up in the treasury things new and old for use when on duty in your high calling.

THE COUNTRY'S WEAL.

THIS Session bills have been put through the House of Assembly affecting the interests of education from the Public School to the University. As regards the Primary and

Secondary Schools, the bills dealt with amendments only, no question of principle being involved. The bill in which the greatest interest centred was the one on Confederation of Universities; this bill included the Government's treatment of Upper Canada College. In regard to the latter institution, the general impression is that it has been "plucked" badly, and set adrift with only a financial feather or two left of its former endowment from the Crown. The proposal to put the new buildings for the school in the rear of the University buildings is a most unhappy one. Every schoolmaster knows what it means to the management of a Secondary School to have it in the thick shadow of a large institution attended by young men, properly left to the guidance of their own judgment; therefore, the buildings should be at some distance from the academic buildings in the University Park. What we wish to say on Confederation will have to be deferred for the present; truth to say, important changes were made in these bills at the very last sitting of the House, so that we could not deal satisfactorily with this important question. And this leads us to say, what has frequently been stated before, that we cannot understand why the Government should delay, to the very close of the Session, all their important measures. We take the liberty of suggesting that all the educational bills should have been on the table of the House the first or second week of the Session; thus, time for consideration and discussion would have been secured, and thereby the ample crop of amendments which is sure to follow crude and hasty legislation would have been avoided. Do, gentlemen, follow British practice in this regard to your own honour and for the country's weal.

THE TRAINING SCHOOL FOR
NURSES IN TORONTO.

MUCH is being thought and written at the present time on the higher education of women, and many young women of means are availing themselves of the privileges of college and university training, but there are still many others of limited means in need of occupation—women possessed of some degree of culture and refinement, who look in vain for some suitable outlet for their energies. We would direct the attention of such to the advantages which a Training School for Nurses affords for the cultivation of both the intellectual and the moral nature.

There has been a too-prevalent impression that it is a waste of ability for an educated woman to become a nurse, but those who have tried it know that, on the contrary, there is in this work room for the exercise of talents of the highest, and virtues of the rarest, order. Professor Gross once said, that myriads of human beings perish annually in the so-called civilized world for want of good nursing, and that this country needs a million Florence Nightingales, and half that number of John Howards, to aid physicians in their strife with disease and death.

It was to meet this need that Training-Schools were first established, and it was that this Canada of ours might not be behind other countries, that in Toronto in 1881, a Training-School for Nurses was established, with sixteen pupils, in connection with the Toronto General Hospital.

During its earlier years, it laboured under many disadvantages, but at present it is in a flourishing condition, with thirty-five pupils constantly in attendance. This Training School has been a centre from which other hospitals have drawn, for at the present time five of the hospitals in On-

tario (London, Kingston, Brantford, The Sick Children's Hospital, Toronto, The Lakeside Home, Toronto Island) are superintended by graduates from this school, while other graduates are engaged in hospital work, or as professional nurses in private families, both in the United States and the Dominion.

The training consists of practical work in the hospital wards, together with weekly lectures, delivered by the visiting staff, and a class conducted by the Lady Superintendent, Miss Snively. These lectures are gratuitously given by our most prominent physicians, and embrace a large number of subjects, viz. : Diseases of the Nervous System, Dr. Cameron ; Materia Medica, Dr. Geo. Wright ; Gynecological Nursing and Qualifications of a Nurse, Dr. A. H. Wright ; Minor Surgery, Dr. Grasett ; Diseases of the Respiratory Organs and Poisons, Dr. G. A. Fetters ; Eruptive Diseases, Dr. A. A. McDonald ; Obstetrics, Dr. J. Burns ; The Eye and Ear, Dr. Reeve ; Emergencies, Dr. J. MacCallum.

The Toronto Training-School is modelled after that of Bellevue Hospital, New York, of which the Lady Superintendent of the Toronto General Hospital is a distinguished Canadian graduate. Miss Snively entered upon her present duties some two years ago, and, to quote from an address delivered by an eminent Toronto physician on the occasion of the presentation of diplomas to the graduating class of nurses for 1886, "is pre-eminently qualified for the position which she holds." It is a matter of simple justice to add that the credit of the present high reputation of the Training-School, and of the great improvement which has taken place in it, during the past two years, in many respects, is due to the Lady Superintendent.

Applicants for admission must be

of good health and good character, between the ages of twenty and thirty-five. A fair education is also required, and in every case the first month after entrance is considered a term of probation. During this probationary term, it sometimes happens that candidates are found deficient in some important practical qualification, and for that reason are not allowed to continue the course.

The remuneration given for the first year is \$6 a month, and for the second year \$9 a month. This is not regarded as payment for the services of the nurses, but rather as a provision for personal expenses, text-books, etc. The training and education which they receive is in itself a full equivalent for their services. During the second year of the course, those who have shown themselves best qualified are appointed to the responsible positions of head nurses of the various hospital wards.

After graduation, a nurse engaged in private families usually receives from \$10 to \$14 a week.

A large proportion of graduate nurses continue in the practice of their profession; for instance, out of the two hundred and forty-four nurses who have graduated from Bellevue, one hundred and eighty-four are now in active service, many of them being Superintendents of Nurses' Training Schools.

The demand for trained nurses exceeds the supply. It is an almost daily occurrence at the Toronto Training School, that urgent requests for nurses, from medical men and others, must be reluctantly refused, because there is no one to send. This fact in itself is no slight testimony to the esteem in which the services of professional nurses are held, and is an evidence that those who are successful in their course and final examinations are usually well-fitted to enter upon the profession which they have

chosen, and be co-workers with the physician in the great work of relieving human suffering and saving human life.

REPORT OF THE MINISTER OF EDUCATION FOR 1886, WITH THE STATISTICS OF 1885.

