

Technical and Bibliographic Notes / Notes techniques et bibliographiques

Canadiana.org has attempted to obtain the best copy available for scanning. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of scanning are checked below.

Canadiana.org a numérisé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de numérisation sont indiqués ci-dessous.

- | | | | |
|-------------------------------------|---|-------------------------------------|---|
| <input type="checkbox"/> | Coloured covers /
Couverture de couleur | <input type="checkbox"/> | Coloured pages / Pages de couleur |
| <input type="checkbox"/> | Covers damaged /
Couverture endommagée | <input type="checkbox"/> | Pages damaged / Pages endommagées |
| <input type="checkbox"/> | Covers restored and/or laminated /
Couverture restaurée et/ou pelliculée | <input type="checkbox"/> | Pages restored and/or laminated /
Pages restaurées et/ou pelliculées |
| <input type="checkbox"/> | Cover title missing /
Le titre de couverture manque | <input checked="" type="checkbox"/> | Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées |
| <input type="checkbox"/> | Coloured maps /
Cartes géographiques en couleur | <input type="checkbox"/> | Pages detached / Pages détachées |
| <input type="checkbox"/> | Coloured ink (i.e. other than blue or black) /
Encre de couleur (i.e. autre que bleue ou noire) | <input checked="" type="checkbox"/> | Showthrough / Transparence |
| <input type="checkbox"/> | Coloured plates and/or illustrations /
Planches et/ou illustrations en couleur | <input checked="" type="checkbox"/> | Quality of print varies /
Qualité inégale de l'impression |
| <input checked="" type="checkbox"/> | Bound with other material /
Relié avec d'autres documents | <input type="checkbox"/> | Includes supplementary materials /
Comprend du matériel supplémentaire |
| <input type="checkbox"/> | Only edition available /
Seule édition disponible | <input type="checkbox"/> | Blank leaves added during restorations may
appear within the text. Whenever possible, these
have been omitted from scanning / Il se peut que
certaines pages blanches ajoutées lors d'une
restauration apparaissent dans le texte, mais,
lorsque cela était possible, ces pages n'ont pas
été numérisées. |
| <input checked="" type="checkbox"/> | Tight binding may cause shadows or distortion
along interior margin / La reliure serrée peut
causer de l'ombre ou de la distorsion le long de la
marge intérieure. | | |
| <input checked="" type="checkbox"/> | Additional comments /
Commentaires supplémentaires: | | Continuous pagination. |

The Educational Journal.

Consolidating "THE EDUCATIONAL WEEKLY" and "THE CANADA SCHOOL JOURNAL."

VOL. I.

TORONTO, JANUARY 2ND, 1888.

No. 16.

The Educational Journal.

Published Semi-monthly.

A JOURNAL DEVOTED TO LITERATURE, SCIENCE, ART, AND THE
ADVANCEMENT OF THE TEACHING PROFESSION IN CANADA.*

J. E. WELLS, M.A. Editor.
H. HOUGH, M.A. Manager Educational Dept.

Terms:—One dollar and fifty cents per annum. Clubs of three, \$4.25; clubs of five, \$6.75. Larger clubs, in associations, sent through association officials, \$1.25 each.

New subscriptions may begin at any time. Payment, when by mail, should be made by post-office order or registered letter. Money sent in unregistered letters will be at the risk of the senders.

The date at the right of the name on the address-label shows to what date the subscription is paid. The change of this date to a later one is a receipt for remittance.

Renewals of all subscriptions should be made promptly.

Subscribers addressing the office on any business will, in all cases, please give the names of the post-offices to which their papers are being sent at the time of writing.

Rates of advertising will be sent on application.

Business communications should be addressed to the publishers; those relating to matter for insertion in the paper, to the editor. These distinct matters should always be treated on separate sheets of paper.

PUBLISHED BY

THE GRIP PRINTING AND PUBLISHING CO.

TORONTO, CANADA.

JAMES V. WRIGHT General Manager.

Table of Contents.

	PAGE.
EDITORIAL NOTES.....	245
EDUCATIONAL THOUGHT.....	246
SPECIAL PAPERS—	
High School Physics.....	247
FOR FRIDAY AFTERNOON.....	247
MATHEMATICS.....	248
HINTS AND HELPS—	
Carpeting.....	249
How to Illustrate Long Division.....	249
What to Do During Recess.....	249
Hints on Teaching Geography.....	249
How Far Shall I Help the Pupil?.....	249
Lie and Lay.....	249
SCHOOL ROOM METHODS—	
Observation Lessons.....	250
One Way of Recitation.....	250
Language.....	250
Lessons to Develop the First Ideas of Number.....	250
EXAMINATION PAPERS—	
Geography.....	251
Physics.....	251
Euclid.....	251
Composition.....	251
EDITORIAL—	
An Interesting Case.....	252
The Protestant Committee of Quebec and Academies.....	252
Education and Morality.....	253
Knowledge and Education.....	253
OUR EXCHANGES.....	253
MISCELLANEOUS—	
Miss R.—'s School Discipline.....	254
What Darwin Thought of his School.....	254
BOOK REVIEWS, NOTICES, ETC.....	255
CORRESPONDENCE—	
Uniform Promotion Examinations.....	255
EDUCATIONAL NOTES AND NEWS.....	255

BUSINESS NOTES.

WE forwarded the orders for premiums, clubbing, etc., under our offers for '88, on Tuesday of last week. Will those who by any chance fail to receive their books after a reasonable term of waiting notify us of the fact by post card. We shall send any further such orders about Jan. 15th and 31st, after which the arrangement will come to an end.

ONCE in a while a subscriber sends back a paper without inspecting the date on the label. This is evidence of a forgetfulness of the able and kindly discourse which we recently delivered on this subject. One terrible example of such forgetfulness, or something worse, occurred lately, in which a subscriber, after regularly receiving the paper from the P.O. for over a year, returned it with the remark that it "had never been ordered." We tried to comfort ourselves with the reflection that there was not another teacher in the country who would do a thing like that. Better to examine the date and calculate the arrearage. Or, better still, to avoid the risk of such a misdeed, don't send back at all. Send the year's subscription instead. For we believe every teacher, recognizing the character of the paper, and the improvements which have been made in it, will consider it a necessity with which none can afford to dispense.

Editorial Notes.

IN view of the fact, announced some time since by the Education Department, that the Normal Schools in Toronto and Ottawa had already their full complement of students engaged for the session beginning on the 17th January, and that therefore new applicants must wait till August, the Kingston papers urge, not without force, that more normal school accommodation is needed, and that the site held in reserve by the Government in that city for the purpose, should be made use of without delay.

SOME clever journalist tries to satirize the prevalent demand that moral men be elected to fill municipal offices, by suggesting that "moral candidates be chosen as school trustees." We hope facts render the satire pointless, but if it has any point more's the pity. The Toronto *Mail* goes so far as to say, "Something more even than good character is required of a trustee. He should be a man of sense and of some education." The London *Advertiser* caps the climax with the alleged fact

that the Forest City has in the past had trustees, or a trustee—we forget which and wish to be accurate—who could neither read nor write. We trust that was in the long ago.

THE Belleville Board of Education are about to adopt an original method for the detection of truancy. The teachers are to be furnished with truant cards and punchers. The cards have numbers representing the days of the year. When the pupil is present the number for the day is punched out, otherwise it stands as a witness against him. The plan may not be without its merits, if it can be carried out without too great a draft upon the teacher's time. It is to be hoped, however, that the teachers will regard it only as a last resort to prevent truancy, relying first of all and as far as possible on making the school and its work so interesting that the average pupil will deem absence itself a heavy penalty.

WE should have noticed sooner the new and probably unique departure which has been taken by our contemporary, the *Supplement*. From a monthly educational magazine it has transformed itself into a monthly school textbook, or exercise book on some subject of the public school curriculum. These manuals are prepared specially for the purpose, and are issued from the office of the *Supplement Co.*, 50 Bromfield St., Boston. The samples we have seen are skilfully prepared and neatly got up, and seem likely to prove helpful to teachers in their work. The names announced as authors of forthcoming numbers give good reason to expect that the quality will be well kept up. The price of the monthly series of books is the same as that of the former magazine.

THE people of St. John, N.B., are taking steps for the establishment of a reformatory for juveniles. Such an institution must be greatly needed, especially if the alternative is, as we suppose it must be, to send young offenders just taking the first steps in crime to the common jails, to herd with confirmed criminals. We hope the movement may be successful, and the institution to be founded made really what its name implies, and not a mere penal establishment. We hope, moreover, that the necessity, at least equally strong, of having industrial schools will not be overlooked. Just as the well-conducted reformatory intercepts and saves many a youth on his way to the penitentiary or the gallows, so the well-conducted in-

dustrial school intercepts and saves many a child on its way to the reformatory.

"ZETA," in the *Montreal Star*, is justly severe upon the "boorishness of speech and manner of a leading male teacher" in one of the public schools of that city. He intimates that he has himself heard said teacher indulge in such personal and insulting remarks as, "You're a pack of young fools," "Ye've got no brains," and also in sickly attempts at feeble wit at the expense of some delicate lad. We have heard of similar cases in Ontario, though we hope, for the honor of the profession, that they are extremely rare. Such methods are as cowardly as they are boorish. It may be pretty safely assumed that the person would not use them were he dealing with a man of his own size, able to resent insult. As "Zeta" well observes, "We do not want our Canadian boys to be bullied or brow-beaten by the ignorant want of tact which would hardly qualify a man to drive a herd of cattle through the public streets."

MESSRS. J. E. BRYANT & CO. are doing good service to Canadian scholars and readers in bringing to their hands the splendid Henry Irving edition of Shakespeare, now being published by Blackie & Son. This will, no doubt, be *facile princeps* among annotated and illustrated editions of the prince of dramatists. From the plan of the work, the fact that one of its editors is Shakespeare's great interpreter on the stage, Henry Irving, and the other a distinguished Shakespearian student, as well as from a cursory inspection of the first volume, it is clear that the notes, explanatory, historical, biographical, and critical, will shed about all the light that scholarship has as yet been able to gather upon the obscurities of these immortal plays. In view of the increased attention that is being paid to the study of English classical authors—among whom Shakespeare will ever be foremost—in the schools and colleges, this work will be a boon to masters and professors, while to the private student of Shakespeare it will be invaluable.

A PRIVATE high school for boys has been established in Toronto, at the expense and under the management of some of the wealthier citizens connected with the English Church. The school is, we understand, to be modelled, to some extent at least, after the pattern of Harrow, Rugby, and other leading English schools. Mr. Benjamin Freer, B.A., an alumnus of Oriel College, Oxford, and an experienced and successful teacher in Ontario, has been appointed principal. The projectors of the new school announce that instruction in Christian truth as set forth in the system of the Church of England will form an essential part of the educational work. We are not sure that an exotic of this description will take kindly to the soil and atmosphere of this democratic country, but the experiment is based on the correct principle—that of voluntarism. While we do not believe that any portion of the public

funds should be diverted to the support of institutions intended for the benefit of a class only, we have great faith in private schools of the proper kind, and in the right and expediency of parents who are able uniting to establish such schools.

THE Blair Educational Bill, which provides for an appropriation of \$75,000,000 in aid of schools in the South, is to be again introduced in the American Congress. Public education is, of course, under the American constitution, a function of the State not the National Government. The Southern States seem to be making hopeful progress in overtaking the great task set before them by the results of the war, and many strongly object to any interference by the central Government in the matter. But, seeing that the well-being of the whole Union depends largely upon the rapid education of the children of the freedmen, and of the poor whites as well, that the task is a stupendous one, that the prevalent if not predominant feeling in the South is a serious obstacle to the education of the colored children, and that the Federal Treasury is groaning under a surplus which is the danger, almost the despair of statesmen, it does seem as if it might not be easy to make a better disposal of a large sum than in the manner indicated. The bill passed the Senate last session, and will probably do so again. The struggle will be, as before, in the House of Representatives.

By permission of the Toronto School Board, a square envelope has been put in the hands of every pupil in the city, bearing the following upon its face:—

DEAR BOYS AND GIRLS:—You all know about the Industrial School at Mimico—how we have no money for it except what kind people give: how we have had to commence building a new cottage, as the room we had was filled up at once; and how it will cost \$8,000, and we have only \$3,000 towards it. Will you give the \$5,000? The School Board has kindly consented to let me ask you for it. Don't you think that you who are happy and have kind homes might well do something for the poor, neglected boys who will grow up to be bad men unless they can be led into better ways? Will it not be a beautiful thing this Christmas to realise that it is more blessed to give than to receive? We will call it the Children's Cottage; and I will be so thankful, and think ever so much more of it than if it was for myself.

W. H. HOWLAND.

Inspector Hughes explains in an accompanying note that there are 17,500 children in the city schools, so that an average of nearly 30 cents from each child would be required to make up the amount needed. It is hoped that those having ample means will be glad to give liberally in order to make up for the deficiency on the part of many who will be unable to give the 30 cents. The plan is a good one, adapted to bless alike the givers and those for whose benefit the gift is to be appropriated. If rightly put before the children it will be to them a practical lesson in Christian charity, one of the very best kinds of religious instruction.

Educational Thought.

WE may have well-trained minds, though we know very little, if we know that little well.—*Leslie Stephen.*

YOU will do the greatest service to the state if you shall raise, not the roofs of the houses, but the souls of the citizens: for it is better that great souls should dwell in small houses rather than for mean slaves to lurk in great houses.—*Epictetus.*

WE scatter seeds with careless hand,
And dream we ne'er shall see them more;
But for a thousand years
Their fruit appears,
In weeds that mar the land,
Or healthful store. —*John Keble.*

THE true object of education is not to make the most of life in the vulgar and hunger-bitten sense of mere worldly advantage, but to go through life having the powers of observation enriched by the results of knowledge, to have a right estimate of what is good, a sincere love for our fellow-men and desire to benefit them, and above all to find peace with God.—*Canon Farrar.*

TIME, teaching and love; these three transmute all things when life is at work. There is no incapacity which can prevent observation. There is no stupidity. Once impress upon the minds of a generation that teaching and training are names of life and pleasure, names of new senses, new strength, new delights, which all can attain, and Plato's school-boy will appear again.—*Thring.*

HEREIN lies the importance of education. I say education rather than instruction, because it is far more important to cultivate the mind than to store the memory. Studies are a means, not an end. "To spend too much time in studies is sloth; to use them too much for ornament is affectation; to make judgment wholly by their rules is the humor of a scholar: they perfect nature and are perfected by experience. . . . Crafty men continue studies, simple men admire them, and wise men use them."—*Bacon.*

YOU will teach more cheerfully under disadvantage if you realize that most of your pupils will have no educational advantages beyond the public school, and that you are diffusing the "fertilizing waters of intellectual knowledge" through all the years of their life, through all the channels of their influence. If the teacher could realize in how many ways, by how many influences, he makes the world better, stronger, more prosperous, his work would seem quite different from what it now does. Project your own thought into the future for your own comfort.—*Journal of Education.*

IT is not the eye that sees the beauties of heaven, nor the ears that hear the sweetness of music, or the glad tidings of a prosperous accident; but the soul that perceives all the relishes of sensual and intellectual perceptions; and the more noble and excellent the soul is, the greater and more savory are its perceptions. And if a child behold the rich ermine, or the diamonds of a starry night, or the order of the world, or hears the discourses of an apostle; because he makes no reflex act on himself, and sees not what he sees, he can have but the pleasures of a fool or the deliciousness of a mule.—*Jeremy Taylor.*

ALL real teachers must take the highest and broadest possible view of the work they are to do. He who degrades pedagogics to a trade, to be practiced for the sole purpose of getting dollars, is not a teacher and can never be one. Teaching is not mechanical routine nor imitative art, but the judicious application of great principles with an intelligent and loving purpose to accomplish the highest attainable good. All true or correct teaching arouses the mental powers to conscious action. It wastes neither time nor energy in repetitions of useless forms, but appeals directly to consciousness in such manner as to arouse mental activity. This being done, the acquisition of knowledge becomes comparatively easy, and always a pleasure. There are, properly speaking, no grades in the art of teaching. That is, no primary-grade teachers, grammar-grade teachers, etc. Specialists are necessities of imperfections in teaching. They are the necessary outgrowth of misconceptions of the true work of teaching.—*Col. Parker.*

Special Papers.

HIGH SCHOOL PHYSICS.

BY JAMES ASHER.

I WISH to correct a few errors in the new "High School Physics." Future editions of this good book should not have these faults. Besides, I wish to give some information and suggestions on steam and electricity.

Steam Engines.—The work says the motion of the slide valve is always opposite that of the piston. A cut shows the piston at one end of the cylinder, and the valve lets steam enter the port, which is wide open. The slide valve of an engine moves in part of its stroke the same way as the piston and in the rest the opposite way. The main crank is set at nearly a right angle to the crank or eccentric that moves the valve. In some engines the valve has partly opened the steam port when the piston begins its stroke; in others, it does not begin to open the port till the piston has moved a short distance. In the former the valve has positive, in the latter negative lead.

"The steam engine with all its merits and with all the improvements which modern mechanical art has devised is to-day a most wasteful machine. The best engine that has been constructed utilizes only 20 per cent. of the heat power used." This is not in accord with the second law of thermodynamics, which says the fraction of total heat which can be changed into mechanical work in a heat engine depends on the difference in absolute temperature between the initial and exhaust working fluid. The book makes a mistake, like calling as head the height of water in a penstock above the bottom of the tail race. The height of water in the penstock above the surface of tail water is the head. Estimates of a water wheel's efficiency are based on this fact. The miller may get more power by making a higher and stronger dam.

The fraction of total heat energy that could be changed into work by an ideal engine without friction and radiation is expressed by the difference in absolute temperature between the initial and exhaust steam taken as numerator and the absolute temperature of the initial steam as denominator. The absolute zero, the point at which a body would have no heat, the point at which the molecules of the body would not move, is nearly 460° below zero Fahrenheit.

