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THE ONTARIO TEACHER:

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HIGH VS. PUBLIC SCHOOLS.

Our remarks in the October No. of the ONTARIO TEACHER have given rise to a good deal of criticism. We have received the strongest assurances from different quarters that the work done by our High Schools, compared with the expenditure, is not at all equal to the work of the Public Schools, and that a radical change, by which more work might be secured for a given expenditure, or the number of feeble, sickly High Schools reduced, ought at once to be brought about.

We have also reason to believe that our remarks in regard to High Schools have, in some instances, been misapprehended. We did not at all intend to convey the idea that High School teachers are, as a class, incompetent. We know well to the contrary. Indeed, some of the best educators in the Province are to be found among them. But, whatever may be our own opinion in regard to individuals, we were obliged, from the reports of High School Inspectors, to assume that there was great and gross inefficiency somewhere. By

some correspondents, this inefficiency is charged to the Public Schools, from which the High School scholars are drafted. By others it is charged upon the High Schools themselves. Mr. McLellan, High School Inspector, from whose report we quoted pretty freely, throws the *onus* upon the Public Schools, and endeavors to make it appear that his report was made by us to serve a purpose for which it was never intended. In a recent communication to a leading daily paper, he says that his reports were "private and partial, and merely designed to show that, as the entrance examinations in general were not sufficiently stringent, many pupils found their way into the High School who were quite unprepared to enter upon a High School curriculum with advantage." He says "they were not to be taken as official documents relating to the general efficiency of the schools."

We are extremely sorry if by quoting from Mr. McLellan's report, we have done our High Schools an injustice. We, how-

ever, believe still that Mr. McLellan's report, whatever may have been its design, clearly proves what we knew little or nothing about till we saw it there, that is, the inefficiency of the High Schools. For instance, in his report of the Guelph school, he says the "reading of nearly all the 20 candidates for entrance (*whom the regular pupils scarcely surpassed*) was VERY BAD."

Of Elora he says, "four candidates for entrance, 20 pupils present." Five got "coal" question—*three old pupils*. Stratford. "Parsing by *whole school* anything but good."

Strathroy. "Forty on roll. Only eight in *whole school* could find the difference between 2275 and 5-16ths and 2174 and 11-112ths."

Sarnia. "Even the old pupils did *badly*. All failed in analysis."

Wardville. "Forty-four on roll. *Only seven* got subtraction question and of coal."

Oakville. "Only *three* in school (36 on roll) got above question in subtraction."

From these quotations it must be apparent that Mr. McLellan's report (whether *ex parte* we cannot say) does more than simply refer to the candidates for entrance, and that we were justifiable in using it in the way we did.

We are well aware that the High Schools are not at all to blame for the "meagre attainments" of candidates who are sent up from the Public Schools. Nor did we ever say they were to blame. But Mr. McLellan's report not only shews the meagre attainments of the "candidates," but it also refers, in many instances to the "old pupils," "the whole school," in which cases we are obliged to infer that he means what he says. We say nothing in regard to inefficiency except what Mr. McLellan is evidently responsible for, and if his record is correct, then we have not said any too much. If, however, any injustice has

been done to the meritorious schools, ours is not the blame.

In our first article on this subject, we referred to the very liberal appropriations made by the Government to High Schools as compared to Public Schools, the proportion being \$8.75 and \$0.40 per pupil. There is another evil referred to in Mr. McLellan's reports, already quoted, that is the deficient training of High School teachers in the English course, which now composes the greater part of High School work. Mr. McLellan says, "I presume but very few of our best masters could take a first class A, under the new law." Further on he says, "I unhesitatingly assert (and my notes will prove it) a great majority of our union grades are not as well qualified to teach the English subjects as Public School teachers holding A 1 certificates under the new law."

Does not this account for some of the statements in Mr. McLellan's report, or are we to saddle the whole blame on the Public Schools; as Mr. McLellan says in his recent letter to a public journal would, "perhaps" be the guilty party? But why, we ask, require the High School to do so much Public School work at all? Why not begin where the High School programme naturally breaks off? As the respective programmes are now laid out, the High School begins with the Fourth Form of the Public School and assumes, we suppose, to carry out the balance of the programme with greater efficiency than could be done in the Public School, otherwise, why assumes to do it all? Would it not be better to confine the High School entirely to its original design of being a classical school, in the true sense of the word, and thus avoid encroaching on Public School work? Were this course adopted, then each could be held responsible for its own work, and neither could blame the other for dereliction of duty. Besides, if a First A Public School is more capable of teaching the

English course than the majority of High School teachers, as Mr. McLellan says they are, then there would be positive gain to the educational interests of the country.

But, apart from this, the financial reasons stated in a previous article are not unworthy of consideration. Take, by way of illustration, an ordinary union village school, with one High School teacher, an assistant, and a Public School with four teachers. The High School teacher receives say \$800 per annum, and his assistant \$500, making for High School salaries \$1300. Say the High School is attended by the average number of High School pupils, 30. The Public School is in all probability attended by 350 scholars. The first teacher likely receives a salary of \$550, three assistants an average of \$300 each, making in all \$1750. Here, then we have the enormous discrepancy of an incorporated village paying \$1300 for the education of 30 scholars in the High School, whereas it only pays \$1750 for the education of 350 in a Public School. Now, what is the effect of this on the Public School? Simply, to produce the evils which Mr. McLellan refers to by innuendo—inefficiency in the Public School. Nay, more. The High School absorbs so much of the resources of the municipality to maintain its feeble and, in some cases, useless existence, that the Trustees are compelled to hire teachers at the lowest possible salaries in the Public Schools, or become bankrupt. How much better would it be, in many cases, to abolish the High School altogether, and use the money it absorbs in increasing the salaries of hard-working teachers in the Public Schools? How much better would it be for the country to give its young men and women a good English education than to crowd them into a High School where they receive only what Mr. McLellan says is, in most cases, a smattering of classics and French? Many Public School teachers

who labor hard in many of our rural villages and towns on a paltry salary, would accept an advance of \$100 as a "Godsend," but which Trustees cannot afford to give, simply because their treasury is exhausted by the High School Board.

To remedy this evil what should be done? Simply reduce the number of High Schools. One in each county, or one to so many thousand inhabitants, or, if preferable, one to those places only where there were at least fifty pupils who could pass the required examination. By adopting this course, and confining the High School almost entirely to a classical course, we have no doubt the efficiency of both classes of schools would be promoted.

It might be urged that, by reducing the number of High Schools, many would be deprived of a classical education who are anxious to prepare themselves for the University. There might be some force in this objection we admit. But it is not *individual* cases that we are required to consider, but the interests of the whole.

A High School in every county would supply, with very little inconvenience, all the facilities for a classical education, which individuals might require, and the removal of such a drain upon the resources of many small towns would enable Boards of Trustees to provide better advantages for their Public Schools, and thus add to their efficiency and usefulness.

We trust the Ontario legislature will take this matter into consideration at its next session. We believe the only way to do justice to our Public Schools would be to allow them to carry out in its integrity their own legitimate work, and in those cases where they have so degenerated, from whatever cause, that they cannot supply fifty scholars who could pass a good examination as candidates for a High School, that the High School, in such cases, should be abolished or suspended till the required efficiency was secured in the Public School.

THE PHILOSOPHY OF TEACHING.

BY JAMES E. GREY, TEACHER, ST. CATHARINES.

Man is a compound being, physical, moral and intellectual; and the science of education may be defined to be those laws by the observance of which this compound nature is properly developed, directed, and perfected. It comprehends those laws upon which depend the development and improvement of the physical or bodily powers of man; those laws by which the harmonious growth of all the powers and sensibilities of the mind is promoted; and those laws which regulate the formation of a true and noble character. How necessary is it then that we who are engaged in the work of training the young should have correct views of the end of education. How necessary is it that we should have a proper knowledge of the material upon which we operate. How necessary is it that we should know just what food or nourishment is suited to the growth or expansion of each part. And how necessary is it that we should know how to present that food in the way best calculated to secure the desired end.

Education, then, does not consist, as we fear too many suppose, in merely giving the child as much instruction as will enable him to transact the ordinary business of life; but is a gradual development and improvement of all the powers and faculties of the man from infancy to the end of his days. If these views of education be correct, what extensive preparation does the teacher need to make, in order that he may discharge his duties intelligently and in the most profitable way to those entrusted to his care. His knowledge of the anatomy of the human frame, and of the laws which

control the healthy development of the organs of the body should be extensive and accurate; he should be intimately acquainted with the different faculties of the mind, their nature, their relative importance, the period of the child's life in which they are most active and most susceptible of cultivation, and the branches of study best adapted to the training of each faculty; and he should not only be a good man himself, that he may influence by his example, but also he should be skillful in dealing with the conscience, in promoting and encouraging that which is good, and eradicating that which is bad.

In the further discussion of this subject, I will ask your attention to some principles gathered from my own experience and the opinions of others, which should form the basis of our system of instruction, and to an exemplification of these principles in the teaching of arithmetic to the young.

1. *Exercise is the grand specific for all development.* If I wish to increase the strength of my arm, I must exercise the muscles in accordance with physiological laws. If I wish to strengthen and develop my intellect, I must carry out the same rule, and present to the perceptive faculties, the memory, the recollection, the imagination, the understanding and the reason, that food by which all these divisions of the mind may be stimulated to active exercise. If I wish to cultivate the moral powers of the child, I of course teach him right from wrong, but if I stop here I am not educating him; I must go a step farther and see that he puts into practice what I have taught him. I wish to re-

mind myself, as well as my fellow teachers, of the great importance of this principle in the work in which we are engaged, and that it is impossible to educate, in the proper sense of that word, unless we can induce the pupil to use the powers with which God has endowed him. The highest teaching talent by no means consists in being able to explain fluently and intelligently the difficulties which the learner has to encounter, but it certainly does consist in being able to awaken the latent powers of the child's mind, and in being able to call into activity all the organs, faculties and sensibilities of his being. The teacher is qualified for his profession, and is successful in his work, just in proportion, not as he is able to cram, but as he is able to draw out into lively exercise all those faculties the training of which is entrusted to his care.