THIS Report differs in some important respects from those which have preceded it. It seems as if Mr. Ross were determined to celebrate this year of Jubilee by giving his readers a rest from the perusal of the Reports' of his subordinates. Certain it is that we have not the usual dogmatic utterances of the High School Inspectors. The Director of Teachers' Institutes has been allowed to confine his attention to the delivery of lectures in connection with his own special work; while the Inspector of Model Schools is silent upon the wonderful results accomplished in making efficient teachers out of raw students by the three months' course of professional training at those schools. Was it for this reason, too, or because of the more important calls upon his time and attention by the recent election, that we have no word from the Minister himself about his visit to the Old Country last summer? We had entertained great hopes of the good results of that visit, for we thought that a man of his full mind on educational subjects would return with a host of new ideas on the important interests committed to his care. In no country in the world; except, perhaps, Japan, has there been such a number of reforms accomplished in recent years in all branches of education as in England. In elementary education in particular, immense strides have been made. Dr. Johnson said, in one of his conversations with Boswell, that an intelligent traveller reminded him of the Spanish proverb—"You must take the wealth

of the Indies with you to bring the wealth of the Indies home." Mr. Ross took the wealth of the Indies with him. Has he brought the wealth of the Indies home? This we have yet to learn. A greater than Dr. Johnson has said, "The wise man's eyes are in his head," and surely Mr. Ross has not allowed conceit in our own educational system to blind him to points of superiority in what he saw of education in Britain. In some shape we shall still hope to get the benefit of his travelled experience. Though *he* has been silent, we have a report from his Superintendent of Mechanics' Institutes, who, under the name of "Commissioner," was entrusted with the duty of arranging our Educational Exhibit at the Colonial and Indian Exhibition held in London last year. We know of no better hands to which that duty could have been entrusted, and though we are far from thinking that the profession would have chosen him to represent the Education of Ontario, we have no doubt that he merited the judicious praise of the *Morning Post's* critic, who says that he "arranged the display in a manner which reflects greatly upon his judgment and organizing power." We only hope that he made the exhibit a fairly representative one, so that we may not have a repetition of what occurred after the Centennial Exhibition at Philadelphia, when intelligent United States' visitors to our schools asked, but asked in vain, to see the apparatus with which that display led them to believe our schools were furnished. That our part of the Exhibition created a most favourable impression the extracts which the Report gives from the English press show, and this adds point to the anecdote we have heard with regard to one of our representatives there. On the occasion of a public meeting connected with the Exhibition, when he had spoken as the representative

of Ontario, an intelligent Englishman remarked to a Canadian, "You Canadians are a strange people, you send a man to represent you in educational matters who drops his h's in 'ide Park, and picks them up in Hislington."

The total school population between the legal ages of 5 and 21 years for 1885 was 583,137. For the previous year it was 471,287, but then the maximum age was only 16 years, so that we have 111,850 to represent those between 17 and 21 years old. In previous years not more than ten per cent. of that number attended school, and these lived mainly in the country, and attended during the winter months. Of course, owing to this small attendance of those over 16, there will appear a greater discrepancy between the school population and those enrolled as scholars. This number in 1885 was 472,458, or about 81 per cent. of the school population, and it was 5,541 in excess of that for the previous year. As usual, the boys predominate—in this year to the extent of 6 per cent. While the registered attendance was 472,458, the average attendance was only 225,907, or 48 per cent. of the registered attendance. This was the same average as that of the previous year. Mr. Ross, commenting upon this small average, calls attention to the fact that 9 per cent. of the pupils registered attended less than 20 days in the year; and 241,189, or about 51 per cent. attended less than 100 days, which is about half the year. He asks, "Is it not possible for trustees and inspectors to do something whereby a more regular attendance at school may be obtained?" We ask further, is it not possible for the Minister of Education himself to do something to secure this desirable end? We have a compulsory law, why should he not see that it is enforced? Surely to enforce the law

is one of the chief duties of an executive officer. That it needs to be enforced not only do the figures which we have already quoted show, but there is the additional fact crying out for action, that 91,269 scholars between the ages of 7 and 13 years did not attend 110 days as the compulsory clauses of school law require. In commenting upon this Mr. Ross takes a most statesmanlike view of the matter; he says, "the tax payer who is rated without his consent for school purposes for the public good has a right to expect that those for whose education he is compelled to provide should be obliged to attend school, at least during the time required by the School Act." But to whom can the tax payer look to have the law carried out, but to the Minister of Education.

While the average attendance for the whole province was 48 per cent., that for cities was 62, for towns, 48, and for rural sections, 44 per cent. 38 per cent. of those attending were in the First Reader, 21 in the Second, 23 in the Third, 16 in the Fourth, and 2 in the Fifth. These figures, as compared with those of the previous year, shew an increase of 2 per cent. in the First Reader, a decrease of 2 and 1 in the Second and Third respectively, and an increase of 1 in the Fourth, while the percentage in the Fifth Reader remained the same, though in that book there was an actual decrease of 466 pupils. This decrease is to be accounted for by the efforts Mr. Ross has made to remove the Fifth Book classes from our public schools, and relegate them to the High Schools. Now, a boy or girl cannot be considered as fully prepared for the work of life without the training which a Fifth Book class affords. This training, therefore, properly belongs to Public Schools, whose very existence can be justified only by the education they give as a pre-

paration for citizenship. Besides, why should parents who do not wish their children to take a High School course be put to the inconvenience, and the country to the increased expense, of sending them to schools where the cost per pupil is \$52.36 per annum, when they can receive similar training in schools where the cost is only \$14.66?

RECEIPTS AND EXPENDITURE.

Public Schools, receipts, \$3,594,969.77; expenditure, \$3,108,169.41; cost per pupil in average attendance, \$14.66. R. C. Separate Schools, \$218,096.81; \$204,530.77; \$13.41. High Schools, \$458,940.78; \$429,761.87; \$52.36.

