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THE CANADA  
EDUCATIONAL MONTHLY  
AND SCHOOL CHRONICLE.

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FEBRUARY, 1880.

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THE TUNING FORK.\*

BY JAMES LOUDON, M.A., PROFESSOR OF MATHEMATICS AND NATURAL  
PHILOSOPHY, UNIV. COLL., TORONTO.

THE slight sketch which I propose to present this evening will be drawn from the border-land between Science and Art. Chosen from such a quarter, any subject, I may safely assume, is sure to command attention from those who advocate a rational system of education. The chief boast of this Province is its admirable system of public schools, as fit for the richest as they are free to the poorest in the land. To the cause of elementary education especially do we contribute with open hand. This, too, is the age of the inspector and the superintendent; and here, if anywhere, we flatter ourselves, there is no longer a danger of "the innocents being slaughtered," as in days gone by. Notwithstanding our confessed superiority in all these respects to a former age, no one, I trust, is satisfied that we have reached the educational

millennium, or that the youthful mind receives at school precisely that training which best fits it for the battle of life. The Gradgrinds are not all dead yet, and many a father is still vexed in spirit because his children do not worship unceasingly at the shrine of the "hard grain'd Muses" and their kindred sisters. With the present condition of our schools I am not, I regret to say, personally familiar; but I accept as facts acknowledged on all hands the improvements which have taken place in the buildings, in the methods of discipline, and in the efficiency of the staff. In these respects the school of to-day is far superior to my old acquaintance of five and twenty years ago. How far the present general scheme of elementary education merits the praises so lavishly bestowed on it is quite another question, which ought not to be hastily decided in our own favour without inquiring if we

\* An address delivered before the Toronto Teachers' Association, on the 23rd January, 1880.

observe those due proportions which should exist between the various parts of the educational structure. In earlier days, when the programme was comparatively short, it was much easier to observe this law of symmetry, and to make some attempt at cultivating the tastes as well as strengthening the reasoning powers. In one school at least, both drawing and music were then taught without any injury to progress in other directions. A feeble but honest attempt, in fact, was made to combine in due proportions the so-called ornamental and useful branches of education. On looking back to those early days I can of course see that there was room, as there is at all times, for many improvements; but I can just as clearly perceive that my early instructor possessed a true idea of the essential requisites of a rudimentary education. Since those days, whilst Art, in one sense, has been stationary, Science has been advancing with enormous strides; and there is a danger in a new country like this that she may wholly displace her more gentle sister. The example of other countries more advanced in the Arts and Sciences than we are, ought, however, to shew us the expediency of preserving a proper balance between the useful and ornamental sides of education. In France and Belgium the exhibitions of drawing by school children are so far above our own attempts that a Canadian is apt to conclude that they must be all born artists there. Such a contrast should not be without its lesson to us. It should at any rate lead us to consider if our own system is not capable of producing equally satisfactory results. It should not be forgotten that the so-called ornamental branches are in many respects the most useful in after life, and their cultivation exerts in many ways a most important influence on the material interests of a country.

It is equally important to remember that in order to educate the hand, to train the eye, to cultivate the ear, the proper exercises should be commenced at an early age. To learn even the rudiments of drawing or violin-playing is no easy matter to a grown-up man—to excel in either is simply impossible. Leaving aside the question of ultimate advantage, however, there is an additional reason for not allowing the *useful* branches to engross the attention of the pupil. His is of necessity the treadmill age of education, and it is wise to mingle with his severer tasks some studies that are better calculated to captivate him. His progress in grammar and arithmetic will not be retarded by his taking a lively interest in music and drawing.

These preliminary remarks have been suggested to my mind mainly by the nature of the subject on which I have chosen to address you; for in no department of knowledge is the advantage of this blending together of Science and Art so well exemplified as in that of acoustics. To thoroughly apprehend its phenomena and understand its laws, the acoustician must combine the knowledge of the mathematician, the physiologist, and the psychologist, on the one hand, and possess the trained ear of the musician on the other. Amongst the mechanical problems of the subject may be mentioned the inquiry into the vibrations of elastic bodies, such as plates, bars, rods, wires, strings, the air. Then there is the mechanism of the ear to be studied in order to explain the mode of communication of the vibrations of the air to the auditory nerve. And finally one has to engage in the work of analysing the sensations produced. It is in this last office that one finds the advantage of possessing a well-trained ear. By that I do not mean to imply that the acoustician should be either a musician or a musical critic (although it is

well that he should be); for instead of being called on to listen to musical compositions with all their varied charms of melody and harmony, he is most frequently obliged to examine individual sounds which often must be prolonged in order to submit them to a sort of process of vivisection. For such investigations one requires the patient attention and observant ear of the tuner, rather than the skill of the performer. The importance of these varied accomplishments for the study of acoustics is well exemplified in the history of the science. The first steps in its progress in later times were made by the mathematicians Euler, Bernouilli, and others; Chladni, to whom we owe great advances in the subject, especially the beautiful experiments on vibrating plates, was an accomplished musician; whilst Helmholtz, who may be called the Newton of the subject, is equally celebrated as a mathematician and physiologist, and is at the same time an accomplished musician.

Amongst the instruments which have enabled acousticians to make the great advances of recent times, none occupy so important a place as the Tuning Fork. Its use as a standard of pitch for the singer and the tuner all have long been familiar with. Its functions now, however, are largely extended. In the accurate measurement of time, in the analysis and synthesis of sounds, in the graphical and optical examination of vibrations, it has become invaluable. As its value for these purposes depends on the peculiar nature of the vibrations of its prongs, I shall proceed in the first instance to describe some of the simplest forms of this so called harmonic motion. Let us consider first the case of a point moving as a particle at the end of a prong. The character of such a harmonic motion is best understood by shewing its relation to the more familiar case of

uniform motion in a circle. When a point is moving uniformly in a circle we can imagine perpendiculars to be drawn from it at every instant to a fixed diameter. The foot of the perpendicular will thus change its position from instant to instant, and its motion will be what is called simple harmonic, of the same kind as that of a particle of the tuning fork. By varying the size of the circle and altering the speed of the point on the circumference, we can represent any simple harmonic motion whatsoever. The movement along the diameter, you will observe, is oscillatory, the extent of the motion on either side of the centre is the length of the radius, and the velocity is continually changing from zero at the end of the course up to a maximum as it passes through the centre. Such motions are not generally of any considerable amplitude. Approximately, however, they are realized on a large scale when, in viewing the heavenly bodies, we observe the motion of a secondary round its primary, the eye being in the plane of the motion. The end of a rod moving in a straight slot will also approximately execute such a motion, if its other end is connected with a uniformly turning crank. The clearest notions, however, of the movement in question are obtained by graphical representation. When a point moves in any manner whatsoever in a right line, we can indicate its position at every instant by an auxiliary figure in which there is a system of lines, one of which denotes the times, and the other the corresponding distances of the moving point from some fixed position. Thus let  $Oy$  be the line of motion,  $Ox$  perpendicular to it the line of times. Divide the former according to some scale (say inches) to represent distances, and the latter according to some scale to represent divisions of time (say seconds). Then the distances of

a point  $Q$  from  $Ox$ ,  $Oy$  indicate the position of the moving point  $P$  at a certain time. Thus if these distances be 3 and 4 respectively,  $P$  will be at a distance 3 inches from  $O$  in 4 seconds. If these distances are known at every instant,  $Q$  will trace out a continuous line, straight or curved, and the whole motion of  $P$  will be exhibited. The same method may be employed to indicate the gradual changes to which any quantity is subject in time. Thus  $Ox$  may represent, as before, the line of times, and vertical distances may represent the changes above or below the average pressure of the atmosphere. In all these cases, when the scales of length and time are given, it is an easy matter to interpret the auxiliary figure, whether the line of points be straight, curved, or broken. Let us now apply this method to represent the motion of a particle of a tuning fork. If  $Oy$  be the amplitude, and  $OA$  the time, of a complete vibration, say the one hundredth part of a second, the motion during one second will be represented by a curve of a wavy form, with 100 crests above  $OA$  and a corresponding number of hollows below. If the vibration is uniformly sustained, the amplitude remains the same, that is to say, the crests and hollows remain of the same height and depth respectively; otherwise they diminish and ultimately vanish. These curves are best obtained mechanically by the aid of a fork provided with a tracer on one of its prongs. The fork, being excited, is drawn so that the tracer draws the curve on a piece of smoked glass; or a strip of smoked paper may be moved under the tracer whilst the fork remains fixed, as in one form of the chronograph. This graphical mode of representing the motion immediately discloses its most important feature, namely, its isochronism; for you will have observed that whether the amplitude is dimin-

ishing or not, no change is made in the intervals between the points where the curve crosses the line of times—in other words, the time of vibration is independent of the amplitude. This fact depends on the circumstance that the force which solicits a particle in this case varies simply as the distance from its mean position. The effect of such a variable force is so to change the velocity from point to point that the particle reaches its mean position in the same time, no matter to what distance it is drawn aside. You are all familiar with the example of the pendulum, in which this isochronism is approximately realized. In the case of the cycloidal pendulum the vibrations are rigorously isochronous; the time of reaching the mean position being independent of the starting point. Now, in this respect, the vibrations of the tuning fork are similar to those of the pendulum, its vibrations being, in fact, generally called *pendular*. Whether it be excited by a violent blow or the most gentle bowing, the time of vibration is the same for the same fork. In other words, the number of vibrations executed in a second are the same, whether their amplitudes are large or small. As the number of vibrations determine the pitch, the same fact is otherwise expressed by saying that the pitch of a fork is constant. In order to complete the description of a fork's motion, it will be necessary to go a little further and inquire how the fork is moving as a whole. Ordinarily the prongs approach and recede in turn, each moving round the stem as a hinge. They are, however, capable of executing more complex movements, the nature of which will be apparent if we first examine some of the modes in which a straight bar can vibrate transversely. We may have, for example, in a straight bar free at both ends, vibrations in which the number of nodes, or stationary points,

are respectively two, three, four and so on. Now if we turn such a bar into a tuning fork by bending it, we must reject the unsymmetrical forms where the number of nodes is odd; so that the fork will have an even number of nodes, equally distributed between the prongs. In the simplest case during the operation of bending, the two nodes approach, and will in the fork nearly coincide at the stem. In the next case, during the bending the inner nodes go to the stem, and the others to points on the prongs, about one-third the distance from the end. In the first case when there are only the two nodes at the stem, the fork gives what is called its fundamental tone. In order to obtain it we simply strike or bow one of the prongs at or near the end in the direction of motion. In the other case when there are four nodes, a much higher tone is produced, a harmonic of the former. To obtain it the bow must be drawn between the stem and one of the upper nodes. The fundamental tone may also be obtained by exciting the fork by an electro magnet under the influence of an intermittent electric current, the intermittence being generally obtained by what is called a *fork interrupter*. These vibrations are communicated to the air around the fork, and ultimately to the air just outside the tympanum of the ear. There small periodic changes above and below the ordinary pressure of the air are produced, and the mode in which these changes succeed one another corresponds to the harmonic motion of the fork. In other words, if we graphically represent these successive changes of pressure that take place in the air of the ear-channel during, say a second, whilst a fork is sounding, we should get a harmonic curve. If the amplitude of this curve is large, the sound is loud, and feeble in the contrary case. Different effects are obtained

as the ear is placed at different points round the fork, the intensity varying from a minimum to a maximum in a quarter turn. In order to bring out the fundamental tone of a fork it is usual to join it to a *resonator*, which is nothing more than a closed pipe open at one end, and containing a mass of air capable of vibrating in unison with the fork. In this respect its office is similar to that of the sounding board, which reinforces the sounds of the strings stretched over it. Detaching the resonator, and making the air in it play the part of the air in the *meatus* or ear-channel, you can all readily perceive the alternations in intensity, as the opening is turned towards different sides of the prongs.

The chief interest in the tones of tuning forks lies in the fact that they are *simple*, in the sense in which we say that the spectrum colours are simple. A musical sound which is not simple is resolvable into those which are. The general subject of sound analysis is too wide for me to enter on it on the present occasion, but it will not be without interest if I direct your attention to one or two points in connection therewith. And first with respect to the analysing power of the ear. When one simple tone is sounding we have seen that the pressure curve for the air in the *meatus* is a simple harmonic one. What, then, is the pressure curve when several tones are sounding at the same time? We cannot, of course, have several pressures coexistent at the same point. The curve, therefore, is unique, and for musical sounds will be found to be periodic. Accordingly no matter how many coexistent vibrations there may be outside, there will be but one series of pressure changes in the *meatus*. Now it is these pressure changes which are ultimately interpreted by the ear according to a complex process which I can-

not now further explain. But that there is a process of resolution gone through every one must know. When a band is playing every one notices the effects of several instruments at the same time, his observation being directed now to one group, now to another. So, also, we recognize very readily the voices of several people talking at the same time. In the second place I have to remark that a single musical sound is generally compounded of simple tones. Thus a note on a violin string, or the piano, is really a collection of tones of different pitches and intensities, embracing the fundamental and several harmonics. For example, on the piano, if *C* is sounded, an attentive ear perceives its octave and the fifth (*G*) above that. A violinist readily perceives when a note is played on the violin a much longer succession of harmonics. Now what is true of the note of the violin is true of the generality of musical sounds; and if we do not usually manifest the acoustician's powers of analyzing them, it is because no useful purpose would be served by our doing so. Indirectly, however, we do recognize the constituent tones of a note. *C* on the piano is different in quality from *C* on the violin only because the harmonic notes are not equally strong. One voice has a different quality from another for a similar reason. These differences in quality we recognize immediately, and, as that generally serves our purpose, it would be useless to enter on a process of analysis. An illustration will convey my meaning more clearly. In listening to several choirs in succession, suppose our object was simply to distinguish one from another. If this could be done without comparing sopranos in one with sopranos in the other, tenors with tenors, and so on, nothing would be gained by such a process of analysis. In order to tell Gilmore's band from the

performers of a country village, it is not necessary to dissect the performance of every member from the drummer boy upwards. So it is in ordinary cases where the ear does not exercise its analyzing powers. By an immediate deduction we recognize the qualities of different voices and instruments; and so the necessity for analysis does not exist. The composite character of sounds, however, is none the less a fact which can be established by synthesis and analysis. If, for example, a fundamental note and its harmonics are simultaneously produced on a series of forks, the former being loud and the latter feeble, the pitch still appears to be that of the fundamental, but the quality of the sound is changed, and the character of the change depends on the number and intensity of the accompanying harmonics. On the other hand all musical sounds, whatever their quality and origin, can be analyzed in various ways and shewn to be compounded, when not simple, of a fundamental and its harmonics. This fact can be established most satisfactorily with the aid of resonators. Thus, if appropriate resonators are applied in succession to the ear, the component tones of a voice emitting a low note can be discovered, and are found to embrace a long series of harmonics in addition to the fundamental. No more interesting example of voice analysis can be adduced than the method which has been employed to examine the vowel sounds. To apprehend the process it must be borne in mind that all vocal sounds are produced primarily in the *glottis* by the vibrations of the vocal chords, but that they only become speech in virtue of certain modifications imposed on them in the mouth. There they are formed into vowels, consonants, syllables, words. During the formation of the vowels the mouth cavity assumes definite

shapes, and for the time plays the part of a resonator. Suppose then that the vocal chords produce a certain note. This in reality consists of a fundamental and several harmonics. When the mouth is formed to pronounce the vowels in succession, the cavity becomes a resonator which reinforces different harmonics. All the vowels can in fact be pronounced on the same fundamental, and, in order to pass from one to another it is not necessary, therefore, to change the vibration of the vocal chords—it is sufficient to modify the form of the mouth and so add to the effect of certain harmonics. Different harmonics are thus found to be characteristic of different vowels. As the vowels are pronounced differently in different languages and dialects, it is, of course, necessary, in determining these characteristic tones, to employ a fixed mode of pronunciation. For the German language this determination has been effected with great precision by Helmholtz, Kœnig and others. Tuning forks, giving these characteristic tones, with the accompanying resonators, are made by Kœnig, of Paris. These forks may be set in sympathetic vibration by the voice when pronouncing the corresponding vowel, or the vibrating fork may be used to set in vibration the air in the mouth when merely formed to pronounce the vowel.

One more illustration of the use of tuning forks, and I have done. For the purpose of tuning (the piano, for instance,) either one fork may be used, or thirteen. In the former case the tuner having tuned a certain note in unison with his standard fork, depends on his ear for tuning the remaining notes. This he does by carefully adjusting the intervals of octaves and fifths, fourths and thirds being also employed by some tuners. In the other case, he simply brings the thirteen notes of one part of the

scale into unison with the forks, and then tunes the remainder by octaves. Now neither of these methods is to be depended on if we wish to attain to extreme accuracy, the source of error lying in the fact that the ear is only capable of deciding within certain limits between two notes lying very near to each other. If one fork, for example, performs 60 vibrations per second and another 61, the difference in the tones may be detected by the ear, but not so if the vibration-numbers are say 200 and 201. By taking account, however, of the phenomenon of the beats which are heard when two notes very near to one another are sounding, we can tune with extreme accuracy. The beats are easily recognized by a rising and falling in intensity, and their number per second is equal to the difference between the vibration-numbers of the two notes. Thus, if one fork vibrates 256 times per second and another 260, they will, when sounding together, produce four beats per second. If, therefore, we wish to make an exact copy of the former, it is only necessary to make a fork which shall produce four beats per second when sounding with the latter. So, also, if we wish to tune a piano very accurately, instead of employing the thirteen forks of a scale of equal temperament, we should employ forks which give each four vibrations less. With such a set a note at this part of the scale will only be correct if it gives four beats per second when sounding with the corresponding fork. This adjustment can be effected with the aid of a metronome with the utmost accuracy, and the remaining notes are then tuned by octaves.

I might continue to describe many other uses of the tuning fork, some of which would possess still greater interest for you; but I trust that the illustrations already adduced are sufficient to indicate that this plain and



unpretentious instrument has risen to an important position in the world of science, and has become a most use-

ful aid in extending the bounds of knowledge.

## OUR SCHOOL SYSTEM.

BY AGRICOLA.

IT is surprising how much ingenuity has been expended in attempts to solve the problem: How are we to render our schools really efficient? It is admitted that individual schools are met with which rise to the necessary degree of efficiency, or come very near it, but the problem, of course, cannot be considered solved until it has become possible to decide beforehand whether a school will be successful or not. In details we have seen so many experiments tried, skilful and otherwise, that we are almost led to believe that the object is not to discover the best solution, but to find one which will fill the place, in some degree, of the true one. Have we come so far on the way of our vaunted progress, and do we still find that the science of Education—perhaps the most important of all—stands still, and seemingly as little advanced as the science of Archæology. But there is no lack of theorists who give much time and ability to the question. Ah! if these theorists could only be induced to abandon their ballooning and keep their feet well on the firm ground, what results we might expect! Let them but recognize that, after all, the whole matter is like the question of making the best boots. How are these to be made? "Oh," says one, "employ good foremen, who will keep a sharp look out after the manner in which the work is done." So the schools have Inspectors. But here is our difficulty. An inspector must

know how to inspect. Now, *inspecting* means *looking into*, and a magpie may "look into" a marrow-bone and be quite at a loss to know what to do next. So inspectors sometimes look into a class-room, and perhaps find it empty of marrow; and sometimes they cannot see what marrow there is certainly in it. To find marrow metaphorically, requires a trained metaphorical eyesight, and it is perhaps a pity to take a successful teacher and make an inspector of him; but if we are to have inspectors, and they are to be of any use, they must be chosen from amongst the list of "successful teachers." An inspector should be a very "round" man, not eager to display his angles and crotchets before teacher and class, exciting perhaps the indignation or contempt of the one, and puzzling the other, and then basing his report upon the confusion which he has himself introduced into, it may be, a well ordered school-room. "Oh!" says another, "inspectors are very good, but they are not enough; we must have searching examinations and plenty of them." In the short space of a twelvemonth, nay, of less than ten months, what an amount of work must be gone over! Yes, gone *over*, not *through*. There is now a goad for indolent scholars; they may be plucked! What does "plucking" mean? Is there disgrace attending it? Whatever it really signifies, it must be something unpleasant. A sensitive child would

not like to have the word applied to himself. Could we forgive the peacock his discordant voice if he were "plucked"? Through a successful answering of examination-questions alone can he be admitted into the highest class in the school; the examination then cannot be shirked. In this way, an element of unrest is introduced into our schools. "But," says the complacent examiner, "these examinations deepen the stream of education." "Yes," replies the teacher, "and narrows it, for, after all, you deepen the stream by bringing the banks nearer together." Now everything must be neglected that does not conduce to the great object of passing the examination. What kind of questions is the examiner likely to ask? Judging from his past questions, what is his individual bias? What, in short, is his hobby, and how can the scholar be best prepared to meet his examiner's idiosyncrasies? One scholar will tell another not to "get up" such and such a subject, because Mr. So-and-so never asks anything about it. So narrow is the stream likely to become that ere long, forced and turbid, its waters will be able to give back no reflection of the flowers that grow upon its banks, or of the blue sky above. The results are seen only by the teacher, the experiments have been planned by another.

Says a third, "You must have in addition to these educational specifics—inspectors and examinations—one more, and then you will have the three complete: Payment by results! We all have heard the phrase before, but do any of us know what it means? Anyone can tell what it ought to mean, and, doubtless, if every man were paid strictly according to the results he produces, every one would get his due. Large sums are handed over to men, who do not teach to discover the "results" that are to be

"paid for." These persons are often quite unable to judge of the value of a set of answers sent in by a young scholar. They can make merry over the grotesque mistakes of immature minds, and perhaps they can always tell whether an answer is right or wrong; but an experienced teacher knows full well that there are often more than two ways of answering questions, and that old heads on young shoulders are phenomenal.

If then inspectors, examinations, and "payment by results" have failed, or are failing, what do you suggest? Fortunately there is one thing that can be done, and unfortunately it will in all likelihood, be left till the last, because it is the best. I alluded previously to the making of boots. How are the best boots made? Just by using the best materials and employing the best workmen. These workmen are well paid. I do not object, indeed I think it is advisable, to have a good foreman—call him an inspector if you will—but he too must be a good workman, and above all things must not display his ignorance before his men. He must know a well-finished boot when he sees it, he must recognize a master in the craft by the way in which he goes about his work; and lastly, he must know how to advise, guide, correct, encourage the apprentice hands.

Teachers have been chilled out of the school-room, whom nature and education had formed for it, and scores are now engaged in teaching whom nature and education intended for something else. The teacher must think of his calling as an artist of his art, as a successful physician or lawyer of his profession. Every detail of it must possess a charm for him. But how many of our teachers have any inducement to do this? They are for the most part ill-paid, and so taught to look upon the school-room but as a passage to some other

occupation. In the advertisements in our papers the candidates for vacant positions are asked to "state salary," and this too, in an era of "payments by results." That is, let them cut down their demands so that the lowest tender will be a very low one. School-boards will tell you that it is a question of demand and supply, and that when so many teach salaries must be low. Is it really necessary to make the statement that good teachers are as rare as good doctors? But the good doctor has the matter in his own hands, while the teacher's career is largely marked out for him by school-boards, thrown together at hap-hazard, and,

as rate-payers in authority, with a keen regard for their own pockets. Hence we know what is meant by saying that teaching is not yet a profession; but when an effort has been made to make it one, when the true teacher shall have been freed from the petty annoyances which tend but to wear out his life, when he receives adequate "payment" for his "results," and is not compelled to look out and beyond for another goal, then, and not till then, will our school-system be placed upon a right and sure foundation, for upon the teacher, and upon the teacher alone, must depend the perfection of the whole fabric of public education.