2. *We should be very careful to give teaching and educating, telling and training, their appropriate places.* I fear there are a great many members of our profession who think their task done and ably performed, if they have, as they consider, clearly and intelligently set before the minds of their pupils the subject under consideration, forgetting all the while that notwithstanding lucid explanation, fluent and pleasing address, the faculties of the child's mind may be perfectly dormant, or exercised by some subject entirely foreign to that which forms the topic of the lesson. We of course do not undervalue the art of communicating instruction—that is an art particularly essential to the success of every teacher, but if the instructor does all the observing, all the thinking and all the reasoning for the pupil, there will be no growth, no expansion of his intellectual powers. To carry out the developing theory we must frequently pause in the course of the lesson, and by a judicious system of questioning call into exercise the faculties of their mind, and cultivate the habit of attention.

Instead of the questioning process, it is recommended by many educators as a higher intellectual exercise to leave blanks in the lesson, especially inferences, and allow the scholars to draw their own conclusions.

3. *We should make a practical application of all knowledge communicated.* Do we teach a child that the verb agrees with its subject in number and person—immediately give him sentences to construct having special reference to this rule—or do we teach a child that $7 + 8 = 15$, as soon as he has learned this statement, give him practical examples to solve, in which these numbers are used. To obtain knowledge is highly important, but to be able to reduce acquired knowledge to practice is of far greater importance.

5. *In teaching any subject to children deal with it analytically, not synthetically; deal with the concrete before the abstract; deal with things, then signs for things.* I think the reason why so many fall short of accomplishing the object of their mission lies just here:—they put a text book in the hands of the child and expect him to manage the subject by managing its pages. Now, subjects in our text books are treated synthetically, or as a science, and children naturally learn by analysis; if, therefore, we begin with the text book, we are reversing nature's order, and must not be disappointed with the poor results of our labor. We consider it essential to the proper education of the child, and to the success of the teacher, that we begin with facts, and ascend to principles—first wholes, and then the parts of which they are composed. After the child has attained a certain age, and when the powers of the mind are somewhat matured by the course of training just indicated, we may with advantage teach a subject as elaborated in a scientific work, but not before.

5. *We should teach by outlines, filling in gradually the details until the whole is complete.* We mean by this that the leading,

salient points of the subject with which we are engaged should first be presented to the mind, and dwelt upon till the pupil has mastered them, and then by successive courses fill in the details, as far as time and opportunity permits. This seems to be the method pointed out by nature. The child visiting a menagerie for the first time is most interested and attracted by the prominent objects—the large animals—and it is only during subsequent visits that he pays any attention to the less conspicuous objects and curiosities. The artist, in transferring the landscape or figure to canvas, first draws the faintest outline, then proceeds with the most prominent objects, and then in detail fills in the more minute parts. The sculptor first chisels out the broadest outline from the marble; he never dreams of finishing any one part before proceeding to another, but he does a little to each part until the whole is finished. From this law of nature I think that we teachers should learn this lesson: that in presenting any branch of knowledge to the youthful mind, we should deal very generally with it at first, and as the pupil advances in years and matures in mind, go gradually into particulars.

6. *Our teaching should be adapted to the age and mental condition of the child.* We think that from 5 to 8 years of age, when the perceptive faculties are in the most lively exercise, we should teach all subjects through the medium of objects. Nature certainly indicates that *this* is the true system—she invariably gives ideas before words—gives perceptions of an object as a whole before she notes the parts of which it is composed—gives ideas of things concrete before those of things abstract, and we would do well to sit at nature's feet and receive instructions from her on this subject. The branches best suited to this period of childhood are a well arranged set of object lessons—reading taught objectively—concrete arithmetic, drawing, which

should include the letters of the alphabet and geometrical figures, and music. From 8 to 11 we find the memory, recollection, and imagination particularly active, and the studies pursued should consequently have special reference to this fact. Were it asked, what are the branches best suited to this period? we might answer briefly, every thing that requires the sheer exercise of memory, or to enumerate particularly, we would say that in addition to the studies pursued in the former period—language—and as we do not study the classics in the Public Schools, we must endeavor to give the memory the same kind of training as is afforded in the study of classics by examining the meaning of words, and in giving them their proper application in the construction of short sentences. Grammar is another branch which should be studied at this age, not, however, as a science, but analytically, by means of oral lessons. Memorizing proper selections of poetry seems to be an exercise indicated by the requirements of the mind at this epoch. History and Geography would be subjects particularly suited to this time of life, as they furnish ample food for the memory and imagination, if properly taught, and the child at 8, if he has gone through a course of concrete arithmetic, might very properly begin the study of abstract numbers; also the exercise which he has had in drawing has laid an excellent foundation for penmanship, in which the child should make considerable progress from 8 to 11. At the age of 12 the child's judgment and reasoning powers are rapidly developed, provided he has been properly taught—his mind is now fully stored with rudimentary facts, and he is prepared for the higher exercises, both of synthesis and analysis. Hitherto, in all our teaching we have proceeded upon the principle of beginning with generals and descending to particulars; the pupil has now arrived at that stage in which he is enabled to reverse

this order, and study branches synthetically or as they are presented to us in our scientific works. The studies best adapted to strengthen the reasoning faculty are mathematics, especially the higher departments of Arithmetic, Algebra, Geometry, Logic and the physical sciences.

7. *Our instruction should be carried on simultaneously and individually, by questions and answers and ellipses.* This questioning process brings into requisition the highest ability of the teacher; it is no mean acquirement to be able to put just such questions as will bring out the knowledge possessed by a child, or to put such questions as will enable the teacher, from the answer given, to determine what further instruction is required from him, that the child may be enabled to reason out the subject for himself. In oral lessons, instead of questioning, we might leave blanks, and require the pupil to fill in, allowing him to go on drawing his own conclusions as long as he keeps the right path. This exercise of giving the pupil an opportunity of supplying ellipses is preeminently intellectual training, and seems to have been the method most frequently adopted by the great Master while on earth.

With regard to the simultaneous and individual mode of questioning, it appears to me that if our object is to find out whether the child has prepared his lesson or not, whether he has been attentive or otherwise, or whether he has comprehended our explanation or not, we must deal with the class individually. On the other hand, if our object is to evoke thought, or develop mind, we can work the class simultaneously.

8. *No lesson is given until it is received by all.* It is a grand mistake for a teacher to think all is well and finished when he has thoroughly prepared himself on a subject, and in a pleasing and intelligent manner propounded that subject to his class; if he stops here he may benefit the atten-

tive and studious, but a large part of the class, especially the listless and the wandering, will not have comprehended the lesson, and therefore much of the teacher's labor will be expended to no purpose. To meet these cases it is recommended that the teacher require from the class, after the recitation is concluded, a verbal statement of the whole exercise, or what is better, a written synopsis of what they have learned during the lesson.

9. I presume it is safe to infer that every child has some peculiarity which distinguishes him from other children. The efficient teacher, in his intercourse with his pupils, will endeavor to find out the characteristic of each, and turn his discovery into profitable account, more especially in his moral training. As the pupils are less restrained in the play-ground than in the school-room, it becomes an excellent field for observation. In the play-ground peculiarities in disposition, temper and habits will more readily show themselves than in the school-room, hence educationists recommend that the teacher accompany his class to the play-ground, or as some term it, the uncovered school-room, for the purpose of correcting what may be seen to be wrong, and of marking peculiarities in constitution, and through them obtain an avenue to the higher principles of their nature.

10. To recapitulate the principles we have endeavored to enumerate, we would say that to teach successfully we must present to the mind first things or objects, then words or signs for things—first facts and phenomena, then laws and principles—first wholes, then the parts—first the concrete, then the abstract—first the analysis, and then the synthesis. Proceed from the known to the region of the unknown, and conduct our lessons in such a manner that they will in reality exercise the child's mind. If we fully carry out these principles, I am convinced that we shall

never have cause to regret that we made them the basis of our system of instruction.

As an exemplification of the system I have briefly attempted to unfold, I will take up the subject of teaching arithmetic to pupils from 5 to 8 years old. With pupils of this tender age the only true method is to carry on all the operations by visible objects, or in other words, as before stated, begin with the concrete. The absurdity of the old method of introducing a child all at once into the mysteries of abstract numbers is all but universally acknowledged, and the more philosophical way of teaching this subject through the medium of objects is practised in nearly all primary departments. We begin then with this branch of the child's education by giving him an idea of numbers, or teaching him to count, using the ball frame or some small objects such as beans; let the first lesson be from one to nine, teaching him as he counts the objects to put down, the sign or symbol that stands for the number of objects enumerated. Let the next lesson be from 9 to 19, explaining particularly that 11 means 1 and 10, that 19 means 10 and 9, &c. Let the next lesson be from 19 to 29, taking care to inform the pupil that 20 means 2 tens, and 24 means 2 tens and 4, &c. I would continue this exercise until the child could, with the greatest freedom, count up to 100, both forwards and backwards, and readily put down the figures standing for any number of things between 1 and 100.

Addition.—The teacher must first endeavor to explain what the term means, and the utility of the rule. To explain the meaning of the term, take a pile of books and increase the size of the pile by laying on more. Suppose you had in the first lot 6, ask them to ascertain by counting how many; then take 3 more and place them upon the first lot; ask how many in the pile now. The act of bringing these two lots into one, making 9 in all, is called ad-

dition. To explain the utility of the rule, distribute to several members of the class different quantities of small objects, such as beans, and ask them to ascertain how many you gave out to all; this they will do by counting, then show them that by putting the numbers given to each under one another, and adding together, that you can arrive at the same result much more easily and quickly than they did. After some oral lessons of this kind take the ball frame and with its aid construct the first line of the addition table thus, $1 + 1 = 2$, $1 + 2 = 3$, $1 + 3 = 4$, $1 + 4 = 5$, and so on, explaining the meaning of the signs + and =, and before proceeding to the next line, let the class be so exercised that each pupil can readily tell the sum of the constant digit used, and any of the nine digits in any order, and carrying out the principle that as soon as knowledge is acquired it should be immediately applied. Give large numbers of practical problems in which the numbers will be the same as those in the line of the addition table under consideration. William has 7 marbles in one pocket and 1 in another, how many has he altogether? There are 5 boys in a class, if 1 more be added, how many will there be? Proceed thus through each line of the table.