That our readers might have a correct idea of what public education costs in Ontario we have grouped the items as above; and to be more accurate, we have separated the items of receipts and expenditure for Public and Separate Schools, which are given together in the Report, so that above we have an accurate statement in regard to each class of schools. As the statistics of the Separate Schools are given in tables by themselves, we see no reason why those of the Public Schools should not be kept apart. It is only thus that a correct report of each class of schools can be given. In proof of this, take the case of Berlin: the total receipts and expenditure for that town in the Public School statistics are \$11,257 and \$10,760 respectively, but these items include the receipts and expenditure for Separate Schools, and when these are deducted the net receipts and expenditure for Public Schools in that town are \$6,574 and \$6,573. The four towns immediately following Berlin in the list have no Separate Schools, and hence the comparison of their statistics with those of Berlin would be misleading. So many of the improvements that we have recom-

mended have been adopted in compiling the Report, that we feel confident that the Minister of Education needs only to have his attention directed to this one to adopt it. The Legislative Grant to Public Schools was 6.5 per cent. of their whole income; to Separate Schools it was 7.2 per cent., while to High Schools it was 19 per cent. It appears from these figures that the schools which have the best right, some contend the only right, to the support of the Government get the smallest proportionate allowance.

STATISTICS OF TEACHERS.

In Public Schools, number of teachers was 6,765; number of pupils to each teacher in registered attendance, 66; number of pupils to each teacher in average attendance, 31; in Separate Schools were 453, 61, 34; in High Schools, 365, 39, 22 respectively. These figures show an increase of 107 Public School, 26 Separate School, and 7 High School teachers, over those of the preceding year.

AVERAGE SALARIES OF TEACHERS.

In Public Schools, males, \$427; females, \$281; both, \$344; in Separate Schools, males, \$358; females, \$190; both, \$221; in High Schools, both, \$806. There was an increase of one dollar in the salaries of male, and two dollars in those of female teachers in Public Schools, while in Separate Schools the increase was seven and two dollars respectively. In the case of High Schools the increase was sixteen dollars. The highest salary paid in Public Schools was \$1,200, and in High Schools \$2,350.

Of the teachers in the Public and Separate Schools about two-thirds are females; 254 hold First Class Certificates; 2,358, Second Class; 3,592 Third Class; while 1,014, or fourteen per cent. of the whole number, hold what are called temporary certificates.

If the holders of these were in every instance competent in management, and efficient in the performance of their duty, no one would complain, but too often certificates of this kind are given through fear or favour, and become premiums upon inefficiency. It would be interesting to know how many properly qualified teachers are kept out of situations through them. One of the reforms teachers were assured of when Mr. Ross took the control of the Education Department was the gradual decrease, if not abolition, of these certificates; but, instead of decreasing, they have actually increased since he came into power. In 1882 the number of temporary certificates was 981; while in 1885 it was 1,014. We are glad to observe, however, that this number shows a decrease from 1884, when it was 1,193. Let us hope that Mr. Ross has begun at last to redeem his promise, and that there will now be a gradual decrease.

The statistics of the Normal Schools are, as usual, meagre and unsatisfactory, so much so, indeed, that we do not care to trouble our readers with them. Were we able to give not only the number of students, but the percentage of those who passed the examination, and the cost of each student to the Province, we would be giving useful and interesting information; but we are unable to do this from the statistics supplied. Year after year we have urged to have the report of the Normal Schools kept separate from that of the Provincial Model Schools, and proper statistics given to enable an ordinary reader to form an intelligent idea of the working of these institutions, and of their expense to the country; but, either through carelessness or design, the statistics of both Normal and Model Schools are so mixed up that for any useful purpose which they serve they might as well be omitted.

DEPARTMENTAL EXAMINATIONS.

It will be interesting to compare the numbers of those who wrote at the various examinations with those of the successful candidates.

Entrance to High Schools, number examined, 13,600; number passed, 6,768; percentage of passes, 49. Non-Professional Certificates, 5,055, 2,076, 31; Professional Certificates of Third Class, 1,445, 1,376, 95.

We are not able to give similar statistics of the Normal School examinations for Profession Second Class Certificates, but we have learned from other sources that the percentage of those who passed was considerably over ninety. Now, why should there be such a discrepancy between the percentages of those who passed non-professional and those who passed professional examinations? It has been contended by some that the former weed out the inefficient ones so completely that little is left to be done but to train the remainder for their professional duties. This would be a valid argument, provided both the non-professional and the professional examinations tested the same qualifications; but while the

one merely shows the successful student, the other is intended to show the successful teacher. Besides, we know that in past years the Normal School examinations resulted in plucking considerable numbers, and we find by the statistics of the Model Schools that there are some creditable exceptions to the indiscriminate passage of candidates. In Middlesex, for instance, a considerable number was rejected. The examiners for the London Model School rejected seven out of thirty-eight, while the Strathroy examiners rejected thirteen out of thirty-seven. We have said enough to show that our professional examinations, as at present conducted, are far from protecting the country against the influx of inefficient teachers into the profession. We see no remedy but that which would result from the establishment of a College of Preceptors, a part of whose functions would be the management of these professional examinations. Such a body, by reason of its existence, would feel bound to protect the public and the profession from the admission of any but competent persons to the ranks of the teaching profession.

OBJECT-LESSONS, giving pupils ideas and thoughts with which they are already familiar, are to be avoided. The interest of a lesson depends very much upon its novelty; and if this element is wanting, there is very little left to create a permanent impression.

For the remarkable progress of the half-century now past, we are not indebted solely to enlightened State action; individual initiative and munificence have done much, and it is significant that it is this part of the educational work which satisfies more completely the requirements of the highest culture than the corresponding work due to Government. For instance, of the three Universities founded in the Queen's reign, the Victoria University, which owes its origin to the munificence of John Owens, is the one which best fulfils the true function of a University. The London University and the Royal

University of Ireland, although they render useful service to education, are now felt to be maimed in their functions and inadequate, in that they do not provide for the teaching of high and disinterested studies by gifted teachers. It is the great function of a University to bring young people within the influence of great teachers, to the end that their characters and intellects may be formed by this influence.