Suppose an engine takes steam at 150 pounds pressure to the square inch and exhausts at 5 above vacuum. The temperature of steam at 150 is 358°, or 818° above the absolute zero. At 5 pounds pressure it is 162°, or 622° above the absolute zero. A perfect engine with these limits would give $\frac{218}{818} = .266$, or 23.96 per cent. of the total energy as work. If the best engine utilizes 20 per cent. of the total energy it is very economical, for it gives $\frac{23.96}{20} = 1.198$ or more than 83 per cent. that of a perfect engine. The Risdon turbine, the first in first class water wheels at the Centennial test, gave 87.66 per cent. The best steam engine is as economical of its working fluid as a first-class turbine water wheel.

The economy of the boiler has not been noticed. A first-rate boiler gives an engine 75 per cent. of the energy in the fuel, 25 per cent. being lost in radiation and the hot gases passing up the chimney. If this loss be reduced a good draught cannot well be had.

The best way of adding to the economy of high class engines is to raise the difference in temperature between the initial and exhaust steam. As the temperature of exhaust cannot well be reduced we may raise the temperature and consequently the pressure of the steam entering the engine. Suppose we give steam at 400 pounds and exhaust at 5, the temperature of the former is 445° and of the latter 162°, or 905° and 622° above the absolute zero. An ideal engine would now give $\frac{283}{905} = .313$ or more than 31 per cent. With live steam at 150 and exhaust at 5, we saw a perfect engine would not give 24 per cent. Therefore we gain much by using very high pressure steam. If the steam engine remain, 500 pounds to the square inch will soon be used. High pressures are as safe as low low pressures when the boilers are proportionately strong. The locomotive has 120, which is double that in the stationary engine. When did a locomotive in Canada explode? Among 70,000 locomotives

in the world when did the latest explosion occur? Forty years ago the pressure rarely exceeded 14 pounds in marine engines; it is now 150 in the greyhounds of the Atlantic. Forty years ago the marine boiler used at least 10 pounds of coal to the hourly horse power; now one pound is used, and the ship's speed has been doubled.

The crank and piston, engineering barbarisms, will soon be abolished. The rotary engine will be used. Conceive a steam reaction turbine taking steam at the centre through its hollow shaft and exhausting at the circumference. The wheel will be enclosed by a neat case with only a pulley protruding. Very high pressure steam will enter and the engine will turn 2,000 times a minute. It will not cost half so much, weigh half so much, occupy half so much space, nor contain half so many parts as any other steam engine. Priming cannot ruin it; there will be neither cylinder, crank, piston, eccentric, balls, nor packing. There will be no dead points, hence it will start without help, and the angular velocity will be absolutely uniform at all points of the revolution. It will have no clearance space to waste steam, and there will be no friction but that of the bearings, hence only two places will need oil. In many cases no pulley will be used; a circular saw, a planer, or a dynamo may be fixed to the shaft.

The steam locomotive for lightning express trains may soon be an improvement on that invented two centuries ago by Sir J. Newton. His Explanation of the Newtonian Philosophy, says it will yet be necessary to travel 50 miles an hour, and shows a drawing of his proposed locomotive. It is a boiler and furnace on wheels, and a long steam pipe extends backward. The long pipe would lessen the speed of the steam and cause greater economy. The steam rushes backward and the locomotive forward on the principle of reaction. The long pipe may be replaced by a short one made into many elbows. Less metal will be required for each elbow lessens the speed of steam as much as would 40 diameters in length of pipe.

I shall explain the reaction. Suppose a vessel filled with high pressure steam, the vessel will not move while closed for the pressure on opposite walls inside balance each other. If a hole in the vessel be opened the pressure at the hole vanishes while that on an equal area of the opposite wall remains, hence there is an unbalanced backward push equal to what was on the covering of the hole. If the pressure was 150 pounds to the square inch, and the area of the hole one square inch, when open the steam would cause an effective backward pressure of 150 pounds. If the supply of steam equal the demand a steady backward pressure of 150 pounds will exist. The rocket, Hero's eolipite, Barker's mill, the recoil of a gun, many turbines, and the rotating lawn sprinkler depend on this elegant principle. It explains why steam boilers often fly many hundred yards after one end is blown out. Many wrongly think recoil depends on the issuing fluid's action on that in which the body moves. For example, they think the rise of a rocket is due to the push against the air of its hissing gases. It will rise faster in a vacuum than in air, for it will meet less resistance.

The express steam locomotive may yet be a boiler on car wheels, and the steam pipe will be many elbows on its back. The steam will exhaust backward through a strong, nearly horizontal smoke stack, increasing the draught of the furnace by steam. A branch of the stack will extend forward for backing. The whole force moving the train will be exerted against the pipe inside the smoke stack, the wheels have nothing to do with it. This engine may run 70 miles an hour. It will run smoothly on the rails, reciprocating motions will be absent, hence the damage to locomotive and track will be small, and high speeds far safer than at present. The driving force here does not depend on the adhesion of the wheels to the rails. The engine and cars will run as well on a greasy track. A similar boiler on runners will be a steam ice yacht.

Ships may be driven by recoil action of steam. B. Franklin, a century ago, made such an experiment. He made steam from a boiler on a boat pass backward through a pipe into the water. It failed for he used low pressure steam. Steam ships will have boilers but no engine; the steam after passing through many elbows will be blown into

the sea through two pipes, one on either side of the stern post near its base. Two pipes will also extend forward, one on either side of the bow, for backing. The ship can be turned to the right or left by setting a valve to make less steam pass through one pipe than the other. There will be no engine to get out of order, neither screw nor rudder to lose in the storms of mid-ocean.

*(To be completed in next number).**For Friday Afternoon.*

A COLLOQUY ON THE CANADIAN SHORE.

(FROM PUNCH.)

Canada—

"Westward the course of empire takes its way."

Britannia—

The Bishop's famous line, dear, bears to-day Modified meaning; westward runs indeed The route of empire—ours!

Canada—

If I succeed

In drawing hither Trade's unfaltering feet, And yours, my triumph then will be complete.

Britannia—

Across your continent from sea to sea All is our own, my child, and all is free. No jealous rivals spy around our path With watchfulness not far remote from wrath. The sea-ways are my own, free from of old To keels adventurous and bosoms bold. Now, from my western cliffs that front the deep To where the warm Pacific waters sweep Around Cathay and old Zibangu's shore, My course is clear. What can I wish for more? To your young enterprise the praise is due.

Canada—

The praise, and profit, I would share with you. Canadian energy has felt the spur Of British capital; the flush and stir Of British patriot blood is in our heart; Still I am glad you think I've done my part.

Britannia—

Bravely! Yon Arctic wastes no more need slay My gallant sons. Had Franklin seen this day He had not slept his last long lonely sleep Where the chill ice-pack lades the frozen deep. "It can be done; England should do it!" Yes, That is the thought which urges to success Our struggling sore-tried heroes. Waghorn knew Such inspiration. Many a palsied crew Painfully creeping through the Arctic night Have felt it fill their souls like fire and light. Well, it is done, by men of English strain, Though in such shape as they who strove in vain With Boreal cold and darkness never dreamed When o'er the Pole the pale aurora gleamed Perpetual challenge.

Canada—

Here's your Empire route!

A right of way whose value to compute Will tax the prophets.

Britannia—

Links me closer still

With all my wandering sons who tame and till The world's wild wastes, and throng each paradise In tropic seas or under southern skies, See, Halifax, Vancouver, Sydney, set Fresh steps upon a path whose promise yet Even ourselves have hardly measured. Lo! Far China brought within a moon or so, Of tea-devouring London! Here it lies, The way for men and mails and merchandise. Striking athwart your sea-dividing sweep Of land; one iron road from deep to deep! Well thought, well done!

Canada—

No more need you depend

On furtive enemy or doubtful friend, Your home is on the deep, and when you come, To the Dominion's land you're still at home.

Britannia—

And woe to him the Statesman cold or blind, Of clutching spirit or of chilling mind, Pedantic prig or purse-string tightening fool, Who'd check such work and such a spirit cool! Yours is the praise and may the profit flow In fullest stream, 'midst your Canadian snow A true Pactolus. Trade's prolific fruit, Should freely flourish on our Empire Route.

Mathematics.

All communications intended for this column should be sent before the 20th of each month to C. Clarkson, B.A., Seaforth, Ont.

CORRESPONDENCE.

THE editor presents his New Year's compliments to the legion of correspondents who have generously snowed him up during the past month under an avalanche of queries and answers. What charm resides in these dry and prosy old problems? Their interest and vitality seem to remain in spite of all counter attractions. Probably the sense of power gives a delight similar to that produced by healthy, vigorous exercise in the gymnasium. As mind-sharpeners and thought-correctors, mathematical studies do not seem likely to lose in the twentieth century their present imperial position in every great system of education. For training the working faculty, for securing independence, accuracy, and rapidity of thought, and for producing an abiding confidence in the unseen and immaterial, mathematics is undoubtedly the finest educational instrument yet invented. But mathematicians should beware of one-sided development, no matter how vigorous it may be. The mathematical all-in-all is apt to be a very ignorant and extremely dogmatic creature. Biography, history, poetry, eloquence, biology, chemistry, philology, ethnology, logic, psychology,—all these have easier subject matter than mathematics, and present unlimited fields of recreation and delight into which every prudent mathematician will make long excursions.

On the other hand, our studies have some beauties that are often overlooked by outsiders. If the rhetorician defines eloquence as the art of compelling the hearer to accept the conclusions of the speaker, what orator is more eloquent than rare old Euclid? If imagination is one of the loftiest characteristics of poetry, why should not trigonometry be classed as poetic composition, seeing that the interpretation of such expressions as $(\cos \theta + \sqrt{-1} \sin \theta)^n$ requires greater effort of imagination than would suffice to interpret any ten lines in Milton or Shakespeare? Kingdoms may rise and fall, but the domain of pure mathematics will abide undestroyed and indestructible after the whole world has turned to coal; and therefore when new worlds spring into existence we hope our army of contributors may be ready to snow up the editor of some other mathematical column, with another avalanche of problems.

In the meantime we are glad to welcome a bright young book into our midst with the aroma of the present century about it. We recommend all our friends to become acquainted with the newly authorized text-book, "McKay's Elements." Modern methods have been judiciously introduced, proper gradation has been looked after, difficulties have been reserved to the appropriate stages, old prejudices have been buried out of sight, rote work has been effectually discouraged,—this is the high praise deserved by the new text book.

J.N.F., Colborne, argues that No. 25, solved in the second column of page 217 December number, does not admit of solution, because the words, "b hours behind time," should mean that the train or person ought to have passed the given point b hours before it actually did; and as we do not know what part of the journey has already been completed in losing the b hours, we can tell nothing about the remainder of the trip. If he will substitute numbers for a, b and c, we think he will probably reverse his judgment.

J.N.F., and Miss J.C.G., Ingersoll, both believe that the bankrupt mentioned by B.B. Formosa, on page 217, "was evidently a swindler." The law of libel is rather strict, and we warn all our correspondents to have a care. Mr. Thomas F. Flaherty, of Lucan, effectively defends the unfortunate man as follows:—

He loses $\frac{1}{3}$ of \$20,000 = \$4,000 on part of his nominal assets.

Next he actually collects ($\frac{1}{3}$ his liabilities - \$4000) Then he loses $\frac{1}{5}$ of what he has collected, i.e. 4%; \therefore on the whole he realizes only $\frac{2}{3} \times \frac{4}{5}$ ($\frac{1}{3}$ liabilities - \$4000, and this amounts to 60% of all his liabilities; \therefore ($\frac{1}{3}$ liabilities - \$4000) $\frac{2}{3} \times \frac{4}{5}$ = $\frac{2}{5}$ liabilities; or $\frac{2}{5}$ liabilities - 6400 = liabilities; \therefore $\frac{2}{5}$ liabilities = 6400; and liabilities = \$22,857.

The same thing may be shown algebraically: Let 4k = assets, then 5k = liabilities, $\therefore \frac{4}{5}$ (\$4,000) = 3k \therefore 7k = 32000, and 5k = 22857, 4k = 18285, k =

Problem b, p. 217, Dec 1st. J.N.F. rightly says that this problem can be solved only approximately without using the calculus for determining the loss for "edgings." A good practical solution is given by Miss J.C.G., by squaring the log first and then sawing it into inch lumber: Thus side of square = $\sqrt{(\frac{1}{2} \text{ of } 27^2)}$ = 19.09 inches, \therefore make 14 cuts with the saw, taking out $5\frac{1}{4}$ inches, which leaves 13.84 inches for the 15 boards, and each board .922 inch thick. Then the amount of lumber = $15 \times 14 \times 19.09$

$\div 12 = 334\frac{1}{2}$ nearly. Mr. Flaherty makes it 378. If the log were 28 $\frac{1}{2}$ inches in diameter we might make 20 cuts taking out 7 $\frac{1}{2}$ inches in sawdust and giving 21 boards that would still require edging. The exact solution can scarcely be given without employing the higher analysis, which would interest only a small minority of our readers. If the log is supposed to taper the problem becomes more difficult.

Mr. S. Anderson, Walton, gives the following solution of No. 5, II., page 239, in H. Smith's Arithmetic:

First cask has 12 wine + 18 water
Second cask has 9 wine + 3 water
Both casks have 21 wine + 21 water. Hence mix the two casks and draw off 14 gals. of the mixture, and we shall get 7 wine and 7 water as required. Solved also by numerous contributors, using fractions, ratios, &c. Perhaps it would accord better with the exact requirements of the problem to take one-third of each cask and mix them together: (4 wine + 6 water) + (3 wine + 1 water) = 7 wine + 7 water.

Mr. S.A. also gives the solution to No. 5, IV., p. 199, H. S. Arithmetic:

500 lbs. at \$7 = \$3,500; 4% com. off leaves \$3,360 to be divided. Let 100 represent the quality of B's flour, \therefore 100:110:116, i.e. 1: $\frac{11}{10}$: $\frac{116}{100}$ will represent the flour reduced to B's standard. Hence 156.137 $\frac{1}{2}$:261 represents the total amounts at B's standard.

Therefore give A, B, C, 275, 300, and 522; 1097th of the money respectively, i.e., \$842.30, \$918.87, and \$1598.83. Solved by a large number of correspondents.

The reference No. 143, p. 247, H. S. Arithmetic, may have been meant for No. 143, p. 274. Mr. Thos. Cottingham, Rye, Ont., does it thus:

$\frac{1}{4}$ and $\frac{1}{5}$ are respectively emptied per hour.
Hence in a certain No. of hrs. the first has lost $\frac{1}{4} \times$ No. And the second has lost $\frac{1}{5} \times$ No.
And there are left $1 - \frac{1}{4} \times$ No.; and $1 - \frac{1}{5} \times$ No.
Therefore $1 - \frac{1}{5} \times$ No. = $2(1 - \frac{1}{4} \times$ No.)
Or $10 - 2 \times$ No. = $20 - 5 \times$ No.
 $\therefore 3 \times$ No. = 10, No. of hrs. = $3\frac{1}{3}$.

Solved algebraically by numerous contributors. We may avoid fractions by supposing each cask to contain 20 gals., then the first loses 5 gals. per hour, and the second 4 gals. per hour

\therefore (20 gals. - 5 gals. \times No. hrs.) 2 = 20 gals. - 4 gals. \times No. hrs;
Or 40 gals. - 10 gals. \times No. hrs. = 20 gals. - 4 gals. \times No. hrs.

But 10 gals. \times No. hrs. = 10 gals. \times No. hrs.
 \therefore 40 gals. = 20 gals. + 6 gals. \times No. hrs.
Or 20 gals. = 6 gals. \times No. hrs.
 \therefore 20 gals. \div 6 gals. = No. hrs. = $3\frac{1}{3}$ hrs.

T. C. asks for a solution of this problem:—"A field contains 300 acres, and is $3\frac{1}{2}$ times as long as it is broad. Find the perimeter." That will depend on the angles contained by the sides. If it is rectangular,

Length by breadth = 300 ac.
Or $3\frac{1}{2}$ breadth \times breadth = 300×160 sq. rods.
 \therefore (Breadth)² = $300 \times 160 \times 2 \div 7$
 \therefore Breadth = $\sqrt{(100 \times 16 \times 60 \div 7)}$
= $10 \times 4 \times 2 \sqrt{(15 \div 7)} = 40 \sqrt{105}$
 \therefore length = $\frac{3}{2} \times 40 \sqrt{105} = 60 \sqrt{105}$
 \therefore perimeter = $2 \times 40 \sqrt{105} = 80 \sqrt{105}$ rods = $720 \times 10.247 \div 7$ nearly.
= $720 \times 1.46385 +$ etc.

We add the following solution which will probably interest a good many of our readers:

A and B put in \$3,400 into business; A's money was in 12 months, and B's 16 months. On settlement A received \$2,070 as his share, and B \$1,920. What capital did each invest?

Solution:—Let $S_1 G_1$ be A's stock and gain
Let $S_2 G_2$ be B's stock and gain
Then $S_1 + S_2 = 3,400$; $G_1 + G_2 = 590$
 $S_1 + G_1 = 2,070$; $S_2 + G_2 = 1,920$.

Also, the gains are proportional to the capital of each for one month.