AT one of the Whitby (England) schools, the geographical teaching is a model of intelligence and ingenuity. The subject is the geography of Yorkshire, and a sand map of the county, with all the important physical features, has been carefully modelled on a terrace adjoining the schoolroom. The sand has been brought by the children from the beach, and has been moulded by them, with the assistance of their teachers, into mountains, hills, valleys and rivers. The proportions are observed with wonderful accuracy; nothing could be neater or more finished in its way than the coast line ornamented with diminutive lighthouses at the well-known points; the towns are represented by little square blocks of chalk, of different sizes, according to their population and importance; the river basins have been carefully distinguished from one another; everything speaks to the eye. It is quite plain that the geography lesson has formed part of the recreation of the school, and the examination is eagerly looked forward to. The children

leave the schoolroom and come out into the fresh open air. They cluster round their terrace map, and it is a pleasure to watch the keen interest, the delight with which they answer questions. In their case one great object of mental education, viz., the development of a sense of pleasure in the acquisition of knowledge, has been successfully attained.

A NEWSPAPER proprietor advertised for an advertisement canvasser, and his test of the applicants' fitness when they appeared was to tell them to get out of his office that instant or he would turn them out. Several timid young men turned and left him with great disgust, but one, more brazen-faced than the rest, nothing daunted by the threat, coolly sat down and refused to leave until his testimonials were examined. So he locked the door, but the key in his pocket, and handed in his papers. "Ah," said the advertiser, "you'll do, I can see. I don't want testimonials; your style is enough for me."  
—*Queenslander.*

## MACAULAY'S ESSAYS.

BY SAMUEL MACKNIGHT, HALIFAX.

MACAULAY, the greatest writer, perhaps, of the English nation, made his most brilliant contribution to literature in a somewhat undignified form. The treasures of his great memory, the enthusiasm of his exalted mind, the descriptive powers of his vivid pen, were concentrated on short and unconnected articles, written on the impulse of transient events, and published in a periodical of literary criticism. Those musical sentences which dethroned from their place of supremacy in letters the refined simplicity of Addison, and the sonorous eloquence of Gibbon, those immortal expositions which bring before our minds in one view the whole nature and history of the Church of Rome in Europe, the whole theory of the development of popular liberty, first in Britain and then on the Continent, the whole contrast between the high-flying philosophy of the ancients and the modest philosophy of Bacon—were all brought into existence to stand side by side with ordinary critical matter in the columns of the *Edinburgh Review*. It is in the essays of Macaulay that we have the best examples known to us of the combination of beauty with force; it is to the essays of Macaulay that we go to study depth of thought united with elegance of arrangement; it is in the essays of Macaulay, if anywhere, that we would expect lofty subjects with lofty surroundings; and yet these very essays were written to

announce the appearance of obscure biographies and new editions of classical works. The articles are generally suggested by obscure publications, and are often prefaced by petty denunciations of the authors. All the fine reasoning in the essay on Milton owes its existence to a musty pamphlet of the great poet, discovered by a Mr. Lemon and edited by a Mr. Sumner. All those paragraphs in the essay on Hastings, by virtue of which we fancy ourselves sitting in Westminster Hall, and think we hear the voice of Sheridan, are mingled in our minds with the imperfections of the Rev. Mr. Gleig, and his incapacity as a biographer. In the essay on Croker's edition of Boswell's *Life of Johnson*, our attention is directed to Mr. Croker's bad English, and even to his bad type. The essay on Robert Montgomery, that nipping of a poet in the bud, is the strength of a master in literature devoted to the immortalizing of a fool.

The peculiar style of Macaulay has, ever since the appearance of his first writings, been the study and admiration of all readers. The most common description of it is to say that the sentences are short, and that general statements are habitually followed by particular statements illustrating them. But it may be doubted whether the most fundamental peculiarity of his diction is the brevity of the sentences. The sentences are not short. It is true that sentences

of twenty words, sentences of ten words, sentences of five words occur in every paragraph. It is true that long successions of sentences, none of them exceeding ten words, are to be found in the most vigorous passages. Yet in many cases where the voice speaking to us is most characteristically the voice of Macaulay, we can count, before a final pause comes, as many verbs and adjectives as could be counted in one sentence by the hearers of Robert Hall, and can be conscious that our ears are kept filled with sound as long as when we read any of those involved and pompous effusions which came with such uniformity from the pen of Samuel Johnson. His short sentences are no more his own than his long ones. There can be little doubt that the secret is to be looked for in some other feature. We must find something that those short sentences and the larger sentences possess in common. That there is something in common we are perfectly assured. It may be difficult to catch, difficult to express; but it seems to us to be expressed by the words *independence* and *unity*. Every sentence appears to be perfectly separated from all others, to stand upon its own ground, to be entirely devoted to the expressing of one truth. Each gives only one idea, but each gives one whole idea. The successive sentences are, of course, not unconnected with one another in thought. But they are connected in no other way than in thought. They are not additions beginning with *and*; they are not results introduced by *hence*. His additional utterance, even where it is a mere repetition, as it often is, brings with it all the dignity as well as the separation of a new idea. If, in relating Addison's travels in Italy, we were to speak as follows, our English would be good enough:—"Addison ascended Vesuvius, visited the tunnel of

Posilipo, and wandered among the verdure of Capreae, thus seeing everything at Naples that could then interest a foreign tourist." But out of the same material, Macaulay produces a different result. "What was to be seen at Naples, Addison saw. He climbed Vesuvius, explored the tunnel of Posilipo, and wandered among the vines and almond trees of Capreae." He gives us two statements, the one little more than a repetition of the other, but both perfectly clear, perfectly distinct, both characterized by the most perfect unity. In meditating upon any subject, his mind became occupied by a number of ideas, distinct, yet kindred. In writing, his object was to determine in what order these ideas should be expressed, and having determined their order, to see that every one of them had an adequate and forcible representation on paper. The following eulogy of Milton, from a thousand eulogies of Milton, is a fine example of distinct, yet kindred ideas, sharply separated into distinct yet kindred sentences.

"Milton was under the influence of all the feelings by which the gallant cavaliers were misled. But of those feelings he was the master and not the slave. Like the hero of Homer he enjoyed all the pleasures of fascination; but he was not fascinated. He listened to the song of the Sirens, yet he glided by without being seduced to their fatal shore. He tasted the cup of Circe; but he bore about with him a sure antidote against the effects of its bewitching sweetness. It is the very struggle of the noble Othello. His heart relents, but his hand is firm. He does naught in hate, but all in honour. He kisses the beautiful deceiver before he destroys her."

Closely connected with the unity and separateness of his sentences, is that characteristic which has gained for his style the epithet Illustrative.

His way with his readers is clear. He first impresses them with the general fact. He then makes it luminous by giving some of the instances upon which his belief in it is founded. These general truths he is continually creating. Under his management long arrays of facts fall into groups, and each of these groups becomes a mere series of illustrations to some general idea. Everything that enters his mind is transformed. He marshals the results of his investigations, and they fall indeed into a splendid file. Where the ordinary informant contents himself with a list of plain facts, Macaulay creates a theory, and makes the facts look as if they sprung out of it. A duller biographer would let Addison go from Rome to Naples and from Naples back to Rome, without attempting to make a distinctive idea pervade the Neapolitan as distinguished from the Roman part of his experience. But the great essayist gives us such an idea, and it is a most natural one.

“He posted along the Appian Way to Naples. Naples was then destitute of what are now perhaps its chief attractions. The lovely bay and the awful mountain were indeed there. But a farm-house stood upon the theatre of Herculaneum, and rows of vines grew over the streets of Pompeii. The temples of Paestum had not indeed been hidden from the eye of man by any great convulsion of nature; but, strange to say, their existence was a secret even to artists and antiquaries. Though situated within a few hours' journey of a great capital, where Salvator had not long before painted, and where Vico was then lecturing, those noble remains were as little known to Europe as the ruined cities overgrown by the forests of Yucatan. What was to be seen at Naples, Addison saw. He climbed Vesuvius, explored the tunnel of Posilipo, and wandered among

the vines and almond trees of Capræe.”

Another peculiarity of Macaulay is his fondness for repetition. He loves to say a thing twice. His favourite ideas seem to him to deserve two or three incarnations, and his pen never fails to furnish two or three different sets of words. This is undoubtedly one of the great secrets of his diction. There are of course many kinds of narration in which it would be out of place; there are many cases in which the idea is evidently not to be dwelt upon. But when a theory is to be stated it is of great advantage that its different parts should be held up in many lights; and when a theory is to be stated, Macaulay is sure to hold it up in many lights. When he wishes to convey an opinion to us, he tells us it first in the broadest terms; he then tells us it in definite language; and often repeats it a third time in language more definite still. Yet this is not all. In some passages he carries out a complicated series of repetitions. Not only is one idea presented to us many times by a succession of sentences, but in later parts of the discourse that same idea is presented to us again and again in new successions of sentences. In this way long paragraphs are placed before us, and we grasp his theory more and more firmly at every new effort of the mind. We seem, as we approach the end, to see as the writer sees.

A noble passage in the introduction to the essay on Bacon illustrates this almost to exaggeration. The essayist as usual, before proceeding to Bacon, has something to criticize in Bacon's editor, Mr. Montagu. He finds Mr. Montagu guilty of hero-worship. And from Mr. Montagu he passes to hero-worshippers in general. Thus is introduced a long and sonorous paragraph, a paragraph of thirty-seven eloquent sentences, covering an entire

page. In this whole page of writing we venture to assert that there are not more than three ideas; and indeed these three are so closely connected that we might call them one. In the first place there is this idea—that we all have an unjust partiality for the great minds of former ages. He next proves this by a more general fact—that we all have an unjust partiality for those to whom we are indebted. Nothing then remains but to shew that we are indebted to the great minds of former ages. These are the three ideas. Now if the use of a paragraph were merely to catalogue a list of thoughts, all the thoughts in this paragraph might be written in three sentences. Indeed, to make more than three sentences of them would be not only extravagant but impossible. But such is not the object of rhetorical writing.

The first of these ideas is expressed at the opening of the paragraph. "There is scarcely any delusion which has a better claim to be indulgently treated than that under the influence of which a man ascribes every moral excellence to those who have left imperishable monuments of their genius." We then proceed to the second. "The causes of this error lie deep in the inmost recesses of human nature. We are all inclined to judge of others as we find them. Our estimate of a character always depends much on the manner in which that character affects our interests and passions. We find it difficult to think well of those by whom we are thwarted or depressed; and we are ready to admit every excuse for the vices of those who are useful or agreeable to us." Now are there not here three statements of one fact? How much difference is there between saying that we judge of others as we find them, and that we estimate others by the manner in which they treat us? Or between saying that we estimate

others by the manner in which they treat us, and saying that we do not think well of those who thwart us, but make excuses for those who are useful to us? The second is indeed more definite than the first, and the third than the second. But is not the idea which is behind the words essentially the same in all the three statements? Having thus dwelt upon the second idea, we return to the first. "Hence it is that the moral character of a man eminent in letters or in the fine arts is treated, often by contemporaries, almost always by posterity, with extraordinary tenderness." We then take up the third. "The world derives pleasure and advantage from the performances of such a man." And what is the next sentence but a repetition of it? "The number of those who suffer by his personal vices, is small, even in his own time, when compared with the number of those to whom his talents are a source of gratification." And the next but a repetition? "In a few years all those whom he has injured disappear. But his works remain, and are a source of delight to millions." This fact is illustrated by the examples of Sallust, Clarendon, Shakspeare, and Fielding. We then come back, for the second time, to the original idea. "A great writer is the friend and benefactor of his readers; and they cannot but judge of him under the deluding influence of friendship and gratitude." And then once more to the second. "We all know how unwilling we are to admit the truth of any disgraceful story about a person whose society we like and from whom we have received favours." And then once more to the first. "Just such is the feeling which a man of liberal education naturally entertains towards the great minds of former ages." And finally state the third again with the most detailed and brilliant elaboration.

The whole paragraph as it stands is

one of Macaulay's greatest achievements with English words. The passage in the history in which he describes with poetic elevation the magnificent foreign policy of Oliver, that terror which hung over the dockyards of Amsterdam, and crept into the ante-chambers of Paris, those English guns which, it had been threatened, might yet resound within hearing of the castle of St. Angelo in Rome; the passage in the history in which he reflects with poetic pathos on the deep humiliation of the Irish at the Revolution, on their long-continued wrongs and slow restitution; the passage in the Essays in which he describes the opening scene of the trial of Warren Hastings, the marshaling of the peers, the culprit's bending his knee—these passages may perhaps have greater claims to being considered the best products of his pen. But in none of those cases is it a theory that he has for his subject, and in none of those cases, perhaps, does he build his edifice so completely from materials furnished by his own mind. The workmanship, we cannot but be persuaded, consists in elaborate and bold repetition. He hammers his nail with many loud and distinct reverberations. His blows are all made upon one object, and aimed in one direction. And at the end, proud of the fastness of his workmanship, he continues to lift his arm and causes it to descend, spell-bound by the mere pleasure of striking, and listening to the sounds he makes.

We have so far been chiefly considering the most mechanical part of our subject. The highest merit of Lord Macaulay's writing is that singular vividness with which he brings distant and obscure objects near. His descriptive power is founded on a habit of rejecting all general expressions in favour of enumerations of definite objects. Whatever the reason of it may be, it is an undoubted

fact that our minds are affected by a general expression in a manner altogether different from that in which they are affected by a statement of details. In the one case, indeed, we are presented with the whole amount of knowledge; but in the other that knowledge sinks in more deeply. In the one case we become fully aware of the fact; but in the other the scene is brought before our very eyes, the sound to our very ears. Thus, if we wish to shew the growth of London since the seventeenth century, we may say that Chelsea was then a rural village, and that that part of the city between Chelsea and Westminster was mere open country. To say that it was mere open country means quite as much as to say that it was covered with corn-fields and hedges, that it had few houses, and was frequented only by people of rural occupations. To say that it was open country would be as full and exact a statement of the fact as could possibly be invented. Yet Macaulay does not say that it was open country, but that sportsmen and milkmaids wandered over it. In the same manner, when he wished to inform us that Herculaneum and Pompeii were unknown in the time of Addison, he could not have told us that fact more accurately than by simply saying that they were unknown. Yet he does not say that they were unknown, but that a farm-house stood on the theatre of Herculaneum, and rows of vines grew over the streets of Pompeii. We thus get a most vivid idea of those undiscovered relics of antiquity, lying underground, buried many feet deep, the peasants above unconscious of their existence.

When again he wishes to tell us that a volume has long ago ceased to be read, he does not say that it has ceased to be read, or that it is out of date, or obsolete, or forgotten, or that it has followed its predecessors



into obscurity, but says that it has followed its predecessors to the dust and silence of the upper shelf. The upper shelf, the dust, the silence, strike us as none of the other expressions could, and to the upper shelf, the dust and the silence, the essayist accordingly has recourse.

To recite the descriptive and pictorial passages of Macaulay would be to recite his whole works; yet no account of his style would be adequate without giving a series of examples of those finer descriptions which abound in the historical essays. If we search for them, even at random, we cannot fail to come upon some of great merit. The following are from the *Essay on Machiavelli*. First, a description of the decay of Venice: "All the curses denounced of old against Tyre seemed to have fallen on Venice. Her merchants already stood afar off, lamenting for their great city. The time seemed near when the sea-weed should overgrow her silent Rialto, and the fisherman wash his nets in her deserted arsenal." Then that of Florence: "With peculiar pleasure every cultivated mind must repose on the fair, the happy, the glorious Florence, the halls which rang with the mirth of Pulci, the cell where twinkled the midnight lamp of Politian, the statues on which the young eye of Michael Angelo glared with the frenzy of a kindred inspiration, the gardens in which Lorenzo meditated some sparkling song for the May-day dance of the Etrurian virgins. A time was at hand when all the seven phials of the Apocalypse were to be poured forth and shaken out over those pleasant countries, a time of slaughter, famine, beggary, infamy, slavery, desair." Again: "The time when eloquence was to be gagged, and reason to be hoodwinked, when the harp of the poet was to be hung on the willows of Arno, and the right hand of the painter to forget its cunning."

The following is a description of the Italian coast:—"The felucca passed the headland where the oar and trumpet were placed by the Trojan adventurers on the tomb of Misenus, and anchored at night under the shelter of the fabled promontory of Circe. The voyage ended in the Tiber, still overhung with dark verdure, and still turbid with yellow sand, as when it met the eyes of Æneas."

The essay on Milton abounds in brilliant descriptions. In language of Cavalier energy he shews the ridiculous aspect of the Puritans. "Major-generals fleecing their districts; soldiers revelling on the spoils of a ruined peasantry; upstarts, enriched by the public plunder, taking possession of the hospitable firesides and hereditary trees of the old gentry; boys smashing the beautiful windows of cathedrals; Quakers riding naked through the market-place; Fifth-monarchy-men shouting for King Jesus; agitators lecturing from the tops of tubs on the fate of Agag." He shews the nobility of the Puritan character, a little farther on, in language which, from its beauty, must be immortal. "In his devotional retirement he prayed with convulsions, and groans, and tears. He was half maddened by glorious or terrible illusions. He heard the lyres of angels, or the tempting whispers of fiends. He caught a glimpse of the beatific vision, or woke screaming from dreams of everlasting fire. Like Vane, he thought himself entrusted with the sceptre of the millennial year. Like Fleetwood, he cried in the bitterness of his soul that God had hid his face from him." His sentences on the age of Charles II. are of unequalled sarcastic power. "The golden age of the coward, the bigot and the slave. The caresses of harlots and the jests of buffoons regulated the policy of the state. The government

had just ability enough to deceive, and just religion enough to persecute. The principles of liberty were the scoff of every grinning courtier, and the anathema maranatha of every fawning dean."

As might be supposed, he has a peculiar power of bringing before us the characters of men. He describes the character of Strafford in a sentence of singular vivacity. "But Wentworth—who ever names him without thinking of those harsh, dark features, ennobled by their expression into more than the majesty of an antique Jupiter; of that brow, that eye, that cheek, that lip, wherein, as in a chronicle, are written the events of many stormy and disastrous years, high enterprise accomplished, frightful dangers braved, power unsparingly exercised, suffering unshrinkingly borne; of that fixed look, so full of severity, at once to forbode and to defy a terrible fate, as it lowers on us from the living canvas of Vandyke?" In giving an account of a scene he sometimes carries his search for striking details to a height which startles us from its deliberate boldness. In the case of the trial of Hastings, after going over the hall, the assemblage, and ceremonies, he proceeds to reveal to us the minds of the audience. "There Siddons, in the prime of her majestic beauty, looked with emotion on a scene surpassing all the imitations of the stage. There the historian of the Roman Empire thought of the days when Cicero pleaded the cause of Sicily against Verres, and when, before a Senate which still retained some show of freedom, Tacitus thundered against the oppressor of Africa." It was his fear of using general language which led him to bring to his aid the celebrated schoolboy. To say that a fact or event was universally known was with him too dull an expression. He therefore availed himself of the schoolboy, say-

ing that the schoolboy knew it. Macaulay's schoolboy is universally renowned for his extensive knowledge. The school girl sometimes comes to his aid, and more rarely the Hebridean minister and the country apothecary. But on the whole his duties must be admitted to be arduous. In the History there is another formula which occurs with a frequency almost equally ridiculous. It is the retirement of fallen ministers to the woods and pictures of their country seats. The writer cannot allow himself to say simply that the statesman retires to his country-house. He brings in the woods, the pictures, the orangery. The flower-pots sometimes come to the relief of the pictures. But the woods are inevitable. Halifax, Temple, Pitt, all go through the same process. Our idea of political overthrow is always to be associated with woods. In only one instance, however, can we remember his love of the particular leading him into real weakness. It is the case of Cowper and the water-lilies. Cowper, we are told, wandered among the water-lilies of the Ouse. The sentence conveys the impression that Cowper was an aquatic fowl.

In power of intense sarcasm he is probably not exceeded by any English writer. His hits at Penn, Prince George of Denmark, Marlborough, Sunderland, and other characters of the time of the Revolution, give his history one of its peculiar points of strength. He can never leave alone the oddities of Burnet, nor forget the subtlety and caution of Halifax and Carstairs. His most cruel blow, perhaps, is levelled at Feversham. Feversham, he tells us, was, at the Revolution, still allowed to preside over the queen dowager's basset table, the only office for which he was eminently qualified. The essay on Robert Montgomery is a satire of which every sentence is of the most scorching and venomous in-

tensity. His persistency in vilifying Cranmer is equalled only by his persistency in vilifying Penn. The Protestantism of that group of statesmen of whom Burleigh was the centre is made very plain to us when we are told that during the Marian persecutions they contrived to have business on the Continent. In a single sentence we learn the trifling disposition of Horace Walpole, when we are told that after his labours in the print-shop and the auction-room, he unbent his mind in the House of Commons. The essayist's hatred of the Oxford movement probably led him beyond the limits of truth when he called the ritualists those new Oxford sectaries who unite the worst features of the Orangeman to the worst features of the Jesuit.

His powers of mimicry are equal to his powers of sarcasm. He has a singular faculty of reproducing other people's thoughts in his own words. That instinct for seizing the valuable and characteristic parts of works, for which he so revered his friend Sir James Mackintosh, was possessed in an eminent degree by himself. And, as in his historical researches, he could readily find the drift of an author, so in the sphere of poetry and eloquence he could readily catch the secret of a master mind. He seizes and embodies in his own prose the Olympian calm of Milton, and the more terrestrial mildness of Addison. There is a passage in the rejected essay on Dryden which may be regarded as the very concentration of *Paradise Lost*, a concentration which could be made only by one whose ear was trained by long familiarity with the harmonies of that divine poem. "To Milton, and to Milton alone, belong the secrets of the great deep, the beach of sulphur, the ocean of fire; the palaces of the fallen dominions glimmering through the everlasting shade; the silent wilderness of ver-

dure and fragrance where armed angels kept watch over the sleep of first lovers, the portico of diamond, the sea of jasper, the sapphire pavement empurpled with celestial roses, and the infinite ranks of the cherubim blazing with adamant and gold." At the close of the essay on Addison, after describing his death, he undertakes to give us his religious opinions. The uninitiated reader might suppose that he got his information from some obscure or rare source. But all that he says of Addison's religious views may be found in those two hymns with which every child is familiar. Notwithstanding the original sweetness of Addison's hymns they appear to derive a new beauty from being translated into Macaulay's prose. "The piety of Addison was in truth of a singularly cheerful character. God was to him the all-wise and all-powerful friend who had watched over his cradle with more than maternal tenderness; who had listened to his cries before they could form themselves in prayer; who had preserved his youth from the snares of vice; who had made his cup run over with worldly blessings; who had rebuked the waves of the Ligurian gulf, had purified the autumnal air of the Campagna, and had restrained the avalanches of Mount Cenis. Of the Psalms his favourite was that which represents the Ruler of all things under the endearing image of a shepherd, whose crook guides the flock safe through gloomy and desolate glens to meadows well watered and rich with herbage."