It cannot be too frequently asserted that the conferring of degrees, and the examining for these, is not the best or highest work of a University. It is to be hoped that London, having all the materials for a Teaching University ready to hand—Sion College, Gresham College, King's and University, to name no others—will, before the close of this Jubilee Year, lose its singular pre-eminence in being the only great European capital without a Teaching University.

SCHOOL WORK.

MATHEMATICS.

ARCHIBALD MACMURCHY, M.A., TORONTO,
EDITOR.

SELECTED PROBLEMS.

By J. L. COX, B.A., Math. Master,
C. I., Collingwood.51. Express $\frac{1}{x^3}$ in a series of fractions of
the form $\frac{1}{p_1} + \frac{1}{p_1 p_2} + \frac{1}{p_1 p_2 p_3}$, etc.

52. Given

$$\left. \begin{aligned} \frac{1}{1+x+x^2} + \frac{y}{1+y+xy} + \frac{yz}{1+z+yz} &= 1 \\ \frac{x}{1+x+x^2} + \frac{xy}{1+y+xy} + \frac{1}{1+z+yz} &= 1 \end{aligned} \right\}$$

none of the denominators being zero, then
 $x=y=z$.

$$53. \text{ If } \left(\frac{x}{a}\right)^m + \left(\frac{y}{b}\right)^m + \left(\frac{z}{c}\right)^m = 1 \\ = \left(\frac{a}{d}\right)^m + \left(\frac{b}{d}\right)^m + \left(\frac{c}{d}\right)^m$$

$$\text{and } \frac{x^m}{a^{m+n}} = \frac{y^m}{b^{m+n}} = \frac{z^m}{c^{m+n}}$$

$$\text{show that } \left(\sum x^{\frac{m}{m+n}}\right) \left(\sum x^{\frac{m}{m+n}}\right) = d^m$$

$$54. \text{ If } x^3 + y^3 = z^3, \text{ then } \{(x^3 + z^3)y\}^3 \\ + \{(x^3 - y^3)z\}^3 = \{(y^3 + z^3)x\}^3.$$

55. If S_n denote the sum of the n th powers
of the roots of a quadratic equation, then the
equation is $(S_n S_{n-2} - S_{n-1})^2 x^2$

$$- (S_{n+1} S_{n-2} - S_n S_{n-1}) x \\ + (S_{n+1} S_{n-1} - S_n^2) = 0.$$

56. O is the centre of the circle, circum-
scribing triangle ABC , AO , BO and CO ,
cut the opposite sides respectively in D , E , F ,

$$\text{show that } \frac{1}{AD} + \frac{1}{BE} + \frac{1}{CF} = \frac{2}{R}.$$

By GEO. RIDDELL, B.A., Math. Master,
Coll. Inst., Galt.

$$57. \text{ Solve (1) } x^4 + 1 = 0; \\ \text{(2) } x^4 + 1 = d(x+1)^4.$$

$$58. \text{ If } x^3 = px + q \text{ and } \alpha + \beta = p, \alpha\beta = -q, \\ \text{show that } x^n = \frac{\alpha^n - \beta^n}{\alpha - \beta} x + \frac{\alpha^{n-1} - \beta^{n-1}}{\alpha - \beta} q.$$

59. From the series in $A. P.$, of which the
sum of the 1st n terms is n^2 , deduce the in-
tegral solutions of $x^2 = y^2 + z^2$; *i.e.*, find all
the sets of integral values for the sides of a
right angled triangle.60. If a, b, c be the p th, q th and r th terms
respectively, both of an $A. P.$ and a $G. P.$,
prove that $a^{b-c} \cdot b^{c-a} \cdot c^{a-b} = 1$.61. Show without the Binomial Theorem
that the total number of combinations of n
things 1, 2, 3... up to n together is $2^n - 1$.62. Find the number of different sentences,
each of eight words, which can be formed
from the 26 letters, a, b, c , etc., without
repetitions.63. In a cricket match 80 runs are made
from the bat by one side (11 men). In how
many ways may these be distributed?64. Obtain an expression for the sum of
1, 2, 3, 4, 5... $r+2$, 3, 4... $r+1$. + etc.,
+ $n(n+1)$... $(n+r-1)$.65. Show that $\sqrt[m+n+p]{abc^q}$ lies in mag-
nitude between the greatest and least of the
quantities $\sqrt[m]{a}$, $\sqrt[p]{b}$, $\sqrt[r]{c}$, $\sqrt[d]{d}$.66. Find an expression for the remainder
after n terms of the expansion of $(1-x)^{-2}$.

CLASSICS.

G. H. Robinson, M.A., Toronto, Editor.

BRADLEY'S ARNOLD.

By M. A.

Exercise 31.

1. Dubitari non potui quin, a fratris tui ingenio alienissimum esset mentiri. 2. Omnes nostri similes diligere solemus. 3. In hoc tam difficili tempore, vereor ut amicus tuus, homo levissimus, patris sui, viri praestantissimi, similis evadat. 4. Quae res in vulgus fuit gratissima, eadem regi ingratissima. 5. Patris ille sui consiliis jamdiu adversabatur, cujus ipse fuit omnibus rebus simillimus. 6. Patris mei et propinquus fuit et ei a puero amicissimus; idem in

me benevolentissimus. 7. Quippe beate vivere inquit, id quod omnes beati omnibus anteposimus, regibus cum bubulcis, pauperibus cum divitibus, commune est. 8. Erga ceteros benevolentissimus esse videbatur; sibi ipsum inimicissimum, fuisse puto. 9. Homo est ab omni ambitu suspicione alienissimus, sed vercor ut ab his iudicibus, hominibus, nequissimis absolvatur. 10. Regum esse proprium dicebat, iis qui optime de se meriti essent dicere.