$\therefore \frac{3 S_1}{4 S_2} = \frac{G_1}{G_2} \therefore \frac{3 S_1 + 4 S_2}{4 S_2} = \frac{G_1 + G_2}{G_2}$

Or, $\frac{3(S_1 + S_2) + S_2}{4 S_2} = \frac{G_1 + G_2}{G_2}$

$\therefore \frac{10200 + S_2}{4 S_2} = \frac{590}{G_2}$; but $S_2 = 1920 - G_2$

$\therefore \frac{10200 + 1920 - G_2}{4(1920 - G_2)} = \frac{590}{G_2} = \frac{12120 - G_2}{7680 - 4 G_2}$

$\therefore 590 \times 7680 - 2360 G_2 = 12120 G_2 - G_2^2$; or using x for G_2

$x^2 - 14480 x + 590 \times 7680 = 0$
i. e. $x^2 - x(14160 + 320) + 14160 \times 320 = 0$
Or $(x - 320)(x - 14160) = 0$
Or $x = 320$, or $14160 = G_2$
 $\therefore 270$, or $-13570 = G_1$
 $\therefore S_1 = 2070 - G_1 = 1800$, or 15640
 $S_2 = 1920 - G_2 = 1600$, or -12240 .

Thus the positive solution, \$1,800 and \$1,600, is the only one that applies to the problem in its ordinary interpretation.

The negative solution represents an imaginary partnership somewhat like this: A, with a capital of \$15,640 takes his son B, who is in debt to the extent of \$12,240 into business with him. The firm gains \$590 and pays off B's debts. The following figures will make this clear:

A's capital = \$15,640 cash | A's loss = \$13,57
B's " = 12,240 debt | B's gain = 14,16

Cash capital \$ 3,400 | Total gain = \$ 590

A's capital \$15,640 | B's debts \$12,240
A's loss 13,570 | B's gain 14,160

A withdraws \$ 2,070 | B withdraws \$ 1,920

So that the father pays the son's debts and gives him \$1,920 to start him in business again.

NOTE.—In writing to this column always send the question itself as well as the reference. If the problem is not likely to be of general interest, or if a prompt reply with full explanations is desired, write privately to the editor who gives instruction by correspondence to those who are unable to attend high schools or colleges.

HOME-MADE PICTURES.

WHAT the carpenter's tools are to him, or the house-keeper's utensils to her, the home-made charts, number cards, material for busy work and collections of curiosities become to the teacher who aims to work skilfully and systematically.

A system of charts become an absolute necessity in most schools, since blackboard room is limited and the record of the work on any subject must be erased to make room for another.

Light manilla paper is inexpensive, and cut into sheets of suitable size may be formed into very good charts.

I have one formed for Language. I cut up one of McLaughlin Bros.' publications, "Domestic Animals," and secured, at a cost of twenty-five cents, very good colored pictures of a cow, a calf, a horse, a sheep, a dog, and a family of cats.

These serve for topics for Animal Lessons as well as Language; from time to time I have added bright colored pictures that delight the children and serve as aids to Language or Reading Lessons.

The children are never weary of using them and do very satisfactory work with them.—*The School Teacher.*

MATERIAL AIDS IN SCHOOL GOVERNMENT.

FIRST among these is a good classification of the school. The scholar who is so classed and directed in his studies that he is encouraged to study the right thing at the right time, and by the right method, will, as a rule, cause but little disorder.

Second.—A clean and well-arranged room has a very wholesome influence upon the order of the school. Cleanliness and order beget a spirit of respectfulness, while a suitable arrangement of the desks and other furniture helps to regulate the posture and movements of the scholars.

Third.—A wholesome industry among the pupils. Find a teacher who maintains a spirit of earnest work in his school, and you find one who is regarded as a successful governor. "The best order," says Calkin, "does not consist in maintaining any fixed posture, nor in absolute quietness, but rather in that interested attention to the lessons which so occupies the minds of the pupils as to leave no inclination for disorder."

Fourth.—The comfort of the pupils as secured by a proper temperature and ventilation of the schoolroom. The experienced teacher soon learns that the exercise of proper precaution in looking after the temperature and ventilation of the room will always yield a rich reward in the order and good spirit of the school.—*John W. Woody, in The Student.*

OLD London is not the only place where starving children are swept in crowds into the public schools. Appalling disclosures recently resulted from an inquiry set on foot in Vienna. Upward of 4,000 children were suffering the pangs of hunger, some of them being on the verge of starvation and not a few of the unfortunate little ones had died. Active measures for relief were adopted by the charitably disposed.

Hints and Helps.

CARPETING.

A TEACHER writes us, not for publication, criticizing the method of computing the length of carpet required for a room, given by Mr. S. A. Walton in our last issue. The critic says that Mr. Walton's method would be laughed at by dealers, if one should tell them so many yards were required for a room, and explain the process by which he had made his computation. The point of the criticism is not made very clear, but we presume it is that as carpets have generally patterns which must be made to match, in each of the lengths when placed side by side, the cases will be very rare in which a greater or less waste of material is not necessary. Mr. Walton's method takes no account of this waste, and so becomes practically useless. "Teacher" suggests that the true method is to teach the child to measure the length and width of the room in order to see how many strips, and of what length, are required. The second strip will need to be longer than the length of the floor by the amount necessary to be cut from it in order to have the pattern properly matched with that of the first length. To the amount required as ascertained by Mr. Walton's method there must clearly be added a quantity equal to the sum of all the pieces it is found necessary to cut from the various lengths, for the purpose of matching the patterns. "Teacher" commends highly the explanation of carpeting, papering, plastering, etc., given in the new Public School Arithmetic, and says that this is the first text-book which has thus dealt with these practical subjects.

HOW TO ILLUSTRATE LONG DIVISION

Long division is a most difficult subject to the beginner, when taught abstractly. It should always be taught in the concrete with objects. Coins are best for this purpose. In the more elementary operations dimes and cents will suffice. Let the example be taken, "How many pounds of butter, at 18 cents a pound, can be bought for 35 cents?" Looking at it in the abstract, as pupils are usually taught to do, it would be supposed that 3 pounds was the quotient, as 1 the first figure of the divisor, is contained 3 times in the first figure of the dividend. 18)35(3. The beginner, however, is not only disappointed, but discouraged and disgusted, when he finds, after repeated trials, that it is not even contained twice. But why employ "guess work?" He should be taught that he can always know to a certainty. Now use the objects, go through the operation. Have two dimes, ten cents wrapped in paper, representing another dime, and five cents loose. The butter costs one dime and eight cents a pound. For how many pounds can you make change, out of three dimes and five cents. Take away one dime and break your dime package of cents. This is paying for one pound. What have you remaining? One dime, and two cents from the other dime, and five cents besides, making one dime and seven cents,—not enough for another pound. In this way take example after example, till the pupil can deal with dollars, dimes and cents, or three figures in division, and call your dollars, hundreds; your dimes, tens; and the cents, units. Long division will then become a pleasant exercise to the pupil, instead of a dread and horror.

TO ILLUSTRATE DIVISION OF FRACTIONS.

Take easy questions to begin, such as, "How often is $\frac{1}{4}$ contained in $\frac{1}{2}$?" Cut an apple into four equal parts. Take two parts, or half of the apple. How many fourths does it contain? Two. $\frac{1}{4}$ is contained in $\frac{1}{2}$, twice. Reverse. How often is $\frac{1}{2}$ contained in $\frac{1}{4}$? Take one-fourth of the apple, and compare half of the apple with it. It is evident that half of the apple is twice as much as one-fourth of it, and that it is, consequently, contained only half a time in one-fourth, or in figures $\frac{1}{2} \div \frac{1}{4} = \frac{1}{2}$. This can be done even to hundreds, and also in decimal fractions.

Decimals are fractions whose denominators are not written, as they are always tens. Thus divide .05 by .5, say five hundredths by five tenths. How many five-tenths in five hundreds, 5-100 divided by 5-10? Divide a line into 100 equal parts, take 5

of them. Now how many 5-10, or 50-100 in 5-100? As many as 50 are contained times in 5, or 5-50, or 1-10, written also .1.—*National Educator.*

WHAT TO DO DURING RECESS.

WHAT do you do at recess? Do you fret and worry over the dull pupils who are kept in to make up their lessons? May be you stand guard over those you have kept in for some school-room disorder. In either case you seem to have forgotten the objects of recess. You need rest just as much as your pupils need it. Go out into the pure air and refresh yourself. In the case of the writer, it happens that he can not play with the pupils, but he always feels better after having spent his recess in looking at them play. Some teachers read a book or newspaper at recess, and frequently they become so much interested in reading that which is foreign to the school-room, that the time runs over two or three minutes. This is wrong, and no thoughtful, conscientious teacher will be guilty of it. In our country schools, where "play-time" is from 12 m. till 2 p.m., one might read, if that which is read bears directly on his profession. If your school is crowded, you may be forced to remain indoors at recess to put on the blackboard some kind of work for the children; but even this is to be avoided, if possible, for nothing helps the teacher as much as a ten minutes' rest in the pure air.

And again, even your presence upon or near the play-ground acts as a first-class preventative of fights, bad language, etc. Nearly all of the many kinds of disorder begin at recess, and grow and grow until they seriously affect the successful running of the school. Many a teacher has to punish boys for a fight that never would have occurred if he had been on or about the play-ground at recess. Prevent, rather than punish, is a good rule for a teacher. I spend all my recess with my pupils, and find that they seem to forget my presence until they are on the point of getting into a quarrel. As a rule, if I walk near, they stop, and soon forget all about it, and presently are back at play again. Many teachers have much to say about "studying the dispositions" of each pupil, and yet they never watch the children at play, where they can learn more about them than anywhere else.

If a teacher reads this who is in the habit of spending recess in-doors, I hope he will try my plan for a month. I know he will feel better and teach with more life. Raise the windows, open the doors, and leave the school-room at recess.—*North Carolina Teacher.*

HINTS ON TEACHING GEOGRAPHY.

LET a pupil write or tell a list of articles found for sale in groceries. Have this neatly written on the board in full sight of the pupils, as early in the week as Wednesday. Have it understood that on Friday afternoon, with the maps before the school, and with the books of reference near by, time will be spent in talking about these various things. From what countries they come, how they are produced, for what they are used, etc. Let all who can, find pictures to illustrate any of these points. The teacher needs to have a little supply of general knowledge in order to direct the talk along certain lines. The tea, coffee, spices, dates, olives, flour, sugar, etc., will bring out many interesting ideas.

The above suggestion, from the *Wisconsin Journal of Education*, is capital. The lists might be extended to include other articles than those found in grocery stores. It need not be confined to foreign products. The dry goods store, the hardware store, the book store, etc., will each afford material for a lesson. It will add to the interest of such an exercise to have not only the reference book convenient, but also the physical map, or the sand map, and to comment on the latitude, elevation, soil, climate, etc., of the different countries which produce the same products; the character of the people who engage in similar manufacture. An advanced class may be led on to note the markets found for such products, the effects of competition, tariff laws, etc. On these latter questions, however, the teacher should be careful to divert the discussion from channels that are too metaphysical for his class. There will be left ample room for imparting much useful information, and for inciting the pupils to investigation.—*South-Western Journal of Education.*

HOW FAR SHALL I HELP THE PUPIL?

IT is always a very difficult question for the teacher to settle, "How far shall I help the pupil, and how far shall the pupil be required to help himself?" The teaching of nature would seem to indicate that the pupil should be taught mainly to depend on his own resources. This, too, I think, is the teaching of common sense. Whatever is learned should be so thoroughly learned that the next and higher step may be comparatively easy. And the teacher should always inquire, when he is about to dismiss one subject, whether the class understood it so well that they can go on to the next. He may, indeed, sometimes give a word of suggestion during the preparation of a lesson, and by a seasonable hint save the scholar the needless loss of much time.

But it is a very great evil if the pupils acquire the habit of running to the teacher as soon as a slight difficulty presents itself, to request him to remove it. Some teachers, when this happens, will send the scholar to his seat with a reproof, perhaps; while others, with a mistaken kindness, will answer the question or solve the problem themselves as the shortest way to get rid of it. Both these courses are generally wrong. The inquirer should never be frowned upon; this may discourage him. He should not be relieved from labor, as this will diminish his self-reliance without enlightening him; for whatever is done for a scholar without his having studied closely upon it himself, makes but a feeble impression upon him, and is soon forgotten.

The true way is, neither to discourage inquiry nor answer the question. Converse with the scholar a little as to the principles involved in the question; refer him to principles which he has before learned, and has now lost sight of; perhaps call his attention to some rule or explanation before given to the class; go just so far as to enlighten him a little, and *put him on the scent*, then leave him to achieve the victory himself. There is a great satisfaction in discovering a difficult thing for one's self, and the teacher does the scholar a lasting injury who takes this pleasure from him. The teacher should be simply suggestive, but should never take the glory of a victory from the scholar by doing his work for him, at least not until he has given it a thorough trial himself.—*D. P. Page.*

LIE AND LAY.

THE difficulty in the use of the verbs *lie* and *lay* is increased by the fact that the past tense of one is the same as the present tense of the other. The subject is worthy of several lessons and any amount of drill. First place on the board the principal parts of both verbs.

Present.	Past.	Past par.
lie.	lay.	lain.
lay.	laid.	laid.

Explain that the first means to recline and never has an object. I lie down to-day. I lay down yesterday. I have lain down. The second verb is transitive and usually takes an object. I lay it down now. I laid it down yesterday. I have laid it down. Next give a large number of sentences illustrating the correct use of both verbs. He *laid* the book on the chair. Has he *lain* down to rest? Will he *lie* still? Shall I *lay* it there? Who *lays* that hat on my desk every day? I *laid* it there. Will he *lie* in bed till noon? I have *lain* awake two hours. The hen *laid* an egg. Now I *lay* me down to sleep. *Lie* down, sir. Can he *lay* two rods of tile? He *lay* on my bed nearly all day. The undertaker *laid* him out.

These and many more should be used and explained. Then write the sentences on the board, leaving blank spaces for the words in italic. Let the pupil fill out the spaces with the proper words. Again let one pupil give a sentence and another decide on its correctness; the teacher acting as umpire. Induce the children to watch for these words in their reading, and bring the sentences properly quoted into the class.—*The Moderator.*

THE enrollment of pupils of all ages for the year 1886, in Manitoba, was 16,926, an increase of 1,936 over the year 1885.

School-Room Methods.

OBSERVATION LESSONS.

It is a pleasure to know that teachers are doing more and more to open the eyes of pupils to the common things about us. The rude but good "old times," when the school-room was regarded as the place where minds were to be crammed with the dry facts of arithmetic and grammar, somewhat as sacks are filled with potatoes, are passing away, and the writer has a hope that the schools will soon begin to send out observers and thinkers instead of parrots. In the hope of aiding this work in some slight degree, the following queries and suggestions are offered:

1. How does ice form on water contained in tubs and other vessels and on lakes and streams?

This query will lead pupils to observe the delicate and beautiful fringes of ice on the margin of the water, the crystal spicules reaching further and further towards the centre until the entire surface is covered. In cold weather a vessel of water may be set outside to be brought before the school for inspection from time to time, as the process of freezing goes on.

2. Is the frost-work on the window panes always of the same pattern?

When a boy, the writer learned to measure the intensity of the cold outside by the frost-figures on his bedroom windows. Peering out from beneath the sheets, he sometimes saw the panes spangled with stars; at other times the frost took the form of the most delicate ferns, or of mountains with tall peaks.

3. How many forms have the flakes of snow? After this question the pupils will notice the forms of the fleecy flakes that fall slowly and silently through the air, and compare them with the pellets that come in fiercer storms. They will soon learn that snowflakes, though assuming a great variety of forms, usually have the outline of a hexagon, or a star with six points.

4. What are some of the uses of snow? Taken home to be discussed at the fireside, pupils will learn that the snow is a blanket spread over the earth to protect countless tender roots from the frost. The farmer's boy will tell of the winter-killing of wheat, of clover, and of timothy for the want of this covering. The bed of strawberries and the vineyard need the snow-wool for protection.

5. Does hard freezing increase or diminish the bulk of water?

Pupils will be able to refer to the bursting of pails and tubs, to the bulging of ice in strong vessels, and some may have noticed large rocks that have been cleft by the freezing of water that had found its way into openings in ledges. This is one way in which nature begins her work of disintegration.

6. Which is heavier, a cubic foot of water or a cubic foot of ice?

7. If ice were heavier than water how would long continued cold affect ponds and lakes?

One or more of the above questions should be given to the pupils some days in advance of the term for listening to the results of their observations. Every one should be encouraged to observe and to think, and all conclusions, however erroneous, should be treated with respect.—*Cadmus, in School Education.*

ONE WAY OF RECITATION.

FIRST see that each member of the class has a number. If the class is large, send the odd numbers to the board just as soon as the class is seated. Let the even numbers prepare to write on paper or slates. Pronounce a few of the difficult words in the lesson for a spelling exercise, written, of course. Change places or papers and correct the work. This need take but three minutes.

Next, for a brief test, ask questions that may be answered by short statements. Change and correct. Next send even numbers to the board, give each a separate bit of work to put upon the board, and while they are at that, call on the odd numbers for topical recitation on review lessons or on the advanced work of the day. Keep every pupil busy.—*Wisconsin Journal of Education.*

LANGUAGE.

(FOR THIRD READER PUPILS.)

How to use "sit" and "set." Teacher places the following on the board where it may be convenient for reference:—

sit means rest	set means place
sits " rests	sets " placed
sat " rested	set " placcd
have sat " have rested	have set " have placed
has sat " has rested	has set " has placed
had sat " had rested	had set " had placed

The teacher then gives sentences using the forms of rest, and requiring the pupil to supply the forms of sit. The following may serve as examples:—

The bell *rests* on the table.
The boys *rest* on the bench.
John *rested* in his chair yesterday.
I *have rested* in my chair all day.
He *has rested* on the floor.
They *had rested* in their chairs all day.

It will be seen that *rest* is used in the sense of support. When we say that the bell rests on the table, we mean that it is supported by the table. When the pupil can readily supply the proper forms of sit for the form of rest, the following forms of place may be used, and the pupil may supply the proper form of set:—

I *place* the bell on the table.
John *places* the teacher's chair on the platform.
Yesterday I *placed* the chair by the desk.
I *have placed* the table in the center of the room.
Mary *had placed* the vase of flowers on the mantel.
John *has placed* the bell on the table.