But we must leave the study of Macaulay's diction, and before closing discuss the aim and subject of his writings. These twenty-seven miscellaneous essays possess, after all, something which connects them. They are all descriptive of English subjects. Only three times is he carried away by the interest of a topic not English

—once in the life of Frederick the Great, once in the history of Von Ranke, once in the intricate life and character of Machiavelli. As the words of his native language, used with exquisite fitness, were his instrument, so also the institutions of his native land were his inspiration. The subjects which most deeply excited him, the subjects which moved his pen, were the literature, the political progress, the glory, of the English people. To these studies he early gave his affections, and he soon found the shrine worthy of the offering. For the history of English thought, and of the progress of English political liberty are not contemptible studies. Civil freedom as it exists in England is one of the noblest and most wonderful products of time. It is in imitation of it that almost all the good institutions of other countries have been founded. At Athens, under the very shadow of the Areopagus, in the very city of Solon, the freedom is the freedom which dates from Magna Charta, the statesmanship is the statesmanship of the Palace of Westminster. It is little wonder, therefore, that Oliver should have been his Pericles, that Oliver's Latin Secretary should have been his Homer. His knowledge, however, of Classical literature, and indeed of all literature, was vast. His great memory and power of reading rapidly are notorious. His knowledge of the greatest of the ancient writers, of the most noted of the Italian, of all the English classics, and of the French dramatists, is evident in every page of his works. It is said that if Milton's great poem had been lost he could have restored it from memory. Yet from an acquaintance with his essays, it may be doubted whether his memory was so absolutely supernatural, and whether the writers from whom he draws his illustrations were not writers who made a specially great

impression on his mind. He did not, moreover, reverence everything that he read. His contempt for some of the classical writers was great. He becomes enraged at the thought of Milton doing homage to Euripides. It reminds him only of the love of Titania for Bottom. He treats Xenophon with a disdain quite as great as the loathing which that unfortunate ancient inspires in the soul of De Quincey.

We regard his memory with a profound veneration similar to that with which he regarded the memory of Milton. As he admired and pitied the great men who went before him, their history, their glory, their passions, their sufferings, their deaths, so can we also contemplate, with affectionate regard, the fulness of his life, and follow his history down to that temple of silence and reconciliation in which his remains find a resting place. How often in tracing the career of an English statesman or poet does he bring it to its sad close in Westminster Abbey, and now he himself is among the great who slumber in that solemn place. It seems as if it was not only the pride of our nation to have had so noble a history, but also to have had minds noble enough to elucidate it. The England of the seventeenth century, the England of Shakspeare and Milton, the England of Oliver and William, would seem actually to have waited for Macaulay to complete the splendour of its successive epochs. In his intellect, in his pages, the events of those times rise and live again. Strafford waits to receive a greater condemnation than his sentence in Westminster Hall; Jeffreys for a more indignant scorn than that of the rabble who pelted his coach into the tower. Now moves the lying tongue of Sunderland, anon appear the smirking features of Dr. Oates. Through the smoke of Killcrankie we see the devout face of

Mackay. Again it is Oliver, striding up the aisle of St. Stephen's, dismissing, with the authority of one whom nature has made a king, the ancient parliament of England. Or it is Burnet, full of vulgar curiosity, and by the sheer power of blundering impertinence, effecting a reconciliation between the noblest of men and the most affectionate of women.

Notwithstanding Macaulay's extreme command over the light and sunny artifices of rhetoric, he must not be regarded as a mere literary juggler, or as a trifler with the minds of men. We are certain that he possessed a noble and tender heart. If this were not known from the history of his life, it would yet be easily seen by every reader of his works. His earlier essays especially, those of which he professed to be ashamed, but his peculiar fondness for which shewed itself even in his very act of condemning them, are full of an exalted love and commiseration. That plenitude of love which he gave to Milton was given not to the mere genius of Milton, but chiefly to that heroism which is so inseparably connected with Milton's genius. The profound and stupendous isolation of Milton's character, the one Puritan among poets, the one poet among Puritans, the man who pressed into the forlorn hope, the glory of heterodoxy, the very prophet of the spirit of rebellion, whose bold pamphlets were preached down from the pulpit of the Westminster Assembly, whose Arian bones were not allowed to give a new consecration to Westminster Abbey, the man who, after suffering every earthly calamity, and being deprived of the sight of external nature, still continued to think of those fountains that warble as they flow, and those birds that ascend with music to the gates of heaven, it is little wonder that such a character should have exerted a spell over his heart. Nor did he

regard without affection those who, possessing like greatness of nature and passing through like sufferings, did not display such Herculean powers of resistance. He was fascinated by the study of the lives of those most unhappy of men, the great men of mediæval Italy. For them he had the pity which a great mind has for kindred spirits whose lives have been spent in a less fortunate age.

Macaulay is often condemned for treating with too great severity those literary aspirants who had been less successful than himself. But he justly defends himself in saying that it is due to our regard for the dignity of a really classical literature that it should be sharply and jealously distinguished from pretentious and vicious authorship.

Another point of accusation against him, one that is too light to weigh seriously, is that he was disrespectful towards his remote ancestors, the Scottish Highlanders. The business of a historian is truth; and if the Scottish Highlanders of the seventeenth century were a race of thieves and assassins, Macaulay is not to be blamed for saying so. His patriotism was not the patriotism of a mountain tribe. He looked up at the rafters of Westminster Hall as the civil temple of his country; he read the measures of the *Faerie Queen* and *Paradise Regained* as the works of his kinsmen, kinsmen by adoption if not kinsmen by blood. In him we forget the Celtic lineage and the barbaric prefix. If his ancestors were distinguished by ignorance and grossness, he strove to be distinguished by knowledge and refinement. If they were violators of every human law, he ministered at the very altar of Themis. If he is blamed for being unlike his remote ancestors, it is little wonder that he should be blamed for differing from his immediate father, the distinguished Zachary Macaulay. That two men

who are radically unlike one another in natural disposition should be like one another in their external actions is not to be expected. Though Lord Macaulay did not possess the Puritan and heroic character of his father, yet his character did not fail to bring forth of its own flower and fruit. In common with the other members of the anti-slavery coterie, Zachary Macaulay held with great rigidity those theological opinions which are called evangelical, and it is remark-

able that the sons of those men, Bishop Wilberforce, Lord Macaulay, Sir James Stephen, should all have dissented with more or less firmness from the creed of their fathers. They retained, however, one fundamental characteristic of that noble group, an intense love of virtue and freedom; and gave to their fathers that respect which is due from children to good fathers, and from patriots to makers of history.

As far as we know, the following pretty little arithmetical trick has never been published: Tell a person to write down a number of dissimilar digits under 1,000. Tell him next to write down the same digits in the reverse order, and to subtract the lesser number from the greater. He is then to state the unit figure of the remainder, and you at once tell him the whole of the remainder. The result will be as under. The middle figure will always be a nine, and the other two figures added together will always equal nine. Thus, suppose he writes, 472; reversed, 274; remainder 198. He states the unit figure of the remainder to be eight. You at once announce the remainder to be 198. The trick may be varied by letting the person tell you the hundred figure of the remainder (if there is no hundred figure the remainder will be ninety-nine), or by giving him the choice of either the hundred or the unit figure.—*Can. Baptist.*

**IMPORTANCE OF THE TEACHING PROFESSION.**—Dr. B. W. Richardson, in replying to a vote of thanks for a paper he read at the recent meeting of the Teachers' Association held in London, on "Health in Schools and Mental Health in Education," expressed his belief that the teaching profession would occupy the chief place among the professions of the future. As the teacher did his work better, so the physician, the lawyer, and even the clergyman, as an instructor, became less needed. Thus the learned professions would decline with the general improvement of knowledge, but the profession of the teacher would continue to rise in importance.

**SCHOOL HYGIENE IN BELGIUM.**—The city of Brussels, in Belgium, possesses an efficient sanitary service, of which Dr. Janssen is chief inspector. All infant, primary, and secondary schools are visited by medical inspectors once a week. Popular lecture courses on health, and on the preventive treatment of very weak children, and of such as are predisposed to constitutional diseases, are given by these inspectors to the boys' and girls' schools. The hygiene and care of the pupils' teeth are attended to by a special dentist. At the beginning of the school year, every pupil is medically examined, and, if weak, or constitutionally ill, placed under treatment. At the end of the year the result of the treatment is registered in presence of the teacher and a second medical man.

**NINETY-NINE** years ago, Robert Raikes started the first Sunday-school at Bristol. To-day his descendant, H. Cecil Raikes, is a member of Parliament, and deputy-Speaker of the House of Commons. Presiding at a "Pleasant Evening" entertainment recently near his country seat in North Wales, he said no nobleman could be prouder of his pedigree than he and his family were of the name of Robert Raikes, the founder of Sunday-schools in England. Next year would be the Robert Raikes centenary, and he had promised Sir Charles Reed, chairman of the London School Board, to take part in the proceedings by which that event would be commemorated.

## COMPOSITION.\*

BY JAS. H. KNIGHT, PUBLIC SCHOOL INSPECTOR, LINDSAY.

A SHORT time ago, at the close of a class in prosody at our teachers' convention in Lindsay, one of our number objected to the introduction of prosody on the ground that very few of the pupils were likely to become poets. Very few persons, I presume, will object to the teaching of composition on the ground of inutility. Probably most of you will admit that it is desirable that the next generation<sup>8</sup> should be much in advance of the present in this important subject. The fact that sensational stories, dime novels, and the like, are a greater attraction than useful literature, calls for a better class of writers. The fact that a minstrel concert is sure to be better attended than the best lecture on any literary or scientific subject, demands more attention to composition; and the general complaint that the influence of the pulpit is well nigh gone, cries emphatically for better sermons.

It may be affirmed that the writers and speakers of the present day are as good as those of former times. This I do not deny. But I say that this is not enough. Our youth, as well as our men and women, read more to-day than they ever did, they talk about what they read and hear, and this they do in a more critical manner than ever, and if they cannot be interested in that which is profitable, they will seek for gratification in some other way.

\* A Paper read before the Peterboro' Teachers' Association.

In the present paper I propose to make a few suggestions to teachers respecting the various methods of treating composition, both in commencing and in the more advanced stages. Composition may be divided into four divisions: I. Ordinary conversation. II. Extempore speaking. III. Written addresses. IV. Correspondence and miscellaneous writings.

With composition several other subjects are intimately connected, such as writing, spelling, reading, elocution, and grammar, and our proficiency in any one or more of the divisions of composition will, to a great extent, depend on our proficiency in its kindred subjects. As much of our composition has to be written, facility in writing greatly assists in recording what we compose. As much that we write will often be read by imperfect readers, it is well to bear this in mind, for it is better to use a familiar though less suitable word, and have our thoughts correctly rendered, than to have the most correct language murdered by mispronunciation or incorrect intonation.

The importance of correct spelling is too obvious to need comment.

Fluency of utterance and correct enunciation are highly necessary whenever we practise reading aloud or elocution. Public speakers adopt one of four different methods. 1st. They read what they have previously written or perchance selected. 2nd. They use notes to call to mind the headings of their subject. 3rd. They

memorize and recite what they have previously composed; or, 4th. They speak what they compose as they go along. This last only is strictly extempore speaking, although the second and third are frequently so designated. The objection to written sermons is that they are generally badly read: the objection to extempore sermons is that the matter is generally poor. Consequently bad readers with bad memories are not likely to make good preachers, however skilled they may be in composition.

Grammar, in its most restricted sense (as when we speak of good or bad grammar), lies at the foundation of elementary composition. In a wider sense, as when we take up analysis, parsing and syntax, by examining and taking to pieces the work of others, it assists us to build up for ourselves. In its most extended meaning, grammar includes all we are now considering.

There are three points at which all composition should aim. 1st. Conciseness. 2nd. Comprehensiveness. 3rd. Purity.

1st. Conciseness. Some persons, when they sit down to write for a newspaper, seem to imagine that there will be but little else in the paper worth reading, and consequently want elbow room. Of the articles intended for publication many never appear, and of those that are inserted not a few are scarcely read at all, simply because they are too long. Nor is this whose nuisance exemplified in newspapers alone. What with repetitions and unnecessary statements, much of our correspondence is extended to needless length,—a loss of time to both writer and reader. "Write to Jones," said a merchant, in rather ill-humour, to his clerk one day. "What shall I write him?" said the clerk. "Something or nothing, and that pretty quick!" was the answer.

In a few days a money letter was received from Jones, and the merchant wished to know what the clerk had written to bring the cash so soon. "I wrote what you told me," said the clerk, turning up the letter-book. "Here it is: 'Something or nothing, and that pretty quick!'"

Post-cards and telegrams have done much to save the use of unnecessary words, an improvement which might with advantage be exhibited elsewhere, though it might be charged with being the result of making "a virtue of necessity."

2nd. Comprehensiveness. By this I mean that nothing essential should be omitted. "One word, your majesty," said a soldier to Napoleon. "I'll have you shot if you say two," said the emperor. "Sign," said the man, as he presented him with a document ready for signature. The two great errors where lack of comprehensiveness occurs are: 1st. Forgetting to make some important statement, as when one gives notice of a meeting but omits to say where it will take place; and 2nd. Taking for granted that the reader or hearer knows what he really does not know, as when a meeting is announced to take place at the usual hour, when possibly some individual in the audience is not aware what the usual hour is. This class of errors requires constant watchfulness.

3rd. Purity. By this I mean that the ideas should be truthful, and the language well-chosen. Unfortunately, on this side the Atlantic, party feeling runs so high, and newspaper writers are so addicted to the use of extravagant language that the narration of bare facts seems to be lost sight of in the desire to further an object, or to injure an opponent. Not in politics alone is this exemplified. Are the merits of itinerant lecturers, minstrels, actors, societies or exhibitions under consideration, the ques-



tion is not "are they worthy of praise?" but "are they liberal supporters of the press?" Are matters relating to religion, education, science, or social economy to be discussed, the question is not what are the real merits, but to what extent will the peculiar views and opinions of the proprietors be advanced or retarded. With what pleasure, as a rule, do we turn from the best of our own publications to such periodicals as *Chambers' Journal*, the *Illustrated London News*, and other carefully written and discreetly edited English newspapers and serials, and feel that we are reading *facts*. Nor is carelessness much less mischievous than wanton malice. In the summary of news known as editors' notes, in which lengthy articles are supposed to be boiled down, how seldom do we find the facts accurately stated, when we know enough of the matter to form an unbiased opinion? With what satisfaction a man, who both by precept and practice encourages the use of simple language, when he has reluctantly and under necessity used such words as "catalectic" and "hypermeterical," finds himself credited with using "hypercatalectic!"

To have a thorough command of language requires extensive reading and close study, but for ordinary purposes, as Benjamin Franklin says, "want of care does more harm than want of knowledge." The same idea may sometimes be expressed in different ways, but generally speaking, every change of words produces a corresponding modification of meaning. For instance, some words are relatively strong or weak, others are of general or particular meaning, while others again are common and familiar, or choice, but less easily understood. The employment of the best word in every case is the highest aim of composition.

In teaching composition we have

carefully to distinguish between the ideas and the words employed to express those ideas. We have also to attend to the form when the composition is written. In the form, I include the place of commencing the lines and paragraphs, the size of the writing, the spaces between the words; the division of words when necessary, punctuation, and the use of capital letters. If the first lessons in dictation have been properly taught, the teacher will have very little trouble with these matters; but if dictation has been employed merely as an exercise in spelling, he will meet with difficulties which might have been avoided.

The practice of requiring scholars to say *capital* whenever they spell a proper noun, I have always regarded as a waste of time. The natural inference would be that words not so spelt should be commenced with a small letter, but such is not the case. The words "and" and "the" are often written with capitals, but you do not spell them *so* orally. North, South, Pacific, Teacher, and Trustee, are spelt both with and without capitals, but spelling London capital L-o-n-d-o-n will not help the scholar in the proper way to write those words. In most schools transcription, that is copying from the Reading-books, is employed in the junior classes, and dictation, as the pupils advance. If pupils are required to make capitals whenever they occur in the books, they will form habits which will be of more use to them than all the rules, and will cover most cases instead of providing for the easiest only, leaving the most difficult unthought of.

Punctuation should be taught with dictation. Let the pupils put in the stops, using their own judgment, and compare with the book afterwards. When they can punctuate other people's writing, they will have no trouble with their own.

The different forms of correspondence should not be neglected at the proper time. The place of the date, the address, and the subscription of a letter, emphatically mark the character of the writer as much as the matter itself. Yet, how few persons take the trouble to be reasonably accurate in these points. When three or four lines are taken, as in the form "I have the honour to be, sir, your obedient servant, N. or M." they should incline to the right downwards, but not too exactly. There is a general tendency with inexperienced writers to crowd the signature to the right. In fact, the practice of crowding words at the end of the lines is very objectionable, and causes much inconvenience to readers. A little care in dictation and other written exercises will do much to correct this habit. A good plan adopted by some teachers is to require pupils to write their names on the last line of each page of the copy-book. This is followed by the date and the name of the village, township, etc., varying from day to day, one object being to train the eye to judge of the spaces different words will occupy, and eventually enable the writer not only to avoid crowding, but also to make the practice of dividing words, so inconvenient to readers, a thing of rare occurrence, and at the same time retain a fair looking page.

So much has been said respecting forms. We now come to ideas and the words used to express them. It is no part of the teacher's work to attempt to originate ideas in the mind of the pupil. It is doubtful whether any effort on his part can accomplish such an object. New ideas may follow the effort to properly clothe those which exist. But the teacher's business is to suppress what is bad, to correct what is imperfect, and to cultivate what is good.

Some teachers begin by giving their

pupils a subject such as "Happiness" or "Christmas," and telling them to write an essay. Others set them to write some lesson from the Reader in their own words. Another plan is to let them describe what they did or saw on the road to school. A fourth, and perhaps the best plan, is to give them single words, such as "to," "too," "two," and let them form sentences. The very mistakes of the pupils will afford material for expanding the ideas, and supply training in the use of words. The other plans may be introduced at the proper time. In writing lessons in their own words, care should be taken that it is not a mere repetition of the words of the books from memory. There is less danger of this in rendering poetry into prose.

Change of construction, that is altering from the active to the passive voice, and from principal to subordinate propositions, etc., should follow as soon as the scholars know enough of grammar. As an example of several principal propositions thrown into one sentence, the following letter from an editor to a delinquent subscriber may be quoted: "Sir,—You promised to pay for your paper last month. You did not do so. I shall stop your paper. I shall sue you in the Division court." "Sir,—In consequence of your failure to pay your subscription according to promise, your paper will be stopped, and the account placed in the Division court for collection." The particular use of the forms, "In reply to your favour of the 1st inst., I beg to state," "I have the honour to inform you," etc. should be fully explained, and the use of the most appropriate in every case insisted on.

I have classed "ordinary conversation" as a department of composition. If this classification be correct great care should be taken with our common talk. We may try to take

extra precaution, but our errors, oddities and vagaries will creep into our writings and speeches in spite of us. The editor who habitually says "I seen it myself," is very likely to get "we seen" instead of "we saw" in his paper. Therefore bend the twig in time, and allow no error in either grammar or pronunciation to pass uncorrected. To do this successfully the teacher himself must be a model in conversation. The pupils will have errors enough driven into them at home and on the street, without having them clinched at school.

As a step towards extempore speaking pupils may be trained to deliver messages verbatim. At first the messages may be composed by the teacher and memorized by the pupil; and afterwards the teacher may give the

substance and allow the pupil to put it into proper shape. Means should be taken to ascertain that the messages are correctly delivered.

I attach but little importance to exercises in composition as homework. A little done under the eye of the teacher is worth a great deal done elsewhere. The examining and correcting of composition involves much labour on his part, but it is worth all the trouble it takes. At first the poor attempts of your pupils may be discouraging, but success will be likely to follow failure. Your pupils may not all be embryo Miltons or Shakspeares, but all may be better for your care, and some may rise to important positions in the community, to which the teacher's practical thoughtfulness may, in no small degree, aid in their reaching.

CHRISTIANITY AND ITS NEW ASSAILANTS.—Those who boast or think that the intellectual battle against Christianity has been fought and won are reckoning without their host. Christianity, even in its sadly imperfect development, is, as a matter of fact, at the head of the world. I am tempted, gentlemen, further to offer you, with a daring which I hope may be thought excusable, a general observation on the frame of mind in which we all—and, most of all, those specially engaged—should meet that conflict or contact with opposing forces, which in this day no thoughtfully educated man can hope wholly to escape. No defence is to be found in timidity, but much defence is to be found in circumspection. What we have most to complain of is a perceptible rapidity of question, trial, and summary condemnation, which is perhaps as far removed from reason as is the grossest of the superstitions it condemns. There is a kind of steeplechase philosophy in vogue; sometimes it is specialism that assumes the honours of universal knowledge, and makes short cuts to its conclusion. Sometimes it is that knowledge of external nature is, by one of the strangest of solecisms, thought to convey a supreme capacity for judging questions which belong entirely to the sphere of moral action and of moral needs. All this suggests that abnormal causes are in some degree at work; that besides research and the great modern art of literary criticism,

and a useful reaction against usurping traditions, there is, so to speak, something of an epidemic in the air. We have need to examine whether there does not creep about among us a predisposition to disturb, a preference for negation, and something of a mental levity, which are more or less included in the term scepticism—a temper to be discouraged, a frame of mind broadly distinguished from what Dante has sanctioned and Tennyson has called "honest doubt," as well as from a hearty allegiance to truth and a determination, so to speak, even to hate father and mother for its sake. If this be so, what I suggest is, in a manner, to meet scepticism with scepticism, a wanton scepticism with a scepticism more legitimate. Put it on its trial; allow none of its assumptions; compel it to explain its formulæ; do not let it move a step except with proof in its hand; bring it front to front with history; even demand that it shall shew the positive elements with which it proposes to replace the mainstays it seems bent on withdrawing from the fabric of modern society. When it alleges that our advanced morality—such as it is—is really the work, not of Christianity, but of civilization, require it to shew cause why this advanced morality has never grown up except under the ægis of the Gospel; why the old civilizations were one and all smitten with decay, and degenerated in moral tissue even before they lost their intellectual vigour.—*Mr. Gladstone.*

ARTS DEPARTMENT.

ARCHIBALD MACMURCHY, M.A., MATHEMATICAL EDITOR, C. E. M.

Our correspondents will please bear in mind, that the arranging of the matter for the printer is greatly facilitated when they kindly write out their contributions, intended for insertion, on one side of the paper ONLY, or so that each distinct answer or subject may admit of an easy separation from other matter without the necessity of having it re-written.

SOLUTIONS.

The following solutions to Nos. 79, 80 and 82, are given by the proposer, Angus MacMurchy, Univ. Coll.:

79. If the squares of the sides of a triangle are in arithmetical progression, the tangents of the angles are in harmonical progression.

$$a^2 - b^2 = b^2 - c^2.$$

$$\sin^2 A - \sin^2 B = \sin^2 B - \sin^2 C,$$

or

$$\sin(A - B) \sin(A + B) = \sin(B - C) \sin(B + C),$$

$$\therefore \sin(A - B) \sin C = \sin(B - C) \sin A.$$

Expanding and dividing both sides by  $\sin A \sin B \sin C$ ,

$$\cot B - \cot A = \cot C - \cot B,$$

$$\therefore \frac{2}{\tan B} = \frac{1}{\tan A} + \frac{1}{\tan C}.$$

80. If  $A, B, C$  be any three quantities;  $s_1, s_2, s_3, l_1, l_2, l_3$ , the G.C.M.s and L.C.M.s of  $B$  and  $C, C$  and  $A, A$  and  $B$  respectively, and if  $G, L$  be the G. C. M. and L. C. M. respectively of  $A, B$  and  $C$ ,

$$\frac{L}{G} = \sqrt{\frac{l_1 l_2 l_3}{s_1 s_2 s_3}}.$$

Let a simple factor  $X$  occur to power  $a, b, c$  in  $A, B, C$  respectively. Suppose them to be in descending order of magnitude without excluding cases in which some of them are equal or zero.