Exercice 49.

1. Aut exulandum ei ultro fuit, aut in acie preendum, aut quidvis potius quam hoc faciendum. 2. Nonne eis quibus gratiam debemus agendæ gratiæ? 3. Imperandum fuit militibus ut a cæde desisterent nequem inermem trucidarent feminis certe puerisque, ne ægris dicam sauciisque, parcendum erat. 4. Quominus tuum ipsius caput periculis objecias non recuso, militum vero saluti in hoc tempore cavendum est. 5. Hoc tibi, homini prudentissimo, faciendum fuit, neque illud prætereundum. 6. Quum videret sibi aut pedem referendum esse, aut cum haud contemnendo hoste die postero conflegendum, statuit aciem instruere et statim pugnare. 7. Neque ei audiendi sunt qui amico, qui assentari nobis adularique nolit, irascendum esse dicunt. 8. Filio tuo homini insipienti persuaderi non potuit ut fateretur rem vel obliviscendam esse vel in oblivionem venire posse. 9. Omnibus aliquando moriendum erit, sed commune illud omnium fatum quando cuique quemadmodum obeundum sit, ne sapientissimus quidem hominum aut præsentire aut prædicere potest. 10. Videmini ad me cuncti in regiam domum duns ob causas convenisse; partim vestri purgandi causa, partim mei consulendi; occasione igitur utendum est, et rege præsentem oranda causa.

SCIENCE.

The following are some of the actions and reactions taking place in thunder-storms:—

1. There exist above the earth's surface strong currents of air moving inward toward

the central line or area of the thunder-storm. This is attested by balloon observations and by observations of clouds.

2. There arises from the sudden expansion of air entering the vortex of thunder-storms from beneath a reaction which produces a compression of the air near the earth's surface, and a rise of the barometer.

3. This compression causes the air near the earth's surface to tend outward in all directions from the centre of a thunder-storm; but the outflow in moving storms is only felt, or attains its greatest strength, on the front of the storm, where the direction of the outflow is combined with the progressive motion of the storm. In tornadoes the vortex usually reaches to the earth's surface, and there is no place for a vertical reaction; but where the vortex is some distance above the earth's surface, there is the same evidence of a straight outblowing wind moving in the direction of the tornado, as there is in a thunder-storm.

4. This rapidly outflowing current, by its dynamic action on the barometer or its environment, frequently or generally causes a depression of the barometer in the front of thunder-storms, where the outflow is most violent.—H. HELM CLAYTON, in *Science*.

IMPROVEMENT OF OUR CLIMATE.—Mr. John C. Goodridge, Jr., has suggested a project for modifying the climate of the Atlantic coast by closing the Strait of Belle Isle, and advances the theory that this scheme is feasible as a problem in physical geography capable of an engineering solution. He argues that it is shown by charts that the great body of the "cold wall" comes to us through that strait. Newfoundland deflects the remainder of the Arctic current to the south-east. Here, pressing against the Gulf Stream, it veers southward in the form of a loop, and finally, running under it, goes on toward the equator. That part of the Gulf Stream that passes our shores has a course directly north and a little west, is deflected slightly toward the east by the coasts of South and of North Carolina, and thence turns more to the north again, when

it is deflected by the cold current returning from the pole. When this cold current is of least strength, as in August and September, the Gulf Stream comes within ten miles of Barnegat; at other times it is distant one hundred and twenty miles, changing with the amount of cold current and of the wind. If we had not the cold wall between our shores and the Gulf Stream, it is fair to presume that we should have a less stormy coast, as the juxtaposition of these two currents with their difference in temperature must from that circumstance tend to an unstable condition of atmospheric equilibrium. Our cold north-west winds would then sweep to the north of us, and become westerly and south-westerly winds.—*Popular Science Monthly.*

MODERN LANGUAGES.

Editors: { H. I. STRANG, B.A., Goderich,
W. H. FRASER, B.A., Toronto..

EXERCISES IN ENGLISH.

1. Contract the following sentences into simple ones:

(a) The proceedings were more interesting than usual.

(b) The event occurred while he was absent from home.

(c) I wrote to him and explained fully what had caused the delay.

(d) There is no doubt that he has made a serious mistake.

(e) He did not deny that the claim which we made was just.

(f) It is supposed that he took them all with him.

(g) He read a paper in which he described the mode in which the operation is usually performed.

(h) He refused to accept it, and so they had to hold another election.

(i) It is a great many years since the event happened.

(j) When he heard that the enemy were approaching he ordered that the gates should be closed.

2. Substitute other words or phrases of the same meaning for those italicized:

(a) Flight did but *temporarily retard* his *inevitable doom*.

(b) The *conspirators* were *terrified* by the *unexpected peril* which *menaced* them.

(c) He was *compelled* to *relinquish* his *design* of *subjugating* them.

(d) The *prosecution* of this *remote* war was *gradually* becoming *more difficult*.

(e) Even men who *deemed* themselves religious *participated* in it without *scruple*.

(f) He *endeavoured* to *allay* political *commotion* and to soften the *asperities* of party strife, and with *laudable* motives stretched his authority on the side of *clemency* to the rebels.

3. Break up into a series of short, simple sentences:

Once upon a time there lived a very rich man, and a king besides, whose name was Midas; and he had a little daughter, whom nobody but myself ever heard of, and whose name I either never knew, or have entirely forgotten.

4. Change to indirect narrative:

The king did not believe that he would keep his word, and said, "I will not let you go unless you find some friend who will come and stay in your place, then, if you are not back when the day comes, I shall put your friend to death in your stead."

5. Change to direct narrative:

Pythias replied that the king was wrong. Damon would come if he possibly could, but he had to come by sea, and the wind had been contrary for some days. However, it was much better that he (P.) should die than Damon. He (P.) had no wife and no children, and he loved his friend (D.) so well that he would willingly die for him.

