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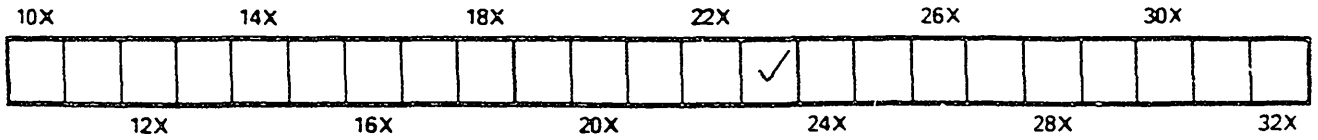

THE ONTARIO TEACHER:

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WHAT A SCHOOL INSPECTOR IS SUPPOSED TO NOTICE.

It might not be uninteresting to Public School Teachers generally, to know something of what an Inspector is supposed to notice in his semi-annual visits to the schools. If there is anybody with whom the teacher desires to stand well, it is the Inspector. He is, in some respects, his superior officer, but, if true to his position he is none the less the teacher's best friend. And though the examination of the school, (speaking in general terms,) is his principal work, yet the mere excellence of recitation, as discernible by the unpracticed observer, is but a small proportion of the data upon which he bases his estimate of the teacher's work, or his usefulness in the profession.

To be explicit in what we wish to say on this subject, let us particularize.

1. ORDER. To the practiced as well as the unpracticed school visitor *Order* is the first thing that strikes the mind on entering a school. Indeed, in many cases, impressions in regard to this matter are received before entering the school at all, when, for instance, the school yard is found in a very confused state, with wood and litter of all kinds strewed hither and thither, it is almost a certain indication of *internal* confusion. "Like coming events, it casts its shadow before." We rarely find, where such are the external indications of chaos, that the internal do not fully sustain our impressions already preconceived. No school visitor but does, in a very short time, decide whether a school is orderly or not. An Inspector is particularly quick in detecting this. The arrangement of books, slates, hats and cloaks, very soon tell the tale. The position of the scholars in their seats—whether erect and attentive, or lounging and indifferent—the manner in which even the first class called makes its way to the front for recitation—the manner in which the scholars stand in their class—the arrangement of the teacher's books on his desk—the personal neatness of the teacher—the work left

standing on the blackboard, all give certain indications which are apprehended in a very short time, and to the stress laid by the teacher, and the attention paid by the pupils to the subject of *order*. The teacher who would stand well with the Inspector in regard to this matter, would do well to consider all these things. Some of them may be small in themselves, but *trifles* constitute perfection, at least they point with unerring certainty towards imperfection. Let the teacher endeavor to disguise matters as he will, the Inspector cannot fail to see what is the order *put on* for the occasion, and what is really the regular and *every day* of the school.

2. ATTENTION. There can be no successful teaching without attention. The mind cannot receive impressions without it. It is one of the first lessons to be learned by the young scholar, and it is the key of success to the advanced student. An Inspector is sure to make the *attention* of the pupils a factor in his estimate of the standing of a school. Should he find pupils negligent of their work, very much occupied with their neighbor's affairs, or very much interested in scrutinizing the school visitors, he cannot fail to conclude that the executive power of the teacher is *weak*, and consequently the progress of the scholars *slow*. And when such is the case during recitation, the conclusion is still more obvious. No teacher that allows any mental wanderings on his own part, or on the part of his class, can be said to discharge his whole duty to the school. We have seen instances where pupils were disposed even to converse during recitation—when istead of fixing their attention on the teacher or the questions he proposed, they became almost unconscious of the situation, and so wrapped up in semi-obliviousness that they aroused with a startle as of an electric shock. Such instances of inattention disclose very fully the utter want of point and pith in teaching. They show that the first lessons of school life have been neglected, and that until learned, but little progress can be rationally expected.

The true teacher lays great stress on *mental* activity. He knows the stimulus it gives to the duties of the school room, and he never fails to display by his own example that which he desires to see reflected in his pupils. The magnetic power of mind over mind is no where more strikingly displayed than in the school room. The natural activity of children soon settles down in an inverse ratio of chronic indifference when its powers are not quickened by contact with the superior strength of a mature mind. The teacher who lacks an animated spirit before his class inevitably fails in keeping up that lively current of thought so conducive to the development of mind. He may be well educated himself, he may speak from a full mind and a thorough knowledge of his subject, but without animation his words fall like so many snow flakes that are as speedily blown away by the first adverse current of thought that sweeps by.

But while the teacher seeks to cultivate this animation, he should at the same time carefully guard against that "fussiness" of manner, which neither indicates vigor of mind, nor solidity of thought. True animation is calm and steady. It never wastes its energy in vociferous exclamations, nor superfluous utterances. It speaks pointedly and clearly, sticks at the root of the matter with a master hand, and arouses the latent powers of the mind on which it acts. Never lacking in dignity, it elevates, and with a sort of kingly power breathes into the soul the breath of life.

Where this is wanting, the Inspector cannot be slow to perceive. The languid, listless teacher, and the idle, indifferent school, are co-relative. They are sure to exist together. On the other hand the busy, bustling teacher and the noisy school are also co-relative. Let the teacher guard against both extremes.

3. ACCURACY. By accuracy we mean cor-

rectness and completeness of recitation. This can only be fully perceived by the practiced and experienced. Many recitations appear tolerably good on the surface that will not bear rigid examination. It is by correctness of work that the Inspector judges of the thoroughness of the teacher. Any school will furnish examples of tolerable proficiency, but it is only in the hands of the *good* teacher that accuracy is found, which fully satisfies the careful examiner. In this way also the work of the careless teacher must generally crop out. At every turn it is perceived that there is some deficiency. There is a mistake here, or a slip there, or hesitation some where else, all indications that something more was wanted to make the work complete. And who is more chagrined many times than the teacher himself? How often have we heard a teacher say at the close of an examination that such and such a class didn't do half as well as he expected? And why? Simply from the fact of their not being properly grounded in their work. The structure was too hastily reared, or the foundation was not properly laid, hence these ugly gaps and fissures which proclaim so loudly the incompetency of the architect.

This want of accuracy is the great fault of Public School work. We know well that for all that exists the teacher is not entirely to blame. Irregularity of attendance has much to do with it. For this the Inspector is bound to make due allowance. But for what he knows the teacher can obviate, he must hold him responsible.

Did teachers only reflect how dangerous to the future welfare of his pupils this habit becomes, he would guard against it more sedulously. The careless habits formed at school, often display themselves in after life. Many misfortunes which overtake men in business, many of the accidents which are so distressing to the public, arise from imperfect calculations and work carelessly performed.

But while it is the duty of the Inspector to note defects, he should be most cautious in coming to conclusions. Many circumstances combine to retard the teacher's work and thwart his designs, and so just credit should be given for what is well done, or faithfully attempted. It should always be more pleasant to commend than to censure, and while not at all blind to defects he should not allow them to divert his attention from anything that was really meritorious.

SCIENCE TEACHING.

BY WILLIAM TYTLER, ESQ., HEAD MASTER ST. MARY'S HIGH SCHOOL. READ AT THE PERTH CO. TEACHERS' ASSOCIATION, SEPT. 19TH, 1873, AND PUBLISHED IN THE "ONTARIO TEACHER" BY REQUEST.

(Continued from January No.)

In regard to the prescribed Text Book, Davidson's "Animal Kingdom," I may say that the author shows a considerable amount of ignorance of his subject. There can be no doubt that it is always a strong point against a text book, in fact against any book, when it is written by a man not practically and extensively acquainted with the subject on which he pretends to give information, and instruct his readers. What Mr. Davidson's qualifications in this subject may be, I know not, although he claims to have had considerable experience in lecturing on subjects connected with Natural History to

juvenile audiences. It must be evident, however, to any one who glances over a list of this gentleman's works, that he is a mere "book-maker." The field of subjects enbraced in that list is so wide, and the nature of the subjects on which he treats so diverse, that it is out of the question that he can have any thorough practical acquaintance with even a majority of them.

I cannot see why in the little book under consideration, Mr. Davidson should have seen fit to adopt the old classification of Cuvier, and to have lumped all the heterogeneous forms of animal life, not embraced in the three highest sub-kingdoms, in the single group *Radiata*. He in fact acknowledges his error, and is simple enough to say in effect: "Learn this just as I tell you, and when you are older, you can read bigger books and find out where I am wrong."

But notwithstanding some disadvantages, I am decidedly of the opinion that the "*Animal Kingdom*" is not at all a bad book for the purpose, that is of course, if the teacher is careful himself to acquire some practical knowledge of the subject. Without this no text book can be of any real service. The mistakes of the author are not of vital importance, and whether his views in regard to the "blowing of whales," and the functions of the *Crab's eyes* in the stomachs of crustaceans are or are not correct, they are just such points as a non-practical man is apt to make slips in. His ideas in regard to the habits of the beaver and some other animals are rather peculiar, but on the whole he has succeeded in making a book, that will prove interesting, and I believe useful.

I believe his arrangement of this subject is good, that it is best to begin with the higher and more developed forms and work downwards. It seems to me that nothing is better calculated to disgust and discourage a class of young children, than to be compelled to make their weary way through descriptions and classifications, even the most superficial, of microscopic animals, which it is scarcely within the bounds of possibility they have ever seen, and which it is very improbable they will ever see. On the other hand, by turning their attention, in the first place to the *Vertebrata*, and using for the purposes of illustration familiar examples, they are brought at once to consider in something of a scientific manner those forms with which they are already intimate, and the attention of the class secured.

I would, in connection with this subject, press upon the attention of teachers the desirability of acquiring, if it is not already acquired, some degree of facility in blackboard sketching. By a few sweeps of the chalk, the work of a minute, a clearer idea can often be given of some peculiarity of structure, or some difference of appearance, than ten minutes of the best description could impart. I know some teachers who have the faculty of drawing eminently developed, and I have often been disposed to envy the ease and quickness with which they could convey to the minds of their pupils the ideas in regard to many objects they intended to communicate. I come now to consider the other subjects prescribed for the Fourth Class. These are "*The Elements of Chemistry and Botany.*"

I was rather surprised on reading the report of Professor Nicholson's address to the Teachers' Association of Ontario, at its late meeting, to find that he considers *Chemistry* as a branch of Natural Science, eminently fitted to form part of the instruction of the children of our Public Schools. It is with considerable hesitation that I must differ with so distinguished a scientist; but I have always been of the opinion that Chemistry is rather a difficult subject to make interesting and instructive to children. It is, certainly, not difficult to interest a class in experiments, especially, if these are of a lively and noisy character, but experiments, unless the principles they are intended to

illustrate are thoroughly understood, are of as little value in an educational point of view as the exhibition of comic pictures in a Magic Lantern. The principles on which all chemical changes and operations depend must be clearly understood, and it has not been my experience that these are comprehended with facility by pupils in the stage of advancement represented by the Fourth Class of our schools. That, of course, may be the fault of the teacher and not of the subject. Others may have been more successful, but I have hitherto failed to meet with any record of such success. As the subject is taught at present, there is about as much real science in the instruction as there is in learning a list of specific gravities, or reading the labels on a druggist's bottles. I suppose the real reason is that most teachers have had no practical work in the application of chemical principles.

It is indispensable in attempting to instruct a class in this subject, that the pupils should begin at the beginning, and get a clear notion of the laws which obtain in the combination of elements and their compounds. Until this foundation is laid firm and sure, there can be no enduring superstructure of chemical knowledge. It will be necessary to see that the class fully understand the nature of elementary substances, and the methods in which they unite to form compounds. Chemical nomenclature is not very enticing, and the teacher must be, at first, sparing in its use, and careful that every technical term is clearly explained and fully comprehended when it is first introduced. Specimens, as far as possible, of the various substances mentioned ought to be examined by the class, that their external characters may be well learned, and their behavior when treated with the most common re-agents should be illustrated in their presence. In the case of the important gaseous elements, their nature and properties must be made manifest by their action. It will require some practice to enable the teacher to perform the necessary experiments with facility and success, and numerous private rehearsals will, in most cases, be required. Failure in experiments in presence of the pupils is apt to leave the impression that the exactness claimed for chemical truth is not so uniform as the books would induce them to believe. In this, as in all scientific subjects, the instructor must prepare himself faithfully for the work. He must, during the lesson, be able to dispense entirely with books. Frequent revisals and examination of past work are here specially important, and it must ever be borne in mind that a comparatively small field thoroughly explored is infinitely more valuable than a wide area superficially examined.