Subtraction. By an oral lesson explain the meaning of the term, and when the rule is to be applied. To explain the meaning of the term take a pile of 6 books, and remove 4—how many left? Here is a class of 10 scholars; suppose I send the first 3 boys to their seats, how many will be left? You see then that subtraction means to take away from, and instead of counting what is left to find the answer, it is much easier and shorter to employ this rule—thus 4 from 6 leaves 2, 3 from 10 leaves 7. You will understand then that we use subtraction when we want to find difference between two numbers or when we want to take one number away from

another. We then take the calculator and give the first lesson thus, explaining the meaning of the sign minus, $10 - 1 = 9$, $9 - 1 = 8$, $8 - 1 = 7$, $7 - 1 = 6$, &c, putting this down as a table on the black-board, and do not advance until every child can readily state the difference between 1 and every number from 1 to 10. After this has been accomplished, and before proceeding to the next line, give numbers of problems in which the numbers just considered are used. John has 7 pence in his pocket; he gives 1 penny to James, how much has he left, &c. It would also be well to occasionally combine addition with subtraction. John had 4 marbles, he won 7 and then lost 2, how many had he left? I would thus go through every line of the subtraction table.

Multiplication. Give first an oral lesson, explaining the term and when the rule is to be used. Ask the class to find out how many panes there are in one of the windows—the answer will soon be given by counting. Show them that by putting down the number of panes in a row as many times as there are rows, and then adding, the same result is obtained much quicker than by counting; then show them that it is still easier to put down the numbers in a row and multiply it by the number of rows. From this illustration it can be easily explained that multiplication is a short way of performing addition, and is always used in preference to addition, when we wish to find the sum of any number of things repeated a certain number of times. Then we formally begin to teach the table by the use of the ball frame, thus, $2 \times 1 = 2$, $2 \times 2 = 4$, &c., explaining the meaning of the sign *into*. We put down the products as obtained from the balls upon the black-board, and after constructing the line, have it learned thoroughly, so that the scholars may not only be able to repeat it forward and backward, but also promptly give the product of 2 and any of the numbers from one to 12. Then, before proceeding farther, exercise the class in the solution of practical problems, such as: How many feet have two cows? Bought 7 eggs at 2 pence, how much did they cost me? &c. Proceed in this way through the whole table, not forgetting to give examples, in which the pupil shall receive some exercise in addition and subtraction as well.

Division. By some oral lessons explain

the meaning of the term by some such processes as the following: Take the class and separate it into groups of 4; count the groups, and ask what has been done. Separate or divide the class into 2 or 3 parts, as the case may be, or take a number of marbles or other small objects, and state you wish to give an equal number to 4 boys; how am I to find out how many to give to each boy? Show them that by giving one to each all round, and repeating this as long as the marbles hold out, you would in that way give an equal number to each, or show that by repeatedly subtracting the number of the class from the number of marbles, till there was nothing left, the number of subtractions will be the number of marbles to give each, informing them that this division was only a short method of doing subtraction. Now show that by knowing the rule of division, you can much more easily tell how many to give each, than either by serving them out one by one, or by subtracting. I should then proceed systematically to teach the division table by the use of the ball frame—thus, $4 \div 2 = 2$, $6 \div 2 = 3$, teaching, at the same time, the sign of division. I would put down the results as obtained from the ball frame, and make the class perfectly familiar with each line before taking up the next. After completing a line in the way just described, give practical examples on that line, such as: Two loaves cost 16 cents, what is the price of one? Divide 12 cents between 2 boys, &c.; and in this way go through the whole table. In learning the division table we can, as we should in all our teaching, rise from the known, by making use of the knowledge acquired in learning the multiplication table, to the unknown. At the end of every lesson there should always be given a few examples on the preceding one. When we are teaching subtraction combine it with addition, when multiplication, with addition and subtraction, and when division, with addition, subtraction and multiplication. Having arrived at this stage, before advancing farther, it would be well to give a large number of miscellaneous examples on the fundamental rules.

Reduction of money, weights and measures. We think this department of Arithmetic is generally very unintellectually taught; in fact, giving a child a table to learn from a book or from the black-board

does not exercise a single faculty of his mind except the memory. We therefore cast this old method aside, and look for some other more in harmony with the object of education, and we find it in the principle, first objects then signs. I will just give one illustration of teaching a table in accordance with this principle. Let the lesson be the table of Dry Measure. The teacher should be provided with the pint measure, the quart, the gallon, the peck, and the half-bushel, and by an object lesson, he first makes the pupils acquainted with the names of these different vessels and the quantity which they hold. Then begin the table thus: take the pint measure and by filling it twice fill up the quart, putting down 2 pints=1 quart; take the quart and by filling it four times fill up the gallon, putting down 4 quarts=1 gallon, and in this way construct the whole table. After committing to memory, give simple examples, such as, how many pints in 3 quarts? Reduce 4 bushels to gallons, &c. Learning the tables in this way exercises every faculty of the mind with which I am acquainted; besides it is communicating knowledge in the most interesting and impressive way.

Fractions. Give an oral lesson to explain the word, thus—take any object, such as a slate pencil. What is this? Is it a whole one? What is another name for whole? Inform the class that the word integer means whole. Now, this whole or

integer slate pencil I am going to break into two equal parts, what would you call one of them? I again divide each of these halves into two equal parts; into how many parts will the whole slate pencil be then divided? Now, these parts when applied to numbers are called fractions, so, you see, the word fractions or broken numbers are a part of a whole. After in this way giving the idea of the meaning of the word, go on to the symbols which are employed to represent broken numbers, thus—take a slate pencil or any other object and divide it say into 3 equal parts, one of the parts is represented by $\frac{1}{3}$, two of them by $\frac{2}{3}$, 3 of them by 3-3rds or 1. Call attention to the fact that the number below the line shows into how many parts the whole was broken, and the number above the line shows us the number of parts taken. Having, by means of such ocular demonstrations, made the pupils familiar with the elementary ideas of fractions, lead them on to addition, subtraction, multiplication, and division, of course, in the simplest form, by the use of visible objects, giving such examples as, two halves and one half, how many? A boy has $\frac{3}{4}$ of an apple—he gives 2-4ths to his comrade, how much has he left? Six boys get $\frac{1}{2}$ of an apple each, how many whole apples did they get? I think concrete arithmetic should end here, and the study of abstract numbers be commenced.

PUBLIC SCHOOL "TEXT BOOKS."

BY H. DICKENSON, TEACHER, BRANTFORD.

There are few things more important than that "Text Books" intended for use in our Public Schools should be judiciously selected and carefully compiled. In the recent legislation in connection with education the matter of Text Books seems to have been left completely in the background, and although they have undergone "mangling" and "mutilation" at the hands of the "Torontonians Band of Authors," during the past few years, yet it must be

said, and generally admitted, that our Text Books are miserably deficient. Admitting that the living teacher should be, to a great extent, THE "Text Book," still, in such subjects as Reading, Arithmetic, &c., proper Text Books are absolutely necessary.

There are a few general principles that ought to be recognized in the compilation of every book intended for use in our schools.

I. The subject should be treated in such a manner as to be readily comprehended by those for whose use the book is intended.

II. Every portion of each book should convey some portion of useful information.

III. Everything calculated to engender a spirit of pride, ambition, or warfare, should be carefully excluded.

IV. In reading books, mere fictions should be entirely discarded.

V. The lessons should be so constructed and arranged as to stamp a ready impress, and produce a well defined idea in the minds of the youth.

Let us look at a few of the recent changes, and by comparing *those* superseded with *those* now prescribed, endeavor to decide as to whether we are advancing in this respect as fast as the increasing intelligence of the people of this Province would warrant, and should demand. In 1865 we had Sullivan's National and Morse's Geographies discarded, (the latter was only permitted, not authorized) and their places taken by Lovell's General, and Lovell's Easy Lessons, also the authorization of a History of Canada. In 1867, we had the introduction of the new National Readers. In 1868, Lennie, Kirkham, and Robertson were unceremoniously ushered out, and H. W. Davies ushered in, as English Grammar standard bearer. In 1869 another "Torationian" made a bold strike for fame in the issuing of the Elementary Arithmetic, followed in 1870 by the Advanced Arithmetic. In the same year we had the authorization of the first of the "bevy," viz: First Lessons in Chemistry. The year 1871 gave us the "Animal Kingdom," and "Our Bodies," and the cry of "still they come" was heard when the second of the "bevy" was issued, viz: First Lessons in Christian Morals.

The question for us to consider is not who compiled those works; neither have we to do with where said compiler resides,

although it is worthy of remark that twelve out of sixteen books enumerated were *fathered* in Toronto. The question we propose to consider is, will our Text Books bear a *general* criticism? Will they bear the application of the principles laid down earlier in this article?—principles laid down, not by ourselves, but by higher authority, as it might be considered unjust by some for the advocate to be the judge. Do every portion of those books convey some portion of useful information? Are the subjects treated in such a manner as to be readily comprehended by those for whose use the books are intended? Are the lessons so constructed and arranged as to stamp a ready impress upon the mind? Do they assist the understanding and reflection of the youth?—two things bitterly longing for assistance. A ten year old juvenile remarked to me the other day, "How is it that our history is as large a work as Collier's British History, although the latter is a record of a country fifteen hundred years older?"

We will say a few words in this article upon First Readers, Second, Arithmetics, in some places comparing old with new—in others applying the principles laid down, and not forgetting that it is much easier to find fault than to suggest a remedy. We have suggested what we conceive to be a remedy against the authorization of any such abortive attempts at book-making as have recently been saddled upon the country.

I. The present Readers are very good exercises in elocution, and can be read both intelligently and intelligibly by pupils well up in History, Geography, [&c., such, for instance, as we might find in the higher forms of some of our High Schools.

The limit for reading in the 5th class comprises any passage in 3rd or 4th reading books, while the limit for History is that of Canada and England. No knowledge of Ancient History is required for

this class, yet in the 4th Reader we find ancient historical records scattered all through the book. It cannot be expected that the student in the 5th class will be able to read and comprehend those records without a great deal of the time that should be devoted in perfecting him in the art of reading being spent in explanation.