When the pupils can readily supply the forms of set for those of *place*, blanks in sentences requiring forms either of *sit* or of *set* should be filled by the pupils. The following will serve to illustrate this:—

Mary — the table for dinner.
I — the chair on the platform, and the teacher — in it.
Who — in this seat last term?
I have — in it for two terms.
— the inkstand on the teacher's desk.
I had — it there before you told me to.

A great variety of exercises of this kind should be used. The pupils are learning to use the words by their meaning and not by their forms. They may be required to write original sentences using these forms. These sentences should show that the pupil knows how to use the form to tell something. Such as follows are worthless: I sit, I have set; you sit, they have set. These do not show that the pupil understands the word. I sit on the lounge, I have set the pitcher on the table, show that the pupil knows the meaning of the words *sit* and *set*.—*Indiana School Journal.*

LESSONS TO DEVELOP THE FIRST IDEAS OF NUMBER.

BEFORE commencing the first lessons in *Number*, the teacher should procure a variety of objects to be counted, as pencils, cents, buttons, beans, pebbles, nuts, marbles, books, apples; also a numeral frame.

FIRST STEP.—COUNTING.

First Group of Numbers, 1 to 9.—The teacher may place several objects of the same kind, as cents, buttons, pencils, or pebbles, on a table before a class, and arrange them in rows, thus:

```
*
* *
* * *
```

The teacher may then commence counting, saying *one*, and at the same time pointing at the first object. Then beginning with the second row, pointing at the two in order, saying *one, two*. Next pointing at the row of three, saying *one, two, three*.

Now the teacher may commence as before, and proceed to point at each object in the order of their groups, and let the children count with the teacher, thus: "*One*," "*one, two*;" "*one, two, three*."

When the children can count objects as far as three, let marks be made on the blackboard in similar groups, thus,

```
|
|
|
|
```

and the children requested to count them in the same manner as they counted the objects on the table.

When the children have learned to count *three* readily, the teacher may place under the other objects a row with *four*, and, commencing at the first, let the children count, as before, "*One*;" "*one, two*;" "*one, two, three*;" "*one, two, three, four*."

When the children can readily count *four* objects, and four marks on the blackboard, and four balls on the numeral frame, the teacher may add a group of five, so that the several groups or rows will appear thus:

```
*
* *
* * *
* * * *
* * * * *
```

The teacher should now commence counting at one again, as before, and let the children count each line, thus: "*One*;" "*one, two*;" "*one, two, three*;" "*one, two, three, four*;" "*one, two, three, four, five*."

When the children can readily count five objects on the table, five balls on the numeral frame, and five marks on the blackboard, the teacher may add a row with *six* objects, and then commence at one, and proceed as before.

The same plan may be pursued until the children are able to count groups of objects from one to nine readily and correctly. Let the teacher ask the children, How many cents* in the first row? "*One cent*."

How many pencils in the second row? "*Two pencils*."

How many buttons in the third row? "*Three buttons*."

How many cents in the fourth row?

How many buttons in the fifth row? "*Five buttons*."

Thus the children may be led to read the objects or marks in groups, as "*Three cents*;" "*four pencils*;" "*five buttons*," etc.

At this stage it would be profitable to call upon individual pupils to count a given number of balls on the numeral frame, or objects on the table, or marks on the blackboard. Let one stand and count five balls, then sit down; another stand and count eight marks; another, four pencils; another, nine balls; another, seven marks; another, three balls, etc.

The children may be requested to count and hold up *three fingers*; then *five fingers*; then *eight fingers*, etc.

Ask the children, How many eyes have you? How many ears? How many feet? How many toes on one foot? How many hands? How many fingers and thumbs? How many wheels has a cart? How many has a waggon? How many wheels has a car? Thus lead pupils to count a great variety of objects.—*Calkins.*

AN interest in study is the first thing which a teacher should endeavor to excite and keep alive. There are scarcely any circumstances in which a want of application in children does not proceed from a want of interest; and there are perhaps none in which *the want of interest does not originate in the mode of teaching adopted by the teacher. I would go so far as to lay it down as a rule, that whenever children are inattentive and apparently take no interest in a lesson, the teacher should always first look to himself for the reason.*—*Pestalozzi.*

* The teacher will, of course, ask the question so as to correspond with the objects used for counting.

Examination Papers.

MIDSUMMER EXAMINATIONS, 1887.

THIRD CLASS TEACHERS.
GEOGRAPHY.

Examiners: { J. J. Tilley.
Jas. F. White.

NOTE—75 per cent. will constitute a full paper but credit will be given for all questions answered

1. (a) Explain the terms Meridian, Zodiac, Ecliptic, Zenith, Circle of Illumination, Isothermal Lines.

(b) Account for winds, dew, clouds, rain, hoar-frost.

2. Write a short explanation of each of the following:—The equality of day and night at the equinoxes; The true shape of the earth; The length of the longest day at the Arctic Circle; The location of the tropics and polar circles, at such a distance from the equator and poles respectively.

3. Give the position and limits of the zones; show the influence of each in the development of animal and vegetable life. Name some animals and plants that are characteristic of each zone; name also those that are specially characteristic of our own country.

4. Give the following particulars concerning the Gulf stream:—(a) origin, (b) course, (c) temperature, (d) points in Europe which it touches, (e) effects (to be given fully).

5. Draw an outline map of Great Britain and Ireland and show the position of Portsmouth, Hull, Manchester, Holyhead, Berwick, Glasgow, Dundee, Loch Lomond, Galway, Queenstown, Valentia, Lough Neagh.

6. Give in order the chief ports on the North Sea, with the country in which each is situated, and describe the general character of the commerce of each country.

7. Where, and for what noted, are the following:—Warsaw, Metz, Florence, Sedan, Lucknow, Valparaiso, Cologne, Everest, Nantes, Dundee, Elsinore, Ajaccio, Andorra, San Marino, Katrine, Thanet?

PHYSICS.

Examiners: { W. H. Ballard, M.A.
J. A. McLellan, LL.D.

NOTE—Seventy-five per cent. will constitute a full paper, but candidates will receive credit for every question answered.

1. What is the meaning of Weight? What is the cause of Weight? How is Weight measured? Explain how the weight of a body may change while the mass remains the same. Distinguish between mass and volume.

2. If a piece of ice at a temperature 0°F. be taken and heat be applied until the temperature reaches 220°F., what changes in volume will take place?

3. Account for the formation of ice on the inside of window panes.

4. Describe an experiment by which gluten, starch, and vegetable albumen are successively produced from the seeds of the wheat plant.

5. What is cohesion? What would be the condition of things if there were no cohesion? If everything possessed cohesion to a great extent, what then?

By what means could you show that water has cohesion? That mercury has cohesion?

6. How is a barometer made? Mention the uses of a barometer.

7. What is specific heat? Describe an experiment to show the great specific heat of water.

8. Give a definition of work. How can we estimate the amount of work done in any case?

A man weighing 150 lbs. is at the base of a mountain whose height is half a mile; how much work must be performed in order that he may reach the summit?

9. What is latent heat? What do we mean when we say the latent heat of water is equal to 79? What is the latent heat of steam equal to?

10. Show the course of a ray of light
(a) through a flat thick piece of glass;

(b) through a piece of glass shaped like a wedge.

11. Describe an experiment to show how the energy of a blow is changed into that other kind of energy which we call heat.

12. State fully how you would show that a voltaic battery has the power of decomposing water.

EUCLID.

Examiners: { J. A. McLellan, LL.D.
W. H. Ballard, M.A.

NOTE.—Two-thirds of this paper counts the maximum.

1. (a) Define:—Right Angle, Circle, Diameter, Scalene Triangle, Rhombus.

(b) What is the use of the Postulates in Geometry? What instruments do they assume the use of? Name and distinguish the two kinds of Propositions.

2. To bisect a given finite straight line, that is, to divide it into two equal parts.

On a given base describe an isosceles triangle, such that the sum of its equal sides may be equal to a given straight line.

3. If one straight line stand upon another straight line, then the adjacent angles shall be either two right angles, or together equal to two right angles.

Prove that the bisectors of the adjacent angles which one straight line makes with another contain a right angle.

4. If from the ends of one of the sides of a triangle, there be drawn two straight lines to a point within the triangle, then these straight lines shall be less than the other two sides of the triangle, but shall contain a greater angle.

Prove that the sum of the distances of any point within a triangle from its angular points is less than the perimeter of the triangle.

5. If two triangles have two sides of the one equal to two sides of the other, each to each, but the base of the one greater than the base of the other; then the angle contained by the sides of that which has the greater base, shall be greater than the angle contained by the corresponding sides of the other.

In a triangle ABC, the vertex A is joined to D, the middle point of the base BC; show that the angle ADB is obtuse or acute, according as AB is greater or less than AC.

6. If a straight line fall on two parallel straight lines, then it shall make the alternate angles equal to one another, and the exterior angle equal to the interior opposite angle on the same side; and also the two interior angles on the same side equal to two right angles.

If a straight line meet two or more parallel straight lines, and is perpendicular to one of them, it is also perpendicular to all the others.

7. If a side of a triangle be produced, then the exterior angle shall be equal to the sum of the two interior opposite angles; also the three interior angles of a triangle are together equal to two right angles.

In a triangle a perpendicular is drawn from one extremity of the base to the bisector of the vertical angle, prove that it will make with either of the sides containing the vertical angle, an angle equal to half the sum of the angles at the base.

8. Triangles on the same base, and between the same parallels are equal in area.

Describe an isosceles triangle equal in area to a given triangle and standing on the same base.

9. To describe a parallelogram that shall be equal to a given triangle, and have one of its angles equal to a given angle.

Describe a parallelogram equal to a given square standing on the same base, and having an angle equal to half a right angle.

10. In a right-angled triangle the square described on the hypotenuse is equal to the sum of the squares described on the other two sides.

From the vertex A of a triangle ABC, AD is drawn perpendicular to the base; show that the difference of the squares on the sides AB and AC, is equal to the difference of the squares on BD and CD, the segments of the base.

HIGH SCHOOL ENTRANCE.

COMPOSITION.

Examiners: { J. E. Hodgson, M.A.
W. H. Ballard, M.A.

NOTE—100 marks count a full paper. A maximum of 5 marks may be added for neatness.

1. Combine the following statements so as to make complex sentences:—

(a) On the seventh day of October Columbus determined to alter his course to a certain direction. In this direction he saw birds flying.

He observed great flocks of small field-birds going towards the south-west.

He knew that the Portuguese navigators had discovered most of their islands by following the flights of birds.

(b) Wise men tell us certain facts regarding coal.

It is breath and sun-light.

It is the breath of living creatures that have lived in vast swamps and forests of some original world.

Sun-light has transmuted that breath into the leaves and stems of trees.

That breath has been locked up for ages in that black stone.

When it is burnt it becomes light and carbonic acid, as it was at first.

2. Change the following from the indirect to the direct form of speech:—

Mr. Blank expressed regret that another attempt was being made in the direction to which he had objected last year. He believed in a smaller rather than a larger committee. He felt sure that all of them would have cause to regret the action then about to be taken and he hoped that his friends on the opposite side of the house would see the reasonableness of the objection.

3. Substitute equivalents for the italicized portions of the following:—

As I looked *more attentively* I saw *several of the passengers* dropping through the bridge into the *great tide* that *flowed underneath* it; and *upon further investigation*, *perceived* there were *innumerable* trap-doors that lay *concealed* in the bridge, which the passengers no sooner *trod* upon than they fell through them into the tide, and immediately *disappeared*.

4. Express in your own words the meaning of the following:—

“ Venetian, fair-featured, and slender,
He lies shot to death in his youth,
With a smile on his lips over tender
For any mere soldier's dead mouth.”

“ No stranger, and yet not a traitor!
Though alien the cloth on his breast,
Underneath it how seldom a greater
Young heart has a shot sent to rest!”

5. Correct and punctuate the following sentences:—

(a) Every person whatever be their station are bound by the laws of morality

(b) Will I be under the necessity of asking for that book

(c) What kind of a medicine do you call that

(d) Toronto has a larger population than any city in Ontario

(e) At christmas the shop-windows looked invitingly

(f) he has only done a small portion of his task

6. Write a short composition, giving in your own words the substance of the lesson entitled “The Bell of Atri,” or of the lesson entitled “The Two Breaths.”

IN my opinion, the boy who leaves at the end of the common school course with a love of reading good books is better prepared for a life of honor and influence than one who passes through a high school course without that love; and he who has an ordinary high school education, combined with a taste for good reading, is better equipped for the duties of life than the graduate of the best college or university in the country without that taste.—J. B. Peaslee.

TORONTO, JANUARY 2ND, 1888.

Editorial.

AN INTERESTING CASE.

A DECISION, which will be of considerable interest to teachers, was recently pronounced at Fergus, by Judge Chadwick. The particulars, as we have learned them, we give briefly for the information of trustees and teachers.

In September, 1884, a young man was engaged as teacher in the public school at a salary of \$500 per year. He completed the year for which he was engaged to the satisfaction of his employers, as evidenced by the fact that he was re-engaged, September 1st, 1885, for another year with an advance of salary to \$600. In July, 1886, he sent in his resignation to take effect at the close of his second year on the first of September. In the meantime the school law had been revised, and the clause regulating the payment of teachers' salaries put into the form in which it now stands on the statute book. According to the provisions of that clause, as our readers are no doubt aware, the amount to which any teacher whose engagement is closed before the expiration of a full year is legally entitled, is to bear the same proportion to the full year's salary, which the number of days actually taught bears to the whole number of teaching days in the year. The Act containing this clause did not specify, if we are correctly informed, any particular date on which its provisions were to take effect.

Now the teacher in question, who had been paid to date on the 1st of January, 1885, and again on the 1st of January, 1886, naturally supposed himself entitled to receive in payment for his services the balance of the sum required to bring up his salary for the second year, closing at the date of his leaving, to the full amount of the yearly salary promised. This seemed the only just and reasonable basis of settlement. But the trustees, who seem to have been shrewd, not to say sharp, mathematicians, found themselves confronted with the following problem:— Suppose we pay the retiring teacher the amount to which he deems himself thus entitled. Suppose also that his successor's term of office should, for any reason, be closed at or before the next midsummer holidays. The latter having been engaged under the Act as it now exists, can claim the benefit of its provisions, and must be paid accordingly. But it so happens that the sum to which he would thus be legally entitled, added to the sum to be paid his predecessor under the agreement, would make the whole yearly outlay amount to some forty dollars more than the sum stipulated in the agreements. It is obvious, however, as the reader will see, that this anomaly would occur only in case of the second teacher's engagement being thus prematurely closed. Acting in view of the results that would follow on this contingency, the trustees paid the retiring teacher for the fraction of the year only the amount called for

by the operation of the new regulation, an amount, as has been seen, less by some forty dollars than the sum to which he considered himself justly entitled. In other words, they "kept back" forty dollars of the \$600 promised as the second year's salary.

He very naturally refused to settle on such a basis, and, failing other means of redress, took the case into court. The result was that the court awarded him the full amount of his claims, leaving the trustees to pay not only the forty dollars wrongfully withheld, but also the costs of litigation. The decision seems clearly equitable, and the wonder is that the trustees could have supposed themselves to have any "case." The ruling of Judge Chadwick, if we understand it aright, amounted to a declaration that no subsequent legislation or departmental regulations, could so operate as practically to deprive a teacher of a portion of the salary to which he was entitled under a prior agreement. Otherwise the law would become an instrument of injustice.

THE PROTESTANT COMMITTEE OF QUEBEC AND THE ACADEMIES.

THE Huntingdon *Gleaner* takes strong ground against the manner in which the Protestant Committee of the Council of Public Instruction of the Province of Quebec distribute the grant in aid of superior education. It says that of the total amount of \$17,600 which was this year at their disposal, the colleges get \$9,150, and the academies, model schools, etc., the balance. In the course of a leading article the *Gleaner* says:

"To apply a fund designed for the general education of the people to the special education of a select class, will strike those who look at the matter dispassionately as a misapplication. Were the grant expended as it ought to be, many a farmer's son and daughter would face the world better equipped than they can be under existing arrangements. That one young man may become a doctor or lawyer at half-price, a whole neighbourhood is deprived of its lawful rights. That such a state of matters exists is due to the composition of the present Committee. One-half of the board are clergymen and more than half have a direct interest in the colleges which receive the money distributed. Three of these colleges are not entitled to the term, and would be scorned as such in Great Britain. The patron of a college that does not average a dozen graduates yearly moves that a college with half a dozen graduates be given \$1,750 of the people's money, and the patron of the 6-graduate college returns the compliment by moving that \$2,260 be given to the 12-graduate college. Thus the fund is dissipated, and our academies lead a struggling existence."

This is certainly putting the case pretty plainly as well as pretty strongly. The *St. John's (P.Q.) News* endorses the *Gleaner's* views, and while giving the "distinguished and honorable" members of the Committee full credit for sincerity and conscientiousness, agrees with its contemporary that the money has been "dispensed lavishly on universities and colleges, and given gingerly to academies and model schools."

But the complaints of the *Gleaner* do not end

with the distribution of the grants. It goes on to say:

"The members of the committee have the power to prescribe the course of study, and to bring grist to their college they have degraded our academies into mere coaching-institutions for intending matriculants. We use the word degraded advisedly, because when a farmer sends his son to an academy in the expectation that he will receive a sound English education he finds he is turned over to an assistant, and that the principal devotes his entire energies to drilling a small class of lads who are preparing for college. In this way, our academies have been degraded from their high place as educators of the people into cramming schools for a select few."