The Text Book on this subject is —*"Dr. Ryerson's First Lessons in Agriculture."* Now I have no desire to say anything which could be by any possibility construed into a want of respect for the eminent gentleman who has so long and so ably occupied the important position of Chief Superintendent of Education in this Province. I fully appreciate and heartily recognize the immense benefit he has bestowed on his country. I cheerfully accord to him the honor of having made Canada, educationally, one of the first nations in the world. The people of this land have reason to be grateful to him, and to hold his name in cherished remembrance.

But, acknowledging, as I do, his vast services in the cause of education, so much the more do I regret that he has allowed himself to be induced to publish this book, and still more that the Council of Public Instruction has required it to be used in our schools. It has not, in any good sense, increased the Reverend Author's reputation, and, I do most sincerely believe, it has had a most injurious effect on the cause of education throughout the Province. I need not here dilate on its many faults; doubtless, they are already well known to you all.

How it is possible that any man in his senses could, at this time of day, deliberately arrange a school text book in the form of a Catechism, is more than I can well understand. A system more eminently calculated to degrade the work of teaching into mere parrotry, and to extinguish the very germs of original thought and the exercise of the reasoning powers, it would be hard to find; and till this "little book" appeared I had imagined was one confined, at least in matters of secular knowledge, to the worst class of young ladies' boarding schools.

In this volume we have a striking illustration of the objections to books on scientific subjects, written by men who are not practical scientists. The author, in his attempt to treat of such subjects, in what is generally called a "popular manner," continually falls into grave errors, and employs, in his definitions and descriptions, language that can only be characterized as *incorrect*. As for example, when he states that "Hydrogen is imbibed by vegetables and becomes solid," or that "the leaves perform the same office in the vegetable kingdom as the lungs perform in the animal kingdom," I mention these merely as samples of what are scattered through the book. You can find many more for yourselves by a little examination of its pages. Such statements as these are not calculated to give true ideas either to teacher or pupils, and when combined with the intolerable dryness of the Catechism style, they render the whole affair more than utterly useless.

From my previous experience of the Reverend Doctor's writing, I entertained the idea that he was capable of expressing his meaning in correct and forcible language. But what can we say of such sentences as the following:

"These leaves (the parts of the Calyx) "are called *Sepals*, and are generally green, "though in the Fuchsia they are white or "red."

Does he mean that in no plant except the Fuchsia are the sepals other than green? This is the meaning his language undoubtedly conveys.

"Is it not discouraging," he asks, "that valuable manure should all be washed into the deep earth by rains?"

But our spirits are considerably raised by the unexpected answer. "It would be very discouraging if it were true, but fortunately it is not true."

Or this: "Many housekeepers know not "how to cook potatoes; they peel the pota-"toes, and put them into cold water to soak; "both of which modes of cooking them is "wrong." I should think both modes *was* wrong, if you like the syntax. I should not like to be compelled to eat *my* potatoes cooked in either of these two ways, either by "peeling" them, or by "putting them into cold water to soak," and yet some housekeepers, it appears, subject the same potatoes to both processes without producing a result satisfactory to the author. The Dr., I believe, is not an Irishman, perhaps the nature of the subject influenced his language.

I may remark here, the part which treats of Botany, short as it is, is even worse than the rest. I defy any teacher, who gets his knowledge from this book, to convey any clear idea of it to a class. I could give many instances of the careless use of language, and the general mistiness of expression which characterize this part of the subject but I forbear. Let any one having even an elementary knowledge of the subject examine it for himself, and the truth of what I say will be abundantly manifest.

If we are to have Chemistry taught in our Public Schools, it must be in other fashion than can be done by following our author's lead. The teacher absolutely requires some book as a guide to his own study and research, and one which shall not only indicate the experiments best adapted to illustrate the subject, but which shall also fully describe the apparatus required, and the

proper methods of manipulation, and if possible, by means of diagrams and woodcuts make clearer than can otherwise be done the minutiae of chemical experiments.

Roscoe's Chemistry leaves nothing to be desired as an advanced text book, but it contains altogether too much matter, and is perhaps too expensive to answer the purpose. I have long thought that an abridgment of this valuable work, retaining the greater number of the beautiful woodcuts, would be an excellent text book for our schools. The pupils don't require one, but a thoroughly good book is, I believe, indispensable for the teacher.

As for Botany I have long been of the opinion that no branch of Physical Science presents more facilities for true scientific teaching in our schools, than this. In the study of vegetable forms, in the examination of the phenomena of plant life, and in a view of the natural system of Plant Classification, we have combined the various methods of scientific study, and we have presented to us an extensive field of instruction in all that is valuable in modes of scientific thought. It is a subject that can be studied practically by all. Specimens in any quantity can be easily obtained. The taste for flowers is one naturally inherent in every child, and I am confident that, if proper methods of instruction are employed, a real and living interest will characterize the class engaged in the study.

The general introduction to the study of Botany must be pretty much the same as in Zoology, the distinction of the Organic from the Inorganic, and a full understanding of the nature of organs and their functions. Next in order is the division into organs of growth, and organs of reproduction. In considering these in detail, constant application must be had to actual specimens of the roots and stems and leaves, and different forms of flowers. It is not necessary to particularize. I doubt whether it will be possible to conduct the class far enough to get any clear idea of classification further than the great sub-divisions of the vegetable world. A few of the more important orders might be taken up and illustrated by typical forms. The examination and determination of new plants would, I am sure, be an interesting and profitable employment for a class. The time at the disposal of the teacher is, however, so limited, that he is compelled to economize his minutes. The formation of a school herbarium would perhaps be an advisable course, provided the pupils themselves were induced to take the chief management of it. In this as in all other branches of the Department the teacher's motto must be "Hasten slowly." There is the objection that the consideration of Botany must, to a large extent, be omitted, at least in a practical way during the winter months; and as the holidays occupy a large part of the summer, that there is thus not much time at the disposal of the teacher for real work in this department.

It will be found, however, that good work can be accomplished during the winter. Specimens of woods and seeds, of dried leaves and flowers are, though not as good as the living plants, of infinite service, and can be used so as to convey nearly all the information that is necessary for a young class.

I have already expressed my opinion of the text book prescribed for use in the Public Schools, and it is therefore unnecessary to say anything more on the subject.

Professor Gray's little book "*How Plants Grow*" is used in High Schools, and it is in every way a suitable book, except perhaps, in the matter of price. This is owing, no doubt, to the large number of beautiful illustrations, without which no text book on Botany can be of much value, and which, in the case of this work, render the study a delight. As it is not at all necessary, or even desirable, that the pupils themselves should have text books, the price is not in reality such a serious objection. It has the

great advantage that the great majority of the plants mentioned and figured for purposes of illustrating the various points touched on, are common and well-known; and actual specimens can without trouble be procured and examined in this class.

Physiology is a subject which, perhaps, more than any other, is pressed upon the attention of parents and teachers as of the utmost importance for the education of children. As far as I can make out, the advocates of Physiology, as a part of school work, base their arguments not at all on its value as a means of mental training and discipline, but altogether on the great advantages of a utilitarian character to be derived from a knowledge of our bodies and the vital phenomena therein occurring.

Now, I do not believe, that the most intimate acquaintance with these and similar subjects has, with the generality of men, any tendency to make them more careful in taking measures for the preservation of their own or others health. The weight of experience is against any such belief.

There are other objections to the teaching of Physiology in our schools, unless in a very confined and imperfect manner. These objections will be evident to every one.

Mr. Davidson is also the author of the text book on this subject "*Our Bodies.*' I have not examined this so carefully as the other books I have already noticed; but from a cursory perusal of its pages, I am inclined to think very favorably of it for the purpose. The matter seems arranged in a very clear and connected way, and the woodcut illustrations serve to explain very lucidly the statements of the text. I doubt whether a better book for beginners in this science can be found.

I have thus as briefly as the nature of the case would allow reviewed the various subjects of scientific study prescribed in our Public Schools: and I shall indeed be glad if anything I have said should prove, even in a slight degree, of any service to my fellow teachers. I believe most sincerely that the teaching of Physical Science is a great and important work, and one that in this age of scientific investigation in every department of nature cannot with safety be left unperformed. If we can only accomplish this, that the children in our schools should, ere they leave the class room to battle in the world's strife for their subsistence, have some clear ideas of the methods which must, in many instances, direct their working and thinking in after-life.

More than this we cannot in many cases expect to accomplish. It is not to be expected that all the pupils trained beneath our care should graduate from our schoolrooms fully instructed in even one branch of Natural Science. But it may be their privilege to go forth from our instruction not in total ignorance of the physical world which lies around them, and with which they have so much to do. It will be well for them if they have learned the great lesson of all scientific study, the love of truth, and the disinclination to receive information at second hand. If the love of the study of Nature once takes hold of them, they will have a means of innocent, and continual enjoyment, of which they would otherwise know nothing, unless, perchance, when their attention was forcibly called to some of the more striking phenomena of Nature. To them in that case every hour will bring fresh pleasure, and in their walks by the wayside, and through the forest, in the daily duties of their lives, in observing the changing face of the sky, in all their amusements and employments they will see with other eyes than those to whom Nature has not declared her charms. They will recognize and admire the chain of law and harmonious order that runs through all the vast creation, and will thus have furnished to them a firm anchor, when their minds may be tossed with doubts and questionings.

It is to our teachers that we must look for the accomplishment of this great work,

and in order to perform it with efficiency they must with earnestness and fidelity prepare themselves for the work. Let them place no blind dependence on books. They are good as servants, bad as masters. Let nothing, when it is possible, be taken on authority, however unquestionable, and the teacher will begin to find that he has something tangible to teach to his class, and the lesson will be lifted from the dry and weary grind of question and answer, both from the book, which it too often is at present.

I should like to see an experiment tried by some teachers who would give it a fair trial, to dispense altogether, totally and entirely, with text books for a week, and see how it would work. Banish them, one and all, Grammars and Geographies, Arithmetics and Algebras, Chemistries and Botanies, Histories and Literatures, and observe the consequences. I imagine the teachers would have to work harder to prepare themselves for the work.

In scientific subjects, at any rate, I believe it is much better not to place any books in the hands of the pupils. Apart altogether from the advantages of such a course, already pointed out, there is the great cause of complaint, to some extent, removed from the mouth of parents, the constant call for new books, and this is not so trivial an affair as some might be disposed to imagine.

One word in conclusion, and it is the conclusion of the whole matter. Whatever we teach, whether Science, or Literature, let it be real, and no sham. Let us see to it that our pupils learn facts, and not words merely, and then our Public Schools will be even more than now, an honor and a glory to the land, and a nursery of future usefulness and intelligence.

PUBLIC SCHOOL "TEXT BOOKS."

BY H. DICKENSON, TEACHER, BRANTFORD.

(Continued from January No.)