Again, in the 4th and 5th Readers will be found no less than one hundred selections that violate the rule that everything calculated to engender a spirit of warfare be excluded. You can scarcely turn over a half dozen leaves in either of those books but some tale of blood will meet the eye. I have no hesitation in saying that more unsuitable subjects could not have been selected, and I also assert that they are a direct insult offered to the youth of our country. The compilers of such collections of extracts, raked together at random, some of which are scarcely consistent with common decency, may safely say to themselves, "We have compelled the juveniles of this country to 'feed upon ashes'—we have offered them 'scorpions instead of eggs' and 'stones instead of bread.'" It is beyond question that scenes and sentiments are exhibited in those books that ought not to be familiarized to the minds of the children. The war gong is ever and anon resounding in their ears, varied with the blood drenched garments of adventure. Everywhere convulsions of nations, horrid scenes of devastation and carnage, panegyrics on public robbers and desperadoes, encomiums on malignant and malevolent passions meet the eye. I leave this question in the hands of your readers, and ask them if, in requiring pupils to select a passage for a reading exercise, they do not, in nine cases out of ten, have some tale of blood selected. At this point I cannot refrain from contrasting the authorized 4th and 5th Readers with the ones superseded. In looking over the old 4th and 5th

Readers, it will be found that the general knowledge of the sciences therein detailed—the fundamental principles and most important facts connected with History, Botany, Mineralogy, Zoology, Astronomy, and Chemistry might prepare the student for afterwards entering upon the study of secular sciences, or induce a taste for any particular branch—all this very well in its place—but what has it to do with correct pronunciation—with a knowledge of emphasis, of tones, of pauses, of inflection, of accentuation. I uphold neither the old Readers, nor the new, but think that a set of Readers to teach reading, and that alone, might be prepared. But I have no hesitation in condemning the "new" as no improvement upon the "old." Why then should the country be put to the expense necessitated by a change of Text Books, at the beck and nod of the Council of Public Instruction, unless that change be for the better, I fail to see. The authorizers of our Text Books might surely succeed in having books that are superseded at least equalled. In this instance, as in numerous others of late, the change is for the worse.

II. Arithmetic Text Books. With regard to those, although Dr. Sangster's works have grave errors in them, if we admit that Smith & McMurchy's treatises equal them, it will be giving the latter all the credit they deserve. The chief advantage that the ones now authorized have over those withdrawn, is that questions are more numerous, more practical, and confirm less to cast iron rule. They differ somewhat in arrangement; for instance, scales are removed from immediately after L. C. M., in Sangster's to the back of the book in Smith's. Neither reason nor necessity exists for this. The pupil is supposed to have gone through the "Elementary Treatise" before entering the larger work of either author, and taking this into consideration, the exercises on "Transfor-

mation of Scales" come none too soon in Sangster's. The time spent in dealing with those scales whose radices differ from ours will assuredly not be lost, as when pupils return to the common or decimal notation, they will be found a great deal more precise and accurate in their computations. A great deal more prominence is given to L. S. and D. Why the pupils attending our Public Schools should be compelled to spend a great portion of their time in dealing with a system of money which is seldom or never heard of outside of the School room, and which it has been proposed to abolish altogether, both in Great Britain and in this country, it is difficult to imagine. In the elementary work now authorized, although the author in his preface states that "especial care has been taken to adapt the book in every respect to the wants of the junior pupils in the schools," we find that the questions for exercise in the different rules are not so simple and interesting to young minds as they might be rendered. Think of putting a question like the following in simple subtraction: A basket contained oranges, nuts and eggs, in all 1769; there were 1696 oranges and nuts and eggs. How many more nuts were there than oranges? and expecting pupils in the first and second classes to master it. The reason why I select this question is because I once had a 3rd class teacher bring it to me for solution, she being unable to do it by simple subtraction. And the book abounds with such questions—questions calculated to puzzle and perplex older heads. In many cases, too, there is a studied brevity and obscurity, instead of rendering the operations of arithmetic simple and perspicuous. Although the pupil may happen to perform mechanically the operations intended, he frequently knows nothing at all of the principle and object of his calculations. It is

true the teacher is expected to explain and supplement the Text Book, but in a crowded and promiscuous school, with new subjects and what not to teach, he cannot afford time to give the necessary explanation to each individual. And why should it be necessary? Why should not our Text Books on Arithmetic be so explicit as to render the object and meaning of every question clear and well defined, even to the youthful understanding? Why should not questions, circumstances and objects be selected as arithmetical exercises which are familiar to the young, and calculated to awaken their curiosity and attention? Echo answers why? Talk of perspicuity! Our Arithmetics are a mere conglomeration of questions, explanations, rules and reasons of rules, huddled together at random, in direct contrariety to the principle that "exercises and lessons be so constructed and arranged as to stamp a ready impress and produce a well defined idea upon the minds of the youth." It is much to be regretted that the pupil, when called upon to engage in the business of real life, has almost the whole of his arithmetical processes to study over again, and to reinvestigate the foundation and principles of his operations in their application to the transactions in which he may be engaged. Why? Because his Text Books were compiled in such an abstract manner as to defeat their own object. He was unable to perceive the drift of his own operations, or the foundation of rules by which his after calculations were to be performed, and consequently was like one walking in the dark, and the teacher having such an immense amount of Christian Morals, Civil Government, Chemistry, Botany and Physiology to elucidate, was compelled to leave him walking in the darkness.

(To be continued.)

MISCELLANEOUS CONTRIBUTIONS.

(Under this head we group together several contributions, which can be given in this way more appropriately than as regular contributions.)

HIGH VS. PUBLIC SCHOOLS. COMMUNICATION.

To the Editor of the Ontario Teacher.

I have read with much interest the article in the October No. of the TEACHER, entitled "High Schools vs. Public Schools," and I shall be glad if you can find room for a few remarks on one aspect of the question, which seems somewhat to have escaped your notice.

It is, no doubt, lamentably true that some of the High Schools, are to a great extent failing to accomplish the work they are intended to perform. I admit at once the truth of the statements in the report of the High School Inspectors, which you quote in your article, and on which you remark, "These quotations show that, as far as the attainments of pupils in the English branches are concerned, there is deficiency calling loudly for energetic action on the part of those controlling our High Schools."

Let us endeavor, if possible, to discover the cause of this sad state of affairs, and place the responsibility where it justly belongs. You have, doubtless, observed that in the extracts which you make from Mr. McLellan's reports, in the majority of schools mentioned, attention is directed to the miserable deficiency that characterizes the pupils lately admitted. You will bear in mind that the question, whether or not these have been properly admitted, has nothing to do with the present argument. You have, I believe, listened to Dr. Sang-

ster's masterly exposition of his views as to the proper methods of teaching the most important branches of our Public School programme, and you were, no doubt, fully convinced of the truth of a statement which he made repeatedly and emphatically—that in many of these branches, English Grammar and Arithmetic especially, the foundation was by far the most important part of the work; that if through the carelessness or incompetence of his instructor, a pupil, when first introduced to the study of these subjects, was not thoroughly grounded in correct principles and methods, it was scarcely within the bounds of possibility that, in his future educational career, the mischief done could be altogether repaired, however great his own diligence, or his teacher's zeal and ability.

Now, who are the pupils whose deplorable ignorance of the elements of English Grammar, and the fundamental principles of Arithmetic is so ruthlessly exposed by the Inspector? Are they boys and girls who have grown up from early childhood in the High Schools, whose infant steps have been guided in the paths of knowledge by the High School masters, and for whose intelligence and acquirements they are, therefore, alone responsible? These pupils, with scarcely an exception, are from the highest classes of our public Schools. Although the programme prescribed for entrance to High Schools is that of the fourth class of our Public Schools, there are very few schools, none with which I am acquainted, in which the pupils are examined for admission until they have gone through, at least, the work of the fifth

class. No one at all acquainted with the subject will pretend to deny that the pupils of the fifth, or even of the fourth class, of any properly conducted Public School should, after the completion of their programme of studies, be able, with facility and intelligence, to work a simple question in "Subtraction of Fractions," or to parse and analyze a simple English sentence. Yet this is precisely the work which we find pupils who have gone through the whole Public School curriculum, from first class to sixth, utterly unable to perform. And the only inference that occurs to you is—"there is deficiency calling loudly for energetic action on the part of those controlling our High Schools!" In view of the deplorable facts you cite as evidence, does the idea not present itself that there is a call for some degree of energetic action on the part of those controlling our *Public Schools*?

I think you will be disposed to agree with me, that for the unhappy state of ignorance and incapacity exhibited by so many of the pupils of our High Schools, the masters of these schools are, only in a very slight degree, responsible. If from the beginning of the school course the pupils are taught in the right way, if they are thoroughly instructed in the elements of the various branches of study, such deplorable displays as are now too often witnessed will become well nigh impossible. If, on the other hand, these precious moments of early opportunities are allowed to pass unimproved, it will be equally impossible to repair the evil in after days. I have already adduced Dr. Sangster as an authority for this statement. It is one which commends itself to the common intelligence of every reasoning man.

Had you seen as much of the candidates for entrance to High Schools as I have, you would cease to be astonished at any depth of ignorance or any want of intelligence. And this you will observe in pu-

pils from the highest classes in our Public Schools. Such pupils when they cross the threshold of a High School do not become supernaturally endowed with clear intellects and a true knowledge of the reasons and principles of the work they have hitherto been blindly and unthinkingly performing, or attempting to perform. To any one who has had much to do in examining such boys and girls, it will afford matter of no surprise, that after a few months of even the best High School instruction, they are still unable apparently to entertain, much less to express any clear ideas in regard to what has all their school life been their daily work.

H. M.

RECOLLECTIONS OF SCHOOL LIFE. BY TENA.

When I say that my school life was spent in a rural, in a retired part of the country; and that the school was a plain brick building without any adornment, not even a bell; some of you may wonder if anything of interest could happen there. Plain and unattractive as it may seem to others, to me it is hallowed by recollections of the past, by memories sacred to those who were my friends and playmates in the happy days of youth. Friends who are now scattered far and wide, some in their graves, some in distant lands, and some I have lost sight of altogether.