Index of  $X$  in  $\frac{L}{G}$  is  $a - c$ ,

Index of  $X$  in  $\left(\frac{l_1 l_2 l_3}{s_1 s_2 s_3}\right)^{\frac{1}{2}}$  is  $\frac{1}{2}(b + a + a - c - c - b) = a - c.$

The same proof applies to every other factor,

$$\therefore \frac{L}{G} = \left(\frac{l_1 l_2 l_3}{s_1 s_2 s_3}\right)^{\frac{1}{2}}.$$

82.  $A, B, C$  is a triangle; a new triangle is formed by joining the feet of the perpendiculars drawn from the angles  $A, B, C$  on the opposite sides. Prove that according as one side of the triangle is an  $A, G$  or  $H$  mean between the other two, so is the cosine of one of the semi-angles of the new triangle an  $A, G$  or  $H$  mean between the cosines of the semi-angles of the other two.

Let  $AD, BE, CF$  be the perpendiculars meeting in point  $K$ , the quadrilaterals  $ABDE, ACDF$  can each be inscribed in a circle,

$\therefore$  angle  $EDC =$  angle  $BAC =$  angle  $FDB.$

$$\therefore \frac{1}{2} \text{ angle } FDE = \frac{\pi}{2} - A.$$

$$\therefore \cos \frac{FDE}{2} = \sin A.$$

Now,  $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$ ,  $\therefore$  cosines

of the semi-angles of pedal triangle are proportional to the sides on which their vertices lie; therefore whatever homogeneous relations subsist between the sides of the original triangle must subsist between the cosines of the semi-angles of the pedal triangle.

Solutions to questions 106 and 109, by the proposer, D. F. H. Wilkins, B.A.

106. For the question, see January number, 1880.

The left-hand side of the identity is

$$\begin{aligned} & \frac{(a+b)^4 \{ (c+b) - (c+a) \} \{ (c+b) + (c+a) \} +}{(a+b)^2 \{ (c+b) - (c+a) \} +} \\ & \quad \text{anal. anal.} \\ & = \frac{(a+b)^4 \{ (c+b)^2 - (c+a)^2 \} + \text{anal.}}{(a+b)^2 \{ (c+b) - (c+a) \} + \text{anal.}} \\ & = \frac{x^4(y^2 - z^2) + y^4(z^2 - x^2) + z^4(x^2 - y^2)}{x^2(y-z) + y^2(z-x) + z^2(x-y)} \\ & = \frac{(x^2 - y^2)(y^2 - z^2)(z^2 - x^2)}{(x-y)(y-z)(z-x)} \\ & = \frac{3(x^2 - y^2)(y^2 - z^2)(z^2 - x^2)}{3(x-y)(y-z)(z-x)} \\ & = \frac{(x^2 - y^2)^3 + (y^2 - z^2)^3 + (z^2 - x^2)^3}{(x-y)^3 + (y-z)^3 + (z-x)^3} \\ & = \frac{\{ (a+b)^2 - (c+b)^2 \}^3 + \text{anal.} + \text{anal.}}{\{ (a+b) - (b+c) \}^3 + \text{anal.} + \text{anal.}} \\ & = \frac{(a-c)^3 (a+c+2b)^3 + \text{anal.} + \text{anal.}}{(a-c)^3 + \text{anal.} + \text{anal.}} \end{aligned}$$

NOTE.—It will be observed that  $x$  is put for  $(a+b)$ ,  $y$  for  $(b+c)$ , and  $z$  for  $(c+a)$ .

109. If  $x$  be the circular measure of any arc, then

$$1 - \frac{x^2}{2} + \frac{x^4}{24} - \dots = \left\{ 1 - \frac{2x^2}{2} + \frac{8x^4}{24} - \dots \right\}^{\frac{1}{2}}$$

both sides being infinite.

$$\therefore 2 \cos^2 A = 1 + \cos 2A,$$

$\therefore$  if  $x$  be the circular measure of the arc, measuring angle  $A$ , we have, by DeMoivre's Theorem, &c.,

$$\begin{aligned} & 2 \left\{ 1 - \frac{x^2}{2} + \frac{x^4}{24} - \frac{x^6}{720} + \dots \text{ ad infin.} \right\}^2 \\ & = 1 + 1 - \frac{(2x)^2}{2} + \frac{(2x)^4}{24} - \frac{(2x)^6}{720} + \dots \\ & = 2 - \frac{4x^2}{2} + \frac{16x^4}{24} - \frac{64x^6}{720} + \dots \\ & \therefore \left\{ 1 - \frac{x^2}{2} + \frac{x^4}{24} - \frac{x^6}{720} + \dots \right\}^2 \\ & = 1 - \frac{2x^2}{2} + \frac{8x^4}{24} - \frac{32x^6}{720} + \dots \end{aligned}$$

$$\text{or } 1 - \frac{x^2}{2} + \frac{x^4}{24} - \frac{x^6}{720} + \dots$$

$$= \left\{ 1 - \frac{2x^2}{2} + \frac{8x^4}{24} - \frac{32x^6}{720} + \dots \right\}^{\frac{1}{2}}$$

Solution by proposer, Prof. Edgar Frisby, M.A., N.O., Washington.

$$92. \cos A = \frac{b^2 + c^2 - a^2}{2bc}; \quad \sin A = \frac{2\Delta}{bc};$$

$$\cos B = \frac{c^2 + a^2 - b^2}{2ac}; \quad \sin B = \frac{2\Delta}{ac};$$

$$\cos C = \frac{a^2 + b^2 - c^2}{2ab}; \quad \sin C = \frac{2\Delta}{ab};$$

$$\cot A = \frac{b^2 + c^2 - a^2}{4\Delta}; \quad \cot B = \frac{c^2 + a^2 - b^2}{4\Delta};$$

$$\cot C = \frac{a^2 + b^2 - c^2}{4\Delta},$$

whence

$$\cot A + \cot B + \cot C = \frac{a^2 + b^2 + c^2}{4\Delta}, \quad (1)$$

$$\begin{aligned} & a^2 \cot A + b^2 \cot B + c^2 \cot C \\ & = \frac{2a^2b^2 + 2a^2c^2 + 2b^2c^2 - a^4 - b^4 - c^4}{4\Delta} \\ & = \frac{16\Delta^2}{4\Delta} = 4\Delta, \quad (2) \end{aligned}$$

$$\cot^2 A = \frac{b^4 + c^4 + a^4 + 2b^2c^2 - 2a^2b^2 - 2a^2c^2}{16\Delta^2},$$

and similar quantities for  $B$  and  $C$ .

$$\therefore \cot^2 A + \cot^2 B + \cot^2 C = \frac{3(a^4 + b^4 + c^4) - 2(a^2b^2 + a^2c^2 + b^2c^2)}{16\Delta^2}$$

$$\begin{aligned} & \cot^2 A + \cot^2 B + \cot^2 C \\ & = \frac{2a^2b^2 + 2a^2c^2 + 2b^2c^2 - a^4 - b^4 - c^4}{16\Delta} \\ & = \frac{2(a^4 + b^4 + c^4)}{16\Delta^2} \end{aligned}$$

$$1 + \cot^2 A + \cot^2 B + \cot^2 C = \frac{a^4 + b^4 + c^4}{8\Delta^2}. \quad (3)$$

Many other results could be obtained by eliminating  $\Delta$ , &c.

A different solution was sent in by S. T. G. Barton, Univ. Coll.

77. To shew  $\frac{\sin 8A}{\cos 3A \cos 5A}$

$$= \frac{\sin A + \sin 3A + \sin 5A + \sin 7A + \sin 9A}{\cos A + \cos 3A + \cos 5A + \cos 7A + \cos 9A}$$

$$+ \frac{\sin A + \sin 2A + \sin 3A + \sin 4A + \sin 5A}{\cos A + \cos 2A + \cos 3A + \cos 4A + \cos 5A}$$

For

$$\frac{\sin A + \sin 3A + \sin 5A + \sin 7A + \sin 9A}{\cos A + \cos 3A + \cos 5A + \cos 7A + \cos 9A}$$

$$= \frac{(\sin A + \sin 9A) + (\sin 3A + \sin 7A) + \sin 5A}{(\cos A + \cos 9A) + (\cos 3A + \cos 7A) + \cos 5A}$$

$$= \frac{2 \sin 5A \cos 4A + 2 \sin 5A \cos 2A + \sin 5A}{2 \cos 5A \cos 4A + 2 \cos 5A \cos 2A + \cos 5A}$$

$$= \frac{\sin 5A (2 \cos 4A + 2 \cos 2A + 1)}{\cos 5A (2 \cos 4A + 2 \cos 2A + 1)} = \frac{\sin 5A}{\cos 5A}$$

and

$$\frac{\sin A + \sin 2A + \sin 3A + \sin 4A + \sin 5A}{\cos A + \cos 2A + \cos 3A + \cos 4A + \cos 5A}$$

$$= \frac{(\sin A + \sin 5A) + (\sin 2A + \sin 4A) + \sin 3A}{(\cos A + \cos 5A) + (\cos 2A + \cos 4A) + \cos 3A}$$

$$= \frac{2 \sin 3A \cos 2A + 2 \sin 3A \cos A + \sin 3A}{2 \cos 3A \cos 2A + 2 \cos 3A \cos A + \cos 3A}$$

$$= \frac{\sin 3A (2 \cos 2A + 2 \cos A + 1)}{\cos 3A (2 \cos 2A + 2 \cos A + 1)} = \frac{\sin 3A}{\cos 3A}$$

$$\therefore \text{Sum} = \frac{\sin 5A}{\cos 5A} + \frac{\sin 3A}{\cos 3A}$$

$$= \frac{\sin 5A \cos 3A + \sin 3A \cos 5A}{\cos 5A \cos 3A}$$

$$= \frac{\sin (3A + 5A)}{\cos 5A \cos 3A} = \frac{\sin 8A}{\sin 3A \sin 5A}$$

S. T. G. BARTON,  
*Univ. Coll.*

PROBLEMS.

118. To find the local time at Ottawa on 1st February, 1880, when the sun will pass behind a tower which stands  $30^\circ$  south of the west point.

119. To find the probability of throwing  $n$  rings whose diameters are (1) in geometrical progression, (2) in arithmetical progression, over an upright standard. It may be assumed that the rings are thrown so that their planes are perpendicular to their direction of motion, or nearly so, and that a circle, radius  $a$ , may be drawn, having for centre

the apex of the standard to represent unity; so that  $a$  will depend inversely on the skill of the thrower.

W. J. R. McMINN, B.A.,  
*Ottawa.*

120. A square, 160 feet side, has four circular flower beds, the centres of which are at the angular points of square, and radii 80 feet; find the area of the square unoccupied by the flower beds, and the radius of the smaller circle which will touch the four circles, given  $\sqrt{2} = 1.4142$  (approx.)

121. Prove that

$$3(1+1) + \frac{5}{1} \{ (n+1) + 2n + (n-1) \} +$$

$$\frac{7}{12} \{ (n+2)(n+1) + 3(n+1)n$$

$$+ 3n(n-1) + (n-1)(n-2) \}$$

$$+ \frac{9}{13} \{ (n+3)(n+2)(n+1) + 4(n+2)(n+1)n$$

$$+ 6(n+1)n(n-1) + 4n(n-1)(n-2)$$

$$+ (n-1)(n-2)(n-3) \} + \dots = 0,$$

where  $n$  is positive and  $\geq 2$ .

D. F. H. WILKINS, B.A.  
*Math. Master, High School, Chatham.*

122. If  $\frac{A+B+C}{abc} = \frac{A}{a} + \frac{B}{b} + \frac{C}{c}$  (1)

and  $(A+B+C)(a+b+c) = Aa + Bb + Cc$ , (2)

then will  $\frac{A}{1+a^2} + \frac{B}{1+b^2} + \frac{C}{1+c^2} = 0$

and also  $\frac{A}{a + \frac{1}{a}} + \frac{B}{b + \frac{1}{b}} + \frac{C}{c + \frac{1}{c}} = 0.$

$$(A+B+C)(a+b+c) = Aa + Bb + Cc,$$

$$\therefore A(b+c) + B(a+c) + C(a+b) = 0$$

and from (1)

$$A(1-bc) + B(1-ac) + C(1-ab) = 0$$

$$\therefore \frac{A}{(1-ac)(a+b) - (a+c)(1-ab)}$$

$$= \frac{B}{(b+c)(1-ab) - (1-bc)(a+b)}$$

$$= \frac{C}{(1-bc)(a+c) - (b-c)(1-bc)}$$

i.e.,

$$\frac{A}{(b-c)(1+a^2)} = \frac{B}{(c-a)(1+b^2)} = \frac{C}{(a-b)(1+c^2)}$$

$$\therefore \frac{A}{1+a^2} = \frac{B}{1+b^2} = \frac{C}{1+c^2}$$

$$= \frac{A}{1+a^2} + \frac{B}{1+b^2} + \frac{C}{1+c^2} = 0,$$

$$\therefore \frac{A}{1+a^2} + \frac{B}{1+b^2} + \frac{C}{1+c^2} = 0.$$

Again,

$$\frac{A}{a(b-c)(a+\frac{1}{a})} = \frac{B}{b(c-a)(b+\frac{1}{b})} = \frac{C}{c(a-b)(c+\frac{1}{c})}$$

$$\frac{A}{a+\frac{1}{a}} = \frac{A}{a+\frac{1}{a}} + \frac{B}{b+\frac{1}{b}} + \frac{C}{c+\frac{1}{c}}$$

$$\therefore \frac{A}{a(b-c)} = \dots = \frac{A}{ab-ac+bc} + \frac{B}{-ab+ac-bc} = 0.$$

$$\therefore \frac{A}{a+\frac{1}{a}} + \frac{B}{b+\frac{1}{b}} + \frac{C}{c+\frac{1}{c}} = 0.$$

$$123. \text{ If } \frac{xh}{a^2} = \frac{yk}{b^2} = \frac{zl}{c^2} \text{ and } \frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1,$$

$$\text{prove that } \left(\frac{x}{h} + \frac{y}{k} + \frac{z}{l}\right)^2 = \frac{a^2}{h^2} + \frac{b^2}{k^2} + \frac{c^2}{l^2}$$

$$\frac{xh}{a^2} = \frac{x}{\frac{a^2}{h}}, \quad \frac{yk}{b^2} = \frac{y}{\frac{b^2}{k}}, \quad \frac{zl}{c^2} = \frac{z}{\frac{c^2}{l}}$$

$$(1) \therefore \frac{xh}{a^2} = \frac{yk}{b^2} = \frac{zl}{c^2} = \frac{\frac{x}{\frac{a^2}{h}} + \frac{y}{\frac{b^2}{k}} + \frac{z}{\frac{c^2}{l}}}{\frac{h^2}{a^2} + \frac{k^2}{b^2} + \frac{l^2}{c^2}}$$

$$(2) \text{ and } \frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1.$$

\(\therefore\) Dividing the terms in (2) by the corresponding terms of (1),

$$\frac{x}{h} + \frac{y}{k} + \frac{z}{l} = \frac{\frac{a^2}{h^2} + \frac{b^2}{k^2} + \frac{c^2}{l^2}}{\frac{h^2}{a^2} + \frac{k^2}{b^2} + \frac{l^2}{c^2}}$$

$$\therefore \left(\frac{x}{h} + \frac{y}{k} + \frac{z}{l}\right)^2 = \frac{a^2}{h^2} + \frac{b^2}{k^2} + \frac{c^2}{l^2}.$$

J. L. COX, B.A.,

Math. Master, Coll. Institute, Collingwood.

124. What is the length of an edge of the largest cube that can be cut from a sphere 40 inches in diameter?

125. Any number is divisible by 11, if, counting from the units place, the sum of the digits in the odd places is equal to the sum of the digits in the even places, or if the difference between these sums is divisible by 11. Give mathematical proof of this.

126. A circular grass plot whose area is one-quarter of an acre, has erected at its centre a pole 12 feet high, and of the uniform diameter of one foot. Attached to the top of this pole is one end of a cord, the length of which is just sufficient to allow the other end to touch the edge of the plot. The cord is then wound spirally on the post so as to make one complete revolution in every foot of its descent. When it has been thus wound from the top to the bottom of the post, what is the area of the circle, in square yards, of which the unwound part of the cord is radius.

127. If  $x$  be any odd number greater than unity, shew that  $(x^5 - x)$  is divisible by 24; also that  $(x^2 + 3)(x^2 + 7)$  is divisible by 32.

128. The sum of the squares of three consecutive numbers, when increased by unity, is divisible by 12 but never by 24.

$$129. \text{ If } x = (p+q)^2, \text{ find value of } (p^2 + q^2)x - 2pqx - (q^4 + p^4)$$

130. Shew that

$$(x-y)^3 + (y-z)^3 + (z-x)^3 = 3(x-y)^2 + 3(y-z)^2 + 3(z-x)^2 - 6(x-y)(y-z)(z-x).$$

131. Shew that

$$abc > (a+b-c)(a+c-b)(b+c-a).$$

If one relation exists between the values of  $a$ ,  $b$  and  $c$ , this proposition is not true; point out that relation.

132. Two spheres, whose radii are  $x$  and  $y$ , touch each other internally. Find the distance of the centre of gravity of the solid contained between the two surfaces, from the point of contact.

W. J. ELLIS, B.A.

Math. Master, Coll. Institute, Cobourg.

## CONTEMPORARY OPINION ON EDUCATIONAL TOPICS.

## THE VICE-CHAIRMAN OF THE LONDON SCHOOL BOARD ON EDUCATION.

At the final meeting of the London School Board, elected in 1876, among the various votes of thanks proposed was one to the Rev. John Rodgers, the vice-chairman, who has shewn more interest in and sympathy with the work of popular education in London, and the teachers engaged in it, than any other individual at the Board—except perhaps the chairman, Sir Charles Reed. Mr. Rodgers, in his reply to the vote of thanks, stated that whether re-elected to the Board or not, he would in no way relax in his determination to assist in the work of education. His great object of life would ever continue to be to promote the education of the people. Our readers, we are sure, will thank us for bringing under their notice a man who has won the esteem and love of every teacher employed by the London School Board. That they may see how well these feelings are merited we subjoin a speech made by Mr. Rodgers lately, at the annual meeting of the Metropolitan Board Teachers, held at the Crystal Palace, Sydenham.

I am here to represent Sir Charles Reed in part, although I have nothing to say, and I have nothing to say simply because I do not think it is right to inflict a speech on you on your holiday in this charming place. Get out of the gas into the sunshine. You may say to me as Diogenes said to Alexander when the king asked him, "What can I do for you?" "Nothing," said Diogenes, "except stand from between me and the sun." Now what am I to say next? When I look at you teachers I feel a sort of inspiration come to me. I love the word "inspiration." I never swear, but if I ever did, I should say "Con-

found codes and that sort of thing." Teach; don't teach because the codes put down certain things, because there is a School Board ruling over you, because you are paid £ s. d. for doing it. Away with all these reasons! Teach because you love it. Teach because you love what you teach; teach because you are full of it; teach because you love those little, thinking, sensitive beings you call boys and girls, and you want to inspire them with the nobility of human life. Your president, in his excellent address, reminded you that the child is the father of the man. You are teaching, not the little children gathered around you to-day, but the men and women that these little children shall be in their day, and the men and women, from them, that shall people this metropolis, and this country and the world a future day. It is a grand, and a noble, glorious work, "moulding" character, as your president said. I like a thing neatly moulded, pretty and that sort of thing, but I like inspiration better. I like very well to see external beauty, but I want to see something more. I like very well to see the drill of a body of soldiers; it is a fine sight to see them stand up and step out together, with measured, uniform tread. I like to see that, but I like better to see the motion of the kitten or the little child; it is natural, graceful, beautiful. I take this merely to illustrate the great work of education. I like to see books and black-boards, but still I do not want you to teach out of books or of blackboards; I want you to teach out of yourselves. I do not want you to teach a boy that twice two are four because the multiplication table says so and has said so ever since I was a boy, but because it is in your consciousness, in your inner life, and part of your own intellectual living being that twice two are four; and knowing it, and



living it, and being it, to inspire the children with it—to inspire them with the intellectual, emotional, moral, and, if you will, religious life which you have in yourselves, and thus influence and benefit them, and by a necessary reaction benefit yourselves. This is what I understand by education; and to do this I do not want Codes, nor Education Departments, nor School Boards. They are required for other purposes—to keep the external machinery in order; but the living teacher is not the work of Sir Francis Sandford nor the Duke of Richmond, nor Lord George Hamilton, nor of the London School Board. Our duty is merely to keep the gearing right; the great work of education rests with you. You metropolitan teachers, I am glad you have associated yourselves together, because I like the fundamental idea of association—Unity. I don't want the teachers of the metropolis to separate themselves from the teachers of the country. I do not want the public elementary teachers to separate themselves from the teachers of the middle-class schools, nor the Board school teachers especially from the voluntary school teachers. I do not like caste. I do not like class. I am not one of the upper *ton*, the "upper ten thousand," and perhaps the grapes are sour. Though there may, and perhaps must, be a difference of position, and though the boy belonging to a nobleman who can afford to pay for his education may, and perhaps ought to, have a better kind of education, I want you to realize that you are dealing with the same thing, and that is humanity, that which God hath made; and I have yet to learn that God hath given the aristocratic portion of humanity a monopoly of brain, or the appreciation of beauty, or of character. I do not go into intricacies of thought as my friend Mark Wilks here, but I am perfectly conscious in my inner life of one thing—that God is the God and father of us all, and that we are one great family, and that you as teachers have to instruct and educate and develop the powers of the young of the family. I go into your schools sometimes—I wish I could go oftener—and sometimes the master

seems to say, "Is not this grand? See what discipline! Listen to their teaching; see how accurately and quickly the children answer!" I say, "Yes, it is all very good, but there is something wanting." I go into another school which is less perfect from certain points of view, which has not the complete accuracy in detail, and the perfection of discipline, and the soldier-like order, and yet I can see there is something in the school that is better than all that put together; I cannot say what it is—it is in the teacher; it is not that he is a better scholar or disciplinarian than the other, but it is that he gets hold of the living child, and has a living sympathy with it, and there is an immortal link, a living union between the spirit of the teacher and the spirit of the pupil, and that accomplishes something which nothing else can. I want you, possessing the power, to exercise it in giving a tone to your schools. Make scholars by all means—accurate, clever scholars—but above all make gentlemen and ladies of them. I am a great admirer of Jesus Christ; looking at Him merely as the great man in the history of humanity, I am a great admirer of Him because He is a perfect gentleman. Take Him as your model, and being imbued, inspired with Him, by being gentle yourselves make your pupils so. I believe in my innermost life that the success and efficiency of education depend upon the teachers, and therefore I am with them heart and soul in all that will raise them, and in raising them, raise and elevate the great work in which they are engaged.

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#### WHAT CONSTITUTES AN EDUCATION?

Education began as soon as a child began to distinguish and discriminate between one thing and another. Cardinal Newman has said that education was the conversion of the Kaleidoscope into the picture. This was so. If there was any one thing which marked an educated man from an uneducated man, and that contributed the highest test of an educated mind, it was this power,—beginning early in life, and developing,—

of analyzing, discriminating, and classifying. It did not make so very much difference what means were used for this development, providing it was something by which we could hook into the child's mind, whereby we might draw him out. David, the Psalmist, was educated. He had not the higher mathematics and classics, but he obtained the advantage of the means of education which were in existence, in his day, and used them in developing his faculties. Real education was a process that went on so long as the mind gave evidence of any degree of capacity or progress. A man at sixty was still developing his education, or if he was not he was in his decay, and it was time for him to make his will. Language, mathematics, and certain other sciences, were of the utmost importance in the process of mental training, and would continue to be regarded as the most essential means, both for education and disciplining the mind, and as sources of knowledge.