6. Analyze the following sentences, and parse the italicized words:

*A traveller, by the faithful hound,
Half-buried in the snow was found,
Still grasping in his hand of ice
That banner with the strange device,
Excelsior!*

7. Change the compound sentences into complex, and vice versa:

(a) I would have bought it, but he was unwilling to part with it.

(b) As she had never seen one she was very much interested in it.

(c) He may have taken it, but I can hardly believe it.

(d) You must take more pains or you will never be successful.

(e) He would not accept either of the offers that were made for it.

(f) The second paper was even harder than the first.

2. Express each of the following in at least two other ways, changing the language and construction as much as possible :

(a) Self-reliance is one of the first requisites of success in any calling.

(b) There is scarcely a function of the human frame that is not harmed by alcohol.

(c) The great value of diamonds arises chiefly from the fact that they are scarce.

3. Arrange in as many ways as possible without destroying the sense :

(a) An ant one day saw on the road the leg of a gold-beetle.

(b) The smallest projection was a mountain to her.

(c) A German pastry-cook was once travelling through Turkey on foot.

(d) A gentleman, while walking in the fields one day, heard the cries of a bird in distress.

(e) Then shook the hills, with thunder riven.

4. Analyze the following simple sentences :

(a) There, contented with the trifling returns of incessant labour, the worthy old weaver tranquilly passed his days, without debt and without anxiety.

(b) One day during the American Revolution, an officer, not dressed in uniform, was riding on horse-back past a squad of soldiers engaged in some military work.

(c) Towards the close of the Revolutionary war an officer in the army, having occasion to transact some business with General Washington, repaired to Philadelphia for that purpose.

5. Combine the following groups into single sentences :

(a) He felt unusually cold. He drew his chair very close to the grate. A strong fire had recently been kindled in the grate.

(b) He dismounted from his horse. He threw off his coat. He assisted the men. They were repairing the bridge.

(c) King Alfred was great and good in peace. He was equally great and good in war. He was always trying to improve the condition of his people.

(d) I once lived at Durham. I was walking one evening in a park. The park belonged to the east of Stamford. I was walking along the bank of a lake. Fishes abounded in the lake.

(e) Once a French army was marching across an Egyptian desert. The soldiers were fainting with thirst. They were choked with fine sand. Suddenly they were revived in spirit. They saw a sheet of water in the distance. At least they thought so.

6. Break up each of the following complex sentences into as many simple sentences as there are verbs :

(a) Behind the defences, which consisted of earthworks, redoubts and a line of entrenchments four miles long, lay an Egyptian force, of the strength of which he had no certain knowledge.

(b) It was only by pointing out to him that he could not be of much use up here, while he could be of great service helping the surgeons with the wounded, that I persuaded him to leave the ridge, and go down into the village where there was less danger.

7. Divide the following into clauses, and tell the grammatical value and relation of each of the subordinate ones :

(a) It often happened that new members of Congress, who had been invited to dine with him, would not arrive until dinner was half over.

(b) When the merchant saw her, and thought of the tenderness she had shown him in his captivity, his heart was moved, and he ran down to meet her.

(c) The iron rails were laid across the fires till the metal was softened, and then

the soldiers took them to the nearest trees and twisted them so that they might not be used to repair the road after the army had passed; for the destruction of the railroads was one of the principal objects for which the campaign was undertaken.

8. Distinguish the meaning of

(a) He may live to see it. May he live to see it.

(b) He only rents the store. He rents the store only.

(c) He can do it if he likes. He may do it if he likes.

(d) He will do it if you ask him. He would do it if you asked him.

(e) He was secretary for three years. He has been secretary for three years.

(f) He divided it between them. He divided it among them.

9. Which of the following are correct:

(a) How nice (nicely) your garden looks this spring.

(b) The accident is likely to be attended by (with) serious consequences.

(c) We have further (farther) to come than he has.

(d) Will (shall) we be allowed to use our rulers?

(e) Who (whom) do you suppose it was?

(f) The affect (effect) was very different from (to) what we expected.

10. Supply the ellipses in the following:

(a) He looks healthier than when I saw him last.

(b) He acted as if he had never been at one.

(c) He never uses it unless in extreme cases.

11. Give two examples each of

(a) A noun clause governed by a preposition.

(b) *That* beginning an adverbial clause.

(c) An infinitive phrase attached to a noun.

(d) An adjective clause beginning with a conjunctive adverb.

12. Correct any errors in the following, giving your reasons:

(a) I have no doubt that we will find it very useful.

(b) Neither of the ropes that he had brought were strong enough.

(c) It is a long time since he has visited the school.

(d) The man whom you thought was honest turned out to be a rascal.

(e) We all expected that he would have been at the meeting.

(f) If it was my own I would lend it to you willingly.

(g) Nobody but the doctor and the nurse were allowed in the room.

(h) He said he didn't know as that would make any difference.

(i) He don't seem to care what the master says to him.

(j) If it hadn't been for you and I the boat would have been lost.

(k) A large quantity of supplies of all kinds were captured.

(l) She hadn't a single question rightly answered, scarcely.

(m) I expect that he had forgot to lock the door.

(n) He said that it seemed sort of strange at first.

(o) He would not accept of any remuneration.

THE CLASS-ROOM.

L. B. DAVIDSON, Head Master, Public School,
Sault Ste. Marie, Editor.

ARITHMETIC.

Second Class Junior.

1. A farmer sold a horse for \$75 and lost \$15.85. He paid \$50.90 less for a cow than for the horse. Find the value of both.

Ans. \$130.80.

2. A man was 27 years of age when he went in the "War of 1812." He died last December. How old was he when he died?

Ans. 101 years.

3. A boy shoots an arrow 107 feet. How far must he walk to be able to shoot the same arrow again from the same place?

Ans. 214 feet.