Our school stood on a green which stretched for quite a distance to the north, west and south; while on the east there was what we called The Pond, which was deep enough to give you a good wetting without any danger of drowning, while here and there through it were logs enough to give you ten chances to one that you fell in if you crossed it. Beyond this there lay a forest which was a forbidden place to us, but, like all other forbidden places, was the very place we would like to play in. How often did we cross the limits when we thought the master would never know, but just as often did we find ourselves mistaken, for the master knew all about it.

How well do I remember the day that we thought we would have our own way for once, and not study our arithmetic, but make pictures all afternoon. The master saw us, and said quietly, "Girls, you know how much you have to do before you leave to-night."

But we determined to have our own way for once, let the consequences be what they might.

Looking back through the vista of long years, I wonder whatever possessed us to do it, as we loved our teacher with all the fervor of youth's first love.

Our dear old master! years have passed since then, and he now labors among the youth in another part of the country, still my heart clings to him as my first and best friend. I have made many friends since then, but I have never met with such disinterested love as his, nor with one who has trusted, through good and evil report.

But to return: when it was writing time, he came round and said, "How much have you done this afternoon, girls?" We made no reply.

"Well, put away your slates now, and take your copies," was his only answer, but before school closed he requested us to wait after the rest were dismissed, as we had our arithmetic to do before we could go.

We waited, and when alone he told us to take our slates and go to work, as we were well aware how much we had to do.

After saying this he took a book and sat down at his desk, and left us to ourselves. We were determined to hold out, and sat talking till it struck five, but still we saw no signs of relenting.

By and by, as the shadows began to lengthen, we began to think it was getting serious for us, as some of us had quite a distance to walk. So we had to give in, and set to work in earnest till we finished our lesson. When we were done he examined our work and quietly said, "That will do girls, you may go now."

Had he scolded us we would have been glad, and most probably have thought ourselves very illused creatures; but, as it was, we were heartily ashamed. Even now, although I have my teacher's assurance of his full and free pardon, I can never forget it. It was the first and last time we ever tried to have our own way with the master.

Oh, how well I remember the parting, when he was leaving the place. There were several of us who were quitting the school for every day life, so the parting was a double one. We were parting from our loved teacher and from each other, and the bonds which bound us were twined closely round each heart, and the parting was the worse as we were going in different directions, and might never meet again. The tears were in his eyes as he rose to reply to an address we had read; when we gave him a small token of our love. How plainly I can still see him, as he spoke words of advice and encouragement to all. Then turning more particularly to us, who were about to begin life's battles, he grew eloquent and spoke words which some of us, at least, have never forgotten. He told us, though he was leaving us, he still would love to hear of our success and rejoice over it. How often do I think of my dear old master, when I am discouraged in my labor, and when I think how often we listened carelessly to his words of earnest advice, I turn with renewed vigor to my work.

May God grant him every comfort and happiness in his declining years, and may we, if we never meet him here, meet him in heaven to dwell forever there.

TRUE OBJECT OF HISTORY. BY ALEX. MACINTOSH, TEACHER, PINKERTON.

The true object of history is to teach nations their responsibilities, and to be a warning to such as would forget those principles which must guide communities as well as individuals. This is equally the main object of all those studies and pur-

suits which are connected with history, otherwise they would be, to a great extent, idle and profitless. The antiquary, who toils to trace the relics of a past civilization, and to investigate ancient manners, and who digs into the bosom of the earth to seek the remains of long-lost [empires; and the numismat, who collects and decipheres the coins of extinct dynasties, are little better than the schoolboy, who spends his summer holidays in robbing the bird's nest, or in picking up the many colored pebbles in the brook, unless their labors furnish a chapter to the history of man, and afford us some useful lesson, or salutary warning. Had I been content to uncover the crumbling monuments of buried Nineveh to gratify an idle whim—had they afforded me no instruction—had they given rise to no earnest reflection—had they proved of no further use to this country than to satisfy a vulgar curiosity—I should indeed have been ashamed to allude to their discovery in such an article as this. I trust that even in the discharge of public duty, and in endeavoring to form my character as a public man, they will prove to me a continual warning, that the fate which befell Nineveh and Babylon may befall the mightiest of nations, when public virtue is no longer held in honor, when great principles no longer guide its counsels, and when the public weal is sacrificed and made subservient to private interests. It is thus that archæology, when studied in the proper spirit, blends with history and offers even a more instructive and solemn lesson than the most eloquent of writings.

I speak from experience, as well as from deep conviction. Few men have had more occasion than I have had to reflect upon the fall of nations, to seek for the causes of their decay, and to muse over the worthlessness of riches, and the hollowness of worldly pomp. The plains of Babylon, fretted with their numberless

canals, now choked with sand, and no longer nourishing the thirsty soil—the vast monuments of Assyria, now buried deep in the earth—the palaces of the kings of kings, now marked by a few solitary columns, and the resting places of the wandering tribes—the graceful temples of the Greeks, now hid by the rank grass—the colonial greatness of imperial Rome, its forums and theatres still standing majestically, but now silent, as a desert. What has brought about these mighty changes? To what are we to attribute this havoc? Surely these are no vain questions, at such a crisis as the present in our country's history. For what good end has Providence permitted those solemn relics of fallen greatness to struggle with decay? For what good purpose has he permitted us, in these days, to recover from their long-forgotten graves the skeletons of great empires? Is it not that we should in time take learning by their fate, and that, having these solemn lessons before us, we should seek to avoid those vices and corruptions which led to their overthrow?

When I see ministers of state in Parliament seeking to justify disasters, and to extenuate fatal errors, disgraceful to a nation, and fraught with the greatest peril, by referring to calamities and events which occurred half a century ago, I naturally ask myself, why is history written? Is it to afford us a justification or a warning? Are we to appeal to it after national dishonor and ruin, or before they overtake us, that we may be saved from them? If to justify our national vices and misconduct is the only object of history, then I care not if every history that has ever been written be consigned to the flames. Of what use, then, the eloquent pages of Thucydides, the glowing episodes of Livy, the varied learning of Gibbon, the philosophic disquisitions of our own Robertson and Hume? If they be treasured but for the gratification of the fancy, or to excite the

imagination, the romance and the Arabian tale would suit as well. No! History has a higher and a nobler aim—she has recorded on her imperishable tablets the deeds of the great, the excellence of national virtue, and the rewards of patriotism, that she might furnish the model, and be an encouragement to great, virtuous, and patriotic men. She has described in warning words successful struggles for liberty, and the happiness and prosperity of free nations, that nations yet unborn might strive to be free. She has traced with unwilling pen the decay of public virtue, the dishonest statesmen, and the loathesome details of corruption, hurrying states to utter ruin, that nations yet to come might honor public virtue, be jealous of the character of those who guide their cour-

sels, and abominate corruption. She has pointed with melancholy earnestness to the tomb of fallen greatness, as a warning for all time, that the immutable laws of God, which govern both the moral and physical world, cannot be outraged with impunity. Such are the objects and ends of history. It is because they are such that her votaries have been ranked amongst the instructors and benefactors of mankind."

The foregoing selection will, I hope, be interesting to the numerous readers of your magazine, especially to those who have been looking out for an essay on "Comparative Value of History." See August No. of ONTARIO TEACHER, 'Young Teachers' Queries,' No. 7.]

SELECTIONS.

ELEMENTARY READING.

Children learn naturally when the order of their progress is from the familiar to that which is unfamiliar—from the known to the kindred unknown. This is the order in which nature leads them while learning to speak, read, and write their mother tongue. Words are first learned as audible signs, or names of familiar objects, actions, and qualities, by means of conversation. Thus they become known to children as sound symbols for things, acts, etc. These words are learned as *wholes* at once, and not by first learning their elementary sounds, or their letters. By this manner children gradually become familiar with more and more words until they are able to use the spoken language with facility. Now, these words are employed as audible signs of thoughts, and, as such signs, the words themselves receive but little attention from the child, as it uses them in conversation; while the ideas represented by them are made chief in importance.

The true order of learning the visible

signs of objects correspond with the natural order of learning the audible signs. Therefore the child's first step in learning to read is to become familiar with the visible signs, or printed words, which represent the spoken words or audible signs already known by it. The child uses a large number of words, which it knows by the ear, when the first step is taken in learning words by sight. These known words are the ones most appropriate for the first lessons in reading. As the ideas represented by spoken words hold the chief place in their use, so the idea represented by printed words should be kept most prominently before the mind, in learning to read, that the visible words may also represent clearly the same thoughts through the eye that the audible words do through the ear.

To attain this important result, it is necessary to teach the printed words first as a whole, just as the spoken word was learned first as a whole. As the elements of the spoken word—its separate sounds,—

are naturally learned after the word as a whole, so the letters, or elements of the printed word, are naturally learned after the form of the word is known as a whole.

It follows, therefore, that the natural order of teaching children the elementary steps of reading is—

First—Teach the form of a word which is already familiar to the ear as a symbol of the spoken word, and also as a symbol of that which the word represents.

Second—Teach the several sounds of the spoken word, then the letters which represent these sounds and compose the printed word, taking care to keep the ideas symbolized by the words prominently before the mind.

Let the order of teaching be, first the idea; then its sound symbol, the spoken word; and finally its representation by writing; and the order of learning to read the language will correspond to the order of using it. Words, then, will become mirrors, reflecting ideas and things to the minds of pupils. *Sense*, and *sound*, and *form* will be so intimately blended together that the pupils may easily be led to use conversational tones in reading, and a natural style of expression will follow as the result.

Before instruction in reading can be commenced, the child must know and use many words in conversation. These spoken words represent ideas to the child; but the separate sounds of these words do not represent elements, or parts of those ideas. Therefore, to teach the separate sounds of a word that is unknown to the child by its use, does not aid in making that child understand what idea the word represents. Again, the separate letters that compose a printed word do not represent elements, or parts of the idea which the word symbolizes. Therefore, to teach the separate letters of any new word does not aid the child, either in understanding that word or in pronouncing it, without comparing it with words of similar forms the letters of which had been previously learned.

Thus it will be seen that the very things which words, both spoken and written, are chiefly used to represent—*ideas*—can not be learned from either their elements of sound or their elements of form.