Our Text Books on Geography now call for a share of attention. When we consider the great number of "non-professionally trained" individuals at present engaged in teaching throughout the Province, also the likelihood of the "supplies" being "non-professionally trained," for some time to come, judging from the number of certificates granted at the July, 1873, examination (out of 886 no less than 820 were of the 3rd class), we are forced to conclude that proper Text Books on Geography as on the other subjects are absolutely necessary. At that period of life when the minds of the young are beginning to expand—when they ardently thirst after novelty and variety—when they are alive to the beauties and sublimities of nature, and listen with delight to the tales of our own and other countries, it is of a truth certain that more care should be taken in the introduction of pupils into the branch, than is taken in nine-tenths of the schools of Ontario. As a rule, instead of being gratified with all that is interesting in the magnitude, form and general arrangements of the earth, pupils are set down in a corner to plod over strange sounds—their memories are burdened, and after many painful efforts they are enabled to vociferate like a number of parrots their medley of hard geographical names, pouring out their lists of the names of towns, cities, bays, gulfs, rivers, straits, capes, &c. with a velocity like water bursting from a spout, without

a single correct idea connected with their exercises, understanding neither "what they say, nor whereof they affirm." Instead of hand books to the maps arranged methodically in a series of drill lessons—uniform the Province over—so that pupils might not be subjected to such frequent changes of landmarks, in change of school or change of teachers, said hand-book interspersed with copious notes as to how this abstract branch should be taught, for the benefit of the numerous untrained teachers, we have an immense amount of information (statistical and otherwise) collected, illustrative of the genius, erudition, and research no doubt of the collector. We do not attempt to deny that they contain a great amount of information —very valuable information—very valuable, indeed. But what practical use can be made of this ton of information in our school rooms? True, they may be regarded as books of reference or directories, but think you something else is not needed in the way of aid to teachers than books of reference, or cyclopœdias. The small work, entitled, "Easy Lessons on Geography" seems to have been constructed with the intention of keeping pupils months and even years in acquiring as much knowledge of geography as they would of theology by the too common routine of mouthing the words and committing to memory the vocables of catechisms. Some will argue that these vocables will serve as food for after thought, and that they will be perfectly understood in riper years. It may, however, be laid down as a maxim that will generally hold true that whenever the words of a proposition are committed to memory without being understood, their meaning will seldom, if ever, be inquired after, or perceived. In the work I speak of we have inserted the definition of a Forest, a Fort, a Lighthouse, an Electric Telegraph, a Railroad, and an innumerable host of others. No necessity exists for the insertion of such questions. We can scarcely imagine the amount of painful labor and drudgery necessary to commit these things to memory at the usual age at which they are prescribed, and after all it is an absolute impossibility that any benefit can accrue to children from vociferating these, unless they have the corresponding ideas.

As to the Text Books lately sanctioned by the Council of Public Instruction little or nothing needs be said. Every one is aware of the gross absurdities and innumerable errors contained in them. Column after column has appeared in the "public prints" expressive of this fact. It is the same no matter whether the book be upon Christian Morals, Agricultural Chemistry, or Natural History. It hath not appeared how many better works have had to succumb in order to let our venerable Chief Superintendent appear to the country as a book author. But it strikes us very forcibly that we have seen somewhere that an offer was made by Professor Nicholson, M. A., M.D., D. Sc., F.R.S.E., of a work on Natural History, adapted to the wants of the pupils attending our schools, and the offer was refused. Since then Professor Nicholson's work has been accepted by nearly all the higher Colleges, both in the United States and Great Britain. Is it not outrageous to presume that he could not furnish a suitable Text Book? We should have nothing to say had the work sanctioned by our Council of Public Instruction been of a high order. Ellis A. Davidson's work, which has received their sanction, comprises 187 pages of print, and it would be impossible to calculate the number of mistakes in it. The classification is obsolete—the style is beautiful. As an example of the errors that appear on almost every page, he says a type of any class of animals is one which possesses ALL the characteristics of the whole group. Now, although I do not profess to know much of Natural History, still it does not require much research to discover—in fact it is generally admitted by

naturalists, that the type of any group is the central form from which the peculiarities diverge in opposite directions. On Page 18 he says that the horse has a backbone or vertebra, when the veriest tyro in anatomy is aware that one of the pieces comprising the back-bone is denominated a vertebra. This gentleman has something original in him too. He has found out that reptiles breathe by means of gills. He has found out that a whale's head is as long as the rest of the body. He has found out that the feathers of Ostriches assist them in walking—even against the wind. Last, though not the least astounding of his discoveries that I shall mention is, that cats have SKELETONS that are wonderfully elastic to enable them to squeeze through narrow openings.

A few words on Dr. Ryerson's work and I have done. His "first of the bevy," or First Lessons in Agriculture, is, without doubt, a lamentable failure. The nomenclature is obsolete, and this in itself is sufficient to condemn it for school purposes. Without taking into consideration such laughable absurdities as the following:—"Why do plants droop and turn to the earth after sunset?" Ans. "Because when the warmth of the sun's rays is withdrawn they turn downwards"—in other words they do because they do. The Spelling and Grammar in all his works are very bad.—Although the Council of Public Instruction has adopted "Worcester" as our standard in Orthoephy and Orthography, and Worcester gives his preference to leaving the "u" out of all such words as labor, honor, etc., with the exception of Saviour, I find that on the first 75 pages of his "Chemistry" Dr. Ryerson inserts the "u" no less than 77 times, and on the first 30 pages of his "Christian Morals," he inserts it 25 times. Instead of endeavoring to study uniformity he first inserts the "u," and the next time he uses one of those words he leaves it out. In the preface to one of his books—I do not just now remember which one—he falls into another curious error, viz.: using "a humble" and "an humble" within a few lines of each other. For Worcester's preference naught cares he. We may safely say that his first effort is a lamentable failure. He plainly shows a want of scientific knowledge—he plainly shows a total ignorance of spelling scientific terms, and his style is altogether unsuited to an elementary work on Agricultural Chemistry.

In his "Christian Morals," the second of "the bevy," he has introduced sectarianism to such a degree as to offend the conscientiousness of at least four different religious denominations in the country, and probably more who have not spoken out through the medium of their respective journals. The four organs that have condemned the work as unfitted for use in Canadian Schools are the *British American Presbyterian*, the *Independent*, the *Canadian Baptist*, and the Roman Catholic *True Witness*. It seems that Dr. Ryerson, at the close of a long, and to a certain extent not disadvantageous connection with our Public Schools, is doing his best to revive that sectarian strife which in times past created so much jealousy and bickering. It is deeply to be regretted then, that up to the present time, with very few exceptions, in an age deemed superlatively liberal and enlightened, our Text Books are compiled in such a manner as to be repugnant to the dictates of reason—inefficient for enlightening and ameliorating the human mind—and little short of a direct insult offered to the understandings of the young. While nearly every authorized book has for its motto—

"Delightful task! to rear the tender thought
"To teach the young idea how to shoot,
"And pour the fresh instruction o'er the mind,"

the great objects which they ought to promote have been shamefully neglected.—Words have been substituted instead of things—the elements of language have been preferred to the elements of thought—they

exhibit the key of knowledge instead of knowledge itself, and the minds of the pupils attending our schools, at the termination of the common process of instruction, as far as Text Books are concerned, are as destitute and devoid of ideas as at the commencement. We have endeavored to point out what we consider a few of the graver errors to be found in our "Authorized Books." We have endeavored to do what we considered a duty, courting the favor or fearing the frowns of none, and although some may differ with me on some of the points attacked, still after overlooking all our errors of judgment, it must be generally admitted that a change in quite a number of books is needed—that a total reorganization of the body that authorized such books is necessary.

Let a general agitation on this subject be excited—let the importance of a change in this respect be clearly proved and illustrated—let the necessity of a change in this respect be fully established—let a conviction of the utility of such a change be deeply impressed upon the minds of our legislators, and I have little doubt but that they will take such steps, and that immediately, as will bring this urgently needful change about. Society, if once thoroughly aroused to the importance of a proper set of Text Books for use in our Public Schools, would find no difficulty in defraying any extra expense that might be incurred on their introduction, and I see no reason why society should not become aroused, if Teachers would only bestir themselves. Why not have as a part of the duties of our Council of Public Instruction the compilation, as well as the authorization of our Text Books, provided a reorganization and resuscitation of said body can be brought about, and a leaven of the practical element introduced. In a wail from that body not long ago—a wail of 15 clauses,—they confess themselves that they of necessity must violate one of the two trusts reposed in them by society. They also acknowledge that two of their number did not at that time find it convenient to attend—that two vacancies had remained unfilled for a twelvemonth—that during that time their honorable body has had to adjourn for want of a legal quorum quite a number of times. The time was when clergymen might have been the only individuals capable of overseeing education, but that time is past. Judging, then, from the clog Dr. Ryerson has been for some time past to the advancement of education—from the devastation being done in our Provincial Normal School by another Rev. gentleman—from the utter demoralization of the old County Boards of Examination, brought about mainly by their being composed almost wholly of ministers—in all sincerity I assert that from the Chief Superintendent down to our County and City Examiners I would have Clergymen swept from their position, and their places as overseers of education taken by earnest, practical men—men who will devote that time and attention to the duties devolving upon them that their importance demands, and as a concomitant there will be such an influx of talent into the teaching profession as will amply repay the country for the loss sustained by particular communities losing the services of able ministers in the cause of education. I say that if ever teaching is to be elevated into a profession, the encroachments of other professions must be guarded against, and never until it is made evident—by the exclusion of ministers especially—that the ladder of gradation from the office of Examiner,—Inspector, etc., to the seats at the Council of Public Instruction—in the Professional Chairs of Provincial Normal Schools, and the office of Chief Superintendent itself is open to the more meritorious teacher, never till then will the rank and file of our teachers be of the kind of material necessary to place our country in the van, and outstrip all competitors in the race towards perfection and "Excelsior."

OLD AND NEW.

BY WILL. HARRY GANE.

Good bye old friend! give us once more your hand,
We'll try and banish all the past,
And in that ocean wide and vast
Drown bitter thoughts; and on the strand
Shake hands o'er that which may appear,
And live a better life next year.

Good bye old friend! so thou art really gone!
Before we scarce had welcomed thee,
Like some delightful phantasy,
Gone with thy spotless pageant on
Before we learned to lisp thy name,
Or realize thy boasted fame.

Welcome New Year! as o'er the distant hills
Dawns the fair light, we sing
Like wild birds in their wandering,
A song that every tired heart fills—
A song of praise to God above
For his immensity of love!

Welcome New Year! all nature sings with us,
A spotless page before us lies,
On which the eye no blot descries;
O, Master, may it e'er be thus,
For blots of sin may enter there
Unless God guides us everywhere.

Welcome New Year that we may better live,
And better work the task Divine,
Which blessed Jesus once was thine,
To deal with little ones. O give
A power unspeakably great,
Beyond our humble estimate!

INGERSOLL, ONT.

MISCELLANEOUS CONTRIBUTIONS.

OLD TEACHING CERTIFICATES. BY H. DUGSDALE, TEACHER, KINGSTON.

I am very much pleased with your Publication, the ONTARIO TEACHER; being exclusively the Teacher's friend, it is just the very thing required.

The Teacher's profession has been a helpless one in the past in this Province; frowned upon by parents, discouraged and found fault with by Trustees, and as for the encouragement given by Local Superintendents it was simply none. Keenly, indeed, the Teacher has felt that there was no help, no sympathy for him, he had to fight his own battles alone.

Those interested will congratulate you and the profession generally for the assistance rendered it by the excellent articles and general information your happy publication affords. Teachers will stand very much in their own light if they neglect to subscribe for this excellent work.

There is a subject in your last number, (Oct.) more than hinted at, which it would be well to give more prominence to, as it very much interests a large class of Teachers now engaged in the profession in this Province. The subject I allude to is with regard to the Teacher of many years' standing, who commenced the business in early life; and has already spent his youth and best part of his strength and manhood in the employment of teaching, who in the midst of difficulties and opposition calculated to discourage the stoutest hearts, (has discouraged many and turned them aside,) yet surrounded by these discouragements, has conscientiously stuck to the profession; holding the highest certificate of qualification for years under the late Board of Co. Examiners; frequently 'tried' and 'proved' by that august Council, as every Teacher of many year's standing knows, yet never put to the blush by deficiency or delinquency. These Teachers to whom I allude are not few; they have a character and an experience in the art of teaching which younger teachers have yet to acquire. Many of these teachers have already passed through a course of training in other Model Schools, and hold one or more diplomas from those schools in their native land (but unfortunately not recognized by the Council of Education). Now the question is this, is it fair to drag this class of teachers again before the new Board of Examiners? (Some of these examiners probably have been pupils in their own schools.) Is it fair to drag them into the ordeal of a new examination on (some of them) new subjects, or at least subjects never taught, nor is it probable shall ever be taught in many of our Public Schools? The First-Class Teacher under the late Regulations has the same love for study he ever had, and does and will study, but it is absurd to expect from him perfection in new studies. Allow me to state what cannot be denied, that the teacher who has spent 25 or 30 years from his youth up, teaching and preparing lessons for his school, feels to his sorrow that his sight is much impaired; it cannot stand the constant tax and strain on it year by year. Is it not preposterous, therefore, to require such to study new subjects? Is it not also injustice to degrade this class of useful teachers after spending so many years of usefulness by stripping them of that

which they proudly held for years, namely, the First Class Certificate, because forsooth they cannot succeed according to the judgment of the New Board in coming up to the required standard?