4. Express in Roman characters what you must add to 1,050 x 120 to make 107 x 2,060.

Ans. *XCIVCDXX.*

5. A person buys 25 sheep at \$4.25 each, and sells them at \$4.95 each after spending \$10 on them. Find his gain or loss.

Ans. Gain \$7.50.

6. A merchant will give a boy a dozen marbles for 2 cents but the boy says he wants 5 cents worth. How many more marbles will he get? Ans. 18 marbles.

7. A clerk gets a salary of \$600 each year. He spends each week \$3.25. If there are 52 weeks in a year, how many years will it take him to save enough to buy a house worth \$1,293? Ans. 3 years.

8. A farmer sells 25 bags of barley each containing 2 bushels, at 60 cents a bushel, and buys hens with the money at 30 cents each. How many does he get? Ans. 100.

Third Class Senior.

1. A merchant buys paper at \$1.20 per ream, and sells it at 8 cents per dozen sheets. Find his gain on half a ream. Ans. \$1.

2. The fore-wheel of a waggon is 7 feet 6 inches in circumference, and the hind-wheel is 12 feet. How many turns will the one make more than the other in going 1 mile? Ans. 264.

3. A grocer mixes 8 pounds tea worth 30 cents per pound, 7 pounds worth 35 cents per pound, and 6 pounds worth 40 cents per pound. Find selling price of mixture per pound in order to gain \$1.15.

Ans. 40 cents.

4. How many rods are there in 7 miles, 5 furlongs, 6 chains, 11 yards. Ans. 2,466.

5. In 3 years a man makes 300 pairs of shoes, making each succeeding year 25 pairs more than the preceding year. How many pairs did he make the second year.

Ans. 100.

6. Divide \$1944 among 13 persons giving to 5 of them a double portion. Find what each of the 5 will get. Ans. \$216.

7. Two rows of four-foot wood extend side by side 30 feet. If each row be 9 feet high, find the value of the wood at \$3.20 per cord. Ans. \$54.

8. A, B. and C. spend \$162, \$297, \$351, respectively, in buying cattle at a uniform price per head. How many do they all buy? Ans. 30.

Third Class Junior.

1. A speculator buys sheep at \$4.75 each, and by selling them at \$5.37 each he gains \$10, after spending \$2.40 on them for fodder? How many does he buy? Ans. 20.

2. (a) How many times must 12 be subtracted from 60044 to leave 8? (b) What number must be added to 82304 to make it exactly divisible by 126? Ans. (a) 5003. (b) 100.

3. A man spends \$21 in buying equal quantities of oats and barley, the former at 35 cents per bushel, the latter at 70 cents. How many bushels of grain does he buy? Ans. 40.

4. A field is 1,124 feet long and 706 feet wide. How many steps of 3 feet each will a boy take in walking around it? Ans. 1,220.

5. A man earns \$12 a week, and saves during the year \$447.20. How much does he spend each week? Ans. \$3.40

6. John and James together have \$175. John has \$27.50 more than James. How much has each? Ans. John \$101.25. James \$73.75.

7. If 8 ounces of tea be worth 30 cents, find the value of 4 pounds 4 ounces of tea. Ans. \$2.55.

8. Find the value of the following:
 300 pounds pork at \$15 per barrel.
 150 " flour " \$5.88 " "
 1000 " barley " 72 cts. per bushel.
 Ans. \$42.

Fourth Class Senior.

1. A. can do as much work in 3 hours as B. can do in 5 hours. How long will it take A. to finish a piece of work of which B. has done $\frac{3}{4}$ in 15 days? *Ans.* 3 days.

2. A miller exchanges flour worth \$6.60 per barrel with a farmer for hay worth \$9 per ton. If the farmer asks \$10.50 per ton for his hay, what should the miller ask for his flour? *Ans.* \$7.70.

3. A merchant who clears 15 per cent. annually on his investment is forced to give up his business and to lend his money at $6\frac{3}{4}$ per cent.; thus decreasing his income by \$2,541. Find his investment. *Ans.* \$30,800.

4. Four per cent. half-yearly is equivalent to what per cent yearly? *Ans.* 8.16 per cent.

5. The amount of a certain sum of money at simple interest for $2\frac{1}{2}$ years is \$840; for 4 years it amounts to \$924. Find the sum and the rate. *Ans.* \$700; 8 per cent.

6. Which is the more advantageous, buying goods at \$4.12 on 6 months' time or buying the same goods at \$4.06 on 3 months' time, if money be worth 6 per cent.? *Ans.* Equal.

7. A bill of \$738 is drawn on April 1st at 4 months; and discounted May 16th at 5 per cent. Find the proceeds. *Ans.* \$730.

8. Find the perimeter of a rectangular plot of ground whose length is $2\frac{1}{2}$ times its breadth and contains $6\frac{1}{4}$ acres. *Ans.* 140 rods.

Fourth Class Junior.

1. A man travels 71 miles, 4 furlongs, 29 perches, 1 foot, 6 inches, going each hour 2 miles, 5 furlongs, 8 perches, 2 yards, 2 feet. How many hours will it take him. *Ans.* 27.

2. A field is 2,541 feet long and 2,200 feet wide. The owner builds a fence around it 5 boards high, using the greatest length of board possible without making any cuttings. Find the price of the boards at 3 cents each. *Ans.* \$129.30.

3. What is the least sum of money with which a farmer can purchase lambs at $2\frac{1}{2}$, sheep at $7\frac{1}{2}$, and pigs at $3\frac{1}{2}$ each, and how many of each can he buy with this sum of money? *Ans.* \$30; 12, 4, 9.

4. A man pays a tax of 22 mills on \$1, and then he has a net income of \$978. Find his tax. *Ans.* \$22.

5. There are 50 pupils in a room 36 feet long, 30 feet wide, and 15 feet high. How many cubic yards of air are there for each pupil? *Ans.* 12.