The plan of teaching reading by first naming the letters, then spelling and pro-

nouncing, directs the attention of children chiefly to the names and order of the letters, and naturally gives but little to the ideas which the words are intended to bring before the mind. This method leads almost inevitably to habits of reading in a monotonous and unnatural tone of voice, without heeding the thoughts for which the words are signs. This mode of teaching reading, although once nearly universal, is now rapidly disappearing from all good schools.

One of the plans which is substituted for the A B C mode is called the *phonic method*. By this mode the sounds of letters are first taught separately; then these are combined into words; and new words are spelled by sounds instead of by letters, for the purpose of learning them. But by this method no more attention is necessarily given to the ideas represented by the words, than with the A B C plan. Therefore monotonous and unnatural tones are heard from children taught by the phonic method, as well as from those who learned to read by the latter method. Both of these plans give only secondary attention to the thoughts for which the words stand. Letters and sounds should both be used in teaching reading, but neither one to the exclusion of the other, nor in the manner in which they usually are employed. Both letters and sounds should be kept secondary in prominence, while ideas should stand first.

When a child, taught by the latter method, has progressed so far as to be able to read from a book, its attention is usually occupied more with naming letters and pronouncing words than with the meaning of the words. When a child has advanced so far by the sound method as to be able to read from a book, its attention is generally directed more carefully to making the sounds of the letters, and combining them into words, than to the thoughts represented by those words.

Children that are taught to read by spelling words orally are liable to stumble in reading all the way through school, frequently calling *was saw* and *on no*, and making many other mistakes. It is not uncommon to find children that were taught by that latter method who can pronounce words only by naming the letters aloud. In reading they spell each word,

even *the, and, for, by, it,* etc., before attempting to pronounce it.

Now it is evident that any mode of teaching which could frequently produce such lamentable results must be unnatural and unphilosophical. I am convinced that one of the chief causes of the common prevalence of monotonous and unnatural tones in reading lies in the use of improper methods of teaching the early lessons of this subject. If the methods employed in learning to read were as natural and as well adapted to the end in view as are the methods by which spoken language is learned, reading would become just as life-like and natural as conversation now is.

The value of a method in teaching should be judged by its tendencies. If it uniformly tends to produce excellent results, and few evils when properly applied, it must be a good method. It appears that in both the methods of teaching reading—the letter and the phonic—the tendency is toward leading children to form

unnatural habits, without understanding what they read. This unnatural habit does not exist in the ordinary conversation of the same children. What causes this difference between the tones of conversation and those commonly heard in reading? Has the manner of learning anything to do with it?

In conversation thoughts receive chief attention, while words are used simply as a means of communicating ideas. To secure a habit of reading in an easy, natural voice, the child must be trained from the first to deal with printed words as signs of things, actions and thoughts. The signs must become known as representatives of ideas. Both the sounds and forms of the words should be associated with the thoughts which they symbolize. Neither a spoken nor a printed word means anything to a child until it becomes the sign of an idea already in the mind of that child.—*N. A. Calkins in Michigan Teacher.*

THE TEACHER OUT OF SCHOOL.

There is a work out of the school-room that is absolutely binding on the teacher. Some readers, unfamiliar with practical school work, may wonder at the statement. Let us notice, then, one error in popular judgment of school work and workers.

The teacher is often regarded in the community as one who has a comparatively easy time. Laboring men and tradesmen are often heard to remark, "You work six hours a day, while we work from ten to fourteen. You are a lucky man." No, he will prove a very unlucky man if he works but six hours. This popular and erroneous estimate of the teacher arises from a failure to appreciate its true character, and the consequence is that the salary is grudgingly given, when, if the teacher does his whole duty, you may be sure that it is well earned. The work in the school-room consists both in imparting knowledge and in drawing out the faculties of pupils. No matter how well stocked one may be at the outset, there must be a constant filling up, not merely of facts learned, but of mental energy and

enterprise. As we have shown formerly, the teacher should have a growing mind, and one furnished with a cultivated taste. Of him who aims at anything short of this, the popular opinion is quite right. If, however, the teacher has any right appreciation of his calling, and he is far more likely to have it than those by whom he is employed, he will regard what is done in the school-room as only a part of his legitimate work.

Right instruction is not something to be measured out as men do their grain from a certain fixed quantity previously provided. It should have no smell of age: it should be taken, like the brimming cup from the river, from a stream that lives and moves, and so must be forever fed. This means work. If I were to choose a teacher, a habit of industry would be a prime and essential qualification. Teachers, then, have a work to do out of the school-room. How can it be best done?

A preliminary point, and one of the highest importance, is that the teacher be systematic. Of those who fail to extract

the utmost from precious time, the great majority fail at just this point. It has been said that "One needs to go through college to learn the value of five minutes," and there is a deal of truth in it. Any one day's work in our higher institutions of learning would, considered apart, be nothing formidable; but day after day brings the same inexorable demands. This constantly recurring work, continued for months and years, if properly attended to, disciplines to systematic industry. The Freshman, hurried and pushed, eagerly snatching ten minutes twice a day to run to the post-office, often learns for the first time how much his time is worth and of how much he is capable.

But the greater number of our teachers have not, of course, enjoyed these advantages. Some have so much native energy and sense of order that, for this end, they do not need them. To the ordinary mind, however, this caution will be timely. The danger is that the teacher on leaving the school-room will have no plan. This will prove fatal to any substantial progress. It is sailing without a rudder. We are left the sport of circumstances which we, on the contrary, ought to control. It may be objected that the teacher, on leaving the school, should feel relieved from constraint. Certainly, there should be relief, but in what does true relief consist? Not surely in mere idleness, or in doing a little something a-hap-hazard. What the teacher requires is a change and variety of occupation. Systematic effort does not imply that it is irksome. Quite the contrary. Our highest pleasure comes of a sense of progress and accomplishment. This we can not have without a fixed purpose intelligently and persistently followed. Where there is no plan, little or nothing is done, and there we are doomed to a troubling sense of disappointment. If absolute rest is what the teacher needs, let that be a part of the plan. This, however, if the teacher enjoys good health, should be confined to the hours of sleep, and it is the occupations of the waking hours that we now discuss. These we will further specify.

The first thing that has to be attended to, of course, is exercise. The intimate connection between physical and mental vigor is too well recognized to need discussion. The teacher needs and must have

two things, fresh air and a quickening of the blood. These should be habitually sought under the open sky. In our best ventilated school-rooms, the air, especially if it is heated, becomes dead. Mere loitering in the open air, while better than nothing, will not answer the purpose. If you walk, the pace should be brisk and smart. Moping is generally a habit. A little practice will enable any teacher who is fit to enter a school-room at all, to walk a few miles in such a way as to send the blood swiftly through the entire system. Such exercise forces the air throughout the lungs, and is every way beneficial. Walking, while it will be hardly enough for some, will for the majority afford sufficient exercise. While the muscles should always be kept in a sound condition, it is not necessary to people of sedentary pursuits that they should be in a high state of development. If too much blood is used for animal functions, not enough will be determined to the brain.

The time of exercise must be decided for himself according to his taste and experience of the advantage. For myself, I have found an hour or two at the close of the afternoon session the most convenient. If the weather is warm, this should be deferred till later. A companion or two would by many be esteemed an advantage, yet is, I think, not at all essential. Any teacher should be well enough acquainted with nature and enough in sympathy with her to enjoy an hour with her alone. Or, if you please, he should have a mind of such cultivated tastes as to relish the sweetness and independence of solitude. So, if you live in or near the country, you would do better by all means to walk the public roads as little as possible. Rather go where you can enjoy the air, the sky, the wood, with no sound of invasion. It may be that you go home and lie down, because you do not feel like taking any active exercise. But, exceptions aside, that is just the reason why you do not and never will. A great fault in our academies and colleges is that students, when the time of release comes, lounge about in one another's rooms, talking and perhaps smoking, when they should seek the open air and awaken physical force and vigor.

Let no one think, either, that he can safely defer this matter until a holiday arrives, provided he then exercises a half or

whole day at once. When we run down in physical tone, nature does not allow us to catch up in this way. You might as well try to live on pickles and lobsters or other food equally indigestible, for five days, and on the sixth eat a bushel of wholesome bread. In regard to exercise, I should urge every teacher to fix on something definite in time and amount. If you do not, it will almost surely be neglected, and neglect here is fatal. After an hour of active, healthful recreation, the mind will be fitted for severer occupations.

Suppose the mind in a fit condition for work, what next? Here, again, we must reassert our first principle. In whatever you attempt, be systematic. As to any definite plan, it would be useless for me or for any one to prescribe. Circumstances should affect, not our plan, but the forming of it. Taste should be consulted, though not followed in a narrow or servile manner. The particular character of one's school-work must also determine his home-work for a part of the time. As a matter of course, the teacher should have a broad and thorough knowledge of the subjects he is teaching. This will make, in some cases, a large demand on his time. Any teacher, however, especially if he has been long engaged in the work, will find some time for a more general improvement. Individual taste or aptitude may fairly lead us to a more extended labor in one direction, yet there must be sufficient variety to prevent narrow-mindedness. Some things are essential.

A good knowledge of the principles of language is of the first importance to a teacher. It is difficult to see how this can be obtained without an acquaintance with at least one of the classical or modern languages. It can hardly be acquired from English alone. Our language is mixed and anomalous. It has lost nearly all the inflections and has become almost wholly analytic in character. Its syntax—indeed we can hardly claim to have any! It has some good points. It has a great variety, is versatile, and serves remarkably well the uses of poetry and oratory. Yet in order to best learn the principles of language or to clearly understand our own, we must resort to other languages of the same family which have retained their complete and synthetic character. For this object Latin is undoubtedly of the first importance,

more than three-fourths of our English words being derived from it. In fullness and accuracy of form and syntax it is, perhaps, the most perfect language in the world.

Many, however, would for obvious reasons prefer a modern language. Of these I should consider the German by far the best for the purposes of linguistic study and as opening the most desirable field of literature. Now let no teacher shrink from this and say: "With my necessary duties, this is too great a task for me to undertake." Unless your case be unusual, it is both possible and practicable. An average of an hour a day, or even less than that, would in one year accomplish surprising results. Reckon it up and see how much time it would give you. The fact is that many are working on without any plan, and never learn their own possibilities. I happen at this moment to know a lady who has had, I believe, as much household work and sewing as usually fall to the lot of female teachers, yet who had, within seven or eight months, acquired a good knowledge of the German language and can read with some facility. This has been done with no more self-sacrifice than any teacher could well afford. Everyone must admit that, while the teacher is constantly teaching language, and while language itself is the vehicle of all instruction, a thorough knowledge of its principles is indispensable.