Because he fails on any of the new subjects, the teacher is proclaimed in the public prints that he is no longer fit to hold his former position. No wonder that many of these teachers thus dealt with would throw up the whole thing with disgust, and turn their attention to something else ere it be too late.

Their remuneration at best was, and is still small. Many of them have been unable to subscribe to the Superannuated Fund. They have had too little to support their families, much less to subscribe to a Fund, so that there is little hope from that quarter.

The cold hand of charity is a poor prospect to one who has spent a life of usefulness, in that of educating more than one generation; many upon whom much energy and care was spent to their joy have risen, and are now far above them in wealth and honors.

But enough of this. I will now take the liberty of making a suggestion (probably a better one can be given). It is this: Let the useful, upright, honest, hard-working, First-Class Teacher, under the Old Boards, who is looked upon as the good and useful by the present Co. Inspector; let that teacher still retain his standing amongst his brethren till he arrives at a certain age. Let him not be shorn of his diploma in the eyes of the public. Let him get at least some of the respect due to him for his many years of usefulness, and his conscientious adherence to his lawful calling. Let this at least be done for him in the present, and let him feel that his services in the past are appreciated.

These are the few hints I beg leave to suggest.

Will you have the goodness to give them prominence in your publication in whatever way you may deem best. By so doing you will confer a favor on a class that will without doubt accept it gratefully as such.

PROGRESS OF OUR SCHOOLS. EXTRACT FROM A RECENT ADDRESS BY R. HARCOURT, ESQ., M.A., INSPECTOR COUNTY OF HALDIMAND.

For holding the opinion that our schools have been progressing certainly and safely, I find abundant reasons in the following circumstances: There is in the first place a greater uniformity in the work done, as well as a more strict adherence than usual to a fuller programme. I think that after the experience I have had (and I do not forget how limited it is) I can speak with tolerable accuracy of what is being done in the schools of Haldimand. Two years ago, save in the village schools and in a few of the larger rural schools, the want that struck me most was the utter disregard of dictation exercises. The importance of this branch in its bearings on *writing*, *spelling* and *composition* can scarcely be overrated. That in this way with occasional variations, spelling can be taught more thoroughly than in any other, is, I think, a generally admitted fact. Those who are conversant with some of the other languages, can testify practically to the utility of this method as a means of acquiring both the spelling and pronounciation of foreign words. Had greater attention been paid to this subject, the written examination for candidates about to enter High schools would seem far lighter than it does. The plan of so providing, that the scholars in junior classes shall each day write on a slate, a part or all of the day's reading lesson is a very good one. Such a method, in addition to the positive good results has negative ones, such as keeping the children busily engaged, to recommend it. So much importance is attached to this plan in some of the schools of the American cities, that the junior scholars not only write their reading lessons, but dispense with the books al-

together and read their lessons from the slates.

Two years ago 90 per cent. of the scholars in our FOURTH readers, in this county, wrote with very great difficulty the simplest of sentences in dictation. Now, owing to some degree of attention having been paid to it, scholars in most of the schools in the SECOND reader write similar sentences with ease. That our programme, while based on a sound principle is ill-suited in many respects to the vast majority of our schools is plain to every practical teacher. The idea of uniformity is carried too far, for clearly a programme which is adapted to a graded school in a town or village, will be quite out of place when applied to some of the rural schools. Only in a very few schools, in my opinion, can some of the FIFTH form subjects, such as *Chemistry*, *Physiology*, *Civil Government* or *Agriculture*, be taught with even a chance of advantage. As it is best to read but a few books and read them carefully and often, so it is wise to teach a narrow range of subjects, giving to each of them ample and thorough scrutiny. That a desire for uniformity has led to mistakes in other directions, is evident from a glance at the regulation which makes it necessary for each High School Board to employ an Assistant Teacher. Now, certainly, there are High Schools, where, owing to the small attendance no assistant is needed; and to pay that assistant is a financial load calculated in some cases to suspend operations completely.

Perhaps no accomplishment is rarer than that of reading in a pleasing and intelligible style. To be compelled to listen to the drawling monotone of one pupil, and for a change to the harsh, rapid, and high-pitched accents of another, and then to the stammering style of a third, who will pause just when the sense forbids, who knowing nothing of a rising or falling inflection, always sinks the voice into a whisper at the end of each sentence, is surely three-fold torture. May we not justly attribute much of this faultiness of style to imperfect teaching? I can safely say that in the matter of reading, there has been marvellous improvement in the schools of Haldimand. In most of them appreciative attention is carefully paid to pauses, attempts are being made to inflect the voice and cultivate an easy and natural style. As teachers, we should not forget the plain utility of some simple rules of elocution, that there are "pauses," and important ones, too, which the printers' art does not reveal to us, that unless we attend to the *one* emphatic word of every sentence we fail to bring out its full meaning; that the simplest interrogatory sentence admits of half a dozen shades of meaning according to the changes of emphasis and intonation. Much of the difficulty is due to a want of attention to beginners. If well taught at first, progress will be sure and swift, whereas if the early teaching be careless and defective, the task of substituting a good method for a bad one, will be doubly difficult.

Connected with the question of progress in certain branches of study, in relation I might say of cause and effect, are the two items of examination of teachers and school accommodation. The provisions now in force for the examination of teachers, are such that if wisely carried out, the standard of the profession must be raised, and along with it the status of our schools. A council of instruction may pass regulations wise and equitable, school officials may earnestly strive to carry them into effect, yet all will be "flat, stale and unprofitable," unless our teachers are both qualified for their work and conscientious discharge of their every duty. The fact that somehow or another teachers received First and Second Class Certificates three and four years ago, who could not now obtain a third, that while it was exceptional for an applicant to fail then, those who succeed now are but thirty per cent. of the whole, is known to all of us.—

To explain this fact by a mere glance at the *personnel* of the examining boards, is a thing impossible, since in not a few instances our County Councils have wisely retained as examiners, members of the old boards. The oft-uttered statement that the standard is too high, that the supply of teachers must as a consequence fail to meet the demand, when sifted contains but little reason and less truth.

The number of certified teachers is probably larger than ever before; they certainly receive better salaries; the vast majority of them hold certificates of the third grade, and the standard of that grade is *even now* too low. The following statistics may here be fittingly introduced :—

Examination of Dec. 1871—Out of 21 candidates 12 were successful.

Examination of July 1872—Out of 47 candidates 29 were successful.

Examination of Dec. 1872—Out of 26 candidates 8 were successful.

Examination of July 1873—Out of 41 candidates 20 were successful.

The fact that many applicants who fail at one examination, instead of being discouraged, try again and are successful, is a matter of great satisfaction to the examiners. We all, I am sure, rejoice to know that we are to have additional Normal Schools, and that their location will make them easy of access to districts hitherto unprovided for. I would wish that more of our teachers would attend these schools, since those who can, through books alone, without any outside help, "pick up" a good style of teaching, are very few in number. So long as nine-tenths of our teachers are persons who have attended only a public school, who have had no opportunity of comparing different methods of teaching, and who, so soon as they obtain a certificate, set up shop themselves, acquiring what little method they have by years of rough and very expensive experience, our schools will progress but slowly. Surely teaching is a profession, and being such requires considerable time in the mastery of its principles

No one, whose attention has been called to the matter, could imagine the miserable condition of the majority of the school-houses of 1871. At that time there were not ten properly furnished buildings in Haldimand. Many of them with low ceilings, broken floors, and damaged windows, had for seats nothing other than the antiquated bench facing the wall. Too cold and too hot by turns in winter, and suffocating in summer, with nothing to attract and everything to discourage scholars, we wonder that an intelligent public has so long tolerated their existence. Even now in some sections, though attention has been generally directed to the grievance, the Trustees seem to study every possible means for postponing the erection of a suitable building. In the main, however, I am especially gratified at the improvements effected. In two years sixteen brick buildings have been erected; all of them substantial and well furnished, some of them models of neatness and finish. In a dozen sections, preparations are being made for replacing the old houses, so that we have good reason to hope that in a year or two at farthest, our county will no longer be noticeable for the miserable style of its school-houses. Three of the newly erected buildings, I might add, accommodate two teachers, and will seat each of them 110 scholars; also, that of the 80 school-houses in Haldimand 33 are brick, 39 are frame, 3 are stone, 5 are log.

To summarize the foregoing statements, we HAVE progressed since 1871, swiftly in one particular, slowly and steadily in several others. Let us hope that each year will find us making additional efforts; that our Municipal Councils will deal liberally with us; that the public will lend its earnest patronage; that our teachers with better salaries than now, will cling lovingly to their noble profession, and do their utmost

to instil into the minds of our youth, principles of truth and piety, patriotism and philanthropy. But as the shield has its reversed side, as the blackest cloud may have a silver lining, so our subject ere it be dismissed, must be presented in a new and gloomy aspect. Let us not forget there are hundreds of children in each of our counties who are growing up in ignorance; who never darken the doors of school-houses; who spend their time most of them in idleness, a few of them in cruel drudgery; whose future it is sad to contemplate. Until we force the parents or guardians of such to educate them; until noticing that a large per cent. of our youth, attending school less than twenty days each year, reap no good therefrom, we stir ourselves to find a remedy; our system, admirable as it is in some respects, is lamentably deficient.

EXAMINATION QUESTIONS.

FIRST CLASS.

Algebra.

1. Three clocks, A, B, and C, the first of which is gaining uniformly, and the last losing uniformly, while the second keeps correct time, are all right at noon. The rates at which they go are in geometrical progression. When C indicates midnight, A is 2 1-180th minutes ahead of true time. Find how many seconds A gains, and how many C loses, in the hour.

2. A hare is a certain distance ahead of a greyhound. It takes 12 leaps in m seconds, the greyhound taking 9 leaps in the same time; and 2 of the greyhound's leaps are equal to 3 of the hare's. After having taken half as many leaps as are necessary to catch the hare, the greyhound increases by one the number of leaps it takes in n seconds, the length of its leaps remaining unchanged. In consequence of this, it catches the hare t seconds sooner than it would otherwise have done. Find by how many of its own leaps the hare was ahead of the greyhound at starting.

Ans. $\dfrac{3t\,(m+n)}{m^2}$.

3. Given $(m+n)\ pq = p+q$, and $(p+q)\ mn = m+n$.

Prove that, if m and n be the roots of the equation, $2x^2+ax+3=0$, p and q shall be the roots of the equation, $3x^2+ax+2=0$, a being supposed to be distinct from zero. Inquire whether the theorem holds good when a is zero.

4. Find in how many ways 12 guineas may be made up of half-guineas and half-crowns.

5. Solve the simultaneous equations: $xy-2x+3y=21+7$. $x^2-7xy+12y^2=0$

6. Given $2x=a+b+c$, and $2bcy=b^2+c^2-a^2$. Prove $b^2c^2(1-y_2)=4x(x-a)\,(x-b)\,(x-c)$.

7. Given $a^2x^4+b^4y^2=2a^2bx^2y$, and $xy=ab$. Find x in terms of a and b.

8. A train leaves Hamilton for Toronto (distance 39½ miles) at 3.35 p.m., and reaches Oakville at 4.24 p.m.; at Oakville it increases its speed one-fifteenth, and, proceeding at this augmented rate, it reaches Port Credit at 4.45 p.m.. at which time also a train from Toronto arrives at Port Credit, the square root of the rate of the latter train, betwixt Toronto and Port Credit, having been less than the square root of the first mentioned train between Hamilton and Oakville, in the proportion of 14 to 15. The train from Toronto proceeds ot once to Hamilton, which place it reaches at 6 p.m., having maintained, between Port Credit and Hamilton, an average speed of 20 2-5th miles an hour. Find the time at which it left Toronto.