The first requisite necessary in creating an education was to awaken an interest in the pupil which would be to him a spontaneous movement,—in other words, they should present him a motive. Interest might be created accidentally, it might be created methodically. But once awaken the interest and the process would go on. The machine would run itself, so to speak. Therefore awaken an interest in the pupil, and awaken it by any means possible,—except, however, by telling him about his chances of becoming the President of the United States. An indolent and inactive child might be made to become a useful man, if he was only properly drawn out by his teachers. The "bright" boy was seldom the boy from whom the largest results would be obtained in after-life. The right use of memory was an important factor in the process of education. The mere use of memory for a given

lesson to be recited at a given hour was a fatal blunder; an egregious blunder; an inexcusable blunder. And yet that was the most common fault of our system of popular education to-day. To see, apply, and understand was worth infinitely more than to memorize page after page that would be imperfectly understood, if understood at all. The study of object-lessons might be of help, but it was a thing that seemed to be pushed to the front with a little too much persistency sometimes. The child had a mind. Teach him to use it; to apply facts. Teach objects if we would, but teach also ideas. The child would not get his ideas of right and justice from objects.

Good teaching, the speaker believed, came more from the personality of the teacher, than from the text-books. The longer he lived the less faith he had in text books. The best text-book was a living teacher. The best teacher of grammar, for instance, was the man or woman who talked the English language properly. That was the English grammar. After the pupils had learned the English language, then shew them why you spoke this language rather than any other. If there was anything the graduate from a school or college wanted to remember very little about, it was the text-book he had studied. The privileges of the teacher were great. They all centered in the personality of the teacher. If a person was a good teacher, it was because that person delighted in teaching. The good teacher grew in knowledge. In order to teach, he must be ever learning, and the best way to learn was to teach. A great work was committed to the teachers,—none nobler or more responsible,—one that should engage the heart and mind and the whole being, for the child committed to his care was a great trust.—*Rev. Dr. Robinson, President of Brown University.*

## CONTRIBUTORS' DEPARTMENT.

## HIGH SCHOOLS AND COLLEGIATE INSTITUTES.

To the Editor of the Canada Educational Monthly:

SIR,—I beg to be allowed to offer some observations in reply to a communication in your last issue over the signature *Justitia*, a *nom de plume*, it seems to me, singularly at variance with this writer's assertions and his objects. I do not propose at present to follow him in detail through his laboured attempt to justify a species of monopoly; his trepidation in view of the real question at issue, and his anxiety to divert attention by raising side issues, sufficiently indicate to the intelligent reader the merits of his cause. So great are his alarm and confusion that he does not notice that no such proposition as the withdrawing of the extra grant of \$750 to Collegiate Institutes was made by the writer of the article in the *Whitby Chronicle* (to be found in your December issue). The Minister of Education was urged *not* to interfere with vested rights. He *was* urged to reckon a girl of the same value as a boy throughout the High School system. Is *Justitia* prepared to oppose this proposition? It would be interesting in the face of the attitude towards female education of the great universities throughout Europe and America, the founding of Girton and similar colleges, and the brilliant achievements, at the Provincial University, of young ladies coming from the High Schools and Collegiate Institutes, to see his apology for the gratuitous insult that is put upon every young lady in the High School by estimating the worth to the country of the pursuit of classics on her part as utterly without pecuniary value, and that of boys, every year, the handsome sum of ten thousand dollars. The aim of the writer in the *Whitby Chronicle* was not, I repeat, to

deprive the Collegiate Institutes of the extra grant of \$750 per annum, but to gain for the High Schools the same amount, by the pursuit of other subjects of quite as much value as the ancient classics, and open to all, irrespective of sex. *Justitia's* piteous plea for "vested rights" and "extra grant" may therefore, for the present be entertained. As the article in the *Whitby Chronicle* was written with a view to influence legislation; and inasmuch as any part that I might take in the discussion of the question would be solely to that end, and since the matter is now not likely to come up for discussion, this Session, in the Legislative Assembly, I do not think I would accomplish my object by pursuing *Justitia* through his maze of figures, and by combating, step by step, his views. Furthermore, the whole question of the extra grant to Collegiate Institutes will, according to notice, be discussed at the next meeting of the Teachers' Provincial Association, High School Masters' section, and I hope will receive such treatment there that the Minister of Education will see his way to remove all grounds of dissatisfaction in the premises at once and forever. Moreover, the discussion of the subject along the lines indicated by *Justitia* would involve the consideration of the classical work done in the Collegiate Institutes individually, and this I am unwilling, for obvious reasons, to undertake. At the risk of the imputation of want of courage, I decline the odious task of comparison.

I may, however, without at present going into the subject as fully as its importance demands, be permitted to say that *Justitia's* figures appear to prove anything but what he wishes and intends them to prove. His first group proves nothing unless it be that in the Collegiate Institutes in 1878, there was "a little Latin and less Greek," and

in some of them a ridiculously small amount of Greek. The table, it will be observed, gives the number of both *boys* and *girls* in Latin. What the public wants to know, in endeavouring to estimate the value to the country of the Collegiate Institute system, is not how many *pupils* but how many *boys* (for in this delightful system the future mothers of the country are not worth considering) were reading Latin, how many writing Latin, how many were in the merest rudiments, how many were mere "dummies," how many were reading Greek, or how many ever in their lives wrote an Iambic. Until these facts are given to the public I will venture to express the opinion that there are in several of the High Schools more *bona fide* students of the ancient classics, and more advanced ones too, than in some of the Collegiate Institutes.

I beg here to utter my dissent from the construction put by *Justitia* upon the expression "forced into Latin." The phrase was used in its now historical sense. (*vide* H. S. I. Reports)—not the odious sense of coercion, but rather in the horticultural sense of rapid development by artificial stimulus, to wit: by preparatory hot-beds, early transplanting, or dwarfing by planting with heads upside down; a sense in which the expression may be allowed to stand without provoking the resentment of anybody.

His second table is not less imperfect than his first, but is much more damaging to his cause. He seeks to derive an argument for the continued existence of Collegiate Institutes, from the fact that they spend more money than the High Schools! As well might he seek to defend the ἀδελφία of Polyphemus by quoting his bill of fare. *En passant* the sum of \$10,000, the aggregate amount in round numbers of the \$750 extra grant to the 13 Collegiate Institutes, should not be included in the amount raised by localities for teachers' salaries. Admitting, however, the large expenditure in the aggregate of some of the Collegiate Institutes for the years 1877, 1878, it will be found on examination, I submit, that the expenditure

*per caput*, of the great centres of population for higher education is absolutely trifling when compared on the same basis with that of some of the smaller municipalities. His figures, to be worth anything in settling the *raison d'être* of Collegiate Institutes, should exhibit the population of the various localities and the amount contributed by them *per caput* for higher education. What more, I may ask, has any individual in Toronto, or Hamilton, or Kingston, or Cobourg, paid in taxes for the support of higher education than a citizen of "Whitby, Owen Sound, Chatham, Guelph, Stratford, and Waterdown" for the same purpose? In fact he has not paid so much. According, then, to *Justitia's* argument that the Legislative aid should be given most abundantly to those that help themselves most abundantly, Whitby, Owen Sound, Chatham, Guelph, Stratford, St. Thomas, Waterdown and dozens of other places should receive the \$10,000 now granted to Collegiate Institutes. and Toronto, Hamilton and other well-populated "centres of classical and general culture" should go without until they had learned to help themselves. Does not even *Justitia* see the injustice of the system that pays by a bonus raised from all the trifling tax of a wealthy community, and compels a weak and struggling municipality not only to bear in part the burden of the stronger, but, unaided, to bear its own? I think every candid observer will admit that the great centres of population, however much they may appreciate the honour of being "centres of classical and general culture," have not contributed to the support of higher education in proportion to their ability as the districts in which the High Schools are situate have done, and, therefore, that the conclusion that *Justitia* seeks to draw from his imposing array of figures is entirely unwarrantable. *Quære argumenta [Justitia] si qua potis. Nunquam enim hic neque suo, neque amicorum iudicio revincetur.*

I would like to see discussed, Mr. Editor, in the SCHOOL CHRONICLE the startling theory promulgated by *Justitia* that "The avowed principle of the Government (*sic*) in

distributing the High School grant is that those localities are most generously (*sic*) dealt with that contribute most liberally to High School support—not simply those who have but those who *give*." Would *Justitia* kindly indicate where and to what extent this principle is acted upon? Has the Government a different policy for a Public School in a poor township and a High School in a poor municipality? Has the Government derived this idea from Legislative enactment, or is it a figment of *Justitia's* imagination, a corollary to his simple plan

"That they should take who have the power,  
That they should keep who can?"

Is it not wholly a matter of Regulation? What would be its fate if discussed upon the floor of the House? What has the Government of this or any other enlightened country to do with "generosity" in distributing public funds? Its first and only business is to act, not with *Justitia*, but with justice.

Throughout his reply *Justitia* has taken the ground of Shylock: "Is it so nominated in the bond?" "I stand upon the law." The writer in the *Whitby Chronicle* proposed to amend legislation or regulation that seemed defective, and invited a discussion of the *raison d'être* of Collegiate Institutes upon the basis of right. To this invitation *Justitia* has not deigned a reply, but has, instead, raised side issues which have no bearing whatever upon the merits of the case

I regret, moreover, that he has attempted to carry on the discussion by introducing personalities and drawing attention to a writer rather than to his views. It is not a hopeful sign of the growth of dignity in the profession, or a satisfactory expression of "sweetness and light" when a Principal of one of those "centres of classical and general culture" stoops to hint at "jealousy and disappointment" as the motive to the discussion of a confessedly debatable question. Whitby, I may assure him, has no jealousy, except for the right, and no disappointment except that she cannot fulfil her ambition towards her pupils.

The invitation of *Justitia* to the High Schools "on the precarious border land," albeit "it is not possible that every High School will become an Institute," to share the *lot*, to be a "centre of classical and general culture," to stretch hands over the chasm, betrays a feeling, if rightly interpreted, that is most inimical to "honest effort," exposes the mercenary spirit of the system, and betrays the weakness of the situation. Whitby may be forced, by the present method of distributing the High School grant, to seek recognition as a Collegiate Institute, but she would do violence to her traditions and instincts if, when the general discussion comes on, as come it must, she did not cast in her lot with those in the educational world that speak for *Liberty, Equality and Fraternity*.

Yours, WHITBY.

February 10th, 1880.

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THE PUBLIC SCHOOLS OF ONTARIO  
AND THE CENTENNIAL  
EXHIBITION.

By a Foreign Visitor.

To the Editor of *The Canada Educational Monthly*:

SIR,—I am in your country two months now, and at Paris and the Centennial Exhibitions attended. I very much astonished was there the display of school apparatus to find so magnificent. My friends and I myself to one another said, "It is grand, it is superb," and very excellent did we meditate that your schools in Ontario must be. Now am I here, and many schools have visited, and find I nothing as I did intend. All the world in Paris and Philadelphia was under the supposition that the schools at this country were furnished with the seats and desks we there saw; that also, they, every one, had complement of globes, maps, charts, and of object-lessons. But not so, I find it is. What do I find? Nearly fifty schools have been visited with me, and in

forty-four no globe is there : in thirty-nine no map of Canada itself exhibits : in alone two are there charts like the charts at Paris and Philadelphia, of the body and of plants, and they the teachers say they find not time to employ. For object-lessons, in all the schools did I discover not one. Philosophical apparatus, most of the teachers do explain they never have heard with, and chemistry they tell, is at the High Schools taught only!

Mr. Editor, I am astounded. We, at the exhibitions, were impressed, that all the public schools were, with all the apparatus exhibited, wholly furnished, and so must have been the Commissioners both at Philadelphia and Paris too, who the medals and honours awarded. As now appears by me, your *exhibit* was nothing but only a show abstracted from a Museum. Was this proper? Was this British fair play? You make much boast of the honours won by you—they were won by you, I say, on false grounds. Any other civilized nation could as good an exhibit have made, and better, in following a course similar, but they, in the show business, are not what you call "up."

When your Government so well seems to know what every school necessitates, why

does not it compel the schools the things to get, or else not pay them a grant of money, that I am informed it pays?

And then the teachers at the schools too, as well, what are they? I some found to be very good, but in the majority are only young members of the population in third-class certificates. Oh! it is absurd.

That your schools are not good, I say not, but that they the grand and progressive things are that your museum show in Philadelphia and Paris predicated, I do deny.

In Switzerland, in Germany, in Sweden, in Belgium, in Holland, in Denmark, in Scotland, and in England, where public schools have by me been visited, a larger per centum do I find well furnished and taught as I in Ontario do.

Mr. Editor, I write not this to the disgrace of your schools, but in the purpose to shew the bad effects impressed on foreigners about your schools, when they your "show" have seen, and then come to find out the realness in the state of the affairs.

Praying you to excuse for my inaccuracies in the English language,

I am very sincerely yours,

X.

At a recent meeting of the Council of Trinity College, held on 17th inst., the Rev. J. H. Lobley, M.A., D.C.L., was elected successor to Provost Whitaker as head of the College. Dr. Lobley graduated at Cambridge in 1863 as eighth wrangler in the mathematical tripos, and high in the second class of the classical tripos. He was shortly afterwards elected Fellow of his College, Trinity. In 1870 he was awarded a University prize, called the Maitland Prize, founded in honour of Sir Peregrine Maitland, for "an English essay on some subject connected with the propagation of the Gospel, through missionary exertions, in India and other parts of the heathen world." In 1873 he was selected by the late Metro-

politan of Canada, Bishop Oxenden, as the head of his new Theological College, Montreal, and Professor of Theology therein. At the death of the late Dr. Nicholls, Principal of Bishop's College, Lennoxville, Dr. Lobley was elected by the Corporation of the College as his successor, and has filled the offices of Professor of Classics and Mathematics in that institution for the last two years. Under Dr. Lobley's management Bishop's College has been very prosperous, and should he accept the position to which he has now been called, the friends of Trinity College may be congratulated on having secured the services of a gentleman well qualified to succeed Archdeacon Whitaker.—*The Mail*.

## HIGH SCHOOL DEPARTMENT.

## LEGISLATIVE AID TO HIGH SCHOOLS.

ALL interested in the secondary education of our country, and especially those who have lately been endeavouring to secure for High Schools an additional grant from Government, have cause for encouragement even in the small increase in the estimates for 1880. The special and increasingly important claims of these schools for a larger grant are being gradually understood and recognized. For example, the Minister, in speaking of the great amount of "non-professional work" in the preparation of teachers, now accomplished by our High Schools—work formerly required of the Normal Schools—recognized a service that has never been suitably rewarded. The grant for 1880 is only that formerly received. With much additional labour one would expect a liberal advance. In fact we must regard the added \$7,000 as a mere pittance when distributed among 104 schools. Mr. Crooks states that, in 1879, of the 1,207 third-class teachers passed through the Model Schools, 409 were High School pupils, successful at the Intermediate. He might have added, that a large number after passing the same examination, entered the Normal Schools.

An intelligent appreciation of High School work seemed quite general among our legislators. One member, however, from a remote constituency, like some of our frontier obstructionists, interested only in Public Schools, moved a *further reduction* of \$8,000! His motion was lost, and the item, \$83,000, (increase \$7,000) was passed. A Government which boasts of a large surplus ought not to require pressure to be brought to bear, in the form of petition, in order to secure a sum commensurate with *the work done*, and *the local support* given to these schools.

In 1878 the latter amounted to \$202,848, while the legislative grant was only \$77,106. Instead of our legislature insisting on "local equivalents," our municipalities should suggest "legislative equivalents." When the schools receive what they need and merit, the change hinted at will be realized.

The Government, when urged to greater liberality, point to the aggregate grant. High School boards, on the other hand, feel that their actual receipts are in many cases becoming unaccountably small. We once read of a bishop who enclosed one dollar in a two dollar bill, with the remark, "the *dollar* is for the heathen; the *two dollars* to pay for sending it." The expensive and complex machinery of our Education Department seems to some, at least, to suggest a tate of things analogous to that referred to by the bishop. These High School teachers and trustees say that, on adopting the system of "payment by results," they were assured that the expenditure of local funds and a style and quantity of work, under the new system, would certainly secure from Government as large a grant as similar liberality and labour would bring under the old system. These expectations have not been realized. The local grants have in many cases nearly doubled, the staff of teachers have been increased, and the Inspectors report more satisfactory results; and yet the grant has gradually decreased. Already some faithful teachers have had to suffer from the pressure of additional *work* on the one hand, and the *dissatisfaction of trustees* on the other. The latter are inclined to estimate the worth of their teachers solely by "the amount of Government money they bring to the school." Any decrease in the grant is regarded as an evidence of weakness in the management, while these over-worked teachers may be

struggling against uncalled-for obstacles in the hopeless endeavour to satisfactorily keep up the financial *status* under the new system. Our High School masters have expressed a conviction that some different system of grading schools and distributing legislative aid might be adopted without interfering with their efficiency. At present these teachers are so engrossed with cares *financial*, that their usefulness is interfered with, and their positions rendered in many cases precarious.

If Mr. Crooks can relieve the present system of some of its oppressive and objectionable features, he will receive the thanks of all concerned. He has wisely determined that, commencing with 1880, a more rigid adherence to legitimate duties shall characterize those of the committee whose attention to departmental work has been somewhat interfered with. This principle is susceptible of such general application that he may possibly see his way to further retrenchment, resulting, let us hope, in added resources directly available to our High Schools.

#### ITEMS.

COLLINGWOOD Collegiate Institute will hereafter impose a fee.

PERTH C. I. offers \$10 to each successful candidate at the Intermediate.

AT Whitby Ladies' College, they are undertaking to prepare candidates for the Intermediate.

MR. R. B. HARE, B.A., Ph.D. (Victoria and Breslau), has been appointed Science Master in Hamilton Collegiate Institute.

MR. O'CONNOR, late Mathematical Master in London Collegiate Institute, goes to Harriston High School, as Head Master.

VERY few High Schools have organized volunteer companies. The requirements entail too great expense.

MR. STEELE, of Aylmer High School, has been appointed Head Master of Orangeville High School.

MR. W. CHIPMAN, B.A., has resigned his position as Mathematical Master in Nanawau High School, to accept a position connected with his intended profession, civil engineering.

COBOURG Collegiate Institute has an almost overflowing attendance. The "Lorne Medal" is to be given to the highest candidate at the next Intermediate. The young ladies of the Institute have organized a "Literary Union."

OF the 104 High School head masters in Ontario, 37 are from Toronto University; 23 from Victoria; 9 from Queen's; 4 from McGill; 1 from Albert. Who will give us a similar statement of the *assistant* masters who are graduates?

MR. A. PURSLOW, B.A., LL.B., has been appointed on the Board of Examiners for Northumberland and Durham, in place of Mr. Tilley, B.A., who goes from Bowmanville to Lindsay, as Head Master of the High School.

THE case of Miss Shenick, *vs.* the Trustees of Cobourg Collegiate Institute, has been decided adversely to the plaintiff. The Board had given her notice that after 1st of April last, her services would be dispensed with. She, however, sued for salary to the end of her year, that is, up to the date of her original engagement. There being no written agreement, the Board claimed that they had the right to terminate the engagement on giving reasonable notice. Judge Boswell decided "that by law she was entitled to nothing." He recommended the trustees, however, "to give her one month's salary"! She appealed from the decision to the Minister, who very wisely, we think, declined to interfere. Both teachers and trustees may with profit make a note of this instructive case.



## PUBLIC SCHOOL DEPARTMENT.

[Contributed to, and under the management of, Mr. S. McAllister, Headmaster of Ryerson School, Toronto.]

## THOROUGHNESS IN TEACHING.

BY GEORGE A. INCH, NEW BRUNSWICK.

THE primary idea in thoroughness in teaching is accuracy or completeness, the secondary is comprehensiveness. Thoroughness is secured by teaching just what should be taught as well as it can be taught. Thus it is a subject really requiring a complete treatise. My much less ambitious purpose, however, shall be to suggest to you a few means which appear to me necessary and prominent for approximating to this thoroughness. The first I would propose is, that every Teacher should have clearly and firmly in his mind an intelligent idea of the aim of the educational process. How is it possible for him to attain his end if he does not know what it is? The teacher is the architect who strengthens and embellishes the human edifice. Can an architect fashion a convenient and symmetrical palace without having a plan? No, that palace must stand complete and perfect in his mind before he attempts its erection.

To get an idea of the Teacher's plan, allow me to direct your attention to the method of solving a geometrical theorem. Let us analyze the process and note the steps necessary, and their order.

We must first familiarize ourselves with the hypothesis and conclusion. Of these the conclusion naturally receives attention first. It we must clearly apprehend. Having done this we turn to the hypothesis to see what basis or data we are permitted to use to establish that conclusion. It is evident we must understand precisely what both of these are. If we are indifferent to the conclusion,

its attempted attainment is folly; if we misapprehend it, our work will be futile. Should we erroneously interpret the hypothesis we are working either with an altogether different theorem, or no theorem at all. Having clearly and accurately fixed these in our own minds, we apply certain principles or truths to the hypothesis, and the conclusion is established.

Now teaching is a theorem. A human being to be educated is the hypothesis, and a human being educated is the conclusion. Do we as Teachers understand what these are? If we do not, let us by all means, set ourselves about understanding them. It is not enough to have in our minds a definition of them in vague language. There must be a vivid conception of noble, well-developed manhood and womanhood. Not to have this is the incipient and fundamental cause of loose teaching. Either from example or careless habit, too many of us have been satisfied to go over some routine, and have not exercised our intelligence and skill in shaping our pupils in the similitude of a noble and inborn model, like as the sculptor chisels from the graceful conception he has formed.

Important as the conclusion in this theorem is, the hypothesis is not less so. The Teacher should make himself clear here. It is to know what youthful humanity is. To the Teacher this must appear as capabilities of development, if I may be allowed the expression—a capability of moral, mental, and physical development. In the mental capability he finds a number of faculties—a faculty of observing, of remembering, of imagining, of reasoning, of feeling, of willing.

The third step of the process is the work-

ing out of the conclusion by operating with the hypothesis. This is the active practical work of our profession, and is perhaps the most difficult. A youth, our hypothesis, by a certain training, or rather development, is to approximate to a typical man.

Now the thorough Teacher must note the *condition* of this development, and act upon it.

A shapeless mass of iron is to be moulded into a cannon. What is the most favourable condition for the operation?—Heat. Faculties are to be expanded and strengthened. What is the necessary condition for the operation?—*Exercise*. For the Teacher the exercise of the child's body and soul is the only condition of their development. That is a truth which should be written in phosphorus upon the dark back-ground of every unsuccessful Teacher's record. It is an idea which should permeate the Teacher's being until he acts from it unconsciously. It is by exercise alone that the muscles are strengthened; by exercise the brain in all its lobes is improved; by exercise moral stamina is secured. Whatever means, then, we adopt to reach the conclusion we have in view, let us remember that they must call into use the child's own faculties, that they must be provocative of action and thought. Is it not a prevalent yet foolish wrong to regard our pupils as so many cameras to take impressions from the actinic rays of our own light?