I would not, however, underrate the importance of natural science. The teacher should seek to enlarge his knowledge of this subject far beyond the absolute requirements of the recitation room. Of course it is too exhaustless and engrossing to admit of thorough knowledge in all its branches. We must therefore limit ourselves somewhat in matter and method. One limitation that I would suggest is that the study of these subjects be made as practical as possible. We should spend our time, not so much on what is theoretical and abstract, as on those parts which by their own resources no one can demur. will bring the senses into the fullest use and advantage.

While some time in these pursuits must be given to books, a considerable part should be spent in the open air. For a teacher, an acquaintance with nature is better than one with books on nature.

The curious pebbles by our path should lead us to mineralogy—an easy and interesting subject in spite of its long name. The rocks and the contour of the lands should lead us to geology. Natural history, botany, and so on, may be pursued in a manner limited, to be sure, yet useful and interesting. These subjects pursued in this way yield many advantages, two of which I will mention. In the first place, this method will serve for recreation, or can at least be connected with it. It will call us to the rivers, fields, and woods. It will give aim and zest to a ramble otherwise purposeless. Not to be familiar with every stream and quiet nook should bring a touch of shame. So, also, should the ignorance which may show the thousand objects that every day greet the senses. Yet ignorance is not so bad by half as indifference.

In the second place, this method of study cultivates the power and habit of observation. When this becomes a mental habit, it is very valuable. By it we press into service the remnants of time and turn many a weary hour into both pleasure and profit.

Another point remains to be touched upon. No teacher can afford to wholly neglect general reading. Here, again, progress is conditioned upon plan and system. There must be variety, but in variety there may be order and design. I find it to be an excellent plan to read with reference to some favorite subject for one or more seasons. In this way one feels a positive advance in knowledge, and this feeling is the incentive that always carries scholars and thinkers onward to success.

We should have an acquaintance with men of genius. All would admit this to be necessary for those of the lower. Genius is often exceedingly simple. Its works may be made attractive and inspiring at a very early age. I am convinced that there is great and disastrous neglect in this matter. If scholars read, the teacher should seek to know the character of the reading—as a friend, however, rather than teacher. If they do not read, let us know why not, and see to it that a taste for good reading be formed. If by friendly and judicious counsel young scholars can be led in the right direction in this matter of reading, it would save to them and to society a vast amount of wasted time and strength. It

would prove an immense economy in the development of the mind and character. To succeed in this the teacher should command a considerable range of literature; otherwise he cannot have the requisite skill in selection.

There is another demand sometimes made on the teacher's time which remains to be noticed. Some make it a point for the sake of preventing a difficulty in school, to visit the different families represented. * * * * Some will visit much for the love of it. This is well, but only let it be done spontaneously. Let the teacher go or stay according to his disposition. If he visits for the sake of becoming better acquainted with his pupils, that alters the case, and such an object is to be commended. The teacher's profession differs in its character from the clergyman's. What I believe is this, that the teacher should feel under no obligation to make merely professional visits. He can not afford it, nor indeed can his employers. It is not the social recreation that he needs, and is a waste of time.

Some may object: "You are crowding more into our hours at home than we can possibly do." I think not. I should by no means recommend that all the subjects I have touched upon be taken up at one time or in one season. Two subjects pursued at the same time are perhaps enough to afford variety without distraction. My claim is this, that a teacher do not spend his time in idleness or gossiping; that he attempt something, and attempt it in a systematic manner. One often hears the excuse from our female teachers: "I have so many little things to attend to, so many reports to make out, so much sewing to do, that I cannot find any time for reading or study." Is there any teacher who can not, if she will, devote an hour a day to such pursuits? I think not. I know that ladies have by no means the same freedom from care and matters of dress that the gentlemen enjoy; yet when I hear such excuses, I am often reminded of an anecdote of John Foster. A young lady displayed before him a piece of brightly-colored fancy work that had cost her many hours of labor, and called on him to admire it. "Ah, yes," said Foster, "it is red with the blood of murdered time." — *Connecticut School Journal*.

EDUCATIONAL INTELLIGENCE.

CANADA.

--Dr. Sangster will hold Teachers' Institutes as follows: December 5th and 6th at St. Catharines; Dec. 12th and 13th at Lindsay for Victoria County. Several others are being arranged for.

—A very pleasing and interesting ceremony took place at the Exeter School on Monday, Oct. 27th. The pupils of three departments were assembled in one of the rooms, when an address, accompanied by two handsome presents, was presented to Mr. Curry, the late Principal, who replied amid the deep emotion of the pupils.

TEACHERS' EXAMINATION.—In accordance with the general regulations adopted by the Council of Public Instruction, an examination of candidates for Public School teachers' second and third class certificates, will be held (D. V.) in each county town of Ontario, commencing on Monday, 15th December, at 1.30 p.m., for second class; and on Tuesday, 15th December, at 9 a.m., for third class. The examination of candidates for first class certificates will be held at the same place, commencing on Friday, 26th December, at 1.30 p.m. Forms of the notice to be previously given by the Candidates, can be obtained on application to any Inspector.

—Dr. Sangster has, during the past month, held some more highly successful Teachers' Institutes. The one at Hamilton was largely attended, and in the evening the Doctor lectured on "Heroes and Hero Worship" to a crowded audience. The Hamilton *Times* thus speaks of the lecture: "We are sure that all who heard him will cordially agree that a richer intellectual treat has seldom been enjoyed by any Hamilton audience. In style and manner of delivery it may fairly be regarded as a model of popular lectures. In logical arrangement, accuracy of thought, searching analysis of character, elegance of expression, neatness and good taste, the standard maintained throughout the lecture

is seldom reached—even by recognized lecturers of most distinguished reputation—and was, altogether, a treat little expected, especially by those who know Dr. Sangster only as the author of certain text books in Mathematics and Philosophy."

—The Teachers' Association of Elgin held their second meeting in the High School buildings on Saturday, 8th November. The general proceedings were exceedingly interesting. R. C. Inglesby read an essay on "School Organization;" John Millar, B. A., on "Methods of Conducting Recitations." This last was an able production, and the effect upon those who heard it cannot fail to be productive of good results. A. F. Butler, Esq., Inspector of Schools, led in an able discussion on the best method of teaching reading. Other teachers present took an active part in discussing the several subjects submitted, and a general desire to be up to the times in this all-important calling seemed to pervade the entire assemblage. The next meeting will be held in the same place about the close of the year, and the Committee intend putting forth every effort to make what has already become quite interesting and instructive still more so.

—We have had before us for some time the able and elaborate report for 1872, of Robert Little Esq., Inspector, County of Halton. From the mass of valuable facts and information given we select the following: The total value of property assessed was \$5,670,530; total receipts for school purposes \$49,028; total value of school houses and sites \$62,237; total School Sections 56; school houses 60; total school population 5,838; total between 5 and 21 years of age 6,334; total number attending school 5930; average attendance, first half year 2682.28, second half year 2434.08. Mr. Little visited every school twice during the year, except in one instance where the school was closed, and spent on an average four hours each visit in every department. He examined the pupils

mostly by means of written examinations. He complains of the evil of irregular attendance. Mr. Little has evidently done his work faithfully and well.

UNITED STATES.

—The Indiana State Teachers' Association is to hold its annual session at Indianapolis on the 30th of December—a good time to prepare for a "Happy New Year."

—The new catalogue of Hamilton College for 1873-74 shows that there is 33 Seniors, 42 Juniors, 34 Sophomores and 33 Freshmen, in all 142 students. The obituary record shows fifteen deaths. The Faculty is the same as last year, all the twelve professorships being filled.

—The annual Catalogue of Bowdoin College shows a total of 215 students in the two academical courses, divided as follows: Seniors, 39; Juniors, 51; Sophomores, 51; Freshmen, 74. The Freshmen Class is the largest that ever entered, and the number of students in the four classes is larger than at any former period.

—The professors of Cornell University gave a complimentary dinner last week to Prof. McCandless, who has resigned his position to accept the presidency of the new Agricultural College at Guelph, Canada. Prof. McCandless was formerly at the head of the Agricultural Department of the Royal College at Glasnevin, Ireland.

BRITISH & FOREIGN.

—In Ecuador there are five national colleges, with 757 students, and six female seminaries under the control of Catholic Sisters, having 741 students. At Quito there is a polytechnic school, with nine professors; besides, there are colleges of law and medicine, and a school of trades—the latter after the model of the Catholic Protectorate at Westchester, N. Y.

—Oxford University has conferred the degree of Associate of Arts on Miss Rogers, who stood at the head of the "local examinations," but bestows the scholarship, which goes with it, in such a doubtful way as to make its acceptance a matter of question. The young lady's father, Prof. J. E. Thorold Rogers, asserts that there is nothing in the law of the institution that forbids its bestowment upon a woman, while the vice-chancellor of the

university very stupidly asks him to point out a case. The scholarship has not yet been accepted or declined.

—As to education, Belgium stands thirteenth in the list of European States. In 1867 35 per cent. of the militia could neither read nor write. This number has since diminished to 27 per cent.; but the militia comprises all classes. In Belgium, as elsewhere, the schools of some kind or other are more abundant than the scholars; and there it is necessarily felt that compulsory education must be more than ever considered as the indispensable corollary of all social improvement. There were in 1866 601 different establishments for teaching trades, some supported by the communes, others private, all free. The returns of such communal and adopted schools as are under government inspection comprise—scholars taught gratuitously, 304,276; ditto on payment, 147,368. The infant schools of various kinds comprised 564 female teachers and 50,881 children. There were besides 1,247 schools for adults, having 49,194 free scholars and 4045 paying ones.