Ans. 4. o'clock P.M.

Chemistry.

1. Explain the processes by which the composition of water has been ascertained with reference to both relative weights and volumes of its constituents. Name some of the impurities of water, and state how you would detect them.

2. Explain the formation of nitric acid for nitre or sodium nitrate. Describe its

properties, and state by what experiments you would illustrate them.

2. Give an account of the preparation and properties of sulphuric acid (oil of vitrol). State the action, when heated it has with (1) potassium bi-chromate, (2) mercury, (3) potassium chlorate. What is the test for detecting it?

4. Describe and explain the preparation of chlorine and of potassium chlorate. If 1 lb. of pure black oxide of manganese be used, what quantity of chlorine can be obtained, the atomic weight of manganese being 55?

5. What substances are manufactured from common salt? Describe the processes employed.

6. The density of a gaseous hydro-carbon is 15 times that of hydrogen; the weight of the carbon is 4 times that of the hydrogen. Find the formula which represents its molecular composition.

7. Describe the process of converting pig-iron into bar-iron, and explain the chemistry of it.

8. A franc weighing 5 grains is dissolved in nitric acid, and the addition of hydrochloric acid to the solution gives a precipitate which, when washed and dried, weighs 5.579-16 grains. Find the percentage of silver in the French silver coinage. Cl = 35, Ag. = 108.

9. Give the composition and state the sources whence the following substances are obtained: Saltpetre, borax, black manganese oxide, patassium carbonate, sal amoniac.

10. Define a radicle in chemistry, and explain what is meant by the quantivalence of a radicle.

Physics.

1. A lump of ice is placed in a vessel of water at a temperature 20° C.; trace the action that ensues, and point out the limit at which it ceases.

2 One pound of steam at a temperature of 100° C. is passed through 10 lbs. of water, the temperature of which is 0° C. describe what occurs, and state what will be the temperature of the water at the conclusion of the experiment.

3. How is the absorption of heat affected by color? How is the radiation of heat affected by color? Describe simple experiments by which you would prove your answer.

4. State the laws of refraction of a beam of light passing from water or glass into air, and describe experiments by which they might be illustrated. If a ray of light passes from spirits of turpentine into water, is it bent to or from the normal? Give reasons.

5. Describe the Stereoscope, and explain fully the theory of its action.

6. Explain the formation of an image by a lens.

7. The image and object are to be six inches apart when the lens is between them; what is the greatest focal length of the convex lens which will give this result?

8. I hold in my hand a glass tumbler which I electrify on the inside by moving it about on a brass knob connected with the conductor of a machine, and then I invert the tumbler over some pith balls on a deal table and remove my hand; state and explain the effects which ensue. When the action has apparently ceased it is again renewed if I place my hand on the tumbler; explain why.

9. Describe the construction and action of a galvanometer.

10. Give a brief description of the Morse telegraph, and explain, with the help of a simple diagram, the mode of transmitting signals by means of it.

Education.

1 What end is to be kept in view, and what limitation should be observed, in inflicting punishment?

2 "The acquisition of knowledge is rather a means than the end of education." Discuss this statement.

3 Enumerate the leading principles to be kept in view by the Teacher

(*a*) In conveying instruction.
(*b*) In maintaining order.
(*c*) In cultivating the consience.

4 Give notes of an introductory lesson on

(*a*) Proportion.
(*b*) Grammar.
(*c*) History.

5 Show what methods you would adopt

(*a*) To maintain the school premises in good order.

(*b*) To secure regularity of attendance without punishment.

6. Point out the evils commonly attending public oral examinations, and show how these may be avoided.

7. Show in detail wherein consists the

difference between good and bad questioning.

8. Draw up a time table for the use of a school containing 100 scholars, an assistant teacher being employed.

School Law.

1. State *generally the powers of* County Public School Inspectors as to

a. Granting and suspending Certificates.

b. Disputed Trustee elections.

c. Formation of Union Sections.

d. Disputed School Accounts.

e. Doubtful proceedings at School Meetings.

2. Wherein do the functions of a City Inspector differ from those of a County Inspector in the matters above mentioned.

3. In what cases is the County Inspector to withhold the payment of the School Grant from a School Section.

4. How does the law provide against the Township Treasurer's delay in paying the County School Fund to the Teachers?

5. In what manner is the establishment of a Township School board authorized and effected?

6. Where the High and Public School Boards are united, what is the rule respecting Public School pupils who may be qualified to pass to the High School, but whose parents desire them to complete the Public School course?

7. The law provides a pecuniary penalty for certain offences by a Teacher. What are they?

8. By what process does the law empower Trustees in Towns and Cities to obtain funds for the support of Public Schools?

9. What is the process for uniting two Sections in a Township into one, and when does such union take effect?

10. If the Trustees employ an unqualified Teacher, can they collect a rate for his salary? Has this been tested at law?

Natural Philosophy.

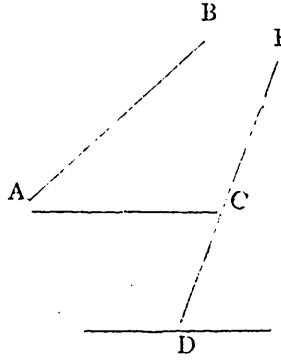
1. A body floats in a liquid, so that less than one-half of it is immersed. By the application of a downward pressure of m ounces, it is sunk to such a depth, that the portion of it now remaining out of the liquid is exactly equal to what was previously immersed. Show that, if the excess of the sp. gr. of the liquid above twice that of the body be 1-1000th, the sp. gr. of water being unity, the volume of the body is m cubic feet. (See note below.)

2. "*A body falling from rest under the influence of gravity at the earth's surface, has acquired, after 5 seconds, a velocity of 160 feet in a second.*" Does this mean, that the body, continuing to fall for an additional second, will, in that second, pass over 160 feet? If not, what does it mean?

b. What is the meaning of the formula, $g = 32$, g being the force of gravity at the earth's surface?

c. A body, falling down an inclined plane passes over 8 feet in the first second from rest. If f be the uniformly accelerating force (acting in the direction of the plane) to which the motion of the body is due, and g be the force of gravity, in what proportion is f less than g?

3. Let ABCD be a parallelogram such that each of the four sides is equal to the diagonal AC. Bisect AC in E. A particle at A being acted on by three forces represented in magnitude by AD, $(1 \div 2\sqrt{\frac{1}{3}})$AE, and $\frac{1}{2}(1 + \sqrt{\frac{1}{3}})$AB, respectively, and in direction by AD, EA (not AE), and AB, respectively, prove that the resultant is in the direction of diagonal of a square described on AC.



4. A uniform heavy rod, AC (which may be considered as a line), is in equilibrium, on a horizontal position, with one end C resting on a smooth inclined plane ED, and the other end A connected by a string AB with a fixed point B. Prove that the tension of the string, and the reaction of the plane on the rod, are equal to one another.

5. Let two particles, whose weights are m and n, respectively, begin at the same instant to move, the former from A, in the direction AB, under the influence of a

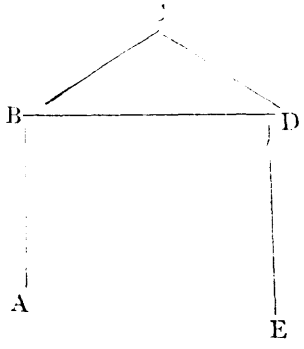
uniformly accelerating force which imparts to it a velocity

$$\frac{nf}{m+n}$$

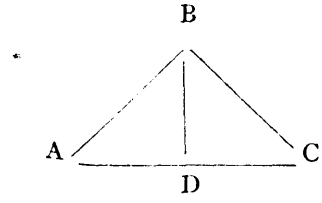
feet in the second, the latter from B, in the direction BA, under the influence of a uniformly accelerating force, which imparts to it a velocity of

$$\frac{mf}{m+n}$$

feet in the second. Inquire whether, as the particles move towards one another, their centre of gravity alters its position.



6. Let BCD be a triangular board, forming two opposite inclined planes, BD being horizontal. Suppose a perfectly flexible uniform heavy cord ABCDE, weighing 14 lbs.. to pass over it, the portions BA and ED hanging vertically. Let the lengths of AB, BC, CD, and DE, be 6 ft., 8ft., 6ft., 8ft., respectively, The cord being supposed capable of moving freely in virtue of its own weight, inquire what weight (if any) must be attached to either extremity (A or E as the case may be) in order that equilibrium may subsist.



7. ABC is a double inclined plane, whose perpendicular height BD is 9 ft. ; AB and BC being each 16 ft. A weight W of 40 lbs., resting on BC, is connected with a weight P, of 32 lbs., resting on BA, by a string passing freely over a fixed pulley at B, the portions of the string being parallel to CB and BA respectively. Prove that W, descending from rest along BC, and drawing P up AB, will pass over a space of one foot in the first second.

NOTE.—The weight of a cubic foot of water may be assumed to be 1000 ounces, and the atmospheric paessure to be 15 lbs. on the square inch.

Arithmetic.

1. A person asked for a lot of land 40 per cent. more than it cost him, but finally reduced his price 15 per cent., gaining on the whole $1000: for how much did he sell the land?

2. A Washington despatch to the *Globe*, September 14, says : "Explanation is made to the Treasury Department that the Coinage Act of 1873, by which the value of the pound sterling was altered from $4.84 to $4.8665, will increase the protective duties upon the imports from Great Britain to the United States by a little more than one-half of one per cent." Explain this statement and find exactly the increase per cent. referred to.

3. The difference between the true and the bank discount of a note of $5,300, payable in 9 months, is $18. Find the rate per cent.

4. A speculator gained 25 per cent. on three-fourths of his investment, and lost 10 per cent. on the remainder, and his net profits were $1000 : what would have been the result had he lost 10 per cent. on three-fourths of his investment, and gained 25 per cent. on the remainder?

5. A banker in Toronto remits $10,000 to Liverpool as follows : first to Paris at 5 francs 40 centimes per $1 ; thence to Hamburg, at 185 francs per 100 marcs ; thence to Amsterdam, at 17½ stivers per marc ; thence to Liverpool, at 220 stivers per pound sterling : how much sterling money will he have in Bank at Liverpool, and what will be his gain over direct exchange at 10 per cent. premium?

6. A merchant buys on January 1st a quantity of coffee at 25c. a pound, and another quantity at 20c., and Chicory at 8c a pound. On April 1st he mixes them together in the proportion of two parts of the better Coffee to three parts of the poorer and five parts of Chicory, and immediately sells half the mixture at 18c. a pound. On

1st July he finds half the remaining stock damaged in consequence of a leak in his warehouse, and sells out the damaged part (12,700 lbs.) at 7c., and at the end of the year he sells the remainder, money being worth 7 per cent. during the year, and rent of warehouse being $200, payable at the end of the year: what must he get per pound for the portion last sold in order to make 5 per cent. on the whole cost at the end of the year?

7. Three men form a partnership: A's money was in 8 months, and he received $500 of the profits; B's was in 9 months, and he received $360 of the profits; and C's was in 10 months, and he received $800 of the profits: find the Capital each put in.

8. A mortgage dated 1st January, 1872, payable in three equal annual payments of $200 each, with interest, payable half-yearly at 6 per cent., is sold on the 1st July, 1872: what sum must the purchaser pay so that the investment may be worth 8 per cent.?

9. Two circles of given radii touch externally, and a common tangent is drawn intersecting the line joining their centres in P. If the tangent touch the circles in Q, R, respectively, find the area of the rectangle contained by PQ, PR.

19. Find:

(1) The area of a quadrant whose radius is 4 rods.

(2) The solidity of a cone whose altitude is 6 feet and circumference of base 7 feet.

(3) The surface of a sphere 5 feet 1 diameter.

(4) The length of the side of a cubical vessel that shall contain three times as much as one whose side is 2 feet.