Now by what means and method can the conclusion be arrived at; or, to drop the figure, what studies are adapted to these faculties to attain the aim, and how shall these studies be treated? Here I can do no more than refer to one or two subjects as representing all.

The Board of Education supplies us with a curriculum. From this we are to choose and adapt. In teaching any subject the thorough plan must be to decide upon the natural result the study of it ought to have upon the pupil, and then intelligently aim to effect that result.

Is the subject Arithmetic? I would ask myself, "What should be my aim in teaching this?" I would answer, "To fit the pupil for everyday life, and to strengthen his

reflective powers." To accomplish the first, it is evident I must make the work of a practical nature, I must propose problems in which the pupil himself is involved, and such as he will directly need. To secure the second he must be trained in mental arithmetic, in the principles on which arithmetic is based—the wherefore of the rules, etc. It is not enough merely to dwell upon this. It is not mechanical. The mind must take it in, grasp it, see it. Bread is the food of the body. It is assimilated with the body. It becomes body. Arithmetic, in this case, ought to be the food of the mind. It ought to be assimilated with the mind.

In teaching this the class should be kept alive. A Teacher will best effect this by being alive himself. Do not keep the pupils dragging upon any single rule or exercise until the interest flags. As soon as they grasp the principle, and have had problems enough to make them at all skilful in its application, pass on. Delay will produce dullness. Besides the educational arena is not so limited that we must speedily retrace the steps we trod before. Have the school classified in this as in all other subjects. Have specified work assigned to each class daily. Test their knowledge of it at the blackboard. All classes can recite at the same time, if there is blackboard surface enough; if there is not, secure enough. Note delinquents in the recitation. Give them until the next day, and encourage them to solve the difficulty. If not then solved, explain. Offer any explanation on the advance work of a class which may be deemed advisable, being careful to omit what there is any probability of their discovering. Thus we keep progressing from point to point. Novelty lends an interest. Of course we must keep reviewing, especially in this subject; but the work in review may and ought to be so that the pupil will work it in a sort of a heroic spirit to shew that he is master of it.

Again, in teaching History the same general plan should, I think, be followed, viz.: the Teacher should make his mind familiar with the results the study of it ought to se-

cure, and then work to bring about those results. Society demands an acquaintance with this subject. Free institutions and a general franchise make it imperative. It is valuable in its adaptability to improve the moral judgment, and to exercise the memory. Rightly conducted, it trains to proper modes of reading by concentrating the attention upon the sense. It should secure a fluent expression of thought. These results I would aim to secure.

In my school-boy days we read a portion and were asked what events occurred at certain dates, and what dates certain events occurred at. This was simple folly. There was no waking up of mind, no tracing the causes and sequence of facts, no criticism of the justice or wisdom of actions, no introduction of collateral history, no comparison of customs, laws, etc., with those with which we are now familiar, no aiming to secure along with this knowledge its fluent and elegant expression.

These, then, I present to you as representative but meagre outlines of methods of attaining thoroughness in teaching. Simply stated, it is to understand child-nature, to know what it may and ought to become, and to skilfully treat it so as to produce your typical man.

Thorough teaching requires a thorough teacher. That is an axiom. The Teacher must be thorough not only in methods, but also in knowledge. Very many of us are not such, but most of us may, I presume, become such. The essential requisite is a manly resolution to do the best we can, and an unflinching performance of that resolution. Should a teacher not thoroughly understand each subject he teaches? Yes, and beyond these, many not found in the curriculum of our common schools. It will not pay for us to secure Second or First Class Licenses, and then fold our student arms and repose upon that intellectual pinnacle. I have known Teachers—young men who had adopted this profession, and had not yet reached the "upper story"—who during a whole term unremittingly, devotedly sharpened and polished themselves for their work by the study

of "Handy Andy," "The Woman in White," etc., utilizing as recreation that part of the daily papers devoted to Hanlan, Ten E-y-c-k, Dick Nagle, and such like literary prodigies.

My friends, ours is intrinsically a noble profession. We ought to be proud of it. Are we? Do we manifest the *esprit de corps* of some other professions? Does our profession occupy that position in the social scale it should? If not the fault is ours. Let us raise the intellectual standard. Let no member of our ranks be contented with mediocrity. To advance needs no endowments of genius; but simply, Newton-like, to keep picking up pebbles upon the shores of knowledge. Cheerful perseverance in any line of action owes its life to principle deeply seated, not to sentiment. The rock upon which the Teacher should build, is the feeling that his is a responsible work requiring the best powers it is his to bestow. This suggests my last topic—Earnestness.

The Teacher must be earnest in his professional work in school and out of school. No minutes of the five or six hours of the daily session must be squandered. His zeal should be such as to take no note of time, except from his flight. Neither can the Teacher who hopes for lasting success put aside all thought of professional work from the time he leaves his school-room until he returns. He should scan the daily lessons. To have each recitation so that he could recite it himself is a good criterion. Except for a casual glance, a text-book in the school-room ought to be considered a bore. Then a little forethought will provide a fund of correlative facts and illustrations ready to utilize. It is wise to have all problems in mathematics solved before the class reaches them, that no time may be lost if an explanation is needed. But he should be careful to explain no problem until the best has been done by the pupils to solve it. Seventy-five per cent. of the benefit arises from the solving, not from the knowledge of how it is solved. Earnestness is verily the philosopher's stone of our profession. Earnestness is the alchemy which transmutes idleness

into activity, apathy into interest, indifference into zeal, dulness into keenness. Earnestness is the key of the Teacher's position. Without it thoroughness will be nowhere found. I would say to all BE EARNEST. We have a work worthy of us. Let us think about it, and we will feel that it is so. It is one of noble possibilities. Thought and action are our implements. Let us use them with what skill we may, so that we may see a rich fruitage of results in the stronger, brighter manhood of the youth we train.

### INSANITY AND OUR PUBLIC SCHOOL SYSTEM.

In the Annual Report for 1879 of the Public Charities for the Province of Ontario, there is no more interesting and carefully written document than that of Dr. Clark, Superintendent of the Toronto Lunatic Asylum. In his general survey of the field over which his labours extend, he classifies the chief superinducing causes of insanity under the three following heads:—

- I. Hereditary taint.
- II. Worry from over-work.
- III. Intemperance.

Under the second head he deals a well-merited blow at our public school system, regarding it as the "pregnant source of the mental and physical deterioration which, in a secondary way, affects the adult population as well as the youth of our land, from the senseless mental overstrain to which school children are subjected."

"Besides the four elementary studies, a smattering of almost every other branch is required from mere children, which in former times was judged to belong only to the colleges. The same programme of studies is laid down for all, without any regard to the difference of mental constitution. A partial solution of this difficulty is attempted in our colleges by a system of options, but it does not exist in our public schools. Nervousness, lassitude, periodic headaches, a lax and prostrated physical and mental system,

and a tendency to, and an invasion of, insanity may end the chapter of blunders."

This and much more is contained in the charge made against all our elementary educational institutions. These strictures we fully believe are well merited. The great number of studies introduced and attempted to be taught in our public schools, but especially the effort to reduce every pupil to the same standard of mental capacity and physical endurance by the imposition of a most extensive but inflexible programme of studies, we have long regarded as one of the great evils of our educational system.

To the school teacher of to-day every little head with so many cubic inches of brain, connected in mystic union with so much muscular and nervous tissue, means just so many promotions, so many square yards of history, so many square miles of geography, so much involution, evolution, and resolution of *powers, roots and forces*; so many divisions of algebra, and so many books of geometry and physics, with *fractions and factors* contorted and distorted in every conceivable and inconceivable order, when the whole mixture may be *sublimed or precipitated* by the prescribed dose of chemical elements, or consolidated somewhere within the cerebral dome by assimilating the whole sub-kingdom of the mollusks.

It is little wonder that the school children who have undergone all this cramming and stuffing, perhaps before the age of twelve, should in later years fail to fulfil the promise of their youth, but on the contrary, as Dr. Clark puts it, manifest signs of "physical and mental deterioration."

Whatever be the merits of our public school system,—and we are willing to allow that it possesses many,—in this particular it is based on a most extraordinary and utterly unphilosophical assumption, for it regards children, with all their varied physical, mental and moral capabilities and defects, just as so much lumber, capable of being turned into so many table legs exactly of the same size and pattern. "Only this and nothing more," is the whole philosophical basis of our public school programme, and the injus-

tice and loss which it often inflicts on this very account, is perhaps but little known to its framers.

In rural districts it not infrequently happens that a number of over-grown boys, who have been kept at home for the summer months to assist in the labours of the farm, are sent to school during the winter season. Their parents hope, and perhaps they themselves expect, to add something to their mental treasury which may be of use to them in after-life. But whatever may be their aims, ambition, or mental activity, the poor fellows are wofully disappointed when they discover that because they are behind in some piece of—to them useless—memory work, they must take their places in a class of children not half their own size or age, where at the end of five months they find themselves little further advanced than at the beginning. But worse than all, whatever little ambition they may have had in the desire for mental improvement has been wholly crushed out of them, and their school-boy history has closed in disappointment or disgust. Had they received, however, a little encouragement and assistance in the studies for which they might manifest an aptitude, such proficiency might have been attained as would have been of material benefit at least to themselves.

In looking over the lives and history of those who have attained the highest places in science, literature, and philosophy, it is surprising to find how many of them in early youth escaped the regular system of education in vogue in their own day, while not one of them had ever been subjected to the hydraulic pressure of such an educational machine as our public school programme. Had they been so treated, it is more than probable that the world would have yet remained ignorant of the laws of gravitation, that our most sublime epics and tragedies would never have been written, and that the most startling discoveries of science would have remained locked up in the store-house of nature.

We feel perfectly satisfied that the tendency of the hot-house system to which chil-

dren are subjected during the six or eight years of their public school life has a tendency to crush out whatever originality there may be in their mental constitution, by the subversion or repression of every inherent tendency of their nature.

"So far and no farther shalt thou go," is the edict that greets every child on the threshold of all his numerous studies. It matters not what his abilities or inabilities, likes or dislikes, may be, "so far and no farther," is the fixed destiny that overhangs them all.

"He has failed in the promise of his schoolboy days," is our final verdict in hundreds of cases; but we fail to connect cause and effect. We do not see that our system tends no higher at least than a respectable mediocrity in everything, but greatness in nothing; that it dethrones the man and sets up the automaton, leaving him through life the mere echo of the thoughts, opinions, and even principles of others.

It is a most mistaken idea of education to suppose it can only be measured by the number of studies through which a child has been dragged or forced. A much higher and more useful type is that which enables the pupil to gather and digest knowledge for himself, and it is surely preferable to the system which forces the unarticulated material into his intellectual stomach, leaving him throughout his whole after-life the victim of a kind of mental dyspepsia.

The highest effort of the true educationist should be employed in directing the expanding and maturing intellect, rather than in forcing upon it indigestible and highly seasoned food, altogether beyond its assimilating power.

We have a very strong suspicion that the present relation subsisting between our high and public schools, by which the latter are looked upon merely as feeders to the former, is responsible for much of the evil complained of in Dr. Clark's report. The number of successful high school entrants is now very generally accepted as the measure of the public school teacher's success. Failure here is the almost certain and

sufficient cause for dismissal, while a successful run for a few examinations in the entrance groove, is the highest ambition, as it is regarded the best evidence, of a successful educationist.

It would be well, when an evil so very generally felt throughout the Province is so pointedly adverted to by one so capable of judging as the Superintendent of the Toronto Lunatic Asylum, that some remedy were kept in view in the many changes and improvements attempted from time to time in our School Law. Some little latitude in the exercise of private judgment allowed to the teacher, especially in rural sections, would leave him less of a teaching machine, and free his pupils from the tyranny of having inflicted upon them studies which they never expect to use, and for which they have neither taste nor aptitude.

DONALD MCCAIG.

#### POLITE ERRORS.—No. I.

AS some good writers, and more good speakers, commit errors of grammatical construction which are rather the result of inadvertency than of a want of familiarity with that science, the following hints may not be inappropriate:—

The *title*, as it implies, is employed simply in contradistinction to vulgar errors, against which it would avail nothing to admonish the class of readers to whom these suggestions are addressed.

From a valuable little book, *The Errors of Speech*, some of the least glaring, or more covert, inaccuracies have been selected, added to which are others derived from various standard authorities.

In most of the examples the errors will appear without the light of general rules; in exceptional instances the rules will be supplied.

"He does not write *as* well as I," should be "He does not write *so* well as I;" but

"He does write *as* well as I," is correct. The negative form takes the adverb *so*; the affirmative, the adverb *as*.

"She looks *beautifully*," should be, "She looks *beautiful*;" "It looks *grand*," not "*grandly*;" "It sounds *fine*," not "*finely*;" "How *sweet* the moonlight sleeps upon the banks," not "how *sweetly*." Rule: When an intransitive or neuter verb is the predicate, the noun that is the subject will take an adjective instead of the verb taking an adverb.

The verb *to lay* is a transitive verb, or one in which the action or state implied passes over to an object.

The verb *to lie* is an intransitive verb, and can have no object after it. Rule: If the person or thing spoken of exerts an action that must pass over to an object, use *lay*, *laid*, and *laying*; but if the person or thing spoken of exerts an action that *does not* pass over to an object, use *lie*, *lay*, *lain* and *lying*. "He *laid* upon the bed" is incorrect, for the *verb* has *no object*; but "He *laid himself* upon the bed" is correct, for there is an objective case, *himself*, supplied. For a similar reason "Let these papers *lay*," should be, "Let these papers *lie*," etc. "They have *laid* in wait" should be "They have *lain* in wait."

The preceding principles also apply to the verbs *to sit* and *to set*, *to raise* and *to rise*, etc.

*To wake*, *to awake*, and *to awaken* are both transitive and intransitive verbs.

Present Tense. Imperfect and Present Participle.  
Past Participle.

Wake.	Waked.	Waking.
Awake.	Awoke or Awaked.	Awaking.
Awaken.	Awakened.	Awakening.

One may say "I *waked*, *awoke*, or *awakened* early this morning," but not that "I *woke*" or that "I *woke* another person," as there is no such word. "I *wakened* at daylight," should be "*awakened* at daylight," as there is no such word as *wakened*.

*Uþ* is used only with *wake*, *waked*, *waking*, but is both superfluous and inelegant.

## PUPIL-TEACHERS' DEPARTMENT.

IN this month's number we are glad to be able to furnish our readers with a selection of examination papers given last September to candidates for the teaching profession in New Brunswick. We commend to their attention those on geography and composition, which are somewhat different, and we think superior, to questions on the same subjects given by the Central Committee of Ontario. We are able, also, to give a selection of questions used at the English Training Colleges in December last: with many of these our own will compare very favourably. They shew a noteworthy difference in the way of testing the student's knowledge. It will be observed that the English examiners give to the student, in many cases, a choice of questions upon a subject. They have then greater certainty in finding out what he knows, and the student has greater scope for shewing his knowledge. None of the questions impress us as some of those of one or two of our own examiners painfully do, with the feeling that they have a greater desire to shew their own knowledge than to test that of their candidates.

## NEW BRUNSWICK EXAMINATION QUESTIONS.

## SCHOOL MANAGEMENT.

1. Shew the necessity of the continuous ventilation of a school-room, (1) in respect of the health of the pupils and teacher, (2) in respect of mental vigour and application, (3) in respect of cheerfulness and good order.
2. Specify the essential conditions of good order in school.
3. Point out the effects of injudicious punishment upon the temper and character of children.
4. How do you propose to deal with pupils that are naturally dull, and cannot keep

up with their classes? How with those whose abilities enable them to outstrip their fellows?

5. Specify the means that may be properly employed by the teacher to secure the greatest possible regularity of attendance of pupils.
6. State the principles which should determine the character of the school *Time Table*. [Give any *illustrations* your time will permit.]

## TEACHING.

1. Justify the following educational principles:—
  - (1) Exercise is the condition of development; and doing, of complete knowledge.
  - (2) The means ought to be consistent with the end.
  - (3) The ultimate objects of the study should always be kept in view by the teacher, that the end be not forgotten in pursuit of the means.
  - (4) Example and practice are more efficient than precept and theory.
2. Illustrate the above principles in a sketch of the course you would pursue, and the means you would employ in teaching reading, or other branch of study.

## CANADIAN HISTORY.

1. Give some account of the life and character of Charles de LaTour, and of his first wife.
2. By whom was the River Saint Croix named? Where and when was the first settlement made on it? Describe the experiences of the settlers.
3. Under whose guidance was the Act of Union between the two Canadas consummated? Give the date, and name some of the leading provisions of the Act.

4. What is meant by the term "Family Compact"? Why was this compact obnoxious to the people? Name its chief assailants in the Maritime Provinces, and in the present Provinces of Quebec and Ontario.

5. Give an account of what happened at Navy Island in the rebellion of 1837.

6. Give the date of the Proclamation of the Dominion of Canada, and name the Provinces at present comprising it.

MENTAL ARITHMETIC.

*This Exercise is to be worked in silence, and without figuring: The answers are to be given on this paper.*

1. A man has  $\frac{3}{8}$  of a dollar, he gives  $\frac{1}{4}$  of a dollar to one person, and  $\frac{2}{8}$  of a dollar to a second, what part of a dollar has he left?

2. Two men hire a pasture in common for \$4.80. One pastures a horse in it 7 weeks, and the other 9 weeks; what ought each to pay?

3. What is the interest of \$132.25 for 4 months and 15 days at 7 per cent. per annum?

4. What is the present worth and discount of \$150, payable in 5 months and 10 days, at 6 per cent.?

5. A triangle contains  $2\frac{1}{2}$  acres, its longest side being 8 chains. How long is the perpendicular from the opposite angle upon that side?

6. A boy playing at marbles lost in the first game  $\frac{1}{2}$  of what he had; in the second,  $\frac{1}{4}$  of what he then had; in the third,  $\frac{1}{2}$  of what he then had; in the fourth 11, and then he had 16 marbles left. How many had he at first?

ARITHMETIC.

*Answers must contain the whole operation.*

1. Divide £1,750 between four persons so that their shares shall be as the fractions  $\frac{1}{4}$ ,  $\frac{1}{2}$  and  $\frac{1}{8}$ .

2. Reduce the decimal .01747 to a vulgar fraction in its lowest denomination.

3. If a man can perform a journey of 2583 miles in  $6\frac{3}{4}$  days, walking  $11\frac{1}{2}$  hours in each day, how many hours a day must he walk,

at the same rate, to perform a journey of 1303 miles in  $31\frac{1}{2}$  days.

4. Express  $3\frac{3}{8} \div (2\frac{3}{4} + 6\frac{1}{4} - 2)$  cwt. as the decimal of a ton.

5. A owned  $\frac{1}{11}$  of a ship. He sold  $\frac{1}{11}$  of  $\frac{1}{11}$  of his share for \$220; what was the value of  $\frac{1}{4}$  of  $\frac{1}{3}$  at the same rate?

6. The simple interest on a certain sum for 9 months at 5 per cent. per annum, is \$150 less than the simple interest on the same sum for 15 months at 4 per cent. per annum. Find the principal.

7. If you mix sugars at 6 cents, 8 cents, 10 cents, and 11 cents per pound, in what quantities must they be taken to make a mixture of 100 lbs. worth 9 cents. per lb.?

8. A square field has a diagonal path across it, measuring 7 chains 35 links; find the side of the field and its area.

9. Find the square roots of .000633679929, and .051, and 5.1.

GEOGRAPHY.

*The examiner will estimate Parts I. and II. as of equal value.*

PART I.

1. What is the Gulf Stream, and where does it originate? Suppose the Gulf Stream were cut off, what results would follow?

2. What are Icebergs, and how are they produced? Why do the Icebergs of the Arctic Ocean not escape southward and cool the atmosphere?

3. Describe the physical features, climate, and productions of South Africa, Mexico, and the Sandwich Islands.

4. Give an account of the principal watershed of Europe, and name the rivers draining the southern slope.

5. What great rivers take their rise in the Alps, through what countries do they flow, and into what seas do they fall? Give the chief towns on each river.

6. Name and describe the great rivers which drain North America: (1) those



which flow north, (2) those which flow east, (3) those which flow south.

7. Specify the motions of the earth, and explain the causes of the succession of the seasons.

#### PART II.

Draw from memory, on the paper given to you, the following maps:—

1. An outline map of Norway or Sweden, and insert the mountain ranges and chief rivers.

2. An outline map of Ireland (the form only is required, but credit will be given for any details inserted).

#### COMPOSITION.

1. As indicated below, make a prose paraphrase of the following lines (addressed to Justice):—

Stern Lawgiver! Yet thou dost wear  
The Godhead's most benignant grace;  
Nor know we anything so fair  
As is the smile upon thy face.  
Flowers laugh before thee in their beds,  
And fragrance on thy footing treads;  
Thou dost preserve the stars from wrong.  
And the most ancient Heavens, through thee,  
are fresh and strong.

(1) Frame questions on the passage. (2) Give formal answers, in your own words, to each question. (3) Combine your answers into sentences and paragraphs,—using such connectives as may be required.

2. (1) Name the measure of the above verses. (2) What can you say of the last verse? (3) Specify the figures of speech employed. (4) Name the words which are not of Saxon origin. (5) Who is the author of the lines? (6) Quote from any other author, or authors, ideas parallel or similar to any of the above, though differently expressed.

3. Combine the following separate propositions into a compound sentence:—

1a<sup>1</sup> A person looked on the waters only for a moment (*att. to "person."*)

2a<sup>1</sup> The waters were retiring (*subs. obj.*)

A. That person might fancy this.

1b<sup>1</sup> A person looked on the waters only for five minutes (*att. to "person."*)

2b<sup>1</sup> The waters were rushing capriciously to and fro (*subs. obj.*)

B. That person might fancy this.

1c<sup>1</sup> A person keeps his eye on the waters for a quarter of an hour (*adv. of time.*)

2c<sup>1</sup> He sees one sea-mark disappear after another (*adv. of time.*)

3c<sup>1</sup> The ocean is moved in some general direction (*att. to direction.*)

C. Then it is impossible for him to doubt of that general direction.

4. What are the elements of an expository paragraph? Illustrate your answer by writing such a paragraph on *Labour Strikes*.

### ENGLISH TRAINING COLLEGES EXAMINATION PAPERS.

#### SCHOOL MANAGEMENT.

Three hours are allowed for this Paper.

Students who are remaining in the Training College after this Examination must omit Section VII., and are not permitted to answer more than one question in each of the other Sections. Students who leave the Training College to take charge of Schools after this Examination, and Acting Teachers, should answer the whole of Section VIII., and one question in each of the other first five Sections.

#### Section 1.

1. Give a brief account of the methods of teaching pursued in the first schools established by Bell and Lancaster.

2. Give some short rules that would impress on your scholars the value of habits of punctuality, cleanliness, and courtesy.

3. What do you understand by "Notes of Lessons?" Why cannot the exact form and order of questions that are required for oral lessons be given in such notes.

#### Section 2.

1. Write out fully such explanations of words, phrases and grammatical difficulties as would be needed for a reading lesson to a first class on the following passage:—

The building was a spacious theatre,  
Half round, on two main pillars vaulted high,  
With seats, where all the lords and each degree  
Of sort might sit in order to behold:  
The other side was open where the throng  
On banks and scaffolds under sky might stand.

2. Give examples of the different sounds expressed by the letters *c* and *i* and the diphthong *ou*. Account for some of these peculiarities.

3. Explain the advantage of giving to older children short biographies of authors whose works are used for reading lessons. Illustrate your reasons by passages from Samson Agonistes, or from some standard poem with which you are acquainted.