—Education in Ireland seems to be still laboring under difficulties. The London *Daily News* says: "The bill of last session, as must now be evident to all the world, would have been doubly mischievous. It dealt a serious blow at completeness in scientific and literary instruction, and yet did not afford the Ultramontane party that security for the association of religion with every branch of thought and learning which their system requires. A heavy price would have been paid, but peace and contentment would not have been purchased. The resolutions of the archbishops and bishops at the Presbytery in Marlborough street, Dublin, contemplate the organization of a complete system of Catholic education, with the institution of Stephen's Green as its center. So long as they are content to carry out this design they are acting upon their principles. But when they proceed to demand, as they implicitly do, State recognition of degrees, conferred without State control, and bind themselves to require from every candidate for a seat in the House of Commons pledges to sustain in Parliament what they call their 'educational rights,' the matter assumes a different aspect."

TEACHERS' DESK.

J. C. GLASHAN ESQ., EDITOR.

Contributors to the 'Desk' will oblige by observing the following rules :

1. To send answers with their questions and solutions with their problems.

2. To send questions for insertion on separate sheets from those containing answers to questions already proposed.

3. To write on one side of the paper.

4. To write their names on every sheet.

CORRECT ANSWERS AND SOLUTIONS RECEIVED

R. Barron, Queensville, 46.

S. F. Passmore, Brantford, 46.

M. Ferguson, Bosanquet, 48, 49 50.

Alex. McIntosh, Pinkerton, 49, 51, 52.

A. G. Campbell, Durham, 48, 49, 50, 52.

Con. O'Gorman, White Lake, 49, 50, 51.

Levi Palmer, Sutherland's Corners, 43, 44, 45, 46.

Wm. S. Howell, Sophiasburg, 42, 43, 44, 45.

H. T. Scudamore, Sutherland's Corners, 43 and 47. (A full and elegant investigation of latter.)

ANSWERS TO CORRESPONDENTS.

A SUBSCRIBER.—The following named works will be found useful :

Peacock's Arithmetic, \$1.50.

De Morgan's Elementary Arithmetic, Walton and Maberly, \$1.50.

Sang's Elementary Arithmetic, Blackwood & Sons, \$1.50.

Sang's Higher Arithmetic, Blackwood & Sons, \$1.50.

Munn's Theoretical Arithmetic, Blackwood & Sons, \$1.50.

The A B C of Arithmetic by Sonnenschein and Nesbitt. Teacher's Book, Preliminary Edition, Whittaker & Co., 30 cts.

Sandeman's Pelicotetics, an Elementary Treatise on Algebra and its groundwork Arithmetic, Deighton, Bell & Co., \$6.

The first two of these works are out of print, but are by no means scarce, and can often be picked up second-hand by an agent. Sang's works are excellent of their class—they are suited to one who understands the elementary operations and seeks arithmetic reduced to a system. Munn's is the best of them all for a teacher.

The A B C OF ARITHMETIC is just out, and the Editor has not yet seen it, but from the names of the authors, he supposes it contains a description and examples of application of their new *Zahlbil-*

der, or number-pictures, and their Improved Abacus, by which they claim to give optical exhibition of numbers up to a million. It is, in fact, an arithmetical exposition of what the Germans call "Anschauungsunterricht," or 'Instruction based on sense-impressions.'

The last work I would not advise anyone to buy unless he is well read in Arithmetic and Algebra, and has no small knowledge of Geometry and Trigonometry. He must also be prepared to overlook the style which is often uncouth and most repulsive. Let him surmount this and he will never regret the effort.

"In this Second Volume on Arithmetic an account is given of the doctrines of Powers, Roots and Logarithms, so far as that can be well done without the aid of general symbols." SANG'S HIGHER ARITHMETIC, *Preface*.

"This book seeks to make Arithmetic and Algebra a science, — a piece of knowledge to wit every where reasoned out in an orderly way from principles expressly laid down, — and toward that end has to run wide of the track of the common books." SANDEMAN'S PELICOTETICS, *Preface*.

H. T. S. Thanks for the 'railway problem, which is interesting indeed.

ANSWERS TO PROBLEMS.

43. There seem to be two principal propositions following 'But' and 'And' respectively, and two subordinate adjective ones each commencing with 'that.' (By the way, has not somebody been polishing Byron here. Did not the poet write 'which?')

Fill is a verb in the middle voice. (Will be taken up in answer to question 52.)

Mountaineers is subject to 'fill.'

44. The proposed answer is incorrect if Tuesday noon means *Tuesday noon*, but correct if 12 m. by the clock is meant. The gain is in proportion to the time *true* or *false*, but antecedent and consequent must be both *true* or both *false*.

45. Clearing of fractions, we find

S of A's steps = 5 of B's.

∴ 24 of " " = 15 " "

Also, —

A makes 44 steps while B makes 65.

∴ A " 88 " " " " 130.

∴ A " 55 of B's steps while B makes 130.

∴ A makes 11 of B's steps while B makes 26, giving B a gain of 15 of his own steps, i. e. bringing him up to A. Ans. 26.

46. On the last evening the snail is more than 16 in. from the top of the pole, else had he been up in the morning, and not more than 31 ins. from the top, else he would not get up by morning, and it would not be the last evening. Now, his gain per 24 hrs. was 15 ins. (31 ins. - 16 ins.) ∴ on the last evening he was up the pole, a multiple of 15 ins.

lying between 389 ins. (420 ins. - 31 ins.) and 404 ins. (420 ins. - 16 ins.) The only multiple within the limits is 390 ins. Dividing by 15 ins. he had been climbing for 26 x 24 hrs. and had 30 ins to climb at the rate of 31 ins. per 12 hrs. The rest of the work is easy. This is substantially the solution of Mr. A. McIntosh, Pinkerton.

BOOK REVIEWS.

THE COMPUTATION OF THE TRANSITS OF VENUS FOR THE YEARS 1874 AND 1882, AND OF MERCURY FOR THE YEAR 1878; FOR THE EARTH GENERALLY AND FOR SEVERAL PLACES IN CANADA. BY J. MORRISON M.D., M. A. (PP. 48.) TORONTO, ROWSELL & HUTCHISON.

The contents of this pamphlet are given in the above title, and we cannot better call attention to it than by this quotation from the *Preface*.

"The following pages were drawn up for the use of Students pursuing the higher Mathematical course in our Colleges and Universities. All the necessary formulae for calculating transits of the planets and solar eclipses from the heliocentric elements, have been investigated in order to render the work as complete in itself as possible; and while I have endeavored to simplify the computation, I have, at the same time, given as full an account of the various circumstances attending these phenomena, as is to be found in any of the ordinary works on Spherical and Practical Astronomy. This is, I believe, the *first* work of the kind ever published in Canada, and therefore I hope it will tend to encourage, in this country at least, the study of the grandest and noblest of the Physical Sciences."

The work is divided into three parts and an appendix. Part I introduces the subject and exhibits the computations for Venus' transit on Dec. 8th, 1884. Part II is occupied with the transit on Dec. 6th, 1882, and with the sun's parallax and distance from the earth. Part III treats of the transit of Mercury on May 6th, 1878. The Appendix exhibits the calculation of solar eclipses.

Mr. Morrison has, as he states, written for mathematical students, and these will find his book both interesting and useful; interesting from its collecting and exhibiting clearly and concisely all the chief calculations on these transits; useful, especi-

ally to those who may have dropped their astronomical studies, in so recalling them that they can, without *back-working*, understand the discussions that have been for some time carried on by astronomers in England. This reminds us that the author in his sketch of the history of the determination of the solar parallax, from observations of transits p. (37) has omitted to notice the bitter controversy that has raged between the 'chartists,' headed by Mr. R. A. Proctor, who advocate applying the old or Halley method to the '74 transit, and the defenders of Sir G. B. Airy, Astronomer Royal, and the Admiralty, who are adopting the new or Delisle method. We confess to disappointment at this omission as also at no notice of what may be termed the physical side of the transit question. In the historic sketch no mention is made of the 'Black-drop' * difficulty, or of Mr. Stone's revision and correction (so to say) of Encke's famous calculations. With this part we are, in fact, far less satisfied than with the mathematical parts. But these are the book, and by them it must be judged, and for them we cordially recommend the little work to the attention of our readers.

PRONOUNCING HAND BOOK OF WORDS OFTEN MIS-PRONOUNCED, BY RICHARD SOULE AND LOOMIS J. CAMPBELL. PUBLISHED BY LEE AND SHEPARD, BOSTON.

This little book is one of the most useful ever issued from the Press. It contains the pronunciation of 3000 words very commonly mispronounced, and is an invaluable aid to those desirous of attaining the correct pronunciation of the English language.

*An artificial black-drop may easily be produced with two fingers or a finger and thumb held in front of the flame of a lamp. Other means easily suggest themselves, some of them exhibiting rather strange delusions regarding optical contact.

EDITOR'S DRAWER.

END OF THE VOLUME.

With this No. closes the first volume of the ONTARIO TEACHER. The most skeptical regarding its prospects may now be convinced that, having successfully passed through the first year of its existence—the period most dreaded by the publishers of all periodicals—that its future success is beyond doubt. To those who gave us their kindly encouragement since the very inception of the TEACHER, we tender our hearty thanks. Their generous countenance and assistance have, we trust, been amply rewarded, and all that they expected from our prospectus fully realized. We trust we disappointed none in the tone and character of our journal, although we have been painfully sensible many times of shortcomings. The want we have endeavored to supply was that of a live, practical journal, independent in its tone, and willing at all times, by words of admonition and encouragement, to sustain the teacher and fit him more fully for the discharge of his arduous and responsible duties.

To those who have, so far, stood aloof from us, and neither by subscription nor recommendation assisted us, we trust we have shewn some evidences of merit, at least sufficient to deserve some tangible recognition of favor at their hands in the support of a second volume.

Financially we can say though the enterprise has left us with no heavy margin of loss, yet the profits have not been such as to compensate in the slightest degree either for time or labor. Encouraged, however, by the kind assurances of our many patrons, we intend to continue its publication. The work we have found very congenial, and we feel, so far, amply

rewarded by the assurance that we have contributed to the advancement of a profession in which we have spent some of the best and happiest years of our lives.

The course pursued in regard to education in our first volume we propose continuing. And we trust that the experience already acquired will enable us to supply our readers even more acceptably than we have done heretofore. We therefore cast ourselves upon our patrons and the public, and look to them for a further renewal of their confidence.

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