English Grammar and Etymology.

"The aggregated soil
Death with his mace petrific cold and dry,
As *with* a trident smote, and fixed as *firm*
As Delos floating *once*; the rest his look
Bound with Gorgonian rigour not to move;
And with asphaltic slime, *broad* as the gate,
Deep to the roots of Hell the gathered beach
They fastened, and the *mole* immense *wrought on*
Over the foaming deep high *arched*, a *bridge*
Of length prodigious, *joining* to the wall
Immoveable of this now senseless world
Forfeit to death; from hence a passage broad,
Smooth, easy, inoffensive, *down* to Hell."

MILTON: *Par. Lost, Book X, ll.* 293-305.

1. Divide the extract into propositions, state their relations to one another, and analyze them.

2. Parse the fourteen italicized words.

3. Parse the italicized words in the following sentences—

"*Farthest* from him is best."

"He told me his sad story on the way *thither*."

"She saved ten dollars a year out of her wages as a *servant*."

4. Correct or justify the forms of expression employed in the following sentences:

"Nobody but the good go to Congress.

"I did groan
To think that a most unambitious slave,
Like thou, shouldst dance and revel on the grave
Of Liberty."

"The hue and cry was raised."

"Having discussed the future of the good, consider we now the destiny of the wicked."

"Failing this arrangement, will you be so good as to come to my assistance."

5. Define the rhetorical figures of which the following quotations are illustrative:—

"Can gray hairs make folly venerable?" —*Junius.*

"To Adam Paradise was a home; to the good among his descendants home is a paradise."—*Hare.*

"Pity, the violet on the tyrant's grave." —*Tennyson.*

6. Explain with the aid of examples the meaning of the terms Grammatical Equivalent and Conjunctive Adverb.

7. Specify and exemplify the various constructions in which the sign of the possessive case is omitted.

8. Write half-a-dozen lines on any subject you choose using only words of Anglo-Saxon origin.

9. Classify the words in the passage from Milton according to their origin.

10. Give the derivation and trace the history of the meaning of *lesson, mean, peer, impostor, insolent.*

History.

1. Explain fully what is meant by saying that the Queen is a constitutional sovereign.

2. Write historical notes on "The Star Chamber;" "The Act of Conformity;" "The Act of Uniformity:" "The Test Act."

3. Compare the foreign policy of Cromwell with that of Charles II.

4. Connect the following dates with important political events in British History: 1265, 1587, 1649, 1660, 1829.

5. Describe the condition of public affairs between England and Scotland in 1547 and 1647 respectively.

6. On what occasions have the public policy of Spain, and that of England been in conflict, and with what results?

7. (*a*) Describe the system of government established in Canada on its cession in 1763, and state its results.

(*b*) Mention in Chronological order, with dates, the successive steps by which Canada has reached self-government.

8. Mention briefly in order, the principal events in Roman history, from the formation of the first Triumvirate to the battle of Actium.

9. Compare the French Revolution of 1789 with those of more recent date.

10. State the causes which during the last quarter of a century, have brought France into collision with Russia, Austria, and Prussia respectively.

Book-Keeping.

1. Journalize the following items:—

TORONTO, January 1st, 1873.

Jan.

1. I have on hand: Cash $1,019.50; Goods, $4,868.45.
1. Received from John Black & Co., Goods as per invoice, $470.75.
1. Received for Cash Sales this day, $52.87.
1. Paid James White, on account, $80.
2. Received from Mr. Gordon's Legacy, deducting duty, $75.50.
2. Received for Cash Sales this day, $54.85.
3. Received from James White, Edition of Euclid's Elements, per invoice, $300.65.
3. Received for Cash Sales this day $45.48.
4. Sold A. MacArthur: 1 Euclid, $1.50; 1 Walker's Dictionary, $1.10; 6 Spelling Books at 15c., $0.90; 50 Reading Books at 40c., $20. Paid James White, on account, $160. Received for this day's sales, $20.45.
5. Remitted John Black & Co., on account $400. Received from James White: Spelling Books, per invoice, $11.20. Received for Sales this day, $61.50.
6. Received from John Black & Co., Goods, per invoice, $213.60.
6. Sold A. McArthur: 24 Scripture Geography at 10c., $2.40. 100 Readers at 60c., $60; 20 Dictionaries at 50c., $10. Paid James White, on account, $71.85. Paid half-year's Rent of Warehouse, $200.
6. Bought a House, and received for my bargain $80. Amount of this day's Sales (Cash) $31.64.
8. Received from A. McArthur, on account, $80. Sold A. Macarthur: 10 Arithmetics at 60c., $6; 12 Geographies at 40c., $4.80. Remitted John Black & Co., on account, $240. Received for this day's Cash Sales, $48.87.
9. Lost a Bank Note, value $40. Took Stock, and found in my possession:

Cash	$ 227.81	
Goods	5,594.59	
Debts due to me	27.70	
		$5,850.01
Debts due by me	44.35	

2. Open the necessary accounts, for the above transactions, in the Ledger, and close the accounts.

Literature.

1. Sketch the lives of Sir Thomas More and Lord Bacon.

2. Discuss the influence of the Puritans on the literature of the seventeenth century.

3. Name and characterize the chief works of Pope and Cowper.

Composition.

1. A Bank-note.
2. Man is a bundle of habits.
3. "Our sincerest laughter with some pain is fraught
   Our sweetest songs are those that tell of saddened thought.

Botany and Agriculture.

1. Explain the meaning of the terms Gymnospermous, Monoecious, Perfect Flower, Follicle, Stipule, Fascicled.

2. Draw a tap-root, a halberd shaped leaf, a sinuate leaf, a spike, and a compound umbel.

3. What is the botanical distinction between a thorn and a prickle?

4. What chemical change does the albu-

men of the seed undergo in germination? Give an account of the various ways in which plants store up a stock of nourishment for future use.

5. Give the characters of the Cress and Rose families.

6. Botanically describe, and name any native plant you know.

7. To what families do the Thistle, Onion, Mullein and Catnip, respectively belong? Botanically name and describe any one of them.

8. To what family do the following characters apply?

"Herbs with small flowers in compound umbels, the 5 petals and 5 stamens on the top of the ovary, with which the calyx is so incorporated that it is not apparent, though sometimes represented by 5 minute teeth. Styles 2. Fruit Dry, 2-seeded, splitting when ripe into two akenes. Stem hollow, leaves generally compound, decompound or much cut."

9. Discuss the value of gypsum, salt and soot as manures.

10. Give an account of the means you would employ, and the method you would follow in order to secure a good crop of winter wheat.

11. What means should a farmer adopt in order to guard against the impoverishment of the soil? Explain how soils may become poor under cultivation.

12. For what crops is a very stiff clay most suitable?

Euclid.

Let AB, BC, CA, the sides of a triangle ABC, be 4 ft., 5ft., and 6 ft., respectively and let BD be the perpendicular let fall from B on AC. Enunciate a proposition of Euclid, from which the length of AD can be deduced, and find AD.

2. What is meant by the distance of a line from a point.

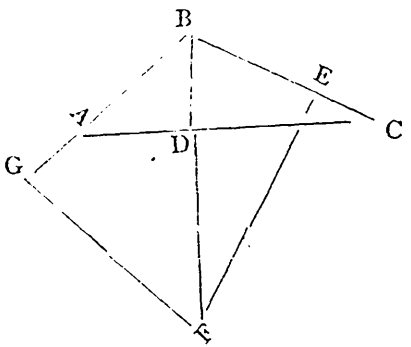
Straight lines in a circle which are equally distant from the centre are equal to one another.

3. To describe an isosceles triangle, having each of the angles at the base double of the third angle. (The candidate may assume the construction to be made; A being the centre of the larger circle, BD the line placed in that circle, and ACD the triangle in the smaller circle. The proof may then be proceeded with, so far as to show that the lines DB and DC are equal to one another; it need not be carried further.)

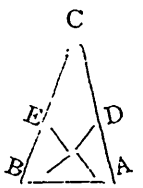
4. If two triangles have one angle of the one equal to one angle of the other, and the sides about two other angles proportionals; then, if each of the remaining angles be less than a right angle, the triangles shall be equiangular to one another.

5. If two triangles, which have two sides of the one proportional to two sides of the other, be joined at an angle so as to have their homologous sides parallel to one another, the remaining sides will be in a straight line.

6. If BD be the diagonal of a parallelogram, ABCD; and the straight lines, DE, DF, be let fall perpendicular on BC and BA, respectively; prove that the sum of the rectangles CB BE and AB BF is equal to the square of DB.



7. From B, the vertex of a triangle ABC, let fall BD perpendicular to AC. Cut off BE=BA; and let EF, at right angles to BC, meet BD produced in F. Let fall FG perpendicular to BA produced. Prove that BG=BC.



8. If EA and BD, straight lines drawn from the extremities of the base of a triangle to points in the opposite sides be equal to one another, prove that the perpendicular let fall from C on the line drawn through A prrallel to BD, is equal to the perpendicular let fall from C on the line drawn through B parallel to EA.

Geography.

1. Describe some of the principal effects of igneous agency in modifying the earth's crust.

2. "The order of succession, or superposition, is the great key to the solution of all geological problems." Explain.

3. Enumerate the principal volcanic products, and state their economic uses.

4. Describe the great *Telegraphic Plateau* of the Atlantic.

5. Upon what do the currents of the ocean chiefly depend? Describe the great equatorial current of the Atlantic.

6. Describe the physical features of S. America.

7. Explain the terms *Eccentricity of Orbit, Perigee, Parallax, Mean Solar Day.*

8. Given on March 21st, the sun's meridian altitude 30°, the sun being south of the observer; the local time being 3h. 15m p.m. when it is 10 a. m. by first meridian time; find the latitude and longitude of the place. Explain the process.

9. How is the sun's distance from the earth ascertained?

10. Into what groups are the West Indies divided, and to what Powers do they respectively belong?

11. Trace the course of the La Plata, Rhine, and Nile, naming chief cities on each.

12. Blenheim, Chincha Islands, Acapulco, Bonn. Where and for what remarkable?

13. Name the Counties of Ontario on L. Huron, their Co. Towns and Rivers.

Zoology and Physiology.

1. Give the characters of the classes of vertebrate animals. What organs in fishes are homologous with the wings of birds?

2. Explain the terms Plantigrade, Marsupial, Pupa, Cilia, Polygastric.

3. Give a general view of the respiratory systems of the Animal Kingdom.

4. Sketch the history of a butterfly from the egg.

5. Give the class, order, and where you can the genus of the following animals:—The Catfish, Loon, Beaver, Woodchuck, Quail, Garter Snake, Dragon-fly, Potato-bug, Snail, Ant, Trichina Spiralis, Sheep-tick.

6. Distinguish by zoological characters, a whale from a fish.

7. What distinctions separate the Arachnida from the Insecta.

7. Fully explain how animal heat is generated, and by what means its uniformity is maintained.

9. Describe the human brain.

10. State the position and explain the functions of the Eustachian Tube, the Lacteals, the Epiglottis, the Cochlea.

11. Describe fully the process of nutrition in a human being.

EDUCATIONAL INTELLIGENCE.

CANADA.

The pupils of Public School No. 10, Pittsburgh, presented their teacher Mr. John Robbs, with a beautiful writing desk, as a Christmas present, accompanied by a neat address expressive of the high regard and esteem in which he is held by them. Mr. Robbs made a suitable reply. He has frequently received similar presents from the pupils of the various schools in which he has taught; he being a very successful and popular teacher.

COUNTY OF LANARK TEACHERS' INSTITUTE.—A Teachers' Institute under the management of Dr. Sangster, was held in Town of Perth, County of Lanark, on the 21st and 22nd days of January. About 150 teachers were present, 135 of whom were from the county, the remainder from Carleton and Renfrew. The Inspector for the County of Carleton, Rev. John May, was also present. The greatest interest prevailed throughout. Dr. Sangster's able efforts in this direction are sure to meet with the success they so richly deserve.