*Section 3.*

1. What description of slates, easels, and blackboards are best adapted for teaching drawing, geography, and music in a class?

2. Analyse the letters of the word "camphorated" into the elementary shapes employed in your system of teaching writing.

3. Which of the following lessons would you consider suitable as subjects of composition for a class of fourth standard children: the battle of Waterloo, the boundaries of their own county, coal, the steam engine, a clock? State your reasons in each case as to the suitability or unsuitability of each subject.

*Section 4.*

1. What are the chief uses of mental arithmetic? Give some examples introductory to a first lesson on division of money.

2. Shew how a child's ordinary knowledge of money transactions may be utilized for illustration of addition of fractions.

3. Give such a series of examples of vulgar fractions, producing terminating decimals, as would fully illustrate the general rule for converting the denominator into a multiple of ten.

*Section 5.*

1. Point out the necessity of a good knowledge of geography for the teaching of history, and illustrate your explanation by the geography of the Highlands of Scotland and of Wales.

2. What do you understand by "Historical Grammar?" Give some examples of the names of animals and of inflexions of verbs.

3. What natural laws interesting to children would require to be clearly stated in a lesson on the pendulum of a clock, the flight of a bird, and the breathing of a fish?

*Section 6.*

Write full notes of a lesson on one of the following subjects:—

1. The cause of foul air in a room lighted with gas.

Or, 2. Some agricultural implement.

Or, 3. Habits of domestic animals.

Or, 4. Our postal system.

Or, 5. Ready-money dealings.

*Section 7.*

(See directions at the head of the paper.)

(a) In drawing up time-tables to be submitted to the Inspector, what difference may be made as to the times of marking the registers in day and evening schools? What alteration of marks is required in the case of a scholar who leaves before the close of the school attendance?

(b) What is the object of the child's school-book? What entries should be made in it when a child leaves your school?

(c) What rule would you lay down for your guidance in those few cases in which you might consider it necessary to inflict corporal punishment?

(d) If a child enters school on Monday, the sixth of January (allowing for a week's holiday at Easter and at Whitsuntide, for three weeks' holiday in June and for five occasional half-holidays) at what date might he be expected to have completed 250 attendances, if we suppose that eight per cent. of the scholars are absent at each attendance from unavoidable causes?

(e) Make out a list of apparatus required for teaching geography, arithmetic, and natural history.

(f) Explain some system for introducing fresh warm air into a schoolroom without producing draughts.

## ARITHMETIC.

(Two hours and a-half allowed for this paper.)

Candidates are not permitted to answer more than *one* question in each section. The *solution* must be given at such length as to be intelligible to the Examiner, otherwise the answer will be considered of no value.

## Section 1.

(a) How many multiples of four hundred and seventy-nine lie between fourteen hundred, and one million five hundred and thirty-nine thousand and twenty-seven?

(b) What is the effect upon the remainder, if the divisor be increased by a small quantity without altering the quotient?

(c) What is the average weight in lbs. of nine hams arranged in a row, if the ham at one end of the row weighs  $1\frac{1}{2}$  qrs. and the weight of each of the others in succession is greater by 36 oz. than the weight of the ham next preceding it in the row?

(d) How many houses can be built on a frontage of  $\frac{3}{4}$  of a mile, each house having a frontage of 36 feet 8 inches, allowing for 11 streets, each having a width of 40 feet?

(These form one question.)

## Section 2.

1. An emigrant ship allows 64 cubic ft. of luggage for each person, and requires 10d. for each cubic foot in excess of this allowance: a man pays £7 13s. 4d. excess for his own, his wife's, and his daughter's luggage; how many cubic feet of luggage does the man take, if the wife and daughter each take half as much again as he did?

2. A span of 16 oxen can draw a load of  $4\frac{1}{2}$  tons for a distance of 7 miles per day; a man carrying 112 lbs. can travel 21 miles per day: how much more will be carried by 120 men a distance of 147 miles (the men going and returning at a uniform rate) than by two spans of oxen?

3. A railway reduces its fares for first class passengers from 3d. to 2d. per mile, and for second class passengers from 2d. to  $1\frac{1}{2}$ d. per mile; before the change of fares 10,000 persons travel second class daily between two towns, and 1,600 first class: after the

change of fares, 10 per cent. of the second class passengers begin to travel first class, but the total number of second class passengers is increased by 50 per cent. Find the total gain per train mile.

## Section 3.

1. Prove the rule for division of vulgar fractions. Find the value of—

$$\frac{2\frac{1}{2} + 3\frac{1}{4} + 7\frac{1}{2}}{3\frac{1}{2} - 2\frac{1}{4}} \times 2\frac{1}{4} \div (4\frac{3}{4} \text{ of } 8).$$

2. Find by successive divisions the G. C. M. of 652,674 and 1,475,600. How would you prove to your class without actual division that your G. C. M. will divide any of the divisors you have used?

3. Find the value of  $7\frac{1}{2}$  of 5 guineas +  $4\frac{1}{2}$  of £3 -  $27\frac{1}{2}$  of 5s., and bring the result to the fraction of 1s. 3d.

## Section 4.

1. Convert to decimal fractions  $5\frac{1}{4}$ ,  $7\frac{1}{2}$ ,  $8\frac{1}{4}$ ,  $11\frac{3}{4}$ .

The length of a metre is 1.09363 yards: convert  $150\frac{1}{2}$  English miles into kilometres.

2. Prove the rule for multiplication of decimals. Find the value of .1590 of 11 cwt. 0 qrs. 5 lbs. 8 oz.

3. Two sums of money are in the ratio of .52 : .16, and their difference is £12 16s. 2d.: find the sums.

## Section 5.

1. If 49 men working for 64 days of  $7\frac{1}{2}$  hours can excavate a pit with vertical sides whose edges form a square (each edge being 14 yards long), how many hours a day must 128 men work for 29 days to excavate a pit of the same depth, but longer and broader by two yards each way?

2. A company possessing £500,000 capital carries forward, at the beginning of the year, £1,082 10s.; at the end of the year a dividend of 5 per cent. is paid, and £1,178 18s. 8d. is carried forward; find the gross receipts, the cost of working being to the net receipts in the ratio of 53 : 47.

3. If a quantity of silver bought at 4s.  $8\frac{1}{2}$ d. per oz., has lost in value £19 6s.  $8\frac{3}{4}$ d.

when silver is sold at £2 11s. 9d. per lb., find the weight of the silver.

*Section 6.*

1. What is the relation between discount, present worth and amount?

In how many years will £675 10s. amount to £945 14s. at 4 per cent. simple interest?

2. A bankrupt's debts amount to £3,750, he pays 13s. in the pound, and defrauds his creditors by concealing  $\frac{1}{3}$  of his assets; find the value of his estate.

3. A man invests £4,000 in four sums of 800, 900, 1,100, 1,200 to produce 2 $\frac{1}{2}$ , 3, 3 $\frac{1}{2}$  and 3 $\frac{3}{4}$  per cent. simple interest respectively per annum; find the gain in income if the whole had been invested to produce 3 $\frac{1}{2}$  per annum.

*Section 7.*

1. Find the square root of 38259.36, and the cube root of 7077.888.

2. A metal is mixed with each of two others in the ratio of 7 : 8 and 5 : 6 respectively, and its value is to those of the others as 3 : 1 and 4 : 1 respectively; find the value of a quantity of the second mixture equal in weight to a quantity of the first that costs £3,190.

3. A charity sells out 10,000 consols at 97 $\frac{1}{4}$ , and invests the proceeds in railway debentures at 160; what interest must the debentures pay that the income of the charity may be increased by £89 per annum, no charge being made for brokerage?

*Section 8.*

1. Two rooms whose breadths are 17 and 1; feet, lengths 19 and 16 feet, and heights 10 and 9 feet respectively, are covered with papers of different values, each two feet wide; if the difference in the two costs be £1 7s. according as the larger room is papered with the dearer or cheaper paper; find the difference in prices per yard of the paper.

2. Copper is 8.96 times as heavy as water; what will a cube of copper, whose edge is 9 inches, weigh when suspended in water, if it lose a weight equal to that of the water displaced, a cubic foot of water weighing 1,000 ounces?

3. Three clocks occupy respectively 33, 22, 11 seconds in striking twelve, and lose 36, 24, 12 seconds daily respectively; if they begin to strike together at 4 p.m. on March 31, on what day will they all strike twelve separately for the first time? Which two will first strike twelve separately?

THAT teacher is likely to be the most successful who makes a speciality of every subject he teaches. To do this both he and his scholars must do more than be the slavish followers of a text-book. This is a rational statement of what there is a great deal of irrational talk about among our neighbours at the present time under the name of the "Quincy Plan." It is as absurd now as it was in Euclid's time to suppose that by this or any other educational nostrum the difficulties of imparting and acquiring knowledge

will be removed. The chief good that we can hope from this Quincy craze is that many teachers will be confirmed in, and others will be led to adopt, natural and rational methods of training their scholars. If it has the effect, not of doing away with text-books, for that would be educational suicide, but of using them as a staff rather than a crutch, thus giving the teacher an opportunity of using his own mind and character as an important factor in the training of his scholars, it will have served a good purpose.

## TEACHERS' ASSOCIATIONS.

## CHRONICLE OF THE MONTH.

TORONTO TEACHERS ASSOCIATION.— This Association held its semi-annual meeting on Friday and Saturday, 23rd and 24th January, in the Wellesley school. Mr. McDonald, the head master of the school, and his assistant teachers had done their best to make their visitors comfortable; and they succeeded. The windows were filled with choice house-plants, some of them in bloom, and the decorations on the blackboards and about the walls gave a very pleasant appearance to what is in itself a handsome room.

The president, Mr. Hughes, occupied the chair, and, with his accustomed tact, kept the business going so that the teachers, of whom there were upwards of 150 present as members, never had a chance of feeling the time drag.

The first subject on the programme was "Expressive Reading for Senior Classes," upon which Mr. Lewis discoursed for upwards of an hour in a manner that only one who is full of his subject can succeed in doing. He indicated that expressive reading consisted in rendering the thoughts of the author as if they were one's own, with proper elocutionary effect. He dwelt upon the human voice as a medium for the expression of thought by means of its modulations. He strongly and inadvertently upon the sing-song style so often heard from the reading desk and the pulpit, in reading from a Book that of all others can be made edifying by expressive delivery. He shewed that in regard to utterance, the chief faults that scholars commit is indistinctness, especially in the unaccented parts, and at the end of words which have similar sounds to those succeeding them. The best remedy he pointed out for this was phonic reading; that is uttering every elementary

sound as it occurs, without reference to the thought, hence it may be done as well reading backwards as forwards. Another fault he pointed out is that of accent at the end of various kinds of sentences. A third is misplaced emphasis. A great aid to remedy the latter was grammatical analysis. For no scholar can give the emphasis aright unless he thoroughly understands the passage he is reading. He indicated various vocal exercises that would be useful for reading, and profitable for the health, saying that short breaths were better than long ones, and that breathing should take place through the nostrils by placing the end of the tongue against the roof of the mouth. He praised highly, and commended to the attention of teachers, Legouvé's work on the "Art of Reading," already reviewed in our columns, one of whose recommendations is to read a passage aloud if you wish to understand it. He illustrated what he meant by expressive reading by rendering with great elocutionary effect several passages from the Fifth reader, notably *Mark Antony's Speech* and *Parrhasius*.

There is one fault that Mr. Lewis himself is guilty of, which renders his audience uncertain whether they have got the full benefit of his address or not. He is always in a hurry—no sooner has he got well into one part of his subject than he finds he will be unable, for want of time, to say a great deal of what he intended to say upon it, and hurries on to the next, so that by the time he concludes, his hearers feel that however rich the feast put before them has been, the courses have followed each other too rapidly to be fully enjoyed.

Mr. Levi Clark, head master of Phœbe

street school, followed Mr. Lewis with some remarks upon "Marking for Conduct and Work." He said there was danger of putting too much stress upon marking; that the securing of good marks became the prime object of the scholar, and not the gaining of knowledge, or rectitude of conduct; which were or should be the objects of the teacher. The only merit he could see in the present marking system is that it stimulates the pupil's ambition. If they looked at the other side of the shield they would find that the marking occupied much valuable time, was in danger of dealing unjustly with very meritorious scholars, was often a reward for superficial rather than thorough work, and in some cases was a temptation to dishonesty. There was danger of imposing bad marks for faults which were due to the teacher's lack of proper discipline; or to his inability to keep up the interested attention of his scholars. Mr. Clark did not think that the schools would suffer much loss if the marking system were entirely done away with. In marking for exercises, done either at home or in school, he would attach more importance to neatness than to accuracy. In the course of his address he threw out an excellent hint for teaching spelling. "Give out by dictation the words you wish to have prepared as a spelling lesson for the next day. The scholars will thus see which they fail in, and will direct their attention more particularly to them."

These papers, with the discussions that followed, completed a good morning's work.

In the afternoon Mrs. Wallace, a teacher in the Park School, read a carefully prepared and well thought out paper on "How I manage my class." She said that a great deal of the secret of successful teaching lay in making the school hours as pleasant as possible for the children. Hence, she studies her scholars, believing that before a class can be in a proper condition for acquiring knowledge, teacher and scholars must understand each other. Point out offences with firmness, and if necessary punish rigorously, but with justice. Try to let troublesome scholars feel that they are an object of interest to you, and

they may thus be won from their evil ways. Shew discretion and tact especially in dealing with new pupils. Cultivate habits of neatness and order, and try to impress your scholars with the utility of what they learn, and thus they can be convinced of the benefits of habits of punctuality, regularity, and diligence. Let the scholars always be made to feel that what concerns them also concerns the teacher, and let the teacher begin work by skilfully leading the scholars to propose the plans she wants carried out for the day. Remember in going over work with them, what is stale to you may be quite fresh to them. She concluded with advising her fellow teachers not to give up, after even repeated failures, for perseverance would in the end bring success. She worked as hard as her scholars did to prevent them getting bad marks.

In the remarks that followed the reading of this paper some excellent hints were given. One lady advised not to let the children get tired, another to give praise when deserved, another to be unflagging in energy.

Mr. Douglas, formerly head master of the Orangeville High School, followed with a paper on "The Education of the Citizen," which we hope to be able to present to our readers in our next issue.

In the evening Professor Loudon, of University College, gave a lecture to the Association in the theatre of the Normal School, upon the "Tuning Fork." His well-known skill in rendering clear a difficult subject to persons with little scientific training was well displayed, and he illustrated it by a number of interesting experiments. The lecture will be found in the proceeding page.

Saturday's work was devoted to the election of officers, the reading of a paper on the "Teaching of History," by Mr. McAllister, which we hope to insert in an early issue; and by replies from the President to questions put to him, bearing more or less upon the interior management of the schools. His answer to the question, What is the best way to teach spelling to junior classes? will bear repeating: "Teach it by reading phonically and by transcription."

The officers for the current year are : President, Mr. James Hughes, P. S. Inspector ; Vice-President, Mr. R. W. Doan, head master of Victoria street school ; Secretary-Treasurer, Mr. R. McCausland, head master Bathurst street school. Board of Directors : Messrs. McAllister and Hendry, and Misses Churchill, Keown, and Williams.

COUNTY OF WATERLOO TEACHERS' ASSOCIATION.—The above Association met in the Berlin Central School on Friday and Saturday of last week. The attendance was very good, and the proceedings throughout proved highly interesting and instructive. The first meeting was at 9 o'clock on Friday morning, the President, Mr. Alexander, in the chair. The minutes of previous meeting were read and adopted.

Mr. Herner took up the subject of reading from the beginning. He considered four months sufficient time for any child to be in the first book ; the work could be gone over in that time with two lessons daily of not more than ten minutes each.

Mr. Alexander took up Arithmetic in a practical manner, shewing his way of teaching from the beginning to decimals. His mode of teaching would be to use some little articles, such as cards or beans, and putting the figure one on the board he would hold up one card, telling them that the figure on the board represented the number he had in his hand, and so on. He would teach Addition and Subtraction together, and also Multiplication and Division.

A committee, formed for the purpose of nominating the officers of the Association for the ensuing year, brought in the following report, which was adopted :—President, Mr. W. F. Chapman ; Vice-President, Mr. W. T. Biggs ; Secretary-Treasurer, Mr. G. Stuernagel ; Managing Committee, Messrs. J. W. Groh, D. Marshall, J. Bingeman, and Misses M. E. Gray and A. Weber.

Mr. Hilliard considered next the question, "Is Provincial Uniformity in Text Books Desirable?" The public good must be the chief consideration in deciding this question. He suggested a committee to select books

for Provincial use, none other than such to be allowed. In discussing the question as to whether the whole thing should be thrown open to competition or the present system should be followed, he considered the system now in use, with some changes, was the better.

It was moved by Mr. Hilliard, seconded by Mr. Groh, that one text book, or a series of text books where necessary, is desirable.

Miss Young read an interesting essay on the influence of teachers over their pupils.

The business being concluded at four o'clock, the members went to the High School to hear Mr. Forsyth's lesson on Chemistry. He took up water, and shewed the different modes of decomposing it by a number of highly successful experiments.

In the evening Mr. Hughes lectured in the town hall on the subject of "Kindergarten." It is a pity the Berlinites did not honour him with a larger audience.

#### SECOND DAY.

Mr. Hallman spoke on "Moments in Philosophy," proving the principle of moments, and proving their use in solving difficult problems.

A committee consisting of Messrs. Alexander, Herner and Suddaby was appointed to consider to what extent the Kindergarten could be used in our common schools, and to report at next meeting of the Association.

Mr. Hughes took up Industrial Drawing. His remarks were characterized by practical thought. The same gentleman followed on the subject of Phonic Reading, shewing the superiority of the Phonic over any other system of teaching reading. He next considered Object Lessons. It would be somewhat difficult to teach in this manner in our schools for want of suitable objects. But the system was a good one. In children it was not the amount of information but development of mind that was valuable.

The Managing Committee handed in a report with the following programme for next meeting :—Arithmetic, Mr. Macintyre ; Reading, Mr. D. Erb ; Grammar, Mr. Sharman ; History, Mr. Pierce ; Should the

Minister of Education acquire the copyright of all text-books? Mr. W. T. Biggs; Es-sayists, Misses Kuehn and Jones; Music, Mr. Groh; Physical Culture, Mr. P. H. Green; Mathematical Geography, Mr. Marshall.

A resolution was passed expressing dissatisfaction with the proposed shortening of the summer vacation, as it would not be in any way helpful to the cause of education to confine children during the hot weather which constitutes the vacation; also urging upon the Minister of Education to hesitate before granting any petition for that purpose.

It was decided to hold the next meeting on the second Friday and Saturday in September.

The Library Committee presented a report. The library consists of 140 volumes, and is in good condition.

Votes of thanks were tendered to the retiring officers of the Association. Mr. S. S. Herner was then elected a delegate to the Provincial Teachers' Association at Toronto.

Mr. Chapman considered the question, "Should the Provincial Teachers' Association be made Representative?" taking the affirmative side, and bringing several arguments to bear upon it. The Provincial Association should be a kind of Educational Parliament.

**NORTH HASTINGS TEACHERS' ASSOCIATION.**—The quarterly meeting of this Association was held at Stirling, January 31st, 1880. The forenoon session was occupied in the discussion of "School Drill," and "How to Teach Arithmetic to Junior Classes," introduced by Wm. Mackintosh, I.P.S.

The subject was ably and exhaustively handled by Mr. Mackintosh. In a simple, lucid and practical manner he shewed how to teach children to recognize numbers at sight; to compare numbers; to analyze them, and to perform the simple elementary operations of addition and subtraction. An especially noticeable feature was his shewing how to teach the principles of "carrying."

The Association adjourned.

A pleasant feature in connection with the meeting was the recognition of the public services of the teachers by several members of the Stirling School Board, who had made arrangements with a leading hotel-keeper to have the teachers dine together as their guests. The courtesy was duly appreciated and acknowledged by the large gathering that enjoyed their hospitality.

The Association met again at three p.m.

The treasurer's report was read, shewing the large balance of \$81.81 on hand, and in the bank. The auditors, Messrs. Mulloy and Shannon examined the accounts and reported them correct.

Mr. J. Johnston, Inspector P. S., South Hastings, then introduced "How to teach Reading to Second and Third Classes." The subject was ably handled, stress being laid upon the necessity of thorough explanation of the lessons when they are assigned, the importance of teachers being able to set a good model for imitation before their pupils, and the value of committing the gems of thought studied in connection with the reading exercise to memory.

Mr. Mulloy and Mr. Sutherland favoured the Association with readings, which were well rendered and received.

Association adjourned.

WM. MACKINTOSH, *President.*



## CONTEMPORARY LITERATURE.

ANNUAL REPORT OF THE MINISTER OF EDUCATION on the Public, Separate, and High Schools; also, on the Normal and Model Schools of the Province of Ontario, for the year 1878. Printed by order of the Legislative Assembly. Toronto: C. Blackett Robinson, Parliamentary Printer.

As if to deprecate unfavourable comment upon the delay of a year in bringing out the Education Report for 1878, Mr. Crooks has shewn a praiseworthy promptness in presenting it to the Assembly at the beginning of the session. We see no reason why there should be this delay, except that dictated by official etiquette. But we have yet to learn that our local legislators take such an all-absorbing interest in education that they like to be the first to enjoy the feast of statistical tables the Report sets before them. As a matter of fact a large section of the general public take a much more active interest in the training of the young. Would it not, therefore, be a wise step on Mr. Crooks' part to recognize the fact, by making public his Report as soon as he has it ready, whether the Legislature is sitting or not? It would then be less an historical document and more one of a live, current interest, the discussion of which might lead to practical results. A great portion of its contents, as they appear now, either have sunk into the limbo of oblivion, or have become stale with the growth of a year's mould upon them.

The number of pupils between the ages of five and sixteen years attending the public schools in 1878 was 467,433, of other ages 21,582, making a total attendance of 489,015 out of a school population of 492,360 between the ages of five and sixteen years. The number reported between seven and twelve years of age as not attending any school during four months of the year is

27,415. A decrease from the previous year is thus shewn of school population of 2,444, of pupils attending school, 1,845; and an increase of those who do not attend any school of 1,441. Our readers will observe that while the returns of those attending school include all ages up to twenty-one years, those of school population take in none over sixteen years of age. But even this explanation will not account for the fact that while the difference of school population and school attendance is 24,927, a number which presumably takes in those who attend private schools, and who do not attend any school, the number returned between the ages of seven and twelve years as not attending any school for the minimum period of four months is 27,415.

This shews an enormous increase upon the number not attending school in 1877, which was 15,974, and when we come to add the increase of 1,441, as stated by the Report, to this latter number, we get 17,415. Evidently then, Mr. Crooks has not been careful with his figures when he adds, by a slip of the pen, ten thousand to the vagrant juvenile population of the Province. The average attendance was 224,588, which is a fraction under 46 in every hundred of the total number attending school. Although this is two per cent. more than it was last year, we must still regret that not one-half the scholars attending the public schools of the country derive the full benefit of the instruction they afford. In counties 44 out of every 100 attended regularly, in cities 57, and in towns 55.