These articles were written some time ago. We have not seen any denial or defence on the part of the Committee, and do not know whether any notice has been taken of the attacks. The last point made by the *Gleaner* is forcible if the fact be as stated. A very common but an indefensible use of an academy or high school is that of merely drilling a few of its pupils for some college or university matriculation examination, to the neglect of the great majority of its pupils.

EDUCATION AND MORALITY.

It is easy to over-estimate the power of mere intelligence, or educational culture, as a conservator of the public morals. Time was, not so long ago, when in the United States and Canada the vision of the coming universal education, which many noble-minded enthusiasts saw on the horizon, was glorified in their imaginations with a halo of universal honesty and sobriety. The trend of events within the last few years has brought to many of the dreamers an awakening full of disappointment. Not only has the vision receded almost as fast as the footsteps of civilization have advanced, but the halo has wavered and faded until sometimes it has well-nigh vanished. In other words, not only has it been found vastly more difficult than was anticipated for the schools, though set up in every village and country district, and almost at every street corner, to overtake the stupendous and ever-swelling tide of illiteracy, but the level of public and private morality has not been raised in proportion to the progress of the schools. On the one hand, the flood-gates of old world populations have been opened wider and wider, sending forth their swelling streams of ignorance, pauperism and vice to overflow the land of promise. On the other, there are even now continually going forth from the vaunted public schools thousands of those to whom increase of intelligence and mind-power means simply increase of ability to corrupt society and defraud their fellow-men. From this fruitful source come the ruined speculators, the gamblers, the betrayers of trust, embezzlers, boodlers, and self-seeking, heartless monopolists, who are the disgrace, almost the despair, of the business world of America.

The causes which produce the latter are not far to seek, however hard it may be to find and apply the cure. Knowledge is not religion; it

is not, necessarily, even morality or common honesty. The culture of the brain may be diligently carried on while that of the heart and the conscience is utterly neglected. The prevailing tendency to scepticism on the one hand—a tendency to which the hasty generalizations of an imperfectly educated and one-sided class of modern "scientists" has largely contributed—and on the other an insatiate greed of gold, arising out of the inordinate value set upon luxury and display, are the main factors in this disheartening problem. How to check and counteract these evil tendencies, to make the public schools agencies for sound moral as well as intellectual training, and to infuse into social and business life a more healthful tone and worthier motives and ambitions, is the great problem to which many of the best minds and hearts are now devoting their powers. Upon this aspect of the subject it is not our present purpose to dwell.

What we set out to do was to call attention to one set of facts which, however deplorable in themselves, are not without encouragement to educators. In the midst of so many discouragements it is easy to go to the opposite extreme and undervalue the beneficent influence which public schools exert, even apart from any special moral training they may impart. There seems still good reason to believe that even a low degree of mental culture elevates in some measure the tastes of those who receive it, and unfits them for some of the more degrading and brutal vices and crimes. The wife and child-beaters, the dynamiters, bomb-throwers, and other cowardly assassins, the pitiless Anarchists whose hands are against every law-abiding citizen and all that makes for peace and order in a community, are not, as a rule, the children of the schools. They are rather the neglected waifs, the outcast orphans or worse than orphans, who have been too often left to grow up like wild animals, whether at home or in foreign lands. A striking illustration of this is found in the sketches which have been published of the seven Chicago Anarchists, who have lately met the reward of their crimes. Nearly all of them were orphans at an early age; all without exception seem to have been thrown upon their own resources, or turned loose upon society when in their teens, and no one of them had received, so far as appears, more than the elements of a school education. They were, in a word, the product of the streets and not of the schools, and, in most cases, in addition seem to have imbibed, at very early ages, sceptical or atheistic ideas. The most obvious lesson to be drawn from the abounding statistical facts of which these are samples is that society should redouble its efforts in the first place to sweep every child in the land into the schools, public or private; in the second place to afford and secure greatly increased means and facilities for positive moral instruction and influence in the schools, and in the third place, if this is not involved in the foregoing, to rescue the waifs from the streets and

gutters, and cut off the sources of criminal supply, by suffering no child, so far as it can be prevented, to be trained up for a life of sin or shame. In this relation it is worthy of serious inquiry whether altogether too much regard is not had to the supposed rights of parents or guardians, after all such rights have been forfeited by neglect or abuse.

KNOWLEDGE AND EDUCATION.

WE commend the following extract from an article, by Professor Drummond, in the October number of the *Chautauquan*, to the attention of teachers of all grades. The distinction pointed out is, it is true, an old and familiar one, but Professor Drummond presents it with a freshness of statement and illustration which are peculiar to himself, and which give it all the charm of originality. The great demand of the present day is for the practical, the useful, to be taught in the schools. This demand cannot be set aside. It is the outgrowth of deep-felt want, stern necessity. The market value of the thing taught and learned has to be taken into the account. The educator's problem is how to satisfy this reasonable and just demand and at the same time subordinate it to the higher, the true idea and method of education. The thing can be done and is being done. It is being discovered that many of the studies which are in demand on account of their market value lend themselves as readily, in the hands of the skilful teacher, to the higher ends of education, as the ancient and musty lore which made up the staple of educational material half a century ago. The point to be emphasized here is, that the educational idea is the higher and should be the dominant idea. The true teacher's first aim will still and always be to "draw out," to "lead on," to ensure "the gradual, careful, symmetrical unfolding" of all the powers of his pupils:

"If you think it over carefully, I think you will find that the desire to know is an illusion. I do not say it is a delusion, but an illusion. We all think we care very much to know; in reality we care very much not to know. We are never more completely taken in than when in pursuit of knowledge. Our idea is that we want the knowledge itself. In reality we wish no such thing. Men imagine, when they go to classes or join reading circles, that they wish to learn history, and logic, and mechanics, and geology, and chemistry. No such thing. That is the illusion of the spirit of learning, and it is a very beautiful and successful illusion. They are no more in pursuit of these things than the angler, who spends a summer day by the river, and comes back with a basketful of trout, cares for the material products of his skill. It is not the trout he cares for, but the pursuit. And it is not the knowledge that men care for, but the pursuit of it. The trout are edible, and will count for something on the breakfast table; and knowledge is good, and its social and market values are not to be despised. And yet it is an illusion, a mere bait to make them do something else and become something else without their knowing it.

"The moment a thing is known to us our interest in it largely ceases. Having striven to reach it for months, now that we have made up

to it, we look at it patronizingly for a moment, then, with perfect indifference, say good-by and walk on to the next hilltop. There is a man who has nearly blinded himself for the last two years peering down a microscope. He has discovered two new facts; he hopes by next year to have discovered three. And yet there are three thousand established facts stated, illustrated, and described in the *Micrographical Dictionary*, not one of which he knows. And yet he is right. His three are of more value to him than the three thousand. Not because they have given him fame, but because they have given him exercise. They have been his bait; they have led him on; they have drawn him out; in other words, they have educated him. Anything that draws us out, anything that leads us on, that we are to seek, for that is education; the gradual, careful, symmetrical unfolding of all our powers."

A LARGE number of teachers in St. John, N.B., have joined the evening classes for the study of natural science. The fact does honor to the profession in that city, and is worthy of imitation. We do not see, however, why attention should be devoted exclusively to the one subject. There are surely others that are equally worthy of study and that would prove of equal advantage to teachers.

OUR EXCHANGES.

Our Little Men and Women for December was a charming number, full to the brim of nice little stories, instructive articles and poems. Its bright, pretty pictures on almost every page are sure to delight the hearts of the little ones.

An extra number of the *Riverside Literature Series* (Houghton, Mifflin and Company, Boston), just to hand, is an especially valuable number. It contains portraits and biographical sketches of twenty American authors.

Harper's Young People is one of the best of the many charming magazines with which American publishers cheer the in-door hours of the young folks. It has the advantage over most of its competitors in being a weekly. The illustrations in the number for Dec. 27, just to hand, are spirited in design, and in execution.

Our Little Ones and the Nursery for December (Russell Publishing Co., Boston), gives its usual quota of good things, and something more in happy glimpses of holidays to which the little people are looking forward with great expectations. This beautiful monthly has its corps of special writers and artists; and all it contains is freshly gotten up with care to please and cultivate the class for whom it is designed.

St. Nicholas for January contains, in addition to its usual attractive variety, a beautiful poem by Whittier, telling the legend of "The Brown Dwarf of Rügen." It is finely illustrated with frontispiece and marginal drawings, by E. H. Blashfield.

WE doubt if the average teacher laughs enough. An honest laugh is good for the digestion, and so for the spirits and temper, *The Epistles of Airlie* will no doubt make an excellent tonic. It is the title of the collection, in book form, of the "Airlie" letters which have appeared in *Grip* during the last few years. It claims to be the best book of Scottish humor ever published. Mr. J. W. Bengough has drawn special illustrations for this edition. Price 25 cents.

GRIP PUBLISHING COMPANY hand us also the following, *Why I Joined the New Crusade: a Plea for the Placing of Taxes on Land Values only*. By Richard T. Lancefield. An address delivered before the Anti-Poverty Society of Toronto. Every Christian, Moral Reformer, Philanthropist, Doubter and Disbeliever, will be interested in the subjects touched on in this pamphlet. Price 10 cents.

Miscellaneous.

MISS R.'S SCHOOL DISCIPLINE.

I TAUGHT school first in a small red building at a four corners; it was "the school-house in Deacon Smith's district," as the minister described it in giving out the appointments for prayer-meetings. The building lacked every element of beauty, of course—most school-houses do. The trustees charged me to "be careful of the property or else the boys would tear the whole consarn down." To prevent this, everything was made strong, the desks and seats were of thick planks; the desks were fastened to the floor by putting a block four inches square on each side of the upright part. These blocks seriously interfered with marching and walking in the aisles; every day some pupil stumbled. But the trustees seemed to fear that even these blocks would not prevent the boys from tearing up the desks, so I stayed in the building every noon to "protect the property."

My next school was in a nearly new building; I left it each noon to go to my boarding house. My departure was the signal for pandemonium to set in. I often thought of Scott's lines:

"At once there rose so wild a yell."

In due course of time the superintendent made his appearance; his examination was brief, but he was satisfied that I was doing thorough work. In addressing the pupils he said: "I am well pleased with all but one thing, you don't take good care of the desks; they are badly scratched and marked up. This new house will soon be like the rest. Boys, I wish you could see what boys Miss R. has, and how they keep their desks."

I was more interested than the boys were. From the superintendent I learned that Miss R. kept school six miles up the river, and I determined to visit her school on the following Friday. The day found me on the spot, and I was surprised by what I saw.

The building stood back about seventy-five or eighty feet from the neat fence in front. There was a gate and a wide walk covered with flat stones. At each corner of the building was a sort of low tower; in the one the boys entered; in the other the girls. The teacher's desk I found between the doors; at the desk was a woman of pleasant aspect, probably thirty-five years of age. She rose as I came in, and, smiling pleasantly, offered me a chair. I began a critical survey of things, and my first feeling was, "Well, Miss R. has civilized beings for her pupils; that is the secret of her success." Then I fell to wondering why her pupils were of better stock than mine; I could see no reason for it and reluctantly came to the conclusion that the difference was caused by the teacher.

I could see that the pupils were managing themselves; that they respected and loved their teacher; that they cared for their books, clothes, and school property. When recess-time came I put the enquiry, "How have you done all this?" for the building was not only neat, it was adorned. The platform was carpeted, the walls were hung with pictures, the blackboards were covered with neat work, the windows had curtains, and all was in nice repair. She smiled:

"Why it seems natural enough to me."

"But do not the pupils cut and scratch the desks? And how did you manage to get a bell for the boys' tower? And how such a neat walk?"

"I talk with the boys and girls about these things, and they talk with their parents, you know."

"But suppose you leave the room at noon, will they not run on top of the desks?"

"Why the rest would—I don't know what they would do to such a pupil."

Just then a pupil stepped to the bell-rope and pulled it three times; waiting a few moments he pulled the bell once, and in marched the pupils.

Again I watched them. They were not self-conscious, not forward, not vain; they were quiet, polite, studious, natural. The lessons went forward with promptness, both the teacher and pupils seemed to be imbued with the same spirit—and here I discovered the secret of Miss R.'s success; she was constantly inviting the best qualities of her pupils. She acted a comrade to them; she met them in the spirit of the Great Teacher.

Well, I fell to pondering on the problem: "Could I accomplish a work like this?" I went home full

of plans; I could scarcely wait for Monday morning. On arriving at the school I got the boys (who stayed out until the last moment) to come in. I told them of my wishes about a plank walk to the edge of the road. To my surprise, the roughest boy I had agreed to bring some planks. I took courage, and when the school was assembled a committee was appointed, and during the week the coveted walk was laid.

This gave me courage to go to my pupils and enlist them to work on problems that puzzled me. I asked them to tell me how the disturbance at noon could be abated. A committee on order took that in hand, and (with suggestions and advice from me, of course) that was successfully battled with.

One after another of the barbarisms I found in existence was attacked by us all *en masse*, and exterminated. My school soon began to have a name; I felt I had something to be proud of. But after all, I could never equal Miss R.'s school. She was an artist; she achieved great results; not in scholarship, perhaps, but in round development. From her I learned that great lesson, that if a teacher would succeed he must get the co-operation of his pupils.—*John R. Dennis, in the Teachers' Institute.*

WHAT DARWIN THOUGHT OF HIS SCHOOL.

NOTHING could have been worse for the development of my mind than Dr. Butler's school, as it was strictly classical, nothing else being taught, except a little ancient geography and history. The school as a means of education to me was simply a blank. During my whole life I have been singularly incapable of mastering any language. Especial attention was paid to verse-making and this I could never do well. I had many friends, and got together a good collection of old verses, which, by patching together, sometimes aided by other boys, I could work into any subject. Much attention was paid to learning by heart the lessons of the previous day; this I could effect with great facility, learning forty or fifty lines of Virgil or Homer, while I was in morning chapel; but this exercise was utterly useless, for every verse was forgotten in forty-eight hours. I was not idle, and, with the exception of versification, generally worked conscientiously at my classics, not using cribs. The sole pleasure I ever received from such studies was for some of the odes of Horace, which I admired greatly.

When I left the school I was for my age neither high nor low in it; and I believe that I was considered by all my masters and by my father as a very ordinary boy, rather below the common standard in intellect. To my deep mortification my father once said to me, "You care for nothing but shooting, dogs, and rat-catching, and you will be a disgrace to yourself and all your family." But my father, who was the kindest man I ever knew, and whose memory I love with all my heart, must have been angry and somewhat unjust when he used such words.—*From "The Boyhood of Darwin," by himself, in Popular Science Monthly.*

THE students of Queen's College have undertaken to raise \$15,000 or \$20,000 on account of the endowment fund. Dr. Grant says the amount so far subscribed is \$220,000. The balance of the quarter million, the minimum at which he aimed, could be speedily secured could he visit certain as yet uncanvassed places, but his health will not permit of his doing any work save in the way of correspondence. He has been unable to lecture so far this session in the theological hall.

LAST Friday there was an examination in false syntax at the Collegiate Institute. One of the questions was, "What is wrong in 'John told James that his ox broke his neck?'" The following is the answer given by one of the boys: It is easily seen that this sentence is ambiguous and should read:

John said to James, Your ox broke his neck,
or " " " " My ox broke his neck,
or " " " " Your ox broke *your* neck,
or " " " " Your ox broke *my* neck,
or " " " " My ox broke *my* neck,
or " " " " My ox broke *your* neck.

—*Stratford Beacon.*

Question Drawer.

WE are often asked to publish lists of subjects prescribed for the Teachers' Examinations of various grades. The full lists are long and would occupy too much space. The official lists and regulations will no doubt be promptly sent on application to the Secretary of the Education Department, Normal School Buildings, Toronto.

FOR answers to questions pertaining to Mathematics and English, refer to the Mathematical and English Departments, respectively. These appear alternately.

WHERE can I obtain a copy of the regulations respecting the Civil Service examination?—A TEACHER.

[Address the Secretary of State, Ottawa.]

CAN a teacher who has taught three years on a non-professional second, and since passed the Junior Matriculation Examination in Toronto University, qualify as a Public School teacher?—W. L.

[Regulation 167 of the Education Department provides that candidates who, in addition to the Departmental Second-Class Non-professional examination, have passed the Junior Matriculation examination of Toronto University, with first-class honors in Mathematics, English, and History and Geography, or an equivalent examination in any of the chartered Universities of Ontario, shall be awarded a First C Non-professional certificate without further examination. The course and examination at a County Model School are necessary to a professional certificate.]

1. IF when a teacher engages with the trustees for a school there is nothing said about building fires, can the trustees compel the teacher to build fires, or see that they are built?—A. B.

[It is the duty of the teacher, if no provision is otherwise made, to employ, at such compensation as may be fixed by the trustees, a suitable person to make fires, sweep, dust, etc. No assistant-teacher or pupil (and of course no head teacher) shall be required to do this work unless regularly employed for the purpose.]

2. CAN the teacher compel the children to sweep and bring in wood; if not, who may be compelled to do so?—A. B.

[See foregoing answer. Refer to Regulation 46 (10).]

3. IF teacher should inflict corporal punishment on a pupil at intermission, or after school hours, can a parent, or guardian of the pupil, legally prosecute the teacher should he be so disposed?—A. B.

[It would be useless for him to do so. It has been authoritatively decided that a teacher has the same control over the pupil during recess, and on the way to or from school, as in school hours. We doubt, though, the wisdom of such a proceeding as that hinted at.]

4. PLEASE explain the cause of the appearance of a man's face in the moon.—A. B.

[The conjoint causes are, we suppose, the activity of the human imagination on the one side, and on the other, the irregular grouping of light and shade which the surface of the full moon presents to the naked eye, and which is caused, no doubt, by the high mountains and deep valleys which make up that surface.]

5. WHICH is the better college to attend for a commercial business course, Belleville or Kingston?—A. B.

[That is a poser. You might ask the respective principals, though we suppose each in his modesty and courtesy would be likely to recommend the other. Watch our advertising columns for further information.]