THE NEW SCHOOL ACT.—We condense from the *Globe* a summary of the provisions of the Act just introduced into the

Ontario Legislature by Hon. O. Mowat, for the amendment of the Public and High School Acts :—

"The first twenty three sections have reference to the Council of Public Instruction ; the next seven make provisions connected with High Schools and Collegiate Institutes ; the following thirty-six relate to Public Schools ; and the concluding nine contain regulations and laws connected with two or three miscellaneous matters.

The condition of the Council of Public Instruction has for a long time past been generally and justly regarded as anything but satisfactory. The present Bill proposes so far to remedy this, by making the appointment of members of the Council only for two years, with, of course, the understanding that those who retire may be re-nominated or re chosen, as the case may be. The Council, as re-constituted, is to draw its members from three distinct sources. In the first place, as at present, the Lieutenant-Governor is to have the power of nominating eight, four of whom, when the preliminary arrangements are completed, shall retire every year. In the second place, all academic bodies possessed of university powers within the Province are to have the power of electing one member to sit at the Council Board,and that for the same period of two years. In the third place, the Inspectors of Public Schools are constituted a constituency for the election of one member ; the legally qualified masters and teachers of High Schools and Collegiate Institutes, another ; and the legally qualified teachers of Public and Separate Schools, a third. Ample provisions are made for the election of these members, and everything arranged as far as possible to have a fair and full expression of the mind of the electors. In the actual working of this scheme a large amount of fatiguing labor will be involved. While we say this, however, we believe that the proposed mode of infusing new blood into the Council is in the right direction. It is also to be noted that while the Inspectors of Public Schools are to be represented in the Council, as well as the High and Public School masters, the Inspectors of the High Schools are to have no place in it.

When we come to the regulations and provisions for High Schools we find that the first change proposed is to require the County Councils to raise, not as at present, half as much as may be apportioned from the legislative grant, but an equal sum, so that as the minimum grant at present is $400, each High School will henceforth have at least $800 for teachers' salaries.

The twenty-fifth section permits High School Trustees to establish, under certain conditions, a preparatory school or class for fitting pupils to pass the entrance examination. By the 28th section, the Chief Superintendent is authorized to pay a certain bonus in money to every Public School teacher for each pupil who shall pass the entrance examination for the High Schools, and so much more for each who shall so pass with honors.

Some modifications in the mode of conducting the examinations for entrance into the High Schools, and in the remuneration of Examiners, are made, but none which call for special notice.

The provisions relating to Public Schools are generally on matters of detail, such as the "alterations of rural school sections," "appeals to County Councils on school matters," "Union School Sections," "question of a Township Board to be annually submitted to ratepayers," "proceedings when Township Boards are resolved on," "remuneration to valuators," "Rural School Trustee Loans," "titles to school property," "enlargement of rural school sites," &c. One provision may be noted: When a school section is very large, or the school-room so situated that a good number of the children could not conveniently attend, then the Trustees may build a second school-house and employ a second teacher without dividing the section. All children not attending school are to be reported, and if, after the parents have been notified, they still continue absent, then a Rate Bill, not above a dollar a month, is to be imposed upon parents and guardians for each child so absent or not receiving any education. A good many sections refer to the superannuation fund, and the mode in which teachers can have the superannuated allowance. It is also provided that the teacher may prosecute his claim for salary within three months after it is due, if he wished to take advantage of the 84th section of cap. 64 of the Consolidated Statutes of Upper Canada.

In remote and new townships the Inspectors are permitted,under certain regulations, to grant certificates to teachers, or to

endorse the third-class certificates of any County or City Board of Examiners.

In the issuing of certificates to Public School teachers the following change is proposed:—The Council of Public Instruction is to have authority to issue second as well as first-class certificates for the Province, and second as well as third class certificates are to be awarded by city and county Boards of Examiners. Only one examination for certificates is henceforth to take place in the year. Students of any Normal School in the British Dominions are to have certificates issued to them on certain terms, and the standing of the student at the Institution where he was educated is to be marked on such certificate. Section 68, in reference to the government of new Normal Schools, and the examination of their students, is somewhat ambiguous.

The Depository for books and maps is not to be abolished, but an authorized catalogue is to be made out, and trustees can purchase from booksellers, or wherever they may think best, any of the books in that catalogue, and be entitled, on presenting the due vouchers, to have repaid one-half of the cost which such books could have been had for at the Depository. It is a very reasonable provision, added to this liberalizing of the book depository arrangements, to make it imperative that no teacher, Inspector, Trustee, or any other school official, shall in any way be an agent for the sale of books. We can see no reason whatever why the same regulation should not apply to maps and chemical and philosophical apparatus. If such necessaries can be had more cheaply from private parties than from the Depository, why not?"

UNITED STATES.

Photography is to be taught in the Girls' High School in Boston.

Ten Iowa counties have elected women school superintendents for the present year.

The New Jersey Senate has passed a bill making women eligible to the office of school trustee.

An Educational Convention in North Carolina has declared in favor of compulsory education—which seems to be badly needed in that state.

Union College has received notice of a new endowment of $100,000 from a gentleman whose name is for the present withheld.

Twenty-five Brazilian students are now on the register of Cornell University. The anniversary of their country's independence, Sept. 7th, was celebrated at Ithaca, on the 6th inst., with a parade and supper.

Miss Hannah Schofield, of Morris County, New Jersey, is said to be the first young lady elected to the office of school trustee in that state under the law passed last winter allowing women to hold that position.

At the recent meeting of the Michigan Teachers' Association, Superintendent Curtis said that in 1872, 74 per cent. of Michigan teachers were women, receiving 35 per cent of all the wages: while 26 per cent. were men receiving 65 per cent. of the wages. Over a third of rural teachers and no small portion of city teachers are mere boys and girls under 22, without experience or training, who ought to be studying at school.

BRITISH AND FOREIGN.

Heidelberg University last year matriculated 803 students, of whom 32 were from America.

In Scotland, one young man in every thousand of the population goes to college; in Germany, one to every 2,600; in England, one to every 5,800.

A Japanese paper says that three hundred and eighty-two Japanese students are studying in Europe, America and China. Of these, five are women.

Austria has 59 well-trained normal schools with 581 teachers and 3,500 pupils; Prussia, 62, with 3,614 pupils, Saxony, 18 finely-trained, normal schools, Belgium 30, Wurtemburg, 10, and Bavaria 40.

Lord Derby, in distributing the prizes to the students of Liverpool College, made this sensible observation: "It is not mental labor which hurts anybody, unless the excess be very great, but rather fretting and fidgetting over the prospect of labor to be gone through. A man must accustom himself to take things coolly, and avoid hurry and nervous excitement by keeping well beforehand what he has to do." Lord Derby thinks morning work better than night work, and that a man who cannot get through his day's labor without artificial stimulants had 'better consider whether that kind of labor is fit for him at all."

CHOICE MISCELLANY.

"A SOWER WENT FORTH TO SOW."

A sower went forth to sow,
His eyes were wild with woe:
He crushed the f' .wers beneath his feet,
Nor felt the perfume, warm and sweet,
That prayed for pity everywhere.
He came to a field that was harried
By iron, and to heaven laid bare.
He shook the seed that he carried
O'er that brown and bladeless place,
He shook it, as God shakes hail
Over a doomed land,
When lightnings interlace
The sky and the earth, and his wand
Of love is a thunder flail,
Thus did that sower sow:
His seed was human blood
And tears of women and men,
And I, who near him stood,
Said: When the crop comes, then
There will be sobbing and sighing,
And souls to hell-fire flying,
And a woe that is worse than woe.

It was an autumn day
When next I went that way.
And what, think you, did I see?
What was it that I heard?
The song of a sweet-voiced bird?
Nay—but the song of many,
Through-thrilled with praising prayer!
Of all those voices not any
Was sad of memory.
And a sea of sunlight flowed,
And a golden harvest glowed!
On my face I fell down there;
I hid my weeping eyes,
I said: O, Lord, Thou art wise!
And I thank Thee, again and again,
For the sower whose name is Pain.

—*Scribner's.*

How to Secure Attention.—Let it be distinctly understood that you will repeat no question unless it be a long and intricate one, after you have asked it once clearly and distinctly. If a pupil says, "I don't know what the question is" give him a failure and pass on. Ask the question but once, even though it go around the whole class. Persevere in this, and it will teach pupils to notice carefully all the questions that are asked. Do not go through the class in regular order, but call upon pupils irregularly, skipping from one to the other, sometimes calling upon the same person two or three times before you get around the class. Let each one feel that he may be called upon at any time. This will keep them attentive. If you see a pupil whispering, or inattentive, or looking around the room, fire a question at him. Ask him if the answer just given by some one else was correct, or ask him to give it. He will avoid inattention, if he knows that it will surely bring a question to him. Ask the question before you indicate who is to answer it. This cannot always be done, but it can in most cases. If you call on a pupil first, and then ask the question, the others are at ease until that question is answered. Bnt if you ask the question, and then wait a moment before calling on any one, each pupil will be thinking of the answer, not knowing but that he may be called on to answer it. If you pursue this course, the one called on must be expected to answer without any hesitation.—*National Teacher.*

Respect the Body.—Respect the body, dear men and women! Speak of it reverently, as it deserves. Don't take it into an unworthy place; give it sunshine, pure air and exercise. Be conscientious as to what you put down its throat. Remember what is fun to the cook and confectioner may be death to it. Give it good, wholesome food; let it be on good terms with friction and soap and water; and especially don't render it ridiculous by your way of dressing

it. Recognize the dignity of your body; hold it erect when you are awake, and let it out straight when you're asleep. Don't let it go through the world with little mincing steps or great gawky strides; don't swing its arms too much and don't let them grow limp from inactivity. Resolve to respect its shoulders, its back, and its fair proportions generally and straightway shall "stoops," and "wiggles," and "grecian bends," be unknown forever. Respect the body—give it what it requires and no more. Don't pierce its ears, strain its eyes, or pinch its feet; don't roast it by a hot fire all day, and smother it under a heavy bed covering all night; don't put it in a cold draught on slight occasions, and don't nurse or pet it to death; don't dose it with doctor stuffs: and above all don't turn it into a wine cask or chimney. Let it be "warranted not to smoke" from the time your manhood takes possession. Respect the body; don't over-rest or over-love it, and never debase it, but be able to lay it down when you are done with it, as well-worn but not misused thing. Meantime, treat it at least as well as you would your pet horse or hound, and my word for it, though it will not jump to China at a bound, you'll find it a most excellent thing to have, especially in the country.—

EDUCATION AMONG EUROPEAN NATIONS.—An Italian journal contains some interesting reports as to the educational condition of different European nations.

In Saxony, education is compulsory: all inhabitants of the kingdom can read and write, and every child attends school.

In Switzerland, all can read and write, and have a good primary education. Education is obligatory, and greater efforts, in proportion to its means, are made to impart primary instruction than in any other European nation.

In all the smaller states of North Germany, education is compulsory, and all the children attend school.

In Denmark the same is true. All the Danes, with few exceptions, can read, write and keep accounts. The children all attend school until the age of fourteen.

In Prussia, almost all the children attend school regularly, except in some of the eastern districts. An officer, who had charge of the military education of the Landwehr, in twelve years had only met with three young soldiers who could neither read nor write. An inquiry having been instituted, it was found that those three were the children of sailors, who had been born on the river, and had never settled in any place. Instruction is obligatory.

In Sweden the proportion of inhabitants who can neither read nor write, is only one in a thousand. Instruction is obligatory.

In Baden every child receives instruction; and in Wurtemburg there is not a peasant, or a girl of the lowest class, or a servant in an inn, that cannot read, write, and keep accounts correctly; every child goes to school, instruction being obligatory.

In Holland, public assistance is taken away from every indigent family that neglects to send its child to school. It is estimated that the number of illiterate is three per cent.

In Norway, almost all the Norwegians can read and write, and account passably well. Instruction is obligatory. In Bavaria, among the hundred conscripts, but seven whose education was incomplete, or entirely wanting, were found. Instruction is obligatory. France, with its twenty-three illiterate conscripts in a hundred, occupies the twelfth class. It is followed by Belgium, Italy, Austria, Greece, Spain, Portugal, Meldo-Wallachia, Russia and Turkey, in the order named.