When we examine Table B to ascertain the relative standing of the counties in regularity of attendance, we find Brant stands far ahead of all the others, shewing an average of 87 per cent., while Simcoe is much the lowest, having barely 20 per cent. We

are so much struck with this discrepancy that we examine the details of the table, and find there is again a serious mistake in the figures. Simcoe is credited with a school attendance of 18,711, while its average is stated at only 3,731, but there is internal evidence to shew that the 3 thousands should be 8. Brant has a school attendance of 5,153, and an average out of this of 4,510; again the thousands figure is wrong, the table shews that the 4 should be 2. With such mistakes as these we give up in despair any attempt at comparison from the table. Our average attendance compares very unfavourably with that in England and Scotland. In Scotland for 1878 it was 76 per cent. of the number on the registers, and in England it was 69 per cent. These figures are worth the serious attention of those who have control over our schools; and it is worth their while to inquire whether we are likely to maintain the educational pre-eminence we claim for our school system while the attendance compares so unfavourably with that of other and less favoured lands.

Would it not be worth a little extra labour, which the Minister might well cause to be bestowed upon this Report before it is issued, to shew, for instance, that little over 50 per cent. of all our scholars attend more than half the number of days the schools are open; also to exhibit the percentage of average attendance in each county, city, town and village, and thus display the strictness of some school corporations and the laxity of others in this important matter.

The interest that is now taken by the press in educational affairs is a guarantee that any effort of the Minister in this direction would be rewarded by ample publicity, and by judicious criticism. The total expenditure for all public school purposes was \$2,889,347, which is \$12.87 per pupil in average attendance. In England the corresponding item was \$10.18, and in Scotland \$10.42.

There were 4,990 schools giving employment to 6,473 teachers, of whom 3,060 were males. These numbers shew a decrease of 150 schools, and an increase of five teachers on the previous year. As the number of

pupils decreased as well as the number of schools, we may conclude that there are now fewer scholars to each teacher. This, if other things are favourable, is a guarantee that the training will be more thorough. 2,052 teachers are Methodists, 2,042 Presbyterians, 949 Church of England, 789 Roman Catholics, of whom 456 are employed in the public schools and the remainder in the separate schools. The balance of the teachers belong, in varying numbers, to a great variety of denominations. Of the teachers employed, 210 hold 1st class Provincial certificates, 1,409 hold 2nd class, and 3,904 hold 3rd class county board certificates. These numbers shew a decrease of 40 holding 1st class, of 22 holding 3rd class, but an increase of 105 holding 2nd class. In addition to these there were 328 teachers holding 1st class old county board certificates, 142 holding 2nd class, and of holding 3rd class.

These figures shew that more than one-half the teachers of the Province are of the lowest class, or those who have the least experience in their work, and who, if we may be guided by the grade of their certificates are but imperfectly fitted for what they undertake. This preponderance, which for the present is likely to continue, should direct increased attention to professional training, so that what the teachers lack in theoretical knowledge, they may compensate for by experience in school-room work.

While the number of teachers holding 3rd class certificates has decreased, it is a significant fact that those holding interim certificates have increased by 11, making the number of persons in charge of schools in the Province who hold no legal certificate, 480. When there is such a superabundance of legally qualified teachers who are prepared to occupy any situation at a reasonable salary, is it not time that Mr. Crooks abolished the permit system for ever? If one county has not enough of duly qualified teachers, let it be supplied from another that has an overflow. It is true that some counties object to employ teachers with endorsed certificates, but surely these would be better

than those having no certificates at all. This is an important matter to which we may refer at greater length at some future time. The average salary of male teachers in counties was \$382; of female teachers, \$247; in cities, of male teachers, \$730; of female teachers, \$313; in towns, of male teachers, \$577; of female teachers, \$274. We are sorry to note that there was a decrease of \$3 in the average salary paid to male teachers throughout the Province. The highest salary paid to any teacher in a county was \$800, the lowest \$125; in a city the highest was \$1,000, the lowest, \$500; and in a town the highest was \$1,200, and the lowest, \$200. It will be interesting to compare the salaries paid in this country with those paid in Scotland for instance. There the average salary for male teachers in 1878 was \$667, for female teachers, \$352; while 475 male teachers received salaries ranging from \$1,000 to \$1,500 and upwards, and 214 female teachers received salaries ranging from \$500 to \$1,000 and upwards. Ontario is far from being the rich pasture land for teachers many people, in ignorance, or with narrowness of view, believe it to be. The number of High Schools and Collegiate Institutes in the Province continues at 104. They are in charge of 298 teachers,—an increase of 18. The average salary is \$748,—a decrease, for the year, of \$8. The number of scholars on the registers was 10,574, an increase of 1,345; and the total expenditure was \$396,010. This shews the cost per pupil registered to be \$37.45, but a few cents above what it was in the previous year. The average attendance for the whole year was 5,998, or 56 per cent. of the registered attendance; and the cost per pupil in average attendance was \$66. There were 35 registered pupils to each teacher; while in the Public Schools there were 75. Seventy-six of the High Schools are free, the rest charge a fee per term, ranging from 25 cents to \$5.

When we examine the statistical tables of the Normal and Model Schools, we find a great deal of pains displayed to afford information about matters that are of very little moment to any one. For example, who

cares how many applied for admission to the Toronto Normal School since it started, or how many were admitted or rejected? These facts have long since ceased to be of interest even to those who were personally concerned. But it is a matter of moment for the people of the country to know at what cost the young people who go to these institutions for their professional training are turned out as teachers. This information it is impossible to get in regard to the Toronto Normal School apart from the Model School, so we must be content with that supplied concerning the Ottawa Normal School, and supplement it by what is found in the treasurer's report of receipts and expenditure for 1878. We thus find that 87 students were admitted to this institution in 1878, and the gross expenditure for salaries and expenses was \$11,373.40. Hence each teacher in training cost the country \$130 for current expenses, without making any allowance for expenditure on capital account in the shape of buildings, etc.

Seeing that the training of first class teachers is being done at much less expense, and with as good result in our Collegiate Institutes and High Schools, it is worthy of the Minister's serious consideration whether he might not reduce the expenses of the Normal Schools by relieving them of the training of first class teachers altogether, and allowing the not over-worked staff to devote their energies, aided by abundant leisure, exclusively to the professional work legitimately belonging to them as Normal teachers. We must waive, for the present, any reference to the interesting matter contained in the appendices.

In the above synopsis we have tried to lay before our readers a clear and succinct statement of the more important and interesting features of Mr. Crooks' Report. Were we disposed to take a pessimist view of its tabulated results, we might say that they shew a rather retrograde tendency in educational matters, but this we believe is only temporary, and we have no doubt that when Mr. Crooks, a year hence, presents his report for the year just closed, he will be able

to shew the same steady advance which has marked the progress of our educational system during and immediately following the period of Dr. Ryerson's regime.

REPORT OF THE SUPERINTENDENT OF EDUCATION OF THE PROVINCE OF QUEBEC FOR THE YEAR 1877-78.

This is a bulky volume of some 240 pages, giving a statement of the condition of education in Quebec for the period named. From it we gather that there were 234,828 pupils attending 4,209 elementary schools, under 6,072 teachers, of whom 1,167 were male. The average attendance was 180,249, which shews that 77 pupils out of every 100 attended school every school day in the year. This is 30 per cent. higher than the average attained in the public schools of Ontario. The cost of schools was \$1,712,747—made up of \$1,556,363 from local assessment, etc., and subsidies amounting to \$156,384 paid by the Government. This makes the average cost for each pupil registered \$7.30, and for each pupil in average attendance \$9 50.

Enough money is spent on each pupil to produce fair results, and if these are not forthcoming, as we are justified by the Inspector's Reports in saying they are not, it is perhaps because the teachers are so miserably paid. Indeed the professional salaries of the Province are so much a curiosity that we tabulate them for the information or amusement of our readers.

	Males.	Females.
No. of teachers who receive less than \$100 per annum.....	102	2,089
No. of teachers who receive \$100 to \$200	572	2,522
“ “ “ \$200 to \$400.	325	259
“ “ “ \$400 and over.	168	35

Can we wonder, therefore, when we find such remarks as the following in the Inspectors' Reports? "I say, therefore, that the education and instruction of boys in our country parts are almost worthless, and this because these two important matters are entrusted to young girls of from eighteen to twenty years of age." "Convents spring up here and there as if by magic. These houses are kept up by dint of great sacrifices. Why not do as much for the education of boys?

Are not the latter to be superior to the young ladies who are brought up in the convents? It should be so, but with our present system this order is reversed. Yet it would be cheaper to keep a good model school than a convent." "I have 97 female teachers, and the magnificent number of 1 male teacher, in 20 municipalities. 76 female teachers receive from \$64 to \$72 salary; 21 a little over \$100. I have done deploring, or rather I will deplore no more, the fate of most of these young ladies, for I know by experience that they are the direct authoresses of their own misfortune, and that because they take situations at the lowest price." "I regret to have to say that the teachers in general are badly paid, and this disheartens the majority of them. It is therefore desirable that the salaries should be higher, if we wish the schools to continue improving. I have especially remarked that the teachers who are properly remunerated display more zeal and energy in teaching." "There are very few primary schools which may be considered good schools, and I am all the more convinced of this, that the irregular attendance of pupils, and the want of proper knowledge of how to teach, in the teachers, are the principal reasons."

These Inspectors make serious complaints about the numerous badly built and deficiently furnished school-houses. They are greatly exercised too at the variety of text books in use.

In 1878 no Inspector got a salary of more than a \$1,000 a year.

There are 3 Normal Schools, with a staff of 49 teachers, and an attendance of 306 students. Their cost was \$60,800, which makes the average cost of each pupil amount to \$200.

The most interesting part of this volume is the Inspectors' Reports, from which we have already quoted; these will compare very favourably with those found in our own Report, not only in their literary form, but in their contents, which are of considerable educational value. Many of them bear evidence of having been written by thoughtful, experienced, cultured and earnest men. It

is from them that we find how low the standard of education is in our sister province. Their statistical tables shew us that only 42 per cent. can read well, and but 34 per cent. fluently; 60 per cent. only are in writing, and 57 per cent. in arithmetic. Many scholars leave school without the ability to write their names. With facts like these before us we must re-echo what appears with persistent iteration as their opinion that the system of instruction in Quebec must be vastly improved before these schools will turn out either good citizens or good men; that if her population is to be a self-governing one, taking an active and intelligent interest in public affairs, they must be subjected to better mental and moral discipline than they are at present.

With this Report before us we may be pardoned for indulging in a little self-felicitation over our own excellent school system. We are in the happy condition of the Spanish beauty who has the companionship of an ugly duenna to add to her charms.

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CHEMISTRY OF COMMON LIFE, by James F. W. Johnston, M.A., etc. New edition, revised and brought down to the present time by A. H. Church, M.A. New York: D. Appleton & Co. Toronto: Hart & Rawlinson.

Our older readers will remember that the first publication of this work, twenty-five years ago, opened up a mine of knowledge to the general public on matters which deeply concerned their health and life. We have often wished for a reprint of the work which would embody the results of the latest investigations and discoveries on the subjects of which it treats. Mr. Church has

stepped forward and more than gratified our wish. Himself a skillful chemist, and one accustomed to put in a popular form scientific knowledge bearing upon the health and comfort of the people, he has made it a labour of love, as well as duty, in preparing this edition for the press, to incorporate whatever fresh information could be had upon each subject, so that he might make the work as complete as possible up to the present time.

Mr. Johnston's original design was to make the book a manual for schools; his accomplished editor has adhered to that design throughout, and completed it by a new chapter on "The Colours we admire."

Now that we have the teaching of Hygiene among our school subjects, we know of no better book for a teacher to have at hand to assist him, not only in giving rational information and instruction upon matters that concern health, but in shewing to his scholars the scientific basis of what he teaches. The titles of a few of the chapters will indicate the thoroughly practical character of the work for the use we indicate: "The Air we Breathe," "The Water we Drink," "The Soil we Cultivate," "The Bread we Eat," "The Beef we Cook," "The Beverages we Infuse," "The Liquors we Ferment," "The Narcotics we Indulge in," "The Smells we Dislike," "What we Breathe and Breathe for," "What, How, and Why we Digest," "The Body we Cherish." Not the least of the attractions of the book is the pleasant style in which it is written. It has numerous wood cuts, and the paper, binding and typography are particularly suited for the volume as a hand-book.

## EDITORIAL NOTES.

## APPEARANCE VS. REALITY.

Educational systems are in a bad way when those to whom their interests are committed delude themselves with the belief that they have "reached unto perfection." We have all of us long burned incense at the altar of that ideal excellence to which our Ontario school system is supposed to have attained. The quaint but friendly letter, in the Contributors' Department of our present issue, from a foreign visitor to our schools, may, in the particular of school apparatus and general educational furniture, open our eyes to the real position of affairs. The truth of the facts related by our foreign critic will doubtless atone for the treason of his utterance; but is it not time that we should stop patting each other complacently on the back in the belief that no country has a superior or more complete school organization than we have in Ontario? We are not pessimists; but our correspondent's letter reveals a state of things with regard to the impoverished equipment of our schools which it is childish for us to hide from ourselves and criminal to conceal from others. But the letter challenges attention, not only for its revelation of the meagreness of the educational apparatus to be found in the schools, particularly of the rural sections, but in its indictment of our morality in accepting honours conferred at International Exhibitions under false pretences. As educationists, it is the weak side of our character that, misled by pretentious shows, we are too apt to blindly praise and ignorantly to admire. Theoretically, our schools are models; practically, in many instances, they are far otherwise. For years back the Education Department has maintained, for the manufacture of globes, maps, and school apparatus, a monopoly whose operations have been

as primitive and uncommercial as they have been silent and mysterious. If rumour is to be trusted, this phantom Company is represented by one of the chief officials of the Depository, and its charter, it is said, was obtained by the use of the names of business men in Toronto whose interests were conveniently forgotten on the incorporation of the Company. To this semi-mythical and quasi-official firm the schools for years have had alone to look for their supplies of school furniture and apparatus, and education has been deprived of the substantial advantages which an open market and the competition of trade might have otherwise afforded. That this Departmental trading-house has been able to make a good appearance at the Education Office, and has also found it politic to go into the "show business" at Philadelphia and Paris, is easily understood. That it has failed, as a business house, to reach most of the schools of the country, and been inert in extending to them the facilities of an educational supply-store, is, under the circumstances, equally comprehensible. But this the Minister of Education must see is not advantageous to the interests over which he presides, nor is it the function of a Government Education Bureau, either in connection with the Depository which he now wisely promises to abolish, or in connection with a mysteriously operating firm, the chief members of which are among the officials and employés of his Department. For the good name of our schools, and the credit of our educational system, Mr. Crooks will do well to look into the matter we have thus plainly referred to, that *appearances* may be justified of *facts*, and the Province be relieved of the odious imputation of winning its educational honours by fraud or by deceit.

## THE ABOLITION OF THE EDUCATION DEPOSITORY.

It cannot be said that in the matter of closing at an early day the doors of the Education Depository of Ontario, Mr. Crooks has shewn himself to be in any sense a hasty innovator. For twenty years, to our knowledge, has the abolition of the establishment been called for. The trade have fought against it as an illegitimate interference with commerce, and the public have decried it because of its inefficiency and cost. Notwithstanding the arguments repeatedly advanced for its discontinuance, those interested in its operations have always managed to keep it going. It was the one preserve that Confederation had left in the Province to officialism. Hence, at all hazards, it was to be defended and maintained. From an influential and disinterested source, six years ago, it received its death-blow, but the careful tending of many nurses has thus far kept the vital spark alive. What, in this interval of decrepitude, it has unwarrantably cost the Province, only the life-annuitants of the institution can approximately guess. With its profit and loss account the country has never been made familiar, but the accumulation of unsaleable stock is a speaking commentary upon its management. What the character of that stock is, the ten thousand recently printed catalogues of labelled literary rubbish throw some light on. A dear Educational whistle the Depository has ever been, but it entailed the greatest loss upon the country when, under Dr. Ryerson's *regime*, Mr. Mowat weakly sacrificed to its maintenance the able men who composed the last Council of Public Instruction. It may be instructive to remember that the latest official act of that body was to urge upon Government the step which Mr. Crooks, after these six additional years of galvanized life for the institution, is now about to take. The reflection is not a pleasant one that, for that suggestion—treason then, but loyalty now—the country lost the services of men who were doing a priceless work for education and the school system of Ontario.

## CABINET MINISTERS AND SCHOOL TEACHERS IN VACATION.

The Ontario Government has given the screw of economy another turn in reducing the grant to the Ontario School of Art, an institution which has proved itself highly deserving of the small annual pittance the local Government has hitherto contributed towards its support. Of course, if gubernatorial jaunts are to be annually provided for, and at the cost of the one to Manitoba of last summer, with its outlay of \$5,444 for travelling expenses, wine bills, and cigars, it is not to be wondered at that Educational art must go without encouragement and technical drawing be limited to the uses for which "corkscrews," and not crayon stumps, are the indispensable auxiliaries. The drafts upon the Provincial Treasury for this holiday spree of His Honour and Mr. Wood curiously enough come to light while the Minister of Education is considering petitions to shorten the brief summer vacation of the over-worked and ill-paid teacher. How Mr. Crooks can entertain the idea of despoiling the teacher of any portion of his well-earned holidays, while the country learns how, and at what public cost, his colleague the Treasurer spends his, is more than we can comprehend. But without drawing further parallels, it is time that this petty cavilling at the summer holidays of the schools should cease, and the few who clamour for their curtailment be made to know that, in the interest of the teacher and the pupil alike, the full mid-summer vacation is an indispensable provision of the educational system. It would be both immoral and the falsest economy to abridge the holidays; and Mr. Crooks should leave no door open to the chance or option, in any section of the country, of their abridgment.

## MODEL SCHOOLS AND THE DEFICIENCIES OF TEACHERS IN TRAINING.

There are two or three suggestive pages in the current Report of the Minister of Education for Ontario which greatly relieve

the monotony of its statistical departments, and the consideration of which may not be without its lessons. We refer to the opinions expressed by the Principals of the County Model Schools as to the common deficiencies of teachers in training and their suggestions with the view of securing greater efficiency in the future management of the schools under their control. Referring meantime to the former of these, we find the fifty Masters of the Model Schools recording their opinions of the lacking qualifications of the budding teacher, the sum of whose shortcomings may be reckoned up in the one word "veal." In detail, the characteristic deficiencies are labelled with more or less variety and picturesqueness, but the term we have used fairly expresses the present immature condition of their professional powers, though doubtless it is only that of a transitional period. One missing qualification, however, is commented upon by a third of the Masters, namely, "lack of energy," which, though itself a mark of immaturity, is to be noted as a defect in many teachers of even long service in the profession. How best to cure this may well engage the thoughts of both the Minister of Education and of the Inspectors. In times of active, unflagging thought like the present, when so much is expected of both the schools and the pupils, there is no place for the sluggish mood or the torpid intellect. Both are a crime against the age. Yet the remedy will not alone be found in preaching against listlessness and inactivity. Nor will the occasional visit of an energetic inspector avail, unless the teacher is made to take a pride in his work, and has the consciousness of having mastered it. Power can never be manifested in teaching unless there is mastery; and the secret of success is in thorough training. Half-education in the pupil is bad enough; in the teacher it is criminal. The best antidotes are study and sound training, with such stimulants as may be imparted by a zealous and efficient instructor, surcharged with the magnetism which a healthful and vigorous physical frame enables its possessor even unconsciously to exert. It

should, however, be borne in mind that there is a tendency, particularly in these County Model Schools, to attempt too much in the way of professional training, which neither the masters nor the students can satisfactorily grapple with. This of itself will but too readily dissipate energy, and introduce a fevered fussiness inimical to progress and fatal to good order and discipline. In the good work these Model Schools are doing it would be a pity if they should imperil their usefulness by any indiscretions either of over-zeal or of ignorance.

#### INSPECTORIAL. "FINE WRITING."

Is there is no means of repressing, in the interest of a chaste and sober diction, the pathos indulged in at intervals by Inspectors in their Reports to the Education Department of Ontario? "here is scarcely an annual Report issued by the Minister which is not disfigured by instances of high-falutin writing on the part of those whose official position should incite them to set better models of composition before their brethren in the profession. The latest specimen of this "tall writing" is to be found on page 124 of the Annual Report on Education for 1878, just issued by order of the Legislative Assembly of Ontario. It is only an "extract," and the sober mind will be grateful that there is fortunately no more of it, though how ruthlessly the metaphor may have been torn from its context who shall say? Here it is:

"There are many considerations, which enable me to state to you that the wave of progress flows onward to the maturity of perfection, gradually deepening and widening. I regret to have to state that the strength of this wave is greatly diminished, and its velocity retarded, as it strikes against the rocks of frequent change of teachers, irregularity of attendance of pupils, and erroneous conceptions of the nature of Education.

"In the whole course of School Legislation, there has been nothing calculated so well to augment, clarify, and beautify this wave as the Regulation requiring all teachers to be professionally trained, before they assume the momentous responsibility of educating youth.

"The *Intermediate Examination* is a grand tributary to the great Educational wave."



## NEGRO EDUCATION.

Our attention has been drawn to a very able paper written by W. N. Armstrong, of Virginia, and entitled "One Aspect of the Negro Question." This essay, first read before the Yale Alumni Association of New York, was republished the other day in the *Present Century*, one of the numerous eclectic periodicals of that city. While submitting to the inevitable, and recognizing the great fact of the liberation of the negroes as the practical result of the war of Secession, Mr. Armstrong still has the courage to contend that the suddenness of that liberation and of the political enfranchisement which followed it is fraught with peril to the best interests of the Republic. Upon the whole he looks on the Negro Question from the stand-point of Carlyle, rather than from the more emotional platform of the philanthropic abolitionist. Judged in the light of facts, Quashee is an inferior being. "What," asks Mr. Armstrong, "are his antecedents?" When originally imported, his ancestors were ignorant, degraded, savage pagans. Till recent days they have experienced no civilizing influences. Education was forbidden. The marriage tie, the bonds of family feeling, were alike unknown. Nothing but a few of the outward forms of religion and civilization percolated down to them from the energetic domineering race that ruled over them with a rod of iron.

Is it then to be wondered at that thinking men, while discarding all notions of reaction, consider that a great mistake was committed when the electoral body of the States was suddenly swelled by four million voters of this calibre? Distributed, as these men are,

over a large number of States, it is plain that in a closely contested election the balance of power may lie in their hands, and the chance of successful manipulation of the polls indefinitely increased.

"We must educate our masters,"—this was the remark made when the last English Reform bill had struck a layer of voters unaccustomed to the habits of self-governing bodies. With how much more force the remark applies to the United States of today, let each man tell himself who contrasts the most uneducated English artisan with Sambo, slave to fetichism, accustomed to separate religion from morality, liable to imposition, panic, and the surrender of his own will to that of any one stronger or more cunning than himself.

Mr. Armstrong considers that education is doing little as yet to remove these dangers. True, he says, there was an educational "boom" directly after the war. Reading and writing had been so tabooed that their possession seemed to be a charm to conjure with. "When they discovered that there was no immediate connection between learning and money, their zeal began to die out. Studious old negroes studying spelling books by the light of the pine torch are not so common." The vast distances and the poverty of the country, too, are great difficulties in the way of the practical and efficient working of any school system however well devised.

We should like to hear from any of our readers, who may have had experience in teaching the average negro in the Southern States, as to how far their views coincide with those of Mr. Armstrong.

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CORRECTION. —In our last issue we fell into error in saying that Mr. Samuel Woods, M.A., had been appointed to the Chair of Classics in Queen's College, rendered vacant by the recent death of the Rev. Professor McKerras. Mr. Woods, it seems, has simply been requested by the Principal to teach the Greek Classes in the College until the Trustees meet, when they will advertise for a successor to the late incumbent of the office. The Rev. Mr. Nicholson, who has discharged the duties of Assistant Professor of Classics very satisfactorily for two years past, we learn, continues to teach the Latin Classes.