6. IN a school where about half of the pupils are Roman Catholics, and the Scripture Readings and prayers are used, should the Catholics be dismissed some time before four o'clock so as to allow the remainder to be dismissed at the usual time, or should the Roman Catholics be dismissed at four

and the remainder kept after the regular hour of dismissal for Scripture Readings and prayers?—A. B.

[The religious exercises are a part of the school programme and should come within school hours. Those children whose parents object to their remaining should be dismissed at the opening of those exercises before four o'clock.]

COULD you please inform me through the JOURNAL as to what works are read for *Medieval History*, and also for *Modern History*, in the University of Toronto, being the work prescribed for First-Class "A and B." Yours respectfully,
G. S.

[No text-books are, we think, prescribed. Write to the Registrar of the University for a copy of the curriculum.

KINDLY publish the questions set for Composition at the Entrance Examination in July.—C. J.
[See under head "Examination Questions."]

Book Reviews, Notices, Etc.

BOOK NOTICES.

Moffatt's History Reader, Book II.

This volume deals with Early England. Its style is simple, type good, and illustrations numerous.

First Exercises in Latin Prose, with Notes and Vocabularies, by E. D. Mansfield, M.A. Rivingtons, Waterloo Place, London, 1878.

A good practical book for the young student of Latin.

Recitations for Christmas, selected and arranged by Maynard Holmes. Chas. A. Bates, Publisher, Indianapolis, Ind. Price, 25 cents.

A seasonable little book, which many teachers will be glad to get just now.

Tales from History, by Dr. Friedrich Hoffmann, Edited with notes by H. S. Beresford-Webb, late Assistant Master at Wellington College. Rivingtons, Waterloo Place, London.

A neat, useful school edition.

Third Natural History Reader, by Rev. J. G. Wood, M.A. Boston School Supply Co.

This neatly printed addition to the "Boston School Series," can scarcely fail to prove attractive as well as instructive to youthful readers.

Moffatt's History Readers, Book IV. London: Moffatt & Paige, Warwick Lane, Paternoster Row.

This volume is the fourth in the series and deals with Modern England. It has thirteen maps, and numerous illustrations.

We have also received the following from Rivingtons:

A New French Grammar Syntax, by Eugène Pellissier, M.A., B.Sc., LL.B., (Univ. Gallic.), Assistant Master at Clifton College, and Lecturer at University College, Bristol.

Colomba, Par Prosper Mérimée, edited by C. H. Parry, M.A., Assistant Master of Charterhouse.

Graded German Lessons, being a Practical German Grammar, by William Eysenbach.

Ginn & Company, Boston, have published an edition of this work, revised and largely re-written by Wm. C. Collar, Head Master of Roxbury Latin School. Mr. Collar had the exceptional advantage of having used the work as a text-book in the upper classes of the Roxbury school.

Lights of Two Centuries, by Edward Everett Hale. A. S. Barnes & Co., New York and Chicago.

The name of the author is ample guarantee for the excellence of this collection of biographical sketches, or pen portraits, of the leading spirits in the world's advancement in the present century, and the one immediately preceding. The book contains over 600 pages, and is handsomely bound—a fine gift book.

The Schools of Greater Britain, by John Russell, F.E.I.S., F.R.Hist.S.

This work, which comes to us from the publishing house of William Collins, Sons & Co., London and

Glasgow, contains sketches of the educational systems of the Colonies and India. It is a condensed and popular presentation of the facts brought out in the pamphlets and reports of the educational sections of the Indian and Colonial Exhibition of May last, supplemented by information received directly from the educational authorities of the various Colonies. It is therefore a repertory of reliable and valuable information.

Elementary German Course, comprising the Elements of German Grammar, an Historical Sketch of the Teutonic Languages, English and German Correspondence, Materials for Translation, Dictation, Extempore Conversation, and Vocabularies. By Franz Lange, Ph.D., Examiner in German to the College of Preceptors. London: Whittaker & Co.

Zopf und Schwert, by Karl Gutzkow.

Der Bibliothekar, by Gustav Von Moser.

These two works, each edited with a literary introduction and copious notes, by Francis Lange, Ph.D., Professor in the Royal Military Academy, Woolwich, form parts of the excellent series of modern German authors, published by Whittaker & Co., 28 White Hart St., Paternoster Square, E. C. London.

Un Philosophe Sous Les Touts, Journal D'un Homme Heureux. par Emile Souvestre. Edited with Notes and a Vocabulary by W. H. Fraser, B.A., French and German Master in Upper Canada College. Toronto: The Copp, Clark Company, Limited.

This is an edition prepared chiefly to meet the wants of students having in view the University Matriculation examinations or the examinations of the Education Department. The notes and other helps are copious, and seem, so far as we can judge, to be of the right stamp.

A New Part-Song and Chorus Book. For High Schools, Academies, Choral Societies, and Families, by Charles E. Whiting, formerly teacher of music in the Boston Public Schools. D. C. Heath & Company, Boston, 1887.

This work contains six departments, namely: condensed elementary course; vocal exercises; two, three, and four-part solfeggios; three and four-part songs; anthems and choruses; and hymn tunes. It is a book of over 250 pages, about seven by ten inches in size, and will, we have no doubt, give excellent satisfaction to those using it.

Interstate Monthlies. Interstate Publishing Company, 30 Franklin Street, Boston: 185 Wabash Ave., Chicago.

The above are a series of school readers designed to provide periodically new and interesting reading matter for the use of pupils. The series includes

Interstate Monthly Primer. With Supplement. Thirty cents a year. Thirty-two pages. Its progress is very gradual and it is the best for first year pupils.

Primary Monthly contains short stories, beautifully illustrated, for first and second reader grades. Thirty cents a year.

Intermediate Monthly contains stories and sketches by the best authors, suitable for third and fourth reader grades. Thirty cents a year.

Grammar School contains 48 pages, quarto, of well illustrated stories and sketches by best authors, also articles on history, science and biography, well adapted to grammar and high school grades. One dollar a year.

Correspondence.

UNIFORM PROMOTION EXAMINATIONS.

To the Editor EDUCATIONAL JOURNAL.

DEAR SIR,—I see that the subject of uniform promotion examinations is awakening considerable discussion throughout the Province. I would ask for some of your valuable space to express my views on the subject.

I teach in a county where uniform promotion examinations are not held, and I think that if they were, both teachers and scholars would be benefited. My reasons for thinking so are:—

(1) All classes in the county would be at a uniform stage of advancement.

(2) The scholars would wish to pass the examinations and would have a more definite object in view, consequently would study harder. I do not agree with those critics who say that the children of our public schools study too hard. The country boys and girls do not.

(3) The teachers would wish to have their pupils pass and would work harder. Although the teachers, as a rule, work hard enough, there are some indolent ones.

(4) While it might lead to "cramming," I think that the pupils could stand a little more than they get at present.

(5) The standard would be raised, so that pupils changing from country to city schools need not be put back a class or two.

Although it might increase the work of the inspector, I do not think it would overburden him. If he should have too much to do, let the Teachers' Association appoint a committee of examiners to draft papers, etc., in connection with the work.

I think with this aid the inspector would not be at all overworked.

A WENTWORTH TEACHER.

WENTWORTH, Dec. 5th, 1887.

Educational Notes and News.

THERE is already one Japanese student in the Victoria (Methodist) College at Cobourg, Ont., and more are coming.

HARVARD COLLEGE is at a high tide of fortune, having received no less than \$3,000,000 in gifts during the last five months.

A SCHOOL for the teaching of the Volapuk is to be opened by the Bavarian minister of worship at the Luitpold gymnasium in Munich.

THE building for the Ramona Indian Girls' school, at Santa Fe, N.M., commemorating Helen Hunt Jackson, will cost \$30,000, being arranged to accommodate 150 pupils.

AN exchange says, it is a fact not generally known that "Alfred Ayres," the name on the title-page of the *Orthoëpist* and other popular books, is a pseudonym. The author's real name is F. E. Osmon.

THE next meeting of the East Middlesex Teachers' Association will be held on the last Thursday and Friday of February, that of the West Middlesex on the preceding Thursday and Friday. Dr. McLellan will attend both meetings.

THE Montreal *Witness* of a recent date says that "the sweet girl undergraduates of McGill College donned their gowns for the first time yesterday. Of course they looked charming, and were awarded a gentle smile from each Professor as they entered their classes.

EDUCATION is a good thing when it does not directly unfit a man for working for a living. There is a man employed in digging ditches on the streets of Essex Centre, says the *Liberal*, who is entitled by law to write Master of Arts after his name, and who won distinction as a scholar in the classic halls of the famous Dublin University.—*Ex.*

AT the close of the Model School, Milton, on Friday, 9th inst., the headmaster, Mr. H. Gray, and his assistant, Miss B. Maclean, who was music teacher during the session, were presented with complimentary addresses, and the former with a large silver butter cooler, and the latter with a handsome silver cake basket, both elegantly carved.—*Milton Champion.*

ONE hundred and fifty dollars a year is the average salary offered a teacher in the Province of Quebec. It is terribly low. But Ontario cannot boast of the liberality of its school trustees. A teacher in the County of Huron was recently voted \$300 a year, but the board deducted \$10 for the care of the schoolhouse. It is a wonder the thirty trustees did not require the unfortunate educator to board the children.—*The Mail.*

THERE is at present over 1000 children attending the Hebrew schools in San Francisco.

KANSAS now has twenty-three colleges in full operation and at least eight under process of formation.

FIFTY-FOUR new school districts were formed in Manitoba during the year ending 31st January, 1887, making a total up to that date of 496.

THE number of teachers employed in the Protestant schools of Manitoba during the year 1886 was 524, an increase of 48 over the number employed in 1885.

THE census returns of November, 1886, for Manitoba, showed a Protestant school population in organized school districts of 16,834, an increase of 984 over the year 1885.

THE average attendance of children in the Protestant schools of Manitoba during the first half of 1886 was 8,611, being 58 per cent. of the enrollment for the same period. The average for the second half was 7,647, being 54 per cent. of the enrollment for that period.

NEXT year new candidates will not be allowed to write for second class non-professional certificates. In July, 1888, only the following will be eligible to write for second class. 1. Those who hold third class and wish to obtain second class. 2. Those who wrote in July, 1887, for second class, whether they then held third class or not, and failed. 3. Those who at any previous third class examination obtained the aggregate required but who failed in one or more subjects.

IN an address before the Wentworth teachers, the Rev. Dr. Burns, of Hamilton, deplored the general ignorance of young men regarding even the most fundamental principles of government and the lack of ordinary understanding of political economy. He would make way for the study of the principles of government and political economy by the exclusion of technical grammar. He held that studying rules of grammar cannot make a man a correct speaker. At the same meeting Dr. McLellan emphatically condemned diagrams for grammatical analysis.

A LITTLE girl in one of the intermediate departments of a school in this city was asked by her teacher the other day, while in the language class, to define the word "whimsical." She had learned the meaning, for it was part of her lesson, so she promptly replied: "It means odd." "And now," continued the teacher, "please go to the board and write a sentence containing the word properly used." Hesitatingly the little ten-year-old took the crayon and, after a moment's thought, wrote: "There are two kinds of numbers, whimsical and even."—*St. Thomas Times.*

SOME of the Montreal papers are querying whether the provision for the escape of the children from the schools in case of fire is sufficient and reliable. Under the skilful system of fire drill inaugurated by Inspector Hughes, the Toronto schools seem pretty safe. A test was recently made in the Dufferin school, without previous notice to teachers or pupils. This school, whose average attendance is 1,036, was selected because of some fears occasioned by the arrangement of the stairs. At the signal the children arose, and, without any dangerous hurry or confusion, the boys were all out of the building in 1 min. 35 sec., and the girls were clear in 2 min. 2 sec. The scholars of the Ryerson school were able to file out in much faster time, as in that building there is no awkward turning on the landings required.

THE North York Teachers' Association held a local Institute in the school building here on Friday, 18th inst. About sixty teachers were in attendance. The chair was occupied by Mr. M. H. Thompson. Mr. Dickson took up the subject of Literature with a senior fourth. The class subject was handled in a masterly manner. He was followed by Mr. H. Love, showing his method of teaching senior third class Geography and Map Drawing. Miss Wallace gave a very interesting illustration of her method of teaching Reading in the fourth class. Our space will not permit of a lengthy resume of the work done by the Institute: suffice it to say that the session was one of the most valuable and interesting ones that has ever been held by the Association. The attendance also was larger than usual, showing that the teachers in this county are alive to the interests of their profession.—*Aurora Banner.*

Consumption Surely Cured.
TO THE EDITOR—
Please inform your readers that I have a positive remedy for the above named disease. By its timely use thousands of hopeless cases have been permanently cured. I shall be glad to send two bottles of my remedy FREE to any of your readers who have consumption if they will send me their Express and P.O. address.
Respectfully,
DR. T. A. SLOCUM, 37 Yonge St., Toronto, Ont.

—) MUSIC (—
—IN—
The Public and High Schools.

The Books authorized by the Minister of Education for use in the Public and High Schools of Ontario are:
The Public School Music Reader,
PRICE, 40 Cents.
and The High School Music Reader,
PRICE, 75 Cents.
The most progressive, systematic, and complete Text-books published for every grade of school instruction.

NOW READY!
FOR CLASS DRILL, TO ACCOMPANY THE ABOVE.
HOLT'S MUSICAL CHARTS & MODULATORS.

Chart No. 1 (Public School Course).—Drill Exercises in Pitch and Time, Nine Keys. Price, complete with patent iron stand and Teacher's Manual, \$10.
Chart No. 2 (High School Course).—Drill Exercises, One, Two, and Three-Part Singing, including Bass. Price, complete with patent iron stand and Teacher's Manual, \$10.
Drill Chart and Modulator.—Presenting the Major Scale in Nine Keys on the Staff, with Diagram of Scale-Ladder. Mounted separately in Map form, \$1.50.

Canada Publishing Co., Ltd.,
TORONTO.

No. 250 YONGE STREET,
TORONTO.

R. W. DOUGLAS & CO.
(SUCCESSORS TO A PIDDINGTON)

Have the Largest Stock of New and Second-Hand Educational Books in this country. A specialty made of Rare and "Out of Print" Books.

Students would do well, before ordering elsewhere, to try our House, as we are prepared to furnish at shortest notice, Books in every Department of Literature at Lowest Rates.

NOTE THE PLACE. **MAMMOTH BOOK EMPORIUM, 250 Yonge Street.**
Known for twenty-five years as "PIDDINGTON'S."

Teachers! Students!

YOU MAY EARN A
SUBSTANTIAL INCOME

During your vacation by selling our
Subscription Books.

SEE OUR SPECIALTIES:
OUR AGENTS Magnificent Parallel Family Bibles; Dr. Withrow's Popular History of Canada—the best extant; The "Cottage Physician"—an invaluable medical work, selling fast; Gough's "Platform Echoes" and "Lights and Shadows"; Sam P. Jones' "Living Words" selling rapidly at this season; Dr. Dorchester's "Liquor Problem"; "Mother, Home and Heaven"; "Cross and Crown"; Daniels' "History of Methodism," etc., etc.

MAKE MONEY.
Popular Books! Liberal Terms!
Write for our Descriptive Circulars and Terms, stating book desired and your choice of territory.
WM. BRIGGS,
-8 and 8o King Street E., Toronto.

SOMETHING NEW

A Brief EXPOSITION of the
Kindergarten
WITH ILLUSTRATIONS AND SONGS.

PRICE, 25 CENTS. Send to
SELBY & Co., TORONTO.

HOME STUDY. LATIN and GREEK a^t
SIGHT, use the "INTERLINEAR CLASSICS." Sample page and Catalogue of School-Books, free. C. DE SILVER & SONS, No. (L.L.) 110 Walnut Street, PHILADELPHIA, Pa.

ANNUAL VOLUMES, 1887.

JUST RECEIVED.
Band of Hope Review, 35 cts.
Child's Own Magazine, 35 cts.
Herald of Mercy, 35 cts.
British Workman, 50 cts.
Child's Companion, 50 cts.
Children's Friend, 50 cts.
Cottagers and Artizan, 50 cts.
Family Friend, 50 cts.
Friendly Visitor, 50 cts.
Infant's Magazine, 50 cts.
Our Little Dots, 50 cts.
Chatterbox, \$1.00; Sunday, \$1.00; Our Darlings, \$1.00;
Little Folks, \$1.25; Little Wide Awake, \$1.25; Boys' Own Annual, \$2.00; Girls' Own Annual, \$2.00;
Every Boys' Annual, \$2.00; Every Girls' Annual, \$2.50; The Quiver, \$2.50.

JOHN YOUNG,
Upper Canada Tract Society, 102 YONGE ST., TORONTO.
Nov 1887.

The Bennett Furnishing Co.

MANUFACTURERS OF
SCHOOL, CHURCH & HALL
FURNITURE.

— ALSO —
Fine Hardwood Mantels.

Send for new Illustrated Catalogue now in press, and which appears in a few days, with the latest designs in School, Church and Hall Furniture.

WORKS:
Rectory Street, London, Canada,
64 London Road, Glasgow, Scotland.
Victoria Works, Bow, London, England.
OFFICES:
Rectory Street, London, Canada.
24 Dalmarnock Road, Glasgow, Scotland.
173 Usher Road, Bow, London, England.

AGENTS WANTED

In every town for our new Patent Cake Griddle; the best thing in Canada; 100,000 sold in the States; great reductions to agents.

CLEMENT & Co., Toronto.

FOOTBALLS!

LUMSDEN & WILSON

While thanking teachers and pupils throughout the Dominion for the liberal patronage extended to us in the past, we would also thank those who with such patience waited for the filling of their orders during the short time this season that we were out of some sizes of Balls, owing to unexpected delay in arrival of new lot. We will endeavor to have no such delay occur again. Our stock is now complete in all sizes, and, as will be noticed, we have a new Ball, "The Chrome," just introduced in England and forwarded to us. It is pronounced by all who have seen it as the best ball ever shown in Canada. The cover is cut similar to the "Perfection," without any round disks on the ends.

PRICE LIST, FOOTBALLS COMPLETE:

The Celebrated "McKechnie," made from very best hand wrought leather, hand sewn, and filled with tested Bladders of best quality.

No. 1.	Circumference 20 inches.	Price \$1 75
" 2.	" 22 "	" 2 00
" 3.	" 24 "	" 2 25
" 4.	" 26 "	" 2 50
" 5.	" 28 "	" 2 75

Special Match Balls, No. 5 or Association Size.

The Goal, Price \$3 00 | 3rd Lanark, Waterproof, Price \$3 75
 Queen's Park, " 3 25 | Perfection, New Style, " 3 75
 Waterproof Cover, " 3 75
 The Chrome, Price \$4 00.

McIntosh Rubbers, Separate. Prices, No. 1, 60c; No. 2, 70c
 No. 3, 80c; No. 4, 90c; No. 5, \$1.00.

McKechnie Covers, Separate. Prices, No. 1, \$1.25; No. 2, \$1.40; No. 3, \$1.55; No. 4, \$1.70; No. 5, \$1.85.

Covers Separate. The Goal, \$2.10; Queen's Park, \$2.35; 3rd Lanark and Perfection, \$2.85 each.

Football Inflaters, first-class, Price, 75c. each.
 Football Rules, by a Kicker, " 25c. "
 Shin Guards, Cane and Leather, 2 buckles, " \$1.50 pair.
 Football Belts, Leather, Price 25 and 50 cts. each.
 B'y's Ball, Sheepskin Cover, Price, \$1.10 each.
 Cement, for mending Rubbers, " 30c. box.

No delay. Orders all shipped free by return mail to any part of the Dominion. We believe our prices lower than generally asked, and we know we offer better Balls than can be got elsewhere for any money, but as an extra inducement to those favoring us with an order for a complete Ball, we will mail free a copy of "Football and how to play it successfully," by a Kicker, admittedly one of the best living exponents of this popular game. This book is pronounced the most practical and suggestive little work published. Send your money by Post Office order or registered letter. The price must accompany orders to receive attention. Address

Lumsden & Wilson,
 IMPORTERS FOOTBALL GOODS,
 SEAFORTH, ONT.

TEACHERS WANTED

For desirable positions in established schools and colleges in the great Southern and South-Western States. For Teacher's Application Form address: Southern Teachers' Agency, P.O. Box 410, Birmingham, Ala., U.S.A.

WILLIAMS PIANOS

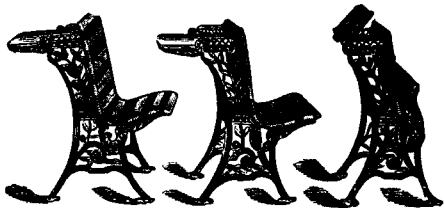
Endorsed by the best authorities in the world.

R. S. Williams & Son, 143 Yonge St., TORONTO.

W. STAHLSCHMIDT & CO.

PRESTON, ONTARIO,

Manufacturers of Office, School, Church and Lodge Furniture.



THE "MARVEL" SCHOOL DESK,

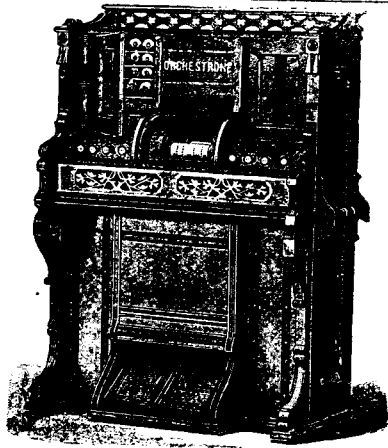
PATENTED JANUARY 14TH, 1886.

Send for Circulars and Price Lists. Name this paper. See our Exhibit at the Toronto Industrial Exhibition.

TORONTO REPRESENTATIVE

Geo. F. Bostwick, 56 King Street West.

YOUNG MEN suffering from the effects of early evil habits, the result of ignorance and folly, who find themselves weak, nervous and exhausted; also **MIDDLE-AGED** and **OLD MEN** who are broken down from the effects of abuse or over-work, and in advanced life feel the consequences of youthful excess, send for and read **M. V. Lubon's Treatise on Diseases of Men**. The book will be sent sealed to any address on receipt of two 3c. stamps. Address, **M. V. LUBON** 47 Wellington St. E., Toronto.



ANY ONE CAN PLAY OUR
Parlor Orchestrones
\$115 to \$200.

A great many lovers of Music have Organs and Pianos, but owing to the great expense for tuition, and the heavy tax on time necessary for practice before even medium efficiency is acquired, we find that eight out of ten give it up in despair.

It is a pleasure to us to be able to inform these that WE HAVE FOUND THE ROYAL ROAD TO MUSIC, and by giving FIVE MINUTES' INSTRUCTION, we can enable them to play better music than 999 out of every 1,000 can on the ordinary Organ or Piano. We invite lovers of music to call and see these wonderful Instruments at

THOS. CLAXTON'S MUSIC STORE
 197 YONGE STREET, TORONTO.

Teachers! Students! Ministers!

YOU can make money and confer blessings on your fellowmen by canvassing for the Most Popular Life Insurance Company in the Dominion—THE CANADIAN MUTUAL AID ASSOCIATION. Assessment System. Cheap Insurance. Large Reserve Fund as Guarantee. We pay one-half the Claim in case of "Total Disability," balance at death. EQUITABLE, RELIABLE AND CHEAP INSURANCE. For particulars, address the Head Office, No. 10, King Street East, Toronto.

Agents wanted in all unrepresented districts.

W. P. PAGE, Manager.

The High School Drawing Course.

THIS COURSE IS NOW AUTHORIZED BY THE DEPARTMENT OF EDUCATION.

1. FREEHAND DRAWING.
2. PRACTICAL GEOMETRY.
3. LINEAR PERSPECTIVE.
4. OBJECT DRAWING.
5. INDUSTRIAL DESIGN.

VANNEVAR & CO.
 Booksellers and Stationers,

Dealers in the books required by TEACHERS:—The Text Books required for TRAINING INSTITUTES, COLLEGES and HIGH SCHOOLS, and for PUBLIC and PRIVATE SCHOOLS.

Save Time, save worry, save disappointment, save money by sending your orders direct to us.

VANNEVAR & CO., 440 YONGE ST., opp. CARLTON ST., TORONTO.

WALL MAPS FOR SCHOOLS.

The most accurate and best series of Wall Maps published. Drawn and engraved by the eminent Geographer, J. Bartholomew F.R.G.S., Edinburgh. Mounted on Strong Cloth, with Rollers, clearly Colored and Varnished.

NO.	SIZE.	REGULAR PRICE.	NO.	SIZE.	REGULAR PRICE.
1. Railway Map of Ontario,	43 by 33 in.	\$3 00	10. Africa,	67 " 52 "	4 50
2. Ontario,	67 " 52 "	4 50	11. British Islands,	67 " 52 "	4 50
3. Quebec,	67 " 52 "	4 50	12. Australia and New Zealand,	67 " 52 "	4 50
4. New Brunswick,	67 " 52 "	4 50	13. Palestine,	67 " 52 "	4 50
5. Nova Scotia and Prince Edward Island,	67 " 52 "	4 50	14. The World in Hemispheres,	67 " 52 "	4 50
6. North America,	67 " 52 "	4 50	15. The World on Mercator's Projection,	67 " 52 "	4 50
7. South America,	67 " 52 "	4 50	16. United States,	81 " 52 "	6 00
8. Europe,	67 " 52 "	4 50	17. The Dominion of Canada,	80 " 49 "	6 50
9. Asia,	67 " 52 "	4 50			

To any Teacher or Board of Trustees subscribing for THE EDUCATIONAL JOURNAL at .50, we will send one or more of the above Maps, each at \$1.00 less than the regular price. This is an opportunity that should not be neglected. Supply your school at once with first-class Maps at wholesale rates. In ordering Dictionaries or Maps please give your nearest express office.

Address, The EDUCATIONAL JOURNAL, Grip Office, Toronto.

F. H. SEFTON,

— DENTIST —

172½ YONGE STREET, next to R. Simpson's Dry Goods Store

10 per cent. reduction made to Teachers.

ALL BRANCHES OF DENTISTRY.

TEACHERS WANTED.

Of all kinds. Principals and Assistants; also several for Art, Music, etc. Application form and information free.

Address—

THE CORRESPONDENCE UNIVERSITY,

Mention this Paper.

CHICAGO, ILL.

EYE, EAR AND THROAT.

DR. RYERSON,

Lecturer on Eye, Ear, Throat & Nasal Passages

IN TRINITY MEDICAL SCHOOL.

60 COLLEGE AVENUE,

TORONTO, ONT.

TEETH WITH OR WITHOUT A PLATE

PERFECT gold filling; warranted for 10 years. Vitalized air for painless extraction. Best teeth on plate, \$8 per set. Telephone 1476. Special discount to teachers. C. H. RIGGS, L.D.S. Cor. King and Yonge Sts., Toronto.



GOLD MEDAL-PARIS 1878-
JOSEPH GILLOTT'S
STEEL PENS
 — SOLD BY ALL —
 STATIONERS THROUGHOUT THE WORLD

* IMPORTANT! *

High School Teachers!

New Edition of French Literature:

Souvestre Un Philosophe, Sous les Toits.

By T. SQUAIR, B.A., Prof. French,
University College, Toronto,

With Full Notes and Vocabulary.

READY, - DEC. 24th.

W. J. GAGE & CO'Y.

SECOND EDITION NOW READY!

LITERATURE FOR

Third Class Teachers' Examination, 1888

Notes upon the Lessons prescribed by the Education Department
from High School Reader forExamination in Literature for Third Class Non-
Professional Examination, 1888.By J. E. WELLS, M.A., formerly Principal Woodstock College,
Editor of Notes on Cæsar's Gallic War, and Notes
on Third Class Literature, 1887.

PRICE, - 30 CENTS.

What was said of Prof. Wells' Edition of
Literature for 1887.

Recommended to Pupils.

I am greatly pleased with the little work "Notes on Third Class Literature," by J. E. Wells, M.A. While I question the wisdom of placing before students explanations of difficult passages, so as to preclude the necessity of *thinking*, I deem it quite legitimate to furnish them with historical, biographical and geographical notes to save them the trouble of referring to libraries and encyclopædias. I shall recommend my pupils to use the "Notes." Libraries and encyclopædias are not always accessible; moreover, time is precious.

A. G. KNIGHT, M.A.
H. M. Campbellford High School.

The Right Kind.

The Notes are of the right kind—suggestive and full of information upon points needing explanation. They will be very useful to those who have not access to works of reference.

W. BRIDEN, M.A.
H. M. Ingersoll Collegiate Institute.

A Valuable Aid.

It is a valuable aid to the teacher, and will save him a great amount of labor.

M. M. FENWICK, M.A., Niagara Falls School.

W. J. GAGE & Co., Publishers, Toronto.

CAESAR.

GALLIC WAR, Book I., Chaps. 1-33.

With Notes and a Vocabulary. By J. E. WELLS, M.A.

PRICE, - 50 CENTS.

(From the Preface.)

While this little work is intended expressly to meet the wants of students preparing for the examinations for which this portion of Cæsar is prescribed, it will be found none the less suitable for use in all classes commencing the study of this favorite author. To pupils at this stage of progress it is a matter of convenience, almost of necessity, to have within the same covers text, vocabulary, and all needful subsidiary matter in the shape of notes, historical, biographical, explanatory, and critical. This information the pupil must gain from some source. He cannot evolve it from his own consciousness. No teacher can take time to give it *viva voce*. Whether the pupil shall find it ready to hand within the compass of a single manual, or gather it laboriously from many sources, would matter little, save for the great loss of time involved in the latter process, and the danger that the student may neglect or fail to reach a satisfactory result, and thus be in danger of forming, at a most critical stage, a habit of looseness or inaccuracy.

There is really no more educational virtue in turning over the leaves of a large tome than of a small one. Nor is a fact in history, or biography, or archæology, any more valuable, from an educational point of view, for having been run to ground and unearthed only after a long and exhaustive hunt. There is, it is true, a certain advantage in making the acquaintance of standard authorities and works of reference, but the student is pretty sure of becoming familiar with these in the later stages of his course.

The author, nevertheless, fully recognizes the truth and value of the educational principle that nothing should be done for the pupil that he is capable of doing for himself. The more he can accomplish by the exercise of his own unaided powers the better. The only help given him in the mastering of the text, apart from the meaning of the words used, should be in the shape of suggestive hints and questions, and reference to broad principles, until, at least, he has done his best.

W. J. GAGE & Co.

PUBLISHERS, TORONTO.

Hughes' Complete Composition Exercise Books.

Nos. 1 and 2. Six Cents Each.

CHEAPER THAN PLAIN EXERCISE BOOKS.

Just Issued! Just Issued!

Gage's Edition New Literature for

* THIRD CLASS *

Teachers' Examinations, 1888

(IN ONE VOLUME.)

COWPER'S TASK,

(BOOKS III. AND IV.)

Introductory Essays, Life, and Notes on Book III., by JOHN
MILLAR, B.A. Notes on Book IV., by J. E. WELLS, M.A.

-AND-

COLERIDGE'S FRIEND,

(LAST FOUR ESSAYS.)

Life by GEO. A. CHASE, M.A. Notes by J. E. WELLS, M.A.

PRICE, - 75 CENTS.

(From the Preface.)

This little book is intended expressly to meet the wants of students preparing for either the Second Class Non-Professional Teachers' Examinations or the University Junior Matriculation Examination for 1888. All such students will find here, within the limits of one compact and low-priced volume, not only the texts of the work prescribed in English Literature, but a carefully prepared introductory essay, containing much necessary and helpful information, concise biographical sketches of the authors from whom the selections are chosen, and copious notes—explanatory, historical and critical—on all passages that seem to require elucidation in the texts themselves. The student is thus furnished with necessary information on various points which otherwise could be attained only by laborious research in works of reference, such as, in many cases, are not readily accessible.

At the same time the sound educational principle has been kept steadily in view that all such helps should be made to stimulate and supplement, but in no case supersede, the self-reliant efforts of the student. The aim has constantly been to incite, and in a manner compel, him to the vigorous exertion of his own powers, and in no case to do for him that which he could reasonably be expected to do for himself.

Announcement of New School Books and New Editions.

Standard Book-keeping is authorized for use in
Schools of Ontario.

STANDARD

BOOK-KEEPING AND PRECIS WRITING,

BY BEATTY & CLARE,

PRICE, - 65 CENTS.

In order to meet the requirements of the new HIGH SCHOOL PROGRAMME, and make this popular work just what is needed for students preparing for the OFFICIAL EXAMINATIONS, or for business offices, the authors have added an Appendix fully treating Precise Writing, or Briefing; Commercial Terms, and Condensing Telegrams.

THIS ADDITION MAKES THE

Standard Book-keeping and Precise Writing

The most complete and practical work published on the subject for School purposes, and exactly what is needed to meet the demands of the new School Programme.

ENGLISH AND CANADIAN HISTORY.

We would ask the attention of Masters in High Schools to the Topical Analysis of English and Canadian History prepared by J. M. HUNTER, M.A., LL.B., Modern Language Master, Barrie Collegiate Institute. This little book is based upon J. R. Green's History of the English People, and will be found an admirable aid in preparing pupils for the Matriculation and Second Class Examinations.

PRICE, - 30 CENTS.

TRIGONOMETRY.

We have pleasure in advising the trade that a New Edition of—
HAMLIN SMITH'S TRIGONOMETRY will be ready in about ten days. Price 75 cents.

HAMLIN SMITH'S TEXT BOOK ON TRIGONOMETRY is authorized by the Minister of Education for use in the Schools of Ontario.

Important to all Teachers who desire to secure the
latest and best

WALL MAP

- OF THE -

DOMINION OF CANADA

The very great favor accorded to our popular "Excelsior" Series of Wall Maps has led us to extend the list, and we have pleasure in announcing that we will have uniform in Size, Design and Plan with the "Excelsior" Series,

Hands-me Wall Map of the Dominion of Canada.

Among other important features the Railway Systems are
printed in different colors

ORDERS RECEIVED NOW WILL BE DELIVERED IN
OCTOBER.

These will be the Newest and Best Maps. Will contain many interesting features not heretofore shown on the School Maps of Canada, and will be sold at lowest prices.

Sold only by

W. J. GAGE & CO., TORONTO.

What is said by some of the Leading Public School
Inspectors of Canada about the Excelsior
Series of Wall Maps:—

"I am greatly pleased with the maps. They possess every feature to be desired in school maps."

FRED. BURROWS, I.P.S., Lennox and Addington.

"They are clear, the colors good, the execution very creditable, and the information correct. There is no crowding with details, and yet the information is ample for all purposes."

REV. THOS. MCKEE, M.A., I.P.S., South Simcoe.

"The 'Excelsior' Series is no misnomer. They possess all the qualifications of excellent School Maps—cleanliness of outline, accuracy of information, and a freedom from a superfluous mass of matter which tends to obscure rather than to instruct. I shall recommend it for use everywhere."

F. L. MICHELL, M.A., P.S. Inspector, Lanark.

MAPS AND MAP CASES.

"The map is excellent; the mode of hanging the best I have seen; the case enclosing the map to preserve it is a boon to trustees, for with such an arrangement Maps will last many years longer. Economy, excellence and convenience are so combined that the 'Excelsior' Maps should sell at sight where skill is appreciated."

J. S. CARSON, I.P.S., West Middlesex.

"Have seen nothing to equal it, and its price places it within the reach of the Boards of Trustees."

D. P. CLAPP, B.A., I.P.S., North Wellington.

"Your 'Excelsior' Maps are very fine."

G. H. IRWIN, Sunderland.

"Bright and attractive, remarkably accurate and full."

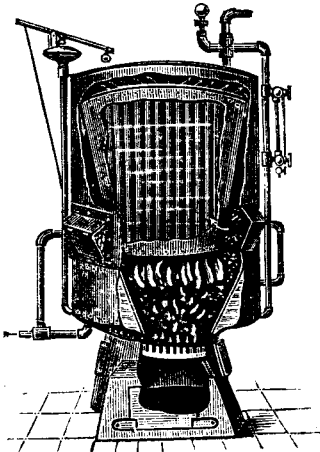
W. H. G. COLLIS, I.P.S., Chatham.

"It seems to me that the Maps are unrivalled."

G. D. PLATT, B.A., I.P.S., Picton.

W. J. GAGE & CO.: Publishers,
TORONTO.

The Gorton
 Low Pressure Steam Boiler
 IS THE BEST FOR HEATING
 SCHOOLS, OFFICES AND PUBLIC
 BUILDINGS.



PLANS, ESTIMATES AND SPECIFICATIONS
 prepared for every description of

HEATING & VENTILATION.

Only the Very Best and Most Reliable Engineers Employed

— PERFECT WORK GUARANTEED —

First-Class Competent Engineers sent to all parts
 of the Dominion. Correspondence Solicited.

SPECIMEN TESTIMONIAL:

ST. MARY'S, ONT., MAY 28TH, 1887.

Frank Wheeler,

DEAR SIR,—I am instructed by the Collegiate Institute Board of Trustees to inform you that the Steam Heating Apparatus put in our Institute Building by you last December has proved highly satisfactory, both as regards the effective way in which the building is heated, and the manner in which the work was executed by you.

The teachers and students no longer complain of cold rooms, or an unequal distribution of heat, but enjoy the comfort of well-warmed and more equally heated apartments.

Yours very truly,

(Signed) A. CARMAN,

Secretary St. Marys Collegiate Institute Board.

FRANK WHEELER,

Hot Water and Steam Heating Engineer,
 56, 58 & 60 Adelaide St. West, TORONTO.

BELL ORGANS

ARE THE BEST IN THE WORLD.

Send for Illustrated Catalogue and Price List (mailed free)

W. BELL & CO.

GUELPH, ONT.

CIRCULAR FREE

CANADIAN BUSINESS UNIVERSITY AND SHORTHAND INSTITUTE

PUBLIC LIBRARY. BUILDING TORONTO

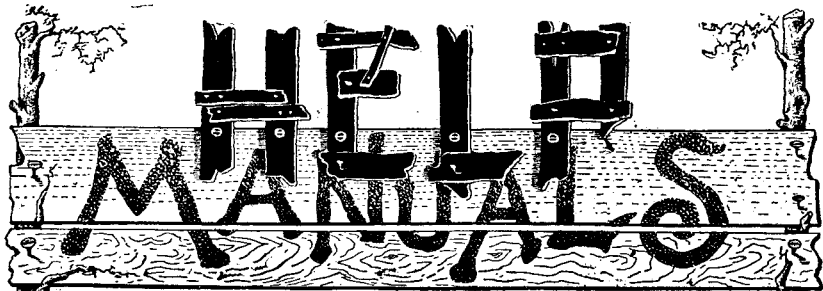
Thos Bengough President Chas H Brooks Secretary & Manager



BUCKEYE BELL FOUNDRY.

Bells of Pure Copper and Tin for Churches, Schools, Fire Alarms, Farms, etc. FULLY WARRANTED. Catalogue sent Free.

VANDUZEN & TIFT, Cincinnati, O.



CATCH-QUESTIONS IN ARITHMETIC is the name of No. 5 of our TEACHERS' HELP MANUALS. This book has had an immense sale in England, and the price of the English edition is equivalent to \$1.35 of our money. The edition which we shall have ready on January 1 is the same as the English edition, except that dollars and cents are substituted, where necessary, for pounds, shillings, and pence. The book contains answers and numerous hints, as well as a variety of original ideas. Subscribers to our series of HELP MANUALS get this book and eight others for \$1.50. The numbers already issued are: No. 1, Practical Grammar; 500 exercises. No. 2, Manual of Correspondence. No. 3, Practical Mensuration (with answers). No. 4, Easy Problems for Young Thinkers (with answers). These books have met with wonderful success. We received a single order on November 15 for one thousand copies. Hundreds of smaller orders have been received, and teachers everywhere are delighted with "The New Idea." We have been besieged with requests for free sample copies. Many think that because we give nine books for \$1.50 we can afford to give away samples. We cannot do this. These manuals are not simple pamphlets, but large, neatly bound, elegantly printed books—books which will sell anywhere for 50 cents each, and be considered cheap.



There are only two ways to secure these books: one is to pay 50 cents each for the cloth editions, and the other, to pay \$1.50 a year for the subscription editions. Nine books make a year. Date your subscription back to No. 1, and get four or five manuals by return mail, and the others on the first day of each month. You must subscribe now, if you desire to get back numbers at subscription rates. For a short time we shall continue to send sample copies of the subscription edition to any address for 25 cents each. No. 5 will be worth the full yearly price.

SPECIAL OFFER FOR A FEW DAYS ONLY. We want you to see these books, and to help you to get started, we make this offer. Get two teachers to subscribe with you,—three in all,—and we will accept your subscriptions for one year at One Dollar each. Do not delay, for this is positively your last chance to secure these books at a reduced rate. Valuable premiums for larger clubs. Mention this paper. Address,

THE SUPPLEMENT COMPANY, 50 Bromfield St., Boston, Mass.

The New Arithmetic, by 300 authors. The best arithmetic in the world. Price, \$1.00.

Eaton's 100 Lessons in Business. A new work. Very practical. Not a book. Price, \$1.00

Canadian Mail should be addressed: THE SUPPLEMENT CO.

P.O. Box 2631, Toronto, Ontario

THE BEST BOOKS

—FOR—

Entertainments and Exhibitions.

THE ELOCUTIONIST'S ANNUAL, No. 15. "The best series of Speakers published." No one should be without all the numbers. 200 pages. Each, cloth, 50 cents; paper, 30 cents.

BEST THINGS FROM BEST AUTHORS, Vol. 5. This volume contains, with all their attractive features, the last three numbers of the Elocutionist's Annual, Nos. 13, 14, and 15. 600 pages. Each, cloth binding, \$1.50. For a limited time we are offering the full set of the series, five volumes, put up in neat and durable boxes, at the special price of \$5.00. The regular price would be \$7.50.

CHOICE DIALOGUES. For School and Social Entertainment. The Dialogues in this book have been arranged on a comprehensive plan, with reference to securing the greatest possible variety, and they have been specially prepared for us by a corps of able writers. Boards, 50 cts.; paper, 30 cts.

CHOICE DIALECT. For Reading and Recitation. This volume contains a rare collection of choice dialect of every variety, covering a broad range of sentiment, and suited to almost every occasion. Boards, 50 cts.; paper, 30 cts.

HOLIDAY ENTERTAINMENTS. Everything is strictly new and has been specially prepared for this book. It is made up of short Dramas, Dialogues, Stories, Recitations, etc., in all of which are introduced many new and novel features that give the spirit and sparkle so desirable for holiday occasions. Boards, 50 cts.; paper, 30 cts.

CHILD'S OWN SPEAKER. This little book is a collection of Recitations, Motion Songs, Concert Pieces, Dialogue and Tableaux, for the very little children of five years' old and thereabouts. Boards, 25 cts.; paper, 15 cts.

HOW TO BECOME A PUBLIC SPEAKER. By William Pittenger, author of "Oratory," "Extempore Speech," etc. This work shows, in a simple and concise way, how any person of ordinary perseverance and good common sense may become a ready and effective public speaker. Boards, 50 cts.; paper, 30 cts.

ILLUSTRATED TABLEUX FOR AMATEURS.
 PART I.—Contains a general introduction (platform, dressing-rooms, frame, lighting, curtain, manager, costumes, announcements, music, etc.), together with twelve tableaux, accompanied with twelve full-page illustrations. Paper, 25 cts.
 PART II.—Contains twelve tableaux, fully described, each being embellished with a full-page illustration. Paper, 25 cts.

The above Books for Sale by all Booksellers and Newsdealers, or mailed, upon receipt of price, to any part of the United States or Canada. Remit otherwise than by two-cent stamps.

THE NATIONAL SCHOOL OF ELOCUTION and ORATORY,

Publication Department, NO. 1124 ARCH STREET, PHILADELPHIA, PA.
 CHAS. C. SHOEMAKER, MANAGER.

TEACHERS AND STUDENTS may have all their book work promptly attended to, either in the new or used line, and on reasonable terms, by addressing,

David Boyle, 353 Yonge St.

Books to various parts of the Dominion, for Inspectors, Teachers and Students, mailed or expressed daily.

CHRONIC PULMONARY AFFECTIONS

Are immediately and permanently benefited by use of

MALTO-YERBINE

It is the best remedy available for all Chronic Pulmonary Affections, Bronchitis, Difficult Expectoration, and for ordinary Coughs and Colds. For sale by all druggists. Send for Pamphlet.

MALTINE MANUFACTURING CO. TORONTO

- THE -

CONCISE IMPERIAL DICTIONARY.

THE LATEST AND THE BEST.

From J. W. CONNOR, B.A.

Head Master High School, Beylin.

[When The Concise Imperial Dictionary was first introduced into Canada, Messrs. J. E. BRYANT & Co. submitted a copy to Mr. Connor and asked him thoroughly to test it, especially in the matter of etymology. Mr. Connor's well-known reputation as a philologist and linguist makes his testimonial of great value to those students of English who may wish to have access to the best results of modern philological scholarship.]

During the last two months I have taken every possible opportunity of testing the accuracy and the usefulness of **The Concise Imperial Dictionary**, and I am now convinced that for general use it is the best dictionary extant.

In *Orthoepy*, it is about equal to *Stormonth*, which is saying a great deal; and it is superior to *Webster*, both in giving the present usage of cultured Englishmen and in employing a notation, which, unlike *Webster's*, can be understood by everyone.

In *Etymology* **The Concise Imperial** is far superior to all its rivals, its editor, Dr. Annandale, having taken full advantage of the labors of Skeat and other late philologists. In this department it quite distances *Stormonth*, whose editor, by his Celtic crochets, has been led into some strange errors, and *Webster*, which begins to need remodelling. In **The Concise Imperial** I have noticed but one derivation to which I would seriously object, that of Huguenot, in which Dr. Annandale has allowed the authority of Ritter, I suppose, to influence him in favor of the old explanation in spite of its phonetic difficulties.

In connection with *the teaching of English literature* I have found **The Concise Imperial** very helpful, especially in explaining words used in unusual senses. Of course I do not say that it will supersede such special works as *Schmidt* for Shakespeare study: but it gives more in this way than I thought would be found in a book of its size. Scientific terms are defined in their present acceptation, which cannot be found in any dictionary published even a few years ago; and in many cases there is added to the definition an amount of useful information that supersedes reference to an encyclopædia.

I may add that our Board of Trustees has, on my recommendation, furnished each of our class rooms with a copy of **The Concise Imperial**. MESSRS. BRYANT & Co. are doing good service to English study by circulating this excellent book.

J. W. CONNOR.

BERLIN, Dec. 13th, 1887.

The Concise Imperial Dictionary, in a beautiful and strong half morocco binding, will be sent by us carefully packed and post-paid to any address on receipt of \$4.50, or in substantial cloth binding, for \$3.25; or it may be had at the same rates from any respectable bookseller.

J. E. BRYANT & CO.,

Publishers, TORONTO.

BOTANICAL NOTE BOOK.

For use of Students in Practical Botany, with Illustrations by F. W. MERCHANT, B.A., H. M. C. I. Owen Sound.

PRICE, - 60 cts.

THE COPP, CLARK CO., Ltd. - Toronto.

Business Forms and Accounts.—No. 3.

For use of High Schools and Collegiate Institutes, with forms of Cheques, Drafts, Bills of Exchange, etc.

By McALLISTER, CLARE & SLATER.

PRICE, - 10 cts.

Nos. 1 and 2 now in use throughout principal Public Schools of Ontario.

THE COPP, CLARK CO., Ltd. - Toronto.

CASSELL'S LESSONS IN FRENCH.

By FASQUELLE. Part I.

Authorized by Department for use in High Schools. Eminent French Scholars say that this book is the best work to be had upon the subject.

CANADIAN EDITION, - 65 cts.

THE COPP, CLARK CO., Ltd. - Toronto.

ELEMENTARY STATICS

By W. H. IRVINE, B.A., Collegiate Institute, Kingston.

For Second-Class Certificates.

PRICE, 50 cts.

THE COPP, CLARK CO., Ltd. - Toronto.

NEW VOLUME OF HENDERSON'S CLASSICS.

Virgil's *Aeneid*, Book 5. With Notes, Vocabulary, etc., by JNO. HENDERSON, M.A., Collegiate Institute, St. Catharines.

PRICE, - 50 cts.

Bellum Gallicum, Cicero in Catilinam, etc., etc., have met with marked favor with the Classical Masters.

THE COPP, CLARK CO., Ltd. - Toronto.

HARKNESS' FIRST GREEK BOOK.

CANADIAN CHEAP EDITION.

Uniform in style with Harkness' Standard Latin Grammar.

PRICE, 90 CTS.

Price of American Edition, \$1.20.

THE COPP, CLARK CO., Ltd., - Toronto.

HIGH SCHOOL GERMAN READER.

By W. H. VANDERSMISSEN, M.A.

Authorized by Department. Price, 75 cts.

THE COPP, CLARK CO., Ltd. - Toronto.

HIGH SCHOOL CHEMISTRY.

By A. P. KNIGHT, LL.D., Collegiate Institute, Kingston.

Authorized by Department. Price 75 cts.

THE COPP, CLARK CO., Ltd. - Toronto.

CHEMISTRY NOTE BOOK.

For class use with Knight's Chemistry, containing spaces for observations, conclusions, etc.

PRICE, - 20 cts.

THE COPP, CLARK CO., Ltd. - Toronto.

HIGH SCHOOL BOOK-KEEPING AND PRECIS WRITING.

By H. S. MACLEAN.

Authorized by Department. In use in principal High Schools throughout Ontario. Price, 65 cts.

THE COPP, CLARK CO., Ltd. - Toronto.

Annotated Book-keeping Blanks,

DAY BOOK, JOURNAL LEDGER, and FIVE-COLUMN JOURNAL, ETC.

With Notes upon Day Book, Journal, etc., and adapted for use with Maclean's Book-keeping. Price 10 cts. each.

THE COPP, CLARK CO., Ltd. - Toronto.

HIGH SCHOOL WORD BOOK.

By J. W. Connor, B.A., and G. M. Adam.

Authorized by Department. Contains an Orthoepist, Verbalist, etc.

PRICE, - 50 cts.

THE COPP, CLARK CO., Ltd. - Toronto.

HAUFF'S DAS KALTE HERZ.

JUNIOR MATRICULATION, 1888.

By W. H. Vandersmissen, M.A. Price, \$1.00.

THE COPP, CLARK CO., Ltd. - Toronto.

MAGNUS MECHANICS.

Canadian Cheap Edition, \$1.00.

Price of English Edition, \$1.20.

THE COPP, CLARK CO., Ltd. - Toronto.

LITERATURE FOR 1888.

Cowper's Task & Coleridge's Friend

Notes by H. I. Strang, B.A., and A. J. Moore, B.A.

PRICE, - 60 cts.

THE COPP, CLARK CO., Ltd. - Toronto.

PUBLIC SCHOOL EXERCISE BOOK,

With Maps, Object Lessons, etc. Specially designed for use in 2nd Book and Junior 3rd Book Classes.

By S. McALLISTER. Price, 5 cts.

THE COPP, CLARK CO., Ltd. - Toronto.

Public School Speller and Word Book.

For Pupils in 2nd and 3rd Book classes. By G. W. JOHNSON, HAMILTON.

Inspectors and Teachers who have examined this new Speller pronounce it the best in the market. Price, 35 cts.

THE COPP, CLARK CO., Ltd. - Toronto.

SLIPS OF TONGUE AND PEN.

By J. H. LONG, M.A., LL.B.

Not only valuable to Students in High Schools, but to all who desire to avoid the errors so common in every day conversation.

PRICE, - 40 cts.

THE COPP, CLARK CO., Ltd. - Toronto.

Strang's False Syntax.

For Candidates preparing for Departmental and Matriculation Examinations.

PRICE, - 35 cts.

THE COPP, CLARK CO., Ltd. - Toronto.

Fraser's Souvestre Philosophie,

WITH VOCABULARY AND NOTES.

PRICE, - 60 cts.

THE COPP, CLARK CO., Ltd. - Toronto.

— SCHMITZ —

Combined History of Greece and Rome.

AUTHORIZED BY DEPARTMENT. PRICE, 75 CTS.

THE COPP, CLARK CO., Ltd. - Toronto.

Todhunter's Advanced Algebra, . \$1 75

Todhunter's Algebra for Beginners, 60

Todhunter's Plain Trigonometry, - - 65

Todhunter's Euclid, Complete, - - 90

Todhunter's Euclid, Books 1, 2, 3, - 40

ALL AUTHORIZED BY DEPARTMENT.

THE COPP, CLARK CO., Ltd. - Toronto.

— HARKNESS' —

Revised Standard Latin Grammar.

AUTHORIZED BY DEPARTMENT.

CANADIAN EDITION, \$1.00.

THE COPP, CLARK CO., Ltd. - Toronto.