THE NECROLOGY OF 1873.—From a long article in a recent number of the TRIBUNE, we obtain the following names of persons who have died within the year who were distinguished in the several walks of life.

Literature has lost the distinguished Lord Lytton, novelist and dramatist: Frederick Raumer, an eminent German historian, and Count Marizoni, the Italian poet and novelist.

Science has been deprived of the illustrious Agassiz; Prof. Donati, of Florence, the discoverer of the comet which bears his name; Baron Liebig, the greatest practical chemist of the age; Prof. Maury, a well-known writer on geographical subjects; Adam Sedgwick the English geologist; and those less widely known, Professor John Torrey of Columbia College, a botanist of considerable distinction; Professor John F. Stoddard, author of the mathematical series bearing his name, and Professor James H. Coffin, who wrote extensively of eclipses and winds.

1. RULES FOR STUDY.—Take a deep interest in what you study.

2. Give your entire attention to the subject.

3. Read carefully *once*, but think often.

4. Master each step as you go.

6. Think vigorously, clearly, and connectedly.

6. Let study, recreation and rest be duly *mixed*.

7. Study systematically, both as to time and method.

8. Apply what you learn.

The student will do well to keep these rules before him until their observation becomes a life habit. Right habits of study are vastly more important than the knowledge acquired. How to learn is the important lesson to be mastered by the young.

Teachers may safely place these rules over their desks, and train their pupils into the habit of observing them; school life will then mean more than the mere knowledge of a few branches—it will fit for real life.—*American Journal of Education.*

THE STUDY OF NATURE.—A school in the country, especially a farming district, ought to aim to give the pupil a good knowledge of the natural objects which come under the eye of every one of common observation. To do this it is necessary to have a teacher who is competent to interest, a teacher who knows and is capable of imparting instruction and of creating an interest and spirit of inquiry in the minds of his pupils. We hope the time is coming when the children of our schools will know the names and the properties of the plants, the trees, the minerals, and the animals that come within the range of their daily observation. Every farmer's boy ought to have the advantage of this kind of instruction. It adds vastly to the happiness of life and does much to impart the power of intelligent observation in which most people are wonderfully deficient.—*Massachusetts Ploughman.*

MUSIC IN SCHOOLS.—What an auxiliary music is to the teacher, brightening up dull faces, inspiring cheerfulness that becomes impetus to labor, softening and soothing nervous irritation, often so difficult to contend against, which had been excited by the crowded school impatient under the restraint of monotony of position and occupation! Think, too of each child frequently going home at night, like the honey laden bee, with a gay little song to charm the work-wearied father's heart; a lullaby which, sung over the baby's cradle, shall soothe the mother's spirit while it closes baby's eyes; holy hymns that shall make the very roof-tree a better shelter for the hearts beneath it. Thus the influence of the public school goes out blessing and blest; and gathers sheaves of joy to hold close to humble hearts, thankful that we may be permitted to aid in making the world happier and better, as well as wiser; that we, too, in the silent. unseen influences, are serving our country and our God, and at the same time learning the useful lesson of how to labor and to wait.

TEACHERS' DESK.

J. C. GLASHAN, ESQ., EDITOR.

Ere entering on a second year of the DESK WE shall review our work already done, fill up one or two omissions, and consider the position we shall take in future.

It will be noticed that the Problems and Queries have been confined chiefly to Arithmetic and Grammar. For this there were several reasons:—Correspondents seemed to take most interest in these subjects; they are the test subjects at examinations for teachers' certificates; in history questions to be of any real value require for answering them a wider course of reading or a larger library than can be asked of second or third class teachers; Natural Philosophy (except as applied arithmetic) is new to many of our readers; the Physical Sciences demand object-study, and teachers are as yet too much accustomed to depend on books for us to propose questions requiring them to make original examination and experiment. Again, for answers on the last three subjects to be worth aught, more space would be required than can be often spared to the DESK. Let us take History for

example. Three classes of questions might here be profitably proposed :—1st, In local history; 2nd, Relating to newly discovered facts; 3rd, Deducing from the facts of our text-books the development in civilization of a people, the policy of its rulers, the means they used to carry out the same, and their effects. A fine example of an answer to the first class of questions is Mr. Scudamore's description of the battle of Moravian Town, in vol. I. page 265. Examples of the second class are Quests. 13 and 26. Answers to such as these should give a full account of the discovery, the value of the documentary evidence, and, if relating to a disputed point, a sketch of the controversey. The answer to 26 gives the hint where to look for more; that to 13 was worthless, except as a warning to teachers that text-books sometimes make with Macaulay confident assertions of which the truth is very doubtful. Our recent school-histories are becoming more and more mere repertories of facts(some not of the facts of the old works, relating solely to bloodshed and battles) requiring the teacher to clothe this skeleton, but to do so he must know the times whereof he speaks. In the hand of one possessed of this knowledge the new books are infinitely better than their predecessors, but where the knowledge is wanting they are not worse, only because such is impossible. The third class of questions would give models of looking beyond the facts, and in doing so of putting flesh on the dry bones. Examples are Quests 12 and 27. Will not contributors consider again, ere wholly neglecting this third class? Answers might well find a place among CONTRIBUTIONS.

"Young Teachers' Queries" still remain to be noticed. We have received many questions, but the answers were very few. Do our teachers lack interest in their professsion, or are they afraid of composition, lacking the confidence of training? It looks suspiciously like the latter. We fear the subject has been very generally neglected in our schools. In the Grammar Schools of England pupils formerly were carefully trained in Latin composition, but left to pick up an English style as best they could. Have our Public Schools adopted this system OMITTING THE LATIN?

Although most willing, we may not review the purposes for which many of the problems were proposed. Even at the time of answering we had to forego this. All we may do is again to ask our readers to think out for themselves the fundamental distinction between symbolic arithmetic and algebra, (Ans. to 42); to call the attention of the younger among them to the fact that as a composer may purposely introduce a discord in his music, so a speaker may intentionally and with an object in view violate a so called grammatical rule, (Ans. to 35); that a word may be correctly parsed in more ways than one, in one and the same sentence, (Ans. to 49); and finally to the meaning of *Prove* as applied to Grammar, Ans. to 51.

To the many contributors to the Desk we return our sincere thanks, and we hope they will continue to give their assistance.

One department of the Desk we purposed opening, but which has hitherto been omitted, shall in futnre receive attention, the progress, discoveries, and publications, in mathematics. We thought at first to give in the present No. a list of the principal papers and articles published in England during the past year, but after selecting and reselecting we found the list of such astonishing length that we were most unwillingly compelled to omit it. The year 1873 has been exceedingly rich in both pure and applied mathematics, as witness the unusually large number of papers (thirty-four) printed in the proceedings of the London Mathematical Society. Of *Books* the year opened with Maxwell's great physico-mathematical treatise on Electricity and Magnetism, was continued by Salmon (and Cayley's) Higher Plane Curves (nominally a second edition but in reality a new work) and Booth's New Geometrical Methods vol. I, and was crowned by the two volumes of Todhunter's great history of attractions and figure of the earth from Newton to La Place. Kelland and Tait's Quaternions and new editions of Williamson's Differential Calculus, Lloyd's Wave Theory of Light and Tait's Quaternions, all improved and much enlarged. Of elementary works there were published a host; in fact counted along with those in physical science, they would *outnumber the novels.* One, the "Algebra" in Collins' School Series, is by a Canadian, T. Loudon, Dean of University College Toronto. Of the mathematical publications of the United States, it can only be said that the majority are as usual beneath contempt. The editor has not had the good fortune to meet with a single example of the minority. Strange that a country that could give to England the "Tables of Uranus," published in the Nautical Almanac for 1877 should be content to use mathematical text-books hardly up to those of two centuries ago.

In *Etymology*, G. H. Kitchen has given us a translation of Brachet's Etymological French Dictionary, a small, but valuable work; a new edition of Stratmann's Old English Dictionary has been issued, and one of Bosworth's Anglo-Saxon Dictionary is promised. The great Icelandic-English Dictionary of Cleasby and Vifgusson, has been completed. Is it not strange that while we have such works as this, and Williams' Sanscrit-English,

Liddell's and Scott's Greek-English, and White and Riddle's Latin-English Lexicons, we have not a respectable Dictionary of the English language itself? What would be thought of even a school-dictionary of Greek, which would not enable a boy to read Homer? Yet let any one try to read Spencer, Shakespeare, or Milton, depending wholly on Worcester and he will find himself without help just where he needs it most. Latham's Johnson's Dictionary is in many places better without the *Latham*. Wedgwood's Etymological English Dictionary, if completed would do very well for one who could distinguish the wheat from the chaff, the fanciful from the real. The best is perhaps Webster's English Dictionary revised by Goodrich, Porter, and Mahn, and how bad is the best will be found by any student who tries to trace by it any old English word from its primary to its present meaning. But why complain of the want of an English Dictionary? He who would have an English Grammar above the level of a third rate school-book must learn German and procure Maetzner, Fiedler and Sachs, or Koch.

EDITOR'S DRAWER.

THE NEW SCHOOL BILL.—We have received a copy of Mr. Mowat's School Bill, but must defer remarks 'till next issue.

OUR CIRCULATION.—Our subscription list has rapidly increased during the past month. All who feel willing to canvass for subscribers would oblige by sending for a circular giving our terms to agents.

EXAMINATION QUESTIONS.—We have now given all the examination Questions except the Second Class Algebra paper. We have had considerable difficulty in getting the necessary type. Having found it impossibe to get it in Canada, we sent to New York, but even then a very imperfect font was forwarded. We have sent to New York the second time, and hope it will come in time for next issue.

VAGARIES OF CORRESPONDENTS.—The vagaries of some of our correspondents would be exceedingly amusing, if they were not so very annoying. In a large number of instances, teachers discontinuing or changing their post offices, neglect to mention the post office where they have been receiving the *Teacher*, and we have to search our whole list to find them. Several have even neglected to give their names! A genius whose Inspector had ordered the TEACHER for him, and who had been receiving it for six months, sends us the following wail:

GENTLEMEN.—In regord to your monthly journal I dont wont you to send it no more because you wont get no pay from me for it, I dint sent you this before becouse I would thinking thot you would not continue to sond it, after recieving no answer, I dont think thot you will sent it no more after this.

I remaine your

PRIZE ESSAY.

The Essays received by us on the "Requirements of our Rural Schools" were referred to a Committee consisting of Dr. McCaul, of Toronto University, and Dr. J. H. Sangster, of Yorkville. The names of the writers were not, and could not by any possibility, be known to them. They read over carefully and critically the essays sent to them, and gave their award in favor of the essay having the motto, "Ora et Labora." This essay was written by Mr. Frith Jeffers, second master, Picton High School, and will be published in our March number. Mr. Jeffers may well be congratulated on the success he has achieved in the face of keen competition. Drs. McCaul and Sangster are entitled to our cordial thanks for undertaking and accomplishing the difficult and laborious task of deciding upon the merit of the essays, and their names are a sufficient guarantee to all parties that the award has been made with perfect fairness and impartiality. They also speak in terms of praise of the essay having the motto "Amicus," written by Mr. George B. Elliott, of Ottawa.

TEXT BOOKS.

We have received a communication from Dr. Sangster in reference to a remark by Mr. Dickenson in the January number of the *Teacher*, page 16, that "Dr. Sangster stated at one of his Institutes recently that the fittest place for them, (our Text Books on Grammar,) was at the bottom of the sea." We were about to have it put in type for insertion when we found unfortunately that it had been mislaid. We can only now, therefore, give the gist of the Doctor's remarks, as nearly as we can, reserving publication till a future issue.

Dr. Sangster denies having made the remark attributed to him. He expressed no opinion on particular Text Books, but spoke at his Institutes in general terms on the evil of placing too much reliance on any text books, and pointed out the benefit that would, in many instances, result from doing away with them altogether. From this it appears that his remarks were incorrectly reported, and bear a totally different construction from that put upon them.