6. A horse and carriage are valued at \$350. One-third of the value of the horse is equal to $\frac{1}{4}$ the value of the carriage. Find the value of a team of such horses. *Ans.* \$300.

7. A piece of cloth when measured by a yard measure .6 of an inch too short appears to be 60 yards long. Find its true length. *Ans.* 59 yards.

8. A bankrupt's assets amount to \$2,100, and he pays 30 cents on \$1. Find his liabilities. *Ans.* \$7,000.

MAKE the school-room cheerful and attractive.

Do not allow pupils to direct their own studies.

NEVER let your pupils see that they can vex you.

ASK two questions out of the book for every one in it.

THE teacher must understand that on which he operates.

LET every lesson have a point, either immediate or remote.

NEVER tell a pupil to do a thing unless convinced he can do it.

NEVER be slow to commend a pupil for good work or deportment.

CONTEMPORARY LITERATURE.

THE first number of the *American Magazine* (illustrated) has just been published. The edition consists of 75,000 copies.

THE April *Book Buyer* contains a portrait of Dr. Edward Eggleston, and many other illustrations. This magazine is exceedingly useful to busy people who would know about the world of books.

THE current number of the *Library Magazine* contains nearly two hundred pages of good reading. Among other articles, that on "General Robert E. Lee," by General Lord Garnet Wolseley; also those on the "Canadian Pacific Railway," and on "Egypt on the Eve of the English Invasion," may be specially mentioned.

The Critic is an admirable literary journal, and a good guide about books and reading of all kinds. Among its distinguished contributors are Dr. Holmes, Joel C. Harris, Edith N. Thomas, Marion Crawford, Dr. Philip Schaff, Francis Parkman, John Burroughs, and many others.

THE April *Overland* has a history of the development of lyric poetry, and an account of the different rhythms and dances originally connected therewith, written by Mr. Rowell, Librarian of the State University of California. Another interesting article is that on "Early Hebrew History."

The Atlantic contains the second installment of Dr. Oliver Wendell Holmes' "Hundred Days," in which he gives accounts of visits to many noted places and people. "De Cullud Lieyer" is an amusing negro story. Mr. Whittier contributes a poem entitled, "On the Big Horn."

Our Little Ones (Russell Publishing Co., Boston,) continues to provide handsomely for the wants of its readers. The illustrations accompanying its stories and short articles are good.

CIRCULARS OF INFORMATION of the Bureau of Education, Washington. Nos. 1 and 2. THE BEST HUNDRED BOOKS (reprinted by E. L. Kellogg & Co., New York). 68 pp., 20c.

ANNUAL REPORT OF THE SCHOOLS OF NEW BRUNSWICK.

CORNELL'S CINNA. Edited by H. E. Huntington, Assistant Master at Wellington College. London: Rivingtons. 87 pp., 1s. 6d.

MISTAKES IN WRITING ENGLISH, AND HOW TO AVOID THEM. By M. T. Bigelow. Boston: Lee & Shepard. 110 pp.

A useful handbook. The matter is so conveniently arranged, the text condensed, and the examples selected with judgment.

THE FRENCH LANGUAGE SELF-TAUGHT. By Alfred Sardou. 470 pp., \$2.50. New York: D. Appleton & Company.

This manual is now so well-known to teachers and students of the French language that any extended notice of it seems hardly necessary. It contains one hundred and eighteen conversations, progressively arranged, also rules and models for the correct use of all French adverbs, prepositions, conjunctions and interjections, and examples of all idioms used in polite society. It is, in short, a most valuable work, and can scarcely fail to be of great assistance in acquiring a knowledge of French.

DANTE HANDBOOK. By Giovanni Q. Scartazzini. Translated from the Italian, with notes and additions. By Thomas Davidson, M.A. Boston: Ginn & Co. 315 pp. \$1.25.

A handbook of the life and works of the great Italian poet, prepared by the first of living Dante scholars, which merits a place in any library.

A DAY IN ANCIENT ROME, being a revision of Lohr's "Aus dem Alten Rom," with numerous illustrations. By Prof. Shumway, of Rutgers College. Boston: D. C. Heath & Co. Fortieth thousand.

In itself, and even to those who know "small Latin," this is an interesting book, and it must be much more so to those who are familiar with the pages of classical authors. There are few teachers who would not be benefited by reading it carefully.

BUSINESS.

If you know your subscription to have expired, renew it at once. \$1 per annum is the subscription price, and there is not a teacher in Canada who cannot afford to pay that sum for a good educational paper.

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We are grateful to the kind friends of THE MONTHLY who have, from many different places, sent us letters of approval and appreciation. If golden words were current

coin, our esteemed treasurer would be able to declare a handsome dividend, and while we are much encouraged by the frequent assurances that THE MONTHLY is fulfilling a noble mission, we would respectfully ask our good friends to forward their subscriptions, as, though one dollar is a small amount, yet when a large number are delinquent in this small sum at one time, the effect is somewhat hurtful to the position of an educational journal, depending chiefly, as THE MONTHLY does, upon the support of the profession.

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Bound copies of this Magazine in cloth may be had from Williamson & Co., or from James Bain & Son, King Street, Toronto, for \$1.50 per copy.

The season for athletic sports is beginning. We invite the attention of our readers to the splendid line of sporting goods to be found at Mr. S. B. Windrum's, 31 King Street East (see advertisement).

THE BEST HISTORY OF EDUCATION.

NINE NORMAL SCHOOLS ordered *COMPAYRE'S HISTORY OF PEDAGOGY* as soon as it appeared. A large number of other Normal Schools and Pedagogical Departments of Colleges have since adopted it as a text-book. Several State Teachers' Reading Circles, The Teachers' National Reading Circle, and Chautauqua Teachers' Reading Union, have also adopted it. Educators are unanimous in pronouncing it "the best History of Education in the English language."

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