

# THE EDUCATIONAL REVIEW.

FOR THE ATLANTIC PROVINCES OF CANADA.

VOL. XVII. No. 9.

ST. JOHN, N. B., FEBRUARY, 1904

WHOLE NUMBER, 201.

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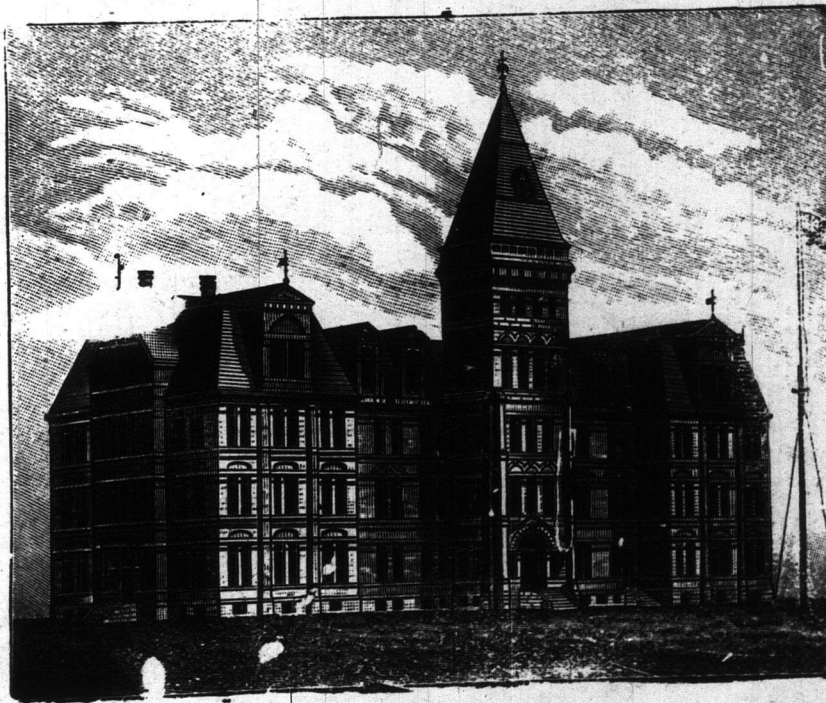
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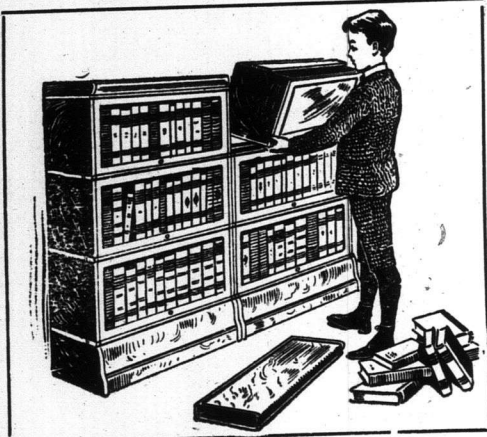
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A. McKAY,  
Editor for Nova Scotia.

## THE EDUCATIONAL REVIEW.

Office, 31 Leinster Street, St. John, N. B.

PRINTED BY BARNES & Co., St. John, N. B.

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THE salaries of the female teachers of Moncton are to be increased. The salary for the first term is to be \$225, to be increased every second year until the maximum of \$300 is reached.

HON. DAVID WARK, Senator, of Fredericton, N. B., is the oldest active legislator in the world. He will, if he lives until February 19th of this year, be one hundred years old. He enjoys good health, retains possession of his faculties, has taken part every year in the deliberations of the Senate at Ottawa, and expects to do so this year. His long life has been a record of simple living and honorable dealing.

THE Dominion Educational Association will meet in Winnipeg, July 13-15. A fine programme has been outlined for the meeting, and a committee of Winnipeg teachers, under the direction of Mr. W. A. McIntyre, Secretary of the Association, is busy making local arrangements. The time chosen is one that, with a little foresight and planning of their work, will suit the majority of eastern teachers. Announcements will shortly be made, giving the programme, rates of travel, and the side trips proposed.

TEACHERS should be as much as possible in the open air. Enjoy the pleasures of this rigorous but beautiful winter weather. If you have snowshoes, put them on and walk over snow banks and through forest paths. The woods have a beauty all their own in winter, and you appreciate this beauty the more in the keen wintry air which sends the blood coursing swiftly through your veins, and makes it a delight to live. Take a vigorous walk on snowshoes for an hour or two every day and you may snap your fingers in the face of Jack Frost and bid him do his worst. Invite some of the larger scholars to be companions of your walks, and many schoolroom troubles will vanish.

THE members of the Jocelyn Botanical Society of Maine will hold their annual gathering at Fort Kent, on the Upper St. John river, during the first week in July next. An invitation has been extended to the botanists of the Atlantic Provinces to meet with this active society, and join in the field work and discussions. The region is one of great interest to plant students, and the meeting will undoubtedly be a great stimulus to workers in these provinces, enable them to cultivate pleasant relations with their co-workers on the other side of the border, and enjoy a week's pleasant recreation and study together in a portion of country attractive for its natural scenery and the variety of its plants. The occasion might be utilized also to form a society for these provinces of those interested in botany and forestry. We have many workers among us, but they need the stimulus that comes from frequent association and united action.

### Better Salaries' Campaign.

The campaign for better salaries to teachers is now on. The justice and moderation with which the claims of teachers have been presented have already won for them the consideration and support of the press, and of all fair-minded people. It has been shown that the salaries of teachers are below that of other wage-earners, that while the expenses of living have increased the pay of teachers has remained stationary, or even decreased, and that through a lack of adequate remuneration many of the best and most progressive teachers are seeking other employments, leaving their places to be filled by persons less competent and experienced. The result may be easily foreseen. Unless adequate living salaries are provided, teaching will be largely left in the hands of those who are dear at any price, and the interests of education will suffer in a corresponding degree.

One of the most interesting and business-like of the documents bearing on the salary question is that of the female teachers of St. John in their recent application to the board of trustees of that city. The moderation of their demands appeals to everyone's sense of justice and fair play, and the spirit in which it is worded is unmistakable. They indulge in no words of complaint, but they arrange their arguments in serious and dignified language, and support their claims by quotations and comparisons so aptly chosen and skilfully applied that it is difficult to see how their arguments can be successfully met except by a prompt compliance with their request. We have no doubt that the justice of their claims and the spirit and moderation with which they are supported will appeal to the board of trustees as it does to other citizens of St. John.

The application stated briefly is, that female teachers now employed shall receive an increase of \$50 a year, and an annual increase thereafter of \$25 for six years until the maximum of \$400 is reached; that assistant teachers be paid a minimum of \$200 a year; that the minimum salary of a teacher when appointed shall be \$250, with an annual increase of \$25, as shown above in the case of those now employed; that female teachers in the high school shall begin with a minimum salary of \$450, to be increas-

ed annually for six years until the maximum of \$600 is reached.

An instructive comparison may be made between the teachers of Philadelphia and the female teachers of St. John in their demands for better financial recognition. In the case of Philadelphia, it was claimed that less was paid to teachers than in any other leading city of the United States; in St. John the women teachers have shown by figures that they are paid less than those of any other leading city in Canada. A few months ago the teachers of Philadelphia entered upon a campaign for better salaries. The increase has been granted and the higher payments begun within a year! The *Philadelphia Teacher* shows how this was brought about:

It is a tribute to the intelligence and good sense of the community generally, and of the board of education and city councils in particular, that the necessity as well as the justice of the proposed increases were recognized with such unanimity. . . . Two facts stand out prominently in a present retrospect of the campaign,—first, the thoroughness of the organization by which it was possible to carry out every detail of the movement as planned by those in direct charge of the affairs of the Philadelphia Teachers' Association; and, second, the able, courageous, and indomitable leadership of the president of the association. With either of these elements lacking, it is doubtful if the movement, however just, and however necessary, could have been successfully concluded; it is certain that the conclusion could not have been reached in so short a time, or with such widespread satisfaction as now exists.

. . . But best of all, a right principle has been established, and one which gives assurance that this city will never willingly allow other great cities to lead her in important public matters.

The lesson in the above is obvious, not only to the women teachers of St. John, but to the teachers' associations of New Brunswick, Nova Scotia, Prince Edward Island and elsewhere throughout Canada. Clear and convincing arguments, and such as no one can dispute, may be published by the yard, but if these are not followed up by the organized effort and the personal work that are found effective in other campaigns, it may take years to accomplish what should be accomplished in a few months. A published declaration such as that by the women teachers of St. John should not lose its effect by allowing people to become lukewarm after the first shot is fired. The influence of the press, the assistance of prominent men, city and municipal councils, the legislature and the board of education, should be enlisted until the victory is won.

**A Letter from Mr. Maggs.**

*To the Editor of the Educational Review:*

DEAR SIR,—I feel sure that you will not refuse me the privilege of a rejoinder to your comment upon my piece in the December number. I do not ask this in any controversial spirit—in fact I should not have asked it at all, but for one or two passages which you chose, perhaps very properly, to omit from my manuscript. Your editorial reference to what I had to say is moderate and kindly, and I find nothing to resent in the sympathy which you feel for me in holding such old-fashioned notions, and being so undeveloped on the “nature” side. But that teacher of mine was a lover of nature, and I hope I am myself, and your regrets would scarcely have been *apropos* if you had allowed me to say in print, as I said in my manuscript: “I submit that a youngster does not best acquire a love of nature and a reverence for her wonderful works by picking a flower to pieces on his desk at school. But let him rise with the sun occasionally to greet the dew and the daisies and the birds singing in their leafy choirs; and if his observation of nature and his love for her be not quickened, then he is of the earth earthy; and his analysis of faded specimens at school simply keeps him out of worse mischief,—that is all.”

I trust that you will not misapprehend my motive in requesting to be heard again on this matter. At the best, it is hard for us to make our fellows understand us. But if there is room for argument as to the justice of my attitude toward natural science, I think that you also were scarcely just in what you implied was my attitude toward nature. I am a friend of nature study, but I am hostile to natural science as it has been taught, and is still taught, in a great many of our schools, and to the requirements in natural science laid down in the course of instruction. The *new* nature study has come none too soon, and I consider our methods of teaching science as not the least of the abuses which it has to reform.

Respectfully yours,

A. B. MAGGS.

Sussex, N. B., January, 1904.

[Mr. Maggs' letter was received too late for the January number. We welcome it and the spirit in which it is written. It is hard, as he says, to make our fellows understand us; but a respect for one another's opinions and aims with a desire to inter-

pret these justly certainly goes far to secure that end. Mr. Maggs' paper, the larger portion of which was published in the December REVIEW, was sent at the request of the editor. The above extract and others were left out in the attempt to make the paper fit a given space.—EDITOR.]

**Miss Bates's School.**

The casual remark that the trustees over in Bayfield were looking for a teacher set Sarah Bates to thinking. She had come to a point where she must decide upon her life-work. Her brother was to remain on the little stony farm, and she—the only other child—what should she do? She had attended the academy at Vinton for a year and had been a member of the “teachers' class.” She had thought, while attending the district school at home, that she would do any kind of work rather than teach; so many rude and unkind things made a large part of the teacher's lot. Teaching was to be a target for petty criticism, to lack sympathy, to wage war with school-boy trickery.

The opening address by the principal to the “teachers' class” put teaching before her in a new light. “If an angel should descend from heaven to live among us he would unquestionably become a teacher. The reason people put so small a value on the teacher's work is because what he does is rarely real teaching, but a substitute for it.”

This principal was a man of unusual mental powers; no matter what study they recited to him the pupils left the class with wonder; he invested grammar, algebra, penmanship, or Latin with interest. A not over-bright boy expressed the general thought by saying, “A fellow could learn anything, even Sanskrit, from him.” He seemed to teach from sheer love of introducing the pupil to new fields of thought; he plainly had a positive pleasure in making young people happy. And then he had read widely and was a keen observer of nature. To pluck plants, whether laden with flowers or not, to observe the forms and arrangement of the leaves, was a never-tiring delight to him while walking along the roadside or through the fields. With the curious ways of insects and birds and the history of the rounded pebbles he had made himself familiar. He had a special delight in reciting poetry to the class in literature, and, of all authors, Browning was his favorite; so often had he recited Rabbi Ben Ezra that many of his pupils knew it.

Miss Bates had, unknowingly, caught a good deal of the spirit of her teacher; if she should ever teach school, she said to herself, it should be in the way he was doing it. That year in the academy seemed to be almost like a year in heaven. A strong glow of feeling now possessed her to open to others those new and beautiful fields of thought, fancy, and fact; no pursuit in life was so entrancing as teaching. The daily discoveries, the poetry she learned and recited (a common practice), deepened her purpose to live like the glowworm in diffusing light, and she returned to her home quite another being than when she left it. Then she thought of selecting a pursuit from the standpoint of money earning; now she thought of expressing, in a strong and delightful way, the desires she had for causing young people to live and think nobly and beautifully.

She applied for the school in Bayfield, a tiny village containing a dozen houses scattered along a single street, and was appointed. Teacher and pupils faced each other one bright September morning and the problem of molding humanity into better forms was now to be undertaken. As she sat at her desk and the younger boys and girls came shyly in and the older ones roughly and defiantly, as she thought, the words of her principal rose in her memory: "It is not the arithmetic lesson or the geography lesson that will mold the character, but *you*; it is your inner purposes that will affect their inner purposes; what your motive is will be their motive."

The school house was an exceedingly plain one and stood at the crossing of two roads; opposite was an open, breezy woods, where a great gray rock lay, around and on which the pupils assembled at noon-time. The teacher, seeing the pleasure they took in this pretty spot, proposed the making of rough seats and a table, and it turned out that the noon-time was turned into a daily picnic. Seeing and feeling that the group looked to her as a thought leader here, as well as in the school room, she told them of the queer antics of a pet crow—suggested by the cawing of crows in the high tree-tops. She had won quite a reputation at school for weaving into her compositions ideas suggested by the natural world, moving into higher realms, it is true, but, after all, based on the incomparable and undying story of poor Cock Robin, over which so many millions of children have mourned, and over which millions more are destined to experience an indefinable poignancy of interest and grief.

The unpleasant autumn weather came on and they could no longer assemble at Stony Rock, and besides

the telling or reading of stories, the noon-time was employed in the playing of games in which the pupils assumed characters, as Solomon, Joseph, Napoleon, Nelson, making some statement or doing some act, leaving the others to think and guess. Still debating she wrote to her teacher for light on the problems that confronted her. His reply was: "Your motive in the story-telling and in the lessons will be the same—the happiness of your pupils. The mother ceases to hold the child on her lap, but encourages it to walk, even though it walks away from her, because she knows that walking will yield larger to the thought that the interest must arise from happiness and of a kind more suited to the development the child has reached."

Miss Bates had set out with the determination that her pupils should be interested; she began to advance the right employment of their activities. The physician in Bayfield, Dr. Forman, was a college graduate, and with him she had many conversations; he agreed with her that there was a vast waste of time and effort on mastering reading and spelling. His advice was that the pupils should write down her stories and the information they gained about the world around them, and acquire spelling on the same principle as they did walking. It was noticed and much commented on by the parents that the children had become great readers under the new teacher's administration.

Miss Bates had learned that a love of novelty is an essential and not to be overlooked element of childhood, implanted by the Creator for the purpose of making great attainments in knowledge possible, and she planned for new features in the school exercises continually. It became a study with her to let the creative powers have opportunity; in one corner of the room was a plain table and a few tools. Here the boys cut paper and thin boards into various forms; here, too, were several shelves on which their productions were placed. A part of every day was spent in making or creating; at this time the school might have been mistaken for a workshop. Each of the four grades had a list of articles they could make. On one of the "Parent Days" four tables were spread with articles made. Dr. Forman explained that, while this was not done when he went to school, yet it helped to make the boys and girls intelligent. It was one of the new discoveries in education.

The spring came; great expectations had been expected concerning their gathering once more at the Stony Rock. Several of the older boys



were to leave at the end of the month to assist at farm work. It was determined to assemble at the Rock on the first bright, warm day. The benches had been replaced; the table was spread with napkins, and a special supply of apples and cakes was laid on them. A single verse was sung:

I thank thee, Lord, for food and health,  
And for thy care of me;  
Continue gifts from day to day;  
Our lives depend on thee.

The repast was a great advance upon the rude ways which prevailed a few months before; they had learned to eat in a manner fitting their general culture. This over, earnest requests arose for a story. "Tell us the Eagle story again." So Miss Bates began:

"A farmer found a young eagle that had fallen from its nest in a high tree and took it home and put it in a cage. His children were much delighted to give it crumbs of bread. It grew tame and it was allowed its liberty, and soon began to mingle with the hens and geese in the barnyard. One day a sound came from the clear heavens which startled the whole barnyard. The eagle looked up and evidently was much agitated: again the cry came from the sunlit heavens and the eagle raised his wings as if he would join the bird in the sky; it was the call of a fellow-eagle, and possibly a brother, that had remained in the nest. He soared up and stayed on the peak of the barn and looked earnestly upward. His wings were not strong for want of exercise and he dejectedly returned to the barnyard. Still, as he heard the note far, far above him, he felt that up there and not in the barnyard was the true place for an eagle. He walked about so evidently unhappy that even the geese pitied him."

That a story like this would reverberate in the minds of her older pupils during the summer months while engaged with toil on the farm, the teacher felt certain; the work she had begun would grow in her absence, possibly better for her absence, for the full force of nature could then be felt.

The closing day, Miss Bates felt, should bring the parents and children together, and she determined to end the school year with a picnic in the adjacent woods. A platform was erected and trimmed with evergreens; tables were made; the people brought chairs in their wagons. After the singing, the recitations, and the compositions, the physician and the minister made brief speeches. "This has been more than a school," they said. A plain farmer said, "I never cared what they did in that school house before."

The pupils were made sad by learning that their teacher would not return to them in the autumn; she had been invited to engage in a broader field of work

in a city at some distance. The closing piece was one in which she took a part, the pupils greeting her and she replying in appropriate quotations from Longfellow. At an appropriate quotation, unexpected by her, a crown of roses was placed on her head and a mantle of roses laid on her shoulders. The parents had been let into the secret and the denouement was awaited with breathless interest. This over, the whole party gathered about the tables. The good cheer, the interest of the children, the evident capacity for leadership in the teacher made a deep impression on the people. Her influence lingers yet in Bayfield, for there is a stronger enthusiasm about all works of art and such skilful teaching must be considered to be the best kind of success.—*Adapted from the Teachers' Institute.*

### St. Valentine.

Long ago there lived a bishop whose name was Valentine.

He loved his people dearly and was always thinking of kind things to do for them. He so loved the little children that he sent them messages of love when he grew too old to go to see them.

In spite of all his goodness the people whom he so loved grew angry with him because he could not believe as they did. They seized him; put him in chains and cast him into prison. Many years passed. The people of the good bishop saw that they were wrong and he was right. They remembered how kind he had been and how he had loved them even when they cast him into prison.

They were sorry and greatly ashamed because they had so ill treated him. So they made him St. Valentine and set aside the fourteenth of February, his birthday, to be kept every year by sending messages of love to their friends.

We, too, keep his birthday each year by sending messages of love to our friends.—*Selected.*

Many, many welcomes,  
February, fair maid,  
Ever as of old time,  
Solitary firstling,  
Coming in the cold time,  
Prophet of the gay time,  
Prophet of the May time,  
Prophet of the roses,  
Many, many welcomes,  
February, fair maid.—*Tennyson.*

### Woodpeckers.

This group or family of birds comprises about 250 species, and out of the lot we have in our Maritime Provinces seven species.

1. Pileated Woodpecker (*Ceophlæus pileatus*).
2. Flicker, or Yellow-hammer (*Colaptes auratus*).
3. Yellow-bellied Woodpecker (*Sphyrapicus varius*).
4. Hairy Woodpecker (*Dryobates villosus*).
5. Downy Woodpecker (*Dryobates pubescens*).
6. Arctic Three-toed Woodpecker (*Picoides arcticus*).
7. American Three-toed Woodpecker (*Picoides Americanus*).

These are no birds for song and story, such practical plodders are not suited to poetical purposes. With no tuneful talent, nor any special habits to startle curiosity, or set in action the imaginative faculty, they have been set down among the commonplaces of the feathered folk. Birds that hunt all day long for grubs and bugs in rotten trees and logs, and use their heads for hammers, and their bills for chisels, and their feet for climbers, and utter no pleasing notes, and build no pretty nests, must not expect to rank as high in human estimation as larks and nightingales and thrushes, and many other winsome creatures in feathers.

In spite of these drawbacks, woodpeckers are exceedingly useful to mankind in keeping down the insect tribes. They are never harmful to our interests, and live on good terms with other kinds of birds. Aside from these items, they have many aspects of structure, and habits that are of great interest to those who care for this humble class of our fellow-creatures.

A typical woodpecker is a highly specialized bird. In order to be well-equipped for the main business of life, serious organic compromises must be effected. The feet and legs are admirably adapted for climbing purposes, but they are useless for walking or running. The tail is used as a brace, hence the feathers are stiff and pointed, the bill is sharpened up and down into a chisel-edge, the tongue can be extended far beyond the bill, and the end is a many-barbed spear to probe and withdraw grubs from their hiding-places.

We are confident that woodpeckers were not among the first feathered creatures. The fossil evidence on that point is conclusive, and show that

the earliest birds were socket-toothed, like reptiles, and must have subsisted upon lizards, amphibians, frogs and shell-fish. Some of them were waders, as indicated by the length of their legs; others again were unable to fly, as we see now in ostriches, and several other species. This is known by the absence of a keel on the breast-bone, that serves as a secure anchorage for the large down-stroke wing-muscles.

The greatest moving agency of all life is hunger, and whenever there are nourishing morsels to be



had, there some organic structure has managed to get them.

We may be sure that woodpeckers were not suddenly produced by a creative fiat, with all their special equipments for obtaining grubs from rotten trees, and a supply of them ready for immediate consumption. We are at the head of earthly creation by virtue of our minds, of our powers of thought and reflection, and reasoning faculties. Truth alone is the proper object of all our quests. "Prove all things," is apostolic advice."

"Come, now, and let us reason together," saith the Lord, is a very old invitation to a rational conference that has ever met with a tardy response. With this word of admonition we go on with the woodpecker's story.

The great majority of birds are glad to find grubs. If that had not been the case long ago, no insects would have hidden their eggs, from which grubs are hatched in the bark, and under the bark, and in the wood of trees. When anything takes to cover, you may be sure there are enemies at its heels. The egg-depositing drill of our insect is the organic response to insect-eating birds, and the woodpecker is in turn a response to the drill and the habits that go with it. Both of them are the products of evolutionary processes. They have emerged from the perpetual struggle for existence.

If by chance this woodpecker specialist becomes stranded in a region where there is no adequate reward for his hard work, then he would do as the kingfishers I have mentioned, that no longer follow the old family vocation. In South America, on the plains of La Plata, that is almost treeless, there is a woodpecker (*Colaptes campestris*) that has given up the chisel and hammer business, and gets his living upon the ground, and nests in holes in the banks.

Two of our species have somewhat fallen from true woodpecker estate. These are the Yellow-hammer, or Flicker, and the Yellow-bellied. The former may often be seen with her young brood out in the grass helping themselves to insects. The latter species is fond of sap, and taps the trees to obtain it, and visits them regularly for that purpose, and at the same time does not overlook the catch of silly flies that have become drowned in the sweets, like the prince in the butt of wine. This "Yellow-belly" has a feeble bill, and a tongue that can be protruded but a little distance, and lacks on it the stiff barbs, having instead numerous bushy filaments. Neither of these two species venture to try the rigorous climate of our winters, but migrate into the Southern States. Nothing in the way of woodpecker structure, but the very best is equal to awakening on a cold limb in the lead of winter, and then begin to peck the frozen wood, and keep at it till something is found to alleviate the pangs of hunger.

Our Hairy, and Downy woodpeckers are to be found all the way from Nova Scotia to the Pacific

ocean, but in that distance they have taken on some species lacks two inches the length of the former.

With us in the East, these two species are so nearly alike in color that the only difference is that the two outer tail feathers of Hairy are white; in Downy they are barred black and white; the latter lacks two inches the length of the former.

In the region of the eastern slope of the Rocky Mountains the wing spots disappear on Hairy, and Downy, and a smoky tinge appears on the under parts. These are nothing more than varieties, but if we did not have before our eyes all the gradations, they would be ranked as separate species.

Our two species of three-toed woodpeckers present an interesting problem. All other birds of this family have four toes, two turned forward and two backward, as we see in parrots. In this instance the first toe is lacking; the fourth, by series, is turned back, reversed, and the birds are good climbers, but no improvement on the general plan. It is no new thing to see animals parting with their toes, as in cats and dogs, where useless claws dangle on the legs; or in cattle, deer and swine, where the dewclaws are but vestiges of toes; or in the horse, where but one toe remains to each leg. In all these instances, the toes ceased to function, and under the operation of a universal law, they are disappearing. A fossil lizard species has but four toes, a species of monkey is destitute of a forefinger. The explanation would seem to be that far back in the history of these woodpeckers, the first toe became inactive owing to a mode of life very different from now, and disappeared; later they developed into woodpeckers, but never regained the lost organ. The problem will do to think about seriously, and that will be good for all of us.

The Three-toed woodpeckers have a golden crown, and by that mark they may be distinguished when there is no opportunity to count their toes.

The Yellow-belly adult male has a crimson crown and chin; female has a white chin; young birds no crimson.

The pileated woodpecker is much larger than any other species north of Florida. All our woodpeckers' nests are excavated in trees; eggs always white, and the reason for that is worth looking up.

I receive invaluable aid from the REVIEW, and I hope you may long continue to serve so efficiently the teaching profession.

Albert Co., N. B.

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## Drawing--No. IV.

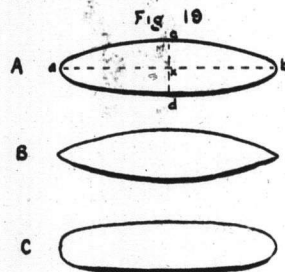
F. G. MATTHEWS, TRURO MANUAL TRAINING SCHOOL.

NOTE.—To avoid repetition, references will frequently be made to figures appearing in preceding numbers. It will be well, therefore, for readers who wish to follow these articles to keep back numbers by them.

## 4.—THE CIRCLE AND CYLINDER.

If any number of common objects be examined, no figure will be found to occur more frequently than the circle. It will be well, therefore, to observe the alterations in appearance that take place with change of position. First take the horizontal circle. Let the student place a number of circular objects, such as a plate, cup, glass or bowl, on a table, and examine them from some little distance. The circles forming the tops of each of the objects have apparently been changed into ellipses, with the major axis of each perfectly horizontal. If the point of view be changed, the same result will be noticed, and the same holds good when the objects are placed above the eye-level. Since vases, columns, etc., standing in a vertical position, contain numerous horizontal circles, the importance of keeping the long axes of these apparent ellipses that represent the circles quite horizontal is evident.

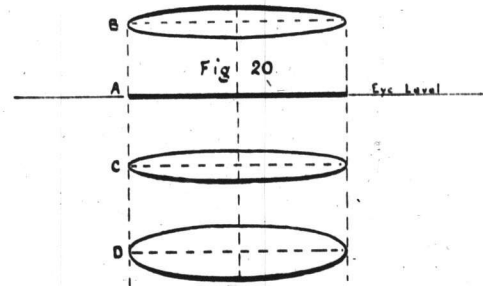
To prove the truth of these observations, the tracing plane may again be used. Cut out a large circle of paper and fasten to a drawing board. Having placed the board horizontally, make a careful tracing. The resulting ellipse will be found to have its long axis parallel to the top and bottom of the tracing plane. Now turn the board with the circle at a different angle, and let another tracing be made. The result, however, will be the same. This ellipse, being a true ellipse, will have its axes perpendicular to one another, and bisecting one



represent the long axis, bisecting it at  $x$ . Now by another, so that the method of drawing a foreshortened horizontal circle is a simple matter.

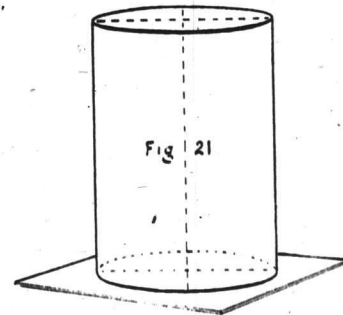
First draw a horizontal line  $ab$  (Fig. 19 A) to

using the pencil alternately horizontal and vertical, as in Figs. 7, 8 and 9, the length of  $cd$  may be compared with  $ab$ . The line  $cd$  may then be drawn vertically through  $x$ , with its middle point at  $x$ . A curved line drawn through  $abcd$  will give the apparent view of the circle. The drawing thus made should be carefully compared with that on the tracing plane, as two very common errors can thus be avoided. One is to make the ends of the ellipse too pointed (Fig. 19 B) and the other to make them too round (Fig. 19 C). When these difficulties have been overcome, good practice may be had by raising and lowering the paper circle to different levels, and drawing it in each position (Fig. 20). When done, note the changes. The



long axis remains the same, but the short one varies, getting longer the farther the circle is above or below the eye level, while on the eye level the circle appears as a straight line.

Now look at Fig. 21, which represents a cylinder



standing on end. The top and bottom surfaces are simply circles at different distances below the eye level, so that the lower one is slightly broader than the upper, while the sides are vertical lines drawn tangential to the two ellipses. A drinking glass is very similar, the only difference being in the lengths of the long axes of the upper and lower ellipses, thus causing the sides to slope instead of being vertical, as in the cylinder. From the foregoing, one would be inclined to argue that because in the horizontal circle the major axis appears as a

horizontal line, that of the perpendicular circle will appear always as a vertical line. This, however, is a wrong conclusion, and the reasons for its being so should be thoroughly investigated by the student.

In the drawing of the roller, Fig. 22, the long

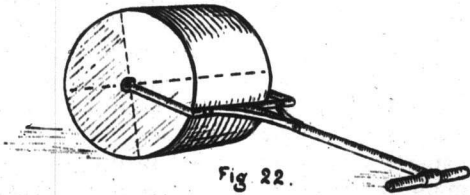


Fig. 22.

axis of the elliptical end is not vertical. As the edge of the roller appears to slope upwards, the person supposed to be looking at it must be standing above the roller. A line drawn from the middle of the elliptical end at right angles to the long axis will be found to run exactly through the middle of the cylinder.

Fig. 23 shows another vertical circle representing

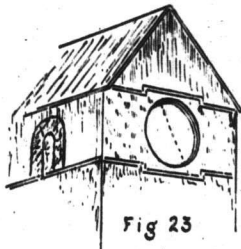


Fig. 23

a window. This time the circle is above the eye level, and again the long axis is not vertical. To prove the correctness of these drawings, take the tracing plane again and the board with the paper circle on it. Place the board with its circle upright in three positions above, on and below the eye level. Although upright, turn the board at an angle instead of parallel to the tracing plane. Standing a few feet away, make a tracing in each position, and then compare the results (Fig. 24). It will be seen

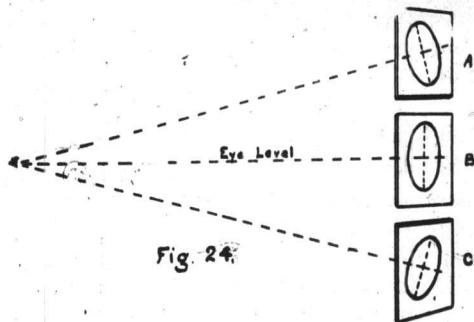


Fig. 24.

that the long axis of the one on the eye level is vertical, while those of the other two are sloping.

Fig. 24 shows the relation between the observer and the drawing. The line passing from the eye to the centre of the ellipse is at right angles to the long axis of the ellipse, and is in fact a continuation of the short axis of the ellipse. It will be evident, then, that if the observer move to a greater distance from the circles, a different result will be obtained. The lines passing from the eye of the observer to the circles will be such that the long axes at right angles to them will be *nearly* vertical. The circular window is therefore evidently drawn by an observer standing near the building. If the observer removed to a distance sufficiently great to comprehend the whole building at a glance, the ellipse would appear almost upright. To sum up our investigations, the amount of slope we must give to the long axis of the ellipse depends on the distance of the circle above or below the eye level, the angle at which it is turned from the observer, and the distance from which it is viewed.

### Drill in Arithmetic.

The following is the plan of a drill in arithmetical computation which I have never heard of failing in interest. Its two purposes are rapidity and accuracy.

Place the pupils' names on the blackboard. Let the pupils take slates or paper. Let each pupil write his or her name on the slate or paper. The teacher then reads out numbers, which she also, at the same time, writes upon the board. The pupils write these numbers on their slates, and then perform the computation, whatever it may be, write the answer, and place their slates in a pile, work downward, upon a table which has been placed conveniently for this purpose. When all the slates are in, the teacher writes the correct answer upon the blackboard, then reverses the pile of slates. The first slate in, if the answer is correct, counts 100 for the pupil whose name is on the slate. If not correct, it is thrown out without credit and the next slate, if correct, gets 100. If the first be correct and the second also correct, the second receives a credit of 95; the third, if correct, 90; if not, it is thrown out without credit, etc. The credits are written on the board, and when the drills are over the credits are added and the pupil which has the most wins. The pupils will invariably endeavor to secure a high standing. Try it to see, —*Selected.*

**Primary Grades—Seat Work.**

In the early months of the school year when it is so hard for little people to settle down to real work, I have found this device in seat work profitable employment for the so-called "busy-work" period. Materials required: Discarded readers, clippings from newspapers, magazines, etc., thin cardboard, envelopes.

For the first step in the work select a page that has a picture. Mount the picture and printed story on separate pieces of cardboard. Now write the story on another piece of cardboard and cut between words. Put mounted picture, printed story and cut up words into envelope. Now this seat work is not mere "busy work," and it can be used in several ways. Of course the first way which suggests itself is matching the written words to the printed story. A child never tires of this, and you will find he learns a great deal from the comparison and discrimination used in his work.

Another way is to read the printed story silently, put it back into envelope, then arrange written words to tell the story about the picture. Again to vary the lesson, tell the children to leave picture and printed story in the envelope. Select the written words, beginning with capitals, and make as many sentences as possible. Now take out the printed lesson and compare. Some day, give the children paper and let them copy the printed story. Now arrange the written words and have the children compare their written work with that done by teacher. This may, or may not, be an aid to work in penmanship—depends on how carefully the teacher's work has been done.

Now in order that this seat-work, or any seat-work, may be successful, we must make the children feel that their work is to be inspected and appreciated. It does not take very much time out of a lesson for the teacher to walk up the aisles, give a little pat here, a nod there, a "silent word" to the lazy child, while his industrious neighbor receives a "Well done, John!" If there is time, allow some child who has done his work extra well to read the story to the class. After a child has worked hard, I think he is entitled to a little reward for his effort. There is nothing much more discouraging to a pupil, than to work diligently all the session and have his seat work collected without a word from the teacher. Now if something should happen so that you cannot inspect work it will not lower your dignity very much to *explain* to the little folks why you couldn't look at their work.

I have been asked in connection with the aforementioned device in seat-work, if there isn't some one in the class continually raising his hand to say that he can't find certain words. No, for I tell the children at the beginning of a period to leave a space for the word they can't find and go on. It is a good idea to have a number of the small cardboard slips on the desk, and just before the envelopes are collected, write the missing words and give to owners.—*Primary Education.*

**Primary Language.**

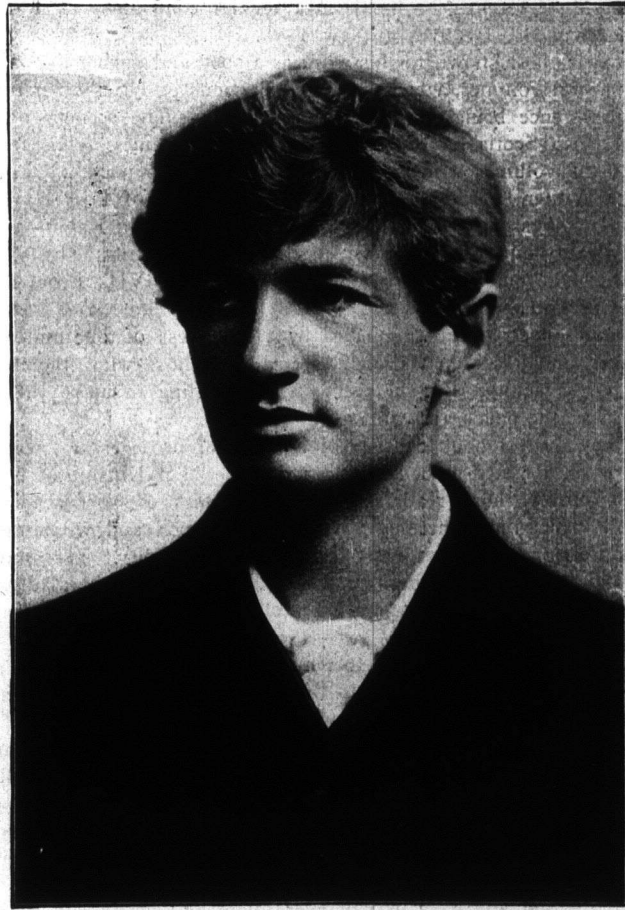
I offer some suggestions for primary language, which, though not new, may prove helpful. In the second grade, in the early part of the year, I use questions, having the children copy them from the board and write answers. I begin with simple questions which they can readily answer, such as, "What is your name?" At first I have the answers given orally before they are written so as to be sure that each answer is a complete statement; also to show that the answers may be worded in different ways. For example, in answer to the question, "What is your father's name?" either of these answers may be given: "My father's name is James Gray." "His name is James Gray." "It is James Gray."

After considerable practice in writing answers to questions, I place on the board lists of suggestive words and they are required to put each word into a question. Questions may be written on cards and distributed, thus giving different ones to each child, and the cards, being changed, will answer for many lessons. I give a list of some of the questions I have often used, the answers to which do not require an extensive vocabulary, as many of the words required for the answers are found in the questions:

How old are you? How many sisters have you? Where do you live? What day is it? What month is it? What season is it? In what month is your birthday? What do cows eat? What do squirrels eat? What fruit grows on a tree? What fruit grows on a vine? How many doors in this room? How many windows in this room? How many children in your class? How many legs has a fly? How many feet have five boys? How many legs have two chairs? Who is your playmate? What is your teacher's name? What tree bears cones? What tree bears acorns? What tree bears white bark? etc., etc.

In forming these questions you can make use of many facts that have been taught in nature study or in physiology. Arithmetic may be brought in, in such questions as "How many arms have six girls?" Questions may be asked concerning many things in or near the school, calling for observation on the part of the pupil. I sometimes have the children write questions which they read aloud, calling upon some member of the class for the answer.—*Primary Education.*

The high school of a western city has a plan which I have not known elsewhere. Each class selects a class-room and adopts it as its own. The room is exquisitely frescoed, the class pin design is beautifully painted upon the wall, statuary rests upon pedestals, pictures hang from the moulding, and in every way the room becomes a thing of beauty and a joy for all time. Already three rooms, 1900, 1901, 1902, are the most beautiful I have ever seen in any public school building. Each class raises nearly two hundred dollars for the equipment of its room.—*Ex.*



BLISS CARMAN.

### BLISS CARMAN.

Bliss Carman, poet, essay writer, and journalist, was born at Fredericton, New Brunswick, April 15th, 1861. His father was the late William Carman, and his mother Sophia Mary Bliss, both of Loyalist stock. He is a cousin of Charles G. D. Roberts. He was educated in the schools of Fredericton, and at the University of New Brunswick, from which he graduated in 1881, with the degree of B. A., winning the Alumni gold medal. He taught school for a short time, took his M. A. degree in 1884, and spent some time in private reading and study at Edinburg, and studied law at Harvard. In 1890 he became literary editor of the *New York Independent*. More recently he has been a regular contributor to different newspapers and magazines. He lives in New York.

Mr. Carman is best known for his work as a poet, and during the past ten years has written several volumes, which include collections of lyrics on nature subjects chiefly, his preference being for woods and waters. The scenery of his native province and Nova Scotia has furnished many of his themes. The following are the names of the volumes which include the most of his poems: *Low Tide on Grand Pré*; *A Winter Holiday*; *Behind the Arras*; *Ballads of Lost Haven*; *By the Aurelian Wall*; *Songs of Vagabondia* (3 small volumes); *St. Kavin—a Ballad*; *At Michaelmas*; *Beauty and Life*; *The Green Book of the Bards*; *The Vengeance of Noel Brassard*; *Ode on the Coronation of King Edward VII*; *From the Book of Myths*; *Pipes of Pan*, Nos. 1 and 2.

Mr. Carman's poetry is distinguished by a sweetness of tone and a very considerable power, and it commends itself especially to those who themselves have some of the poetic faculty. But the reader who is willing to make the intellectual effort to interpret the poet's gift will be rewarded.

Mr. Carman's latest book consists of a series of prose essays, written during the past six or seven years, embodied under the title "The Kinship of Nature." It will attract probably more readers than his volumes of poetry. The style is attractive and virile, the something he has to say good and wholesome, and he leaves the impression on his readers of a marked personality. This book he dedicates to his old friend and teacher, Dr. Geo. R. Parkin, and we gladly give space to a few words in which Mr. Carman gracefully acknowledges his gratitude to an inspiring teacher:

"Here is one of your boys come to tender you an offering long overdue, . . . For the service you did him is, next to the gift of life, the greatest that one man can render another.

"Those were the days when we were all young together, whether at Greek or football, tramping for Mayflowers through the early spring woods, paddling on the river in intoxicating Junes, or snowshoeing across bitter drifts in the perishing December wind—always under the leadership of your indomitable ardour. In that golden age we first realized the kinship of Nature, whose help is forever unfailing, and whose praise is never outsung. . . .

"It is certain that you gave us whatever solace and inspiration there is in the classics and modern letters, and set our feet in the devious aisles of the enchanted groves of the Muses. And I for one have to thank you for a pleasure in life, almost the only one, that does not fail.

"We learned from you, or we might have learned, to be zealous, to be fair, to be happy over our work, to love only what is beautiful and of good report, and to follow the truth at all hazards. . . .

"School will not keep forever. By the feel of the sun it must be already past noon. Before very long the hour must strike for our dismissal from this pleasant and airy edifice, a summons less welcome than the four o'clock cathedral bell in that leafy Northern city in old days, and we shall all go scattering forth for the Great Re-creation."



## Extracts from the Works of Bliss Carman.

## THE WORD TO THE PEOPLE OF THE GROUND.

*("In the Beginning was the Word.")*

Who hath uttered the faint Earth-whisper,  
The rumor that spreads over ground,  
The sign that is hardly a signal,  
The sense that is scarcely sound?

Yet listen, the earth is awake,  
The magic of April is here;  
The all but unobserved signal  
Is answered from far and near.

Go forth in the morning and listen,  
For the coming of life is good;  
The lapsing of ice in the rivers,  
The lipping of snow in the wood,

The murmur of streams in the mountains,  
The babble of brooks in the hills,  
And the sap of gladness running  
To waste from a thousand stills.

Go forth in the noonday and listen;  
A soft multitudinous stir  
Betrays the new life that is moving  
In the houses of oak and fir.

A red squirrel chirps in the balsam,  
A fox barks down in the clove;  
The bear comes out of his tree-hole  
To sun himself, rummage and rove.

In the depth of his wilderness fastness  
The beaver comes forth from his mound,  
And the tiny creatures awake  
From their long winter sleep under ground.

Go forth in the twilight and listen  
To that music fine and thin,  
When the myriad marshy pipers  
Of the April night begin.

Through reed-bed and swamp and shallow  
The heart of the earth grows bold,  
And the spheres in their golden singing  
Are answered on flutes of gold.

One by one, down in the meadow,  
Or up by the river shore,  
The frail green throats are unstopped,  
And inflated with joy once more.

O heart, canst thou hear and hearken,  
Yet never an answer bring,  
When thy brothers, the frogs in the valley,  
Go mad with the burden of spring?

So the old ardours of April  
Revive in her creatures today—  
The knowledge that does not falter,  
The longing that will not stay.

And the love that abides. Undoubting  
In the deeps of their ken they have heard  
The ancient unwritten decretal,  
The lift of the buoyant word.

## THE VERNAL IDES.

There is a day in February which marks off the gray time of winter from the green time of spring as clearly as a line on the calendar. Even the brightest December sunshine gives no ray of hope; it is relentless, forbidding, unpromising, the sky foretells only an eternity of changeless cold; one could never look upon it and prophesy the arrival of summer. But by and by there comes a February morning, when the frost may not be less keen nor the sunshine more bright, yet there is a different expression on the face of the elements. Hope has been born somewhere in the far south, and there are premonitions of change, portents of liberation and joy. It is the first faint rumor of spring. And though the blizzard may sweep down again out of the north in the next hour, we know his victory will not be lasting; "the vernal ides" are on their way; the old Aprilian triumph is at hand. A little patience more, a few weeks or days, and we shall behold the first signals of their advance; the buds will be on the trees; a sudden wild song, fleeting but unmistakable, will break across the noon and be gone again almost before we can recognize it. And then at last we shall wake up in some golden morning, with a blessed song-sparrow singing his litany of joy in our enchanted ears, and know the vernal ides at last are here.

## SELECTED FROM "THE KINSHIP OF NATURE."

"The heart in the work" is not a motto for the artist alone, it is for the laborer as well. . . . Set me a task in which I can put something of my very self, and it is a task no longer; it is a joy, it is art.

The owner of a picture is the man who can make it his own, not the man in whose house it has been immured.

If every day we can feel, if only for a moment, the elation of being alive, the realization of being our best selves, of filling out our destined scope and trend, you may be sure you are succeeding.

Happiness, perhaps, comes by the grace of Heaven; but the wearing of a happy countenance, the preserving of a happy mien, is a duty, not a blessing.

Only the sick are self-conscious; and the first step on the road to health is forgetfulness of self.

All the gray winter through, and even all through the spring, we are waiting for the June days, the perfection of the year . . . (but) June goes by every year like an express train, while we stand dazed at some little siding.

Not one in ten among us knows a beech from a maple, nor a pine from a spruce. . . . A nation which does not know one tree from another is in peril of vanishing from the earth.

Without pride in ourselves, in our work, and in each other, life becomes sordid and vulgar and slovenly; the work of our hands unlovely; and we ourselves hopeless and debased.

The vulgar may be kind and generous and loving. But only the well-bred are tireless in observing the smallest and nicest amenities.

Your nervous individual, whose fund of serenity is low, rushes about in a frenzy of fussy excitement, achieving nothing but his own destruction. In that most detestable of all vulgarisms, he is a "hustler." God help him!

### English Literature in the Lower Grades.

BY ELEANOR ROBINSON.

A RILL FROM THE TOWN PUMP.

(N. B. Reader, No. 4, p. 37.)

*A Rill from the Town Pump*, as it is given in the reader, contains about half of the town pump's speech, as Hawthorne gives it in *Twice-Told Tales*. It is there headed as follows:

(Scene—The corner of two principal streets. The Town Pump talking through its nose.)

The two principal streets are Essex and Washington streets, Salem, the home of the town pump. Hawthorne was born in Salem, and has delighted in celebrating his native town in his writings. Some extracts from his "*Grandfather's Chair*," a series of stories on children from American history, will throw light on references and allusions in the lesson:

Meantime, those of the Puritans who remained in England continued to suffer grievous persecutions on account of their religious opinions. They began to look round them for some spot where they might worship God, not as the king and bishops thought fit, but according to the dictates of their own consciences. When their brethren had gone from Holland to America, they bethought themselves that they likewise might find refuge from oppression there. Several gentlemen among them purchased a tract of country on the coast of Massachusetts Bay, and obtained a charter from King Charles, which authorized them to make laws for the settlers. In the year 1628 they sent over a few people with John Endicott at their head, to commence a plantation at Salem. . . . Many other Puritans prepared to follow Endicott. . . . In 1630 a fleet of ten or twelve vessels left England; for a multitude of people, who were discontented with the king's government, were flocking over to the new world. Among the passengers was John Winthrop, who had sold the estate of his forefathers, and was going to prepare a new home for his wife and children in the wilderness. He had the king's charter in his keeping, and was appointed the first governor of Massachusetts. Imagine him a person of grave and benevolent aspect, dressed in a black velvet suit, with a broad ruff round his neck, and a peaked beard upon his chin. There was likewise a minister of the gospel whom the English bishops had forbidden to preach, but who knew that he should have liberty both to preach and pray in the forests of America. He wore a black cloak, called a Geneva cloak, and had a black velvet cap, fitting close to his head. . . . At that period there were but six or eight dwellings in the town (Salem); and these were miserable hovels, with roofs of straw and wooden chimneys. The passengers in the fleet either built huts with bark and branches of trees, or erected tents of cloth till they could provide themselves with better shelter. John Endicott was the chief person in the plantation, and had the only comfortable house which the newcomers had beheld since they left England.

The minister of the gospel who came out in 1630

was Francis Higginson, called "The Elder Higginson," because his son, also a minister, was a prominent man in Massachusetts.

The extract falls into three main divisions. First, the town pump enlarges upon his office; secondly, he describes his various customers; and, lastly, he pours forth historical reminiscences. In the original he talks on, insisting on his "own multifarious merits," until the clock strikes one, when he says, "Nay, then, if the dinner-bell begins to speak, I may as well hold my peace."

The unity of the whole tale is not to be seen in this fragment, but the beautiful accuracy in the choice of words, and the delicate humour, both characteristic of Hawthorne's style, will repay careful study.

What feelings are expressed by the exclamations in the first paragraph? Why is the last sentence in the form of a question? Turn it into a statement. Note the following account of "The March Meeting."

In a New England township, once each year, usually in March, a town-meeting is held, at which all the grown men of the township are expected to be present and to vote. At the town-meeting . . . town officers are elected for the year.—*John Fiske*.

What titles does the town pump claim, and on what grounds? Study carefully the adjectives "cool, steady, upright, downright, impartial," until you see how exactly they apply to the pump, used literally. Then apply them in their figurative use to the discharge of public business. Note the short and simple words of the paragraph beginning, "Summer or winter nobody seeks me in vain." Collect some other sentences made up of such words and compare them with others containing longer and more sonorous ones. Can you discover on what principle the author is working in using these different kinds of words? Is it only for the sake of variety, or does the wording suit the thought? Consider what opportunities the town pump has for seeing the people of the town. Describe, rather fully, in your own words, the different persons who come to drink.

How does the pump know the history of the town? Study the description of the spring. Compare with it the following picture from Kingslev's *Water-Babes* of a "real North country limestone fountain:

Out of a low cave of rock, at the foot of a limestone crag, the great fountain rose, welling and bubbling and gurgling, so clear that you could not tell where the water ended and the air began.

Which of these descriptions is most like the springs in your part of the country? Find another description of a spring in a book, and then describe in your own words one that you have seen.

Study carefully the sentence beginning, "Thus one generation after another," until you have clearly seen the meaning of each clause.

Write sentences containing the following words and phrases:

High noon; manifold duties; time immemorial; historical reminiscences; of the vicinity; mortal life; rubicund; in perpetuity; a turbid stream; all one; populace; far antiquity; a closer intimacy; waxing and waning; stream of eloquence; calm enjoyment.

Give the moral of the pump's story in your own words.

Answer to question, as to the meaning of the line in "Gray's Elegy"—"And read their history in a nation's eyes:" The paraphrase given in Fowler's notes on Palgrave's *Golden Treasury* is "And see in the contented looks of a whole nation the record of their acts."

#### A Word on Devices.

I am more than ever of the opinion that the class work of schools is allowed to drift too much into the grind of the trivial round, the common task. In work like teaching, which allows of so much variation, it seems to me we ought to do something to avoid the weariness, the lack of earnest enthusiasm which characterizes so much of the class work in our schools. True, "there is no royal road to learning," but we can, if we will, make the well-beaten paths a little more attractive to the hearts and minds of the young. Too many teachers hide their individuality behind a mask of formal lesson plans and turn themselves and their pupils into machines which must do a certain amount of work in a given time. We expect our pupils, at the end of the year, to have accomplished a certain amount of work, and we toil and drill and grind to have our pupils as even as possible in their work, with good standings in all their studies. Nevertheless, we should not leave out the fact that each pupil has an individuality, distinctly his own. Some pupils, who are naturally bright, may not suffer, but the boy who is decidedly deficient in some branches, but who may have tastes in other directions that would lead him to success, sometimes has those same

talents nipped in the bud, utterly destroyed by the teacher's efforts to bring him "up to grade."

History abounds in glorious achievements of the so-called dull boy in the schools. Would it could also hold up to the world the many students who might have been a success had anyone interested themselves enough in their characters to find out what they were adapted for.

In my opinion, we waste far more energy in teaching the mechanics by the grind of everyday work than in the preparation of some simple device that would put animation and joy into our everyday exercises, so that each day would foster more love for the beautiful and beget in the child an earnest desire to unlock the secret springs of the storehouse of knowledge and partake of the pleasures therein.

Question yourself as to how much of the work you receive is born of genuine interest, or is it a set task which the pupils feel must be done.

Just what to do in the line of devices would require a book by itself, and then much of it would be valueless, for what one teacher can do with profit will fail with another. One may breathe into some simple device life and animation which to another is "dead bones awaiting the touch of the Master."

The best suggestion I know of is to put your individuality into your work; love it, feel it, know it, and that glad earnestness will permeate the dead level you have unconsciously fallen into and lift it up into the higher plane of "What is Worth While."  
—*Popular Educator*.

When I was a pupil, there was a boy that gave a great deal of trouble, and we never could tell why this was the case, for Arthur was a great helper when we had excursions. The teacher used to get at him many times a day: "Aren't you ashamed of yourself? You have not looked at the spelling book." If he failed to do a "sum," she would say, "Aren't you ashamed of yourself? The smallest girl in the lesson can do it." Then he would come late, or stay out one day, or two days, and whisper and eat apples. When I began to keep school, I wondered what I could do with boys like Arthur. I thought I must say, "Aren't you ashamed?" but I did not. I have several boys that trouble me, but I don't let them know it. I have found it is a bad plan to have two classes—the good and the bad; I prefer to have them divided into the "hard-tryers" and the "little-tryers."—*E. Benedict*.

**Mineralogy and Geology in Schools — No. V.**

L. A. DEWOLFE.

In the last paper I suggested teaching the practical uses of the rocks and minerals studied. Begin with uses well known to the class. A lesson on building-stones will perhaps be an easy and profitable one. In paper I, it was asked, Which is the more durable, granite or marble? Our study of limestone should help us decide this. What effect has acid upon limestone? Has it the same effect upon granite? There are usually traces of acids in the atmosphere—more especially in cities,—and these in time deface marble. Observe marble tombstones, where climbing vines keep the stone moist. The decaying of these vines give rise to humus acids, which in time obliterate the letters. Whenever marble is exposed to changeable or impure atmosphere, we see the same result. What is another common building-stone? Sandstone. Are all sandstones equally valuable? Which crumbles more easily, coarse-grained or fine-grained? Why? What causes the crumbling on the exposed surface of any rock? Too much iron pyrites in sandstone injures it, for the pyrites decays and stains the stone, besides rendering it porous. Important considerations in choosing a building-stone are its cost, beauty, durability, crushing strength, properties, such as absorbing water, taking a polish, etc., etc.

After discussing these and other building-stones—such as slate for roofs—one might take up sand and clay. Many of the children will know that sand is used for mortar, silicate bricks, moulds in foundries, etc., and clay, for bricks, pottery and porcelain. Perhaps your boys will never be masons or bricklayers in after life, but they may have to employ these, or pass judgment upon their work, and if you can lead them to observe the walls, buildings, street pavements, etc., in their town, or the masonry of bridges or foundations in the country, you have accomplished something towards preparing them for their future education.

There are other common minerals which all children have seen, but have never thought of the varied uses made of them. For instance, mica is familiar to all as the "isin-glass" of stove doors. Besides this, it is used in electrical works as an insulator, is a lubricant, and, when powdered, it is added to wall paper to make it glisten. In what kind of rock do you find mica? In what countries or states is it

abundant? Then what do you infer as to the geology of those countries?

In studying mica, one should contrast it with selenite gypsum, which is also wrongly called isin-glass. This last mistake is due to the fact that many people see no difference between the two last minerals. On comparison, however, there is scarcely a point of likeness, while there are many points of difference. Heat a little gypsum. The result is plaster of paris, the uses of which are no doubt familiar to your class. Gypsum is also ground and used to fertilize the soil. The pure white alabaster is carved into vases, ornaments and statues. What properties eminently fit it for this use? A mineral so widely distributed as gypsum in Nova Scotia and New Brunswick should be better known than it is. Its softness is an easy mark of distinction. If you have a good mineral collection, does it contain any softer mineral? Talc is probably the only one that is noticeably softer. It is more commonly known as soapstone, and is familiar to every schoolboy in his softest slate pencils. It is also used for sinks and bath-tubs, face powders, is a lubricant, gives weight to paper, is made into Chinese images, and is an adulterant for paints and soap. It is used, too, somewhat similarly to asbestos, for linings of stoves, furnaces and fire-places.

All these lessons could be very easily woven in with the geography lessons. If a country has granite mountains, what are probably some of its minerals? If low and level, what is probably its past history? Could conditions ever have been suitable for the deposition of sand and clay, or the formation of limestone and gypsum? Many general conclusions may be drawn from carefully observing the association of minerals with each other, and with variation in land surface. All your children can name gold, silver, copper, iron, etc., as minerals of some given country, but they have no idea whatever of the form in which they occur, or what process of manufacture they must undergo. Some of them may think that tin is found all ready to be made into tin kettles, or that mercury is dipped from wells in liquid state. More of them think nothing about it, and never will think unless we teach them to do so. Heating a small piece of cinnabar in a closed glass tube will teach more about the occurrence and extraction of mercury than many people have learned in a lifetime.

All students in the higher grades should do some blow-pipe work. Very simple experiments will

often teach them much worth knowing. For example, if ores of zinc, lead and iron, be heated upon charcoal, the zinc goes off in fumes, the lead melts to a globule, and the iron is infusible. From this we learn that the different ores require different treatment in process of manufacture. In connection with mercury, the amalgamation process of gold milling is not difficult to show. These are only a few instances of things the boy might learn that would aid him afterwards in making a start at industrial education, or help to make him a better and more useful citizen.

### **Growth of Manual Training in New Brunswick.**

Those interested in the advancement of education in New Brunswick have watched with considerable interest the development of the manual training movement, started a little more than three years ago by Professor Robertson. At that time there was not a single department of manual training in any of the public schools of the province, and the meaning of the term was scarcely known. Now not a hamlet but knows something of its value as a factor of education. This is largely due to the good words spoken of it by teachers in training at the Provincial Normal School, where every student spends some time each week in the manual training room, and thus becomes an enthusiastic exponent of the system. Good work is also being done by some of our inspectors in interesting school trustees. Through it all, however, the quiet but effective energy of Mr. E. E. MacCready, director of manual training for the province, has been always inspiring.

The smaller cities and towns have been notably foremost in their endeavors to provide for its introduction. Campbellton, Woodstock, Fredericton, St. Andrews, St. Stephen, Milltown and Sackville have employed trained instructors, and excellent results have followed.

Another noteworthy feature is its growth in villages and rural districts. Inch's Ridge, Carleton County, and Mascarene, Charlotte County, typical rural schools, have installed equipments and engaged teachers with license to teach this work in addition to regular subjects. Musquash, so disastrously fire-swept last summer, was previously among this number. Florenceville erected a special building and put in ten benches. Here the principal, who has

taken a special course in manual training, devotes a portion of each week to that work. Villages of similar size having two-department schools are arranging to begin next September, the only drawback being the lack of specially trained teachers. One village in particular voted money early last year to start manual training, but is still waiting for a principal qualified to teach it.

To provide such qualification, the Board of Education has added a training department at the Normal School, where three months' courses in manual training are given, with free tuition and travelling expenses paid. The grant to licensed teachers so qualified is increased fifty dollars if they actually teach manual training along with regular subjects. To school boards, rural or urban, which provide equipment, the government pays one-half the cost. A rural equipment of three benches and tools costs about eighty dollars.

In addition to the MacDonald consolidated school at Kingston, there is to be one at Riverside, Albert Co., costing about \$15,000, and others in Charlotte, Kings and Carleton are spoken of. In all these, manual training, domestic science and school gardening will be features.

Where three or more districts unite to form a consolidated school, and add these subjects to the usual course, the government agrees to pay "a sum not exceeding in any one year one thousand dollars, under such conditions and during such period as determined by the Board of Education." It also agrees to pay one-half the cost of conveyance of children in vans.

In all places where manual training has been introduced, the children, parents and trustees are its most enthusiastic supporters, and if this counts for anything—and it does—the next three years will see manual training established in all the leading schools of the province.

L.  
Fredericton, N. B., February, 1904.

An English clergyman declares that there are laborers in his parish who have not 300 words in their vocabulary. An average well-educated person seldom uses more than about 4,000 words in actual conversation; accurate thinkers and close reasoners employ a larger stock, and eloquent speakers have at command about 10,000. Shakespeare, who displayed a greater variety of expression than probably any other writer in any language, produced all his plays with about 15,000 words. Milton's works are built up with 8,000, and the Old Testament says all it has to say with 5,642 words.

## Notes on Mathematics—No. III.

R. G. D. RICHARDSON, B. A.

In the October number, there were a few suggestions as to the teaching of Geometry. In addition, there was a fallacious example given in which *any* two lines are proved equal. A few have written, asking further concerning this problem. It may be proved *geometrically* that one of the perpendiculars 56, 67, falls inside the triangle, and one outside. It is easy enough to recognize this in the *construction*, but the *geometric* proof is not so easy. In order that the elementary, as well as the most advanced, may have a chance, we append another fallacy in which the reasoning is very simple. Euclid wrote one book containing only such examples. However, this book is lost, and this is reputed to be one of the theorems that the old Greek used in teaching Geometry. It may awaken thought in pupils of to-day.

The provincial examiner will tell you that a large percentage of the papers show an utter lack of any idea of a logical conclusion. In Problem I of the list below, how many will be able to say more than "I don't know"? They ought to be able to say decisively, "There is no conclusion." By a little change of figure, Problem II can be made to deceive even the most advanced high school pupils, unless they have learned to reason logically and carefully. A scheme used by some of the most successful teachers in Germany, is to get the pupils to prove a proposition without a figure. The reasoning will then appear the chief thing. Another method used with excellent results is that of asking the theorems that are used in getting from one to another, as suggested in Problem IV. More geometry can be taught in one hour by using these methods occasionally, than in a day using old routine methods that make no impression. In the list of problems below there is merely a skeleton of a plan that may be worked up into something useful in all the grades.

- I. If  $AB > CD$  and  $CD < EF$ , what follows?
- II.  $ABC$  is an isosceles triangle, with vertex at  $A$ . Draw *any* line  $AX$  to the base, and in the triangles  $ABX$ ,  $ACX$ , we have three parts of one equal to three parts of the other. What proposition proves them equal in all respects?
- III. What are the propositions in the first book that use the paralld axim directly.

IV. Trace the connection by giving all *necessary* intermediate theorems between I. 16 and I. 32. Between I. 4 and I. 24.

V. How many degrees in the interior angles of an octagon? If one angle is re-entrant, will it increase or decrease the number of degrees?

VI. Why cannot the propositions of Book III be put before those of Book II? Why not immediately after I. 10?

VII. Can you trisect *any* given angle?

VIII. Are the two circumferences of concentric circles parallel lines?

IX. Given four lengths, the sides of a trapezoid, how many angles is it necessary to know in order to construct the figure? If the trapezoid is a parallelogram, how many sides and angles must we know?

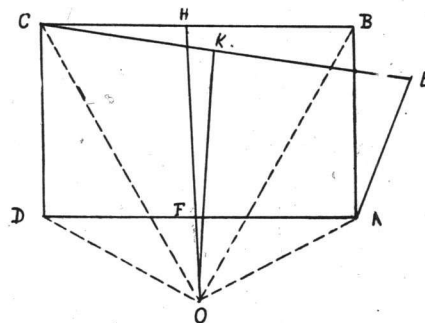
X. When a straight line cuts two parallel lines, how many angles does it make? Divide these angles into groups, each group containing those equal to one another. Name the angles.

XI. How many points are necessary to determine a circle? How many to determine a straight line through the centre of the circle?

XII. Do we mean by the following terms, *areas* or *lines*: triangle, sector, segment, circle, angle, plane?

XIII. How many degrees in the supplement of  $107^\circ$ . In the complement of  $107^\circ$ . Can you construct an angle of  $410^\circ$ .

Theorem: To prove that a right angle is equal to an angle greater than a right angle.



Let  $ABCD$  be a rectangle. From  $A$  draw a line  $AE$  outside the rectangle equal to  $AB$ , and making an acute angle with  $AB$ . Bisect  $CB$  in  $H$ , and through  $H$  draw  $HO$  at right angles to  $CB$ . Bisect  $CE$  in  $K$ , and through  $K$  draw  $KO$  at right angles to  $CE$ . Since  $CB$  and  $CE$  are not parallel, the line  $HO$ ,  $KO$  will meet. Now triangles  $OCK$  and  $OEK$  are equal in all respects. Triangles  $OCH$ ,  $OBH$

are equal, and triangles OFD, OFA are equal. Hence triangles OCD and OAE are equal, since  $AE = CD$  by construction.

Hence angles ODC and OAE are equal; but we have seen angles ODF and OAF equal. Hence angles ADC and DEA are equal, and our theorem is proved.

In the next article, we shall endeavor to discuss some problems in mathematical drawing. In Nova Scotia there is no text-book assigned, and our aim will be to cover the ground of the work for grades IX and X.

Yale University, January 27th, 1904.

### The Sky in February.

The firmament never presents a more varied and splendid panorama than it displays in mid-winter. An hour or two after sunset on any of the nights near the beginning of the month, Betelgeuse and Rigel may be seen in the southern section of the sky with Sirius, a little bit lower in the same quarter. Procyon, the smaller of the dog stars, and the Twins, Castor and Pollux, are in the east, and Capella and Aldebaran away up overhead, the former to the northward and the latter to the southward of the zenith point. About nine o'clock Regulus will come into view in the east, and Spica some two hours later will be in plain sight in the southeastern quadrant. These are all among the brightest of the stars ever visible to us.

Saturn was in conjunction with the sun on the 1st, and is now a morning star, but we shall not see his soft mellow light in the evening sky until August. Uranus and Mercury are morning stars. Mars is in fairly close proximity to the growing moon when it is two days old, and then on the 26th he and his giant brother, Jupiter, almost touch each other. It will be an interesting thing to watch, this gradual drawing together of these two planets until we can hardly see any sky separating them, and then to see them separate and gradually widen their distance. Jupiter still shines a beautiful object in the western section of the evening sky. He is drawing in toward the sun, and at the close of next month will reach conjunction and then pass to the morning sky, a challenger to Venus for its sovereignty. — *Condensed from the N. Y. Times.*

It is never too late to learn. Pierre Germain, a student of the horticultural school at Vilvorde, Belgium, shows that he believes in this truth, for he has just completed his course, at the mature age of sixty-nine years. In the German colleges aged students are by no means uncommon. They are known by the younger generation as "mossy ones" — or, in plain American, "mossbacks." — *Pathfinder.*

### To Find Cube Root by Inspection.

PRINCIPAL A. D. MACDONALD, LONDONDERRY, N. S.

The following method of finding by inspection the cube root of a number will often be found useful. This method applies to numbers of six or less digits only, and fails if the cube root is not a whole number.

The cubes of the nine significant digits should be memorized. They are as follows:

$$1^3 = 1; 2^3 = 8; 3^3 = 27; 4^3 = 64; 5^3 = 125; 6^3 = 216; 7^3 = 343; 8^3 = 512; 9^3 = 729.$$

Examine the above and note the following facts:

- (1) The cube of 1 is 1, and the cubes of 4, 5, 6 and 9 end in 4, 5, 6 and 9 respectively.
- (2) The cube of 2 is 8, and the cube of 8 ends in 2.
- (3) The cube of 3 ends in 7, and the cube of 7 ends in 3.

Upon these facts the method depends. One or two examples will suffice to show their application.

*Example 1.* Find the cube root of 15625.

Counting from the right, mark off three figures by a vertical line, thus 15|625. The nearest perfect cube not greater than 15 is 8. The cube root of 8 is 2. The number ends in 5, therefore its cube root must end in 5. Therefore the cube root of 15625 is 25.

*Example 2.* Find the cube root of 912673.

Mark off three figures by a vertical line, as before, 912|673. The nearest perfect cube not greater than 912 is 729. The cube root of 729 is 9. The number ends in 3, therefore its cube root must end in 7. Therefore the cube root of 912673 is 97.

The cause of poor spelling in these days, and of nearly every other weakness in the learning of children, is mainly due to the blindness of so-called educational leaders who are continually and clamorously demanding easy roads to knowledge. There are not, nor can there be, easy roads to any knowledge worth having. The best things in this world are attained through difficulties. What comes without effort has little value. "There is no other royal path which leads to geometry," is as true now as it was when Euclid said it to Ptolemy I. more than 2,000 years ago. In season and out of season, let the eternal truth be taught to every child, that "There is no excellence without great labor." — *Western School Journal.*

### The School Library.

\* \* \* Eminent educators regard the library as an essential part of the equipment of a school. And it is, therefore, safe to repeat that a few shelves of books—well chosen, that is, some for entertainment and inspiration, others for information—and well used—come very near doubling the efficiency of a school. It is not to be wondered at that children whose reading habits receive little cultivation should have no love for books, at least for those books which are wholesome and helpful. Nor, at this point, should we forget that the golden opportunity to cultivate the taste for reading and to direct it into proper channels is afforded in the elementary schools. It has been found that commonly the desire to read becomes strong about eight years of age, increases steadily to ten, then rapidly from eleven to fourteen, culminating about fifteen, after which it often declines. The home, the school, and the public or school library, working in harmony, should be able to provide for the child's needs in this matter. Dr. W. T. Harris, Commissioner of Education for the United States, has gone so far as to say: "The school is set the task of teaching the pupil how to use the library in the best manner—that, I take it, is the *central object* towards which our American schools have been unconsciously tending." And again, the opinion is offered that "every school should have its own little collection of choice books adapted to the stage of development of the children, and in the periods of leisure before school, after school, at the rainy day recess, or in leisure moments of finished lessons, the children should be allowed to use these books freely."

\* \* \* To the teacher, the library, however small, can be made a most important auxiliary. To himself, it may be a source of entertainment, inspiration and instruction, and if it is not such, neither he nor it should be there. No teacher can use a library to advantage who does not care for its contents. To entertain or inspire others, he must be entertained and inspired himself. The pupil can, through the medium of books, be brought into touch with thoughts and ideals whose influence once felt can never quite be lost. The mind is not only to be exercised, but, like the body, is to be fed also.—*David Wilson, B. A., Inspector of Schools, British Columbia.*

"THE REVIEW is helping me very much in my work," writes one of its young friends. "In one issue I saw an article on Friday Afternoon Entertainments. I have tried it this term and find the children enjoy getting up their own programmes very much. We have an entertainment twice a month, and invite the friends and the teacher and pupils of one of the other rooms in the building."

### The Sand-Man.

The sandman comes across the land  
At evening, when the sun is low;  
Upon his back a bag of sand,—  
His step is soft and slow.

I never hear his gentle tread,  
But when I bend my sleepy head,  
"The sandman's coming!" mother says,  
And mother tells the truth, always!

He glides across the sunlit hill,  
To seek each little child like me;  
Our all-day-tired eyes to fill  
With sands of sleep from slumber's sea.

I try my best awake to stay,  
But I am tired out with play;  
"I'll never see him!" mother says,  
And mother tells the truth, always!

—*Marie van Vorst in Harper's Magazine.*

### Scripture Cake.

A correspondent of the *Orillia Packet* writes: "Here is a receipt for a cake which I have proved by experience to be a good one. The figuring out of the references makes an interesting Biblical exercise. 4 1-2 cups of I Kings iv., 22 (first clause); 1 1-2 cups of Judges v., 25 (last clause); 2 cups of Jeremiah, vi., 20; 2 cups of I Samuel, xxx., 1?; 2 cups of Nahum iii., 12; 1 cup of Numbers xvii., 8; 2 tablespoonfuls of I Samuel, xiv., 25; spice to taste with II Chronicles, ix., 9; six of Jeremiah, xvii., 10; a pinch of Leviticus, ii., 13; 1-2 cup of Judges, iv., 19; baking powder. Finally, follow Solomon's prescription, Proverbs xxiii., 15, for making a good child and you will have a good cake.

No nature lessons as such can compare in interest with an hour among the birds and flowers; no practice lesson as such can compare with the making of a needed thing.—*Manual Training Magazine.*

Let us forever abandon the idea that analysis, dissections, classifications and memorizing of facts will reveal to the children the story, the lesson, or the life of nature. They must be helped to feel its pulse, hear its music, come in touch with its forms, be warmed by its breath, and respond to its call.—*Selected.*

Children like to do things, to make and manage things. They learn by doing, and love of the task in hand sets the pace for their progress. The tasks are wisely set when they lead on to a love of labor, a love of nature, a love of ideas, and a love of God. Nothing else is worth while.—*Professor Jas. W. Robertson.*



**Object Lesson on Matches.**

[The teacher provides a box of matches and a candle; also a piece of steel and a flint and some scraped wood or cotton (tinder) and some shavings.]

It is important to be able to have fire whenever we want it; hence, the invention of matches may be considered one of the most important ones of this century. We must not underrate matches because they are so common.

It is supposed that the first people lived on grains, berries, vegetables, fruits, and raw flesh. Then some day there was a great thunder storm and a tree was struck by lightning. What a surprise it must have been to them to see a piece of wood burn!

In some way they found that this fire would cook meat. Then they studied how to keep fire by burying it in ashes. They found it could be made by rubbing two pieces of wood together, also by striking a flint on a piece of steel. About fifty years ago matches were discovered.

First they cut up a plank or board into small splints by machinery; then they melt some sulphur and dip the splints in that; then into a mixture of glue, chlorate of potash and phosphorus.

You strike the match on something rough; this causes heat enough to set the phosphorus on fire. This causes the chlorate of potash and sulphur to burn and these ignite the stick and so we have a blaze. Now, here are some questions: Where does the sulphur come from? Where the chlorate of potash? Where the phosphorus?—*Teachers' Institute.*

**Picture Study for Primary Grades.**

Lessons from pictures not only lead the child to think, but subsequently to express his thought; it leads to the training of the powers of observation and imagination.

During one of the first lessons it might prove a good plan to have at first the naming of a picture. To aid in this plan a couple of pictures might be shown to the children with their names, thus showing how well the name suited the picture. Then have children give names to a new picture. Place these names on the board; then, after quite a number have been given, select, with the aid of the children, those most suited to the picture. Then reduce these names to two or three, showing why these are most appropriate. The child should be trained to see through the picture into the story it depicts. Aim, by well-connected questions, to have children build up the story. Have several stories told, having the children as far as possible give different narratives. As this is among the first stories written by the class, it might prove more successful for teacher and pupil to write it together, thus giving the children an idea of what will be required in all future stories.—*The Teacher.*

**CURRENT EVENTS.**

The insurgents in Uruguay now threaten the capital, Montevideo; and the government forces are said to be making their last stand in its defence. Nearly all the coast towns are reported to be in the control of the revolutionists.

It is expected that the advance of the British expedition to Thibet will be opposed. Reinforcements are therefore being sent forward, as it is important that the British should not seem to be driven back by threats.

A cloth that always keeps warm is a recent French invention. A fine tissue of metallic threads, woven in with the wool or silk of which the fabric is composed, forms a conducting system which may be kept at an even temperature by the passage of an electric current.

War between Russia and Japan, which has seemed probable for some months, is now apparently so near that it may be a terrible reality before this issue of the REVIEW reaches its readers. Both nations are making ready for the contest. The fate of China, as well as that of Korea, may be decided by the result.

An uprising of the Hottentots in German South-West Africa is becoming serious. It is said to have been caused by ill treatment of the natives.

The Dominican government troops have captured the town of Puerto Plata. This is a severe blow to one of the two or three insurrections that are going on in the little republic.

The electronic theory of matter—that is, the theory that an atom of matter is composed of positive and negative electricity, and nothing else—is thus stated by Sir Oliver Lodge: Electricity exists in small particles, which are called electrons. They compose the atoms of matter. Atoms are small; three hundred millions of them can lie in a row side by side in an inch, and there are a trillion of them in each granule of lycopodium dust. But electrons are very much smaller. One hundred thousand of them can lie in the diameter of an atom, for they are a thousand-million-million times smaller in bulk than atoms are. The negative electrons in an atom are in a state of violent movement, with occasional possibility of escape. Atoms, therefore, are not permanent, though in most substances they behave as if they were so; and the ancient doctrine that all things change is absolutely true, not only of all visible forms, but of the very atoms of which they are composed. Nothing material is permanent. The escape of electrons, from the explosion or spontaneous breaking up of atoms, constitutes the source of energy in radium and other radio-active substances, which has attracted such general attention. And the discovery of this atomic radiation was expected by the scientific world, as the new theory made its existence probable. It confirms the theory that atoms crumble and decay. The next thing to be looked for is the formation of new atoms.

The experiment of introducing camels into South Africa seems to be succeeding, though some parts of the country are believed to be too cold and damp for them.

The new system of signaling under water, in which the water itself transmits the sound of a bell, has been successfully tried at the entrance of Boston harbor. Receivers are placed on both sides of a vessel's hull. These receive vibrations from the distant bell hanging in the water; and the navigator has only to put the ear-piece to his ear and ascertain on which side the vibrations are the louder in order to know the direction of the lightship or other station from which the sounds proceed.

The photophone, as its name suggests, is an instrument for transmitting sounds by means of light. In principle, it depends upon the curious property of selenium, well known to students, of changing its electric resistance under the influence of light. Slight variations in the intensity of light which cannot otherwise be easily detected will so act upon the selenium plate in the receiver as to give audible sounds in the receiving instrument, and a message transmitted in this way can be kept secret, which does not hold true in the ordinary wireless telegraphy. The new system will probably be adopted for military use.

### Manual Training.

The annual report of Dr. A. H. MacKay, Superintendent of Education, for the year ending July 31, 1903, has just been issued. It is interesting to note from it the growth of manual training in Nova Scotia. The total number of public schools was fifteen. To this may be added the public institutions, such as St. Patrick's Home, Protestant Industrial School, Deaf and Dumb Institution, St. Francis Xavier's College, Horton Collegiate School, and others not directly connected with the public schools. In the fifteen schools enumerated, however, were enrolled 1,815 pupils, 568 more than in 1902. In 1903, 1,467 girls received instruction in domestic science, an increase of 439 over 1902.

The number of benches increased from 154 in 1902 to 299 in 1903. The value of the equipment was doubled, being in 1903 \$10,010.00, as against \$5,031.50 in 1902. The amount paid in salaries to mechanic science teachers was \$4,245 in 1902, and \$8,495 in 1903. The cost of maintaining the schools was borne by the towns and the government, the former paying in 1903 \$4,223.10, and the latter paying in the same year \$4,677.95. In 1902 the amounts paid were \$1,423.24 and \$3,525.30 respectively. This shows that the towns are assuming a fairer share of the expense than heretofore.

The total number of pupils attending the public schools of Nova Scotia in 1903 was 98,768. From Grade VI up to Grade XI included 28,878 pupils,

3,282 of whom received regular instruction in mechanic science or domestic science. This is an excellent showing, considering the short time these schools have been in operation.

Last month an appreciative article telling of the success attending the work of Mr. E. H. Blois at the Industrial School, Halifax, appeared in the *Halifax Herald*. It is interesting to notice the effect of manual training on boys who are presumably indifferent in regard to education. Br. Blois teaches both manual training and the ordinary school subjects. It has been found that manual training has enabled the teacher to get in closer sympathy with the boys, and thus enable him to exert a greater influence for good among them. The boys are far below the average in ordinary school work, but grasp readily the idea of manual training, and quickly acquire skill in that branch. Some excellent work was on exhibition at the Provincial Exhibition last year. Here, then, is a case where manual training fills a place nothing else would fit into. The directors of the school are so impressed with the value of manual training in the Industrial School that they have ordered five new benches, with a corresponding outfit for the school.

The same excellent results are apparent at St. Patrick's Home, where Bro. Remegius is doing a similar work.

The manual training department at Annapolis was opened for work last month. Mr. Gerald A. Boak, late of the Macdonald Manual Training School at Truro, is in charge of the department, which is well equipped. Mr. Boak, it is expected, will in the near future have the combined charge of manual training schools at Digby and Bridgetown, in addition to Annapolis. Annapolis makes the twentieth mechanic science department in Nova Scotia.

The consolidated school at Middleton was formally opened on Monday, February 1st. Both domestic and mechanic science are to be taught in the school. It is expected that the mechanic science teacher will be appointed this month and the department opened soon after. The domestic science department will be opened at the beginning of the new school year. The mechanic science room is well lighted, and having been designed by Mr. Leslie R. Fairn, who, up to a short time ago, was a manual training teacher, has all the improvements his experience suggested.

The circulating magazine has, after an absence of five months, again reached the hands of the secretary. It will, in the course of a few days, be sent to the members of the association who have recently joined. It is to be hoped that all will be ready to add to the excellent list of articles when it reaches them.

Address all communications for this page to  
H. W. HEWITT,

Secretary M. T. T. A. of N. S.

## Question Department.

TEACHER.—Please solve the following questions:

(1)  $\frac{bx-az}{cy-az} = \frac{cx-az}{by-az} = \frac{x+y}{x+z}$  then will each of these fractions be equal to  $\frac{x}{y}$  unless  $b+c=0$ . (Hall & Knight Elementary Algebra, page 216).

(2) A telegraph has 5 arms and each arm has 4 distinct positions, including the position of rest. Find the total number of signals that can be made? (Hall & Knight's Elementary Algebra, page 310.)

(3) Suppose a flag-staff whose height is 48 feet and whose end diameters are 18 inches and 3 inches respectively, is in 3 sections of equal length; what is the cost of painting each section at 5 cents per square foot? (Eaton's Practical Mathematics, page 66.)

$$(1) \quad \frac{x+y}{x+z} = \frac{a(x+y)}{a(x+z)}$$

If  $\frac{a}{b} = \frac{c}{d} = \frac{e}{f}$  then each of these fractions =  $\frac{a+c+e}{b+d+f}$  (See par. 294.)

Therefore each of the given fractions =  $\frac{bx-ay+cx-az+ax+ay}{cy-az+by-ax+ax+az} = \frac{bx+cx}{by+cy} = \frac{(b+c)x}{(b+c)y} = \frac{x}{y}$  unless  $b+c=0$ ,

(2) Each arm can be placed in 4 different positions, 2 arms can be placed in  $4^2$  positions, 3 arms in  $4^3$ , 4 arms in  $4^4$ , and 5 arms in  $4^5$  positions. Each of these positions will form a signal, except the one in which they are all at rest.

∴ Number of signals =  $4^5 - 1 = 1024 - 1 = 1023$ .

(3) The lowest section costs more than the middle one, and the middle one more than the highest section. \$3.25 is the cost of the lowest section. The text gives the answer of but one section.

M.—Kindly explain the meaning of the phrases "Old Style" and "New Style" when placed after dates.

The civil year, according to the calendar of Julius Cæsar ("Old Style"), consists of  $365\frac{1}{4}$  days, the quarter days being added to make a complete day every fourth year. The mean solar year consists of 365 days, 5 hours, 48 minutes, 49 seconds. This is over 11 minutes shorter than the average civil year of 365 days, 6 hours. In other words, every Julian year is longer than it ought to be by 11 minutes, 11 seconds. Pope Gregory reformed the calendar in October, 1582, and ordered ten days to be struck off. When the British parliament adopted this "New Style" in 1751, the error amounted to eleven days, and accordingly eleven days were struck out of September, 1752, the third day of that month being called the *fourteenth*. So great was

the prejudice of the ignorant against this change that for some time after a popular clamor at elections was, "Give us back our eleven days!" In Russia the "Old Style" is still adhered to.

The plan adopted to keep the calendar "right," or nearly so, is to leave out three days in every four centuries. The years that complete each century, such as 1700, 1800, 1900, 2000, are not all of them leap years. Only those divisible by 400 without a remainder are so called. Therefore the last of those named above is the only leap year. This accounts for the fact that 1904 is the first leap-year in eight years.

## SCHOOL AND COLLEGE.

Mr. Henry F. Perkins, Ph. B., an experienced and successful teacher has been chosen principal of the Hartland, N. B., Superior School.

Nature work has been made a part of the regular programme of the Cornell Summer School, under the direction of Professor L. H. Bailey.

The summer school which meets in Charlottetown in July next, will have the advantage of hearing lectures from the professors in attendance at the Canadian Biological station on Prince Edward Island next summer.

Recently in the Halifax police court three parents were fined, with the alternative of spending a certain number of days in jail, for neglecting to send their children to school. To enforce the compulsory school law it is necessary to arouse parents to a sense of their duty, and an example of this kind will exert a wholesome influence.

The London *Times* says that as a result of Dr. G. R. Parkin's recent tour of South Africa, New Zealand and Australia, where he has been distributing the Rhodes' scholarships, 75 students will be in residence at Oxford next year. The work of distribution will be practically completed in 1906, when the number of students will have been increased to 175, who will hail from the above countries and Canada, Germany and the United States.

The formal opening of the Macdonald Consolidated school building at Middleton, N. S., took place on Monday, February 1st, in the presence of a large assembly of people. Addresses were delivered by Hon. J. W. Langley, Dr. A. H. MacKay, T. B. Kidner, Esq., and others. In the evening grade ten of the school gave a literary and musical entertainment, the chief feature of which was the dramatic presentation of Scott's *Lady of the Lake*. The building is built of brick at a cost with equipment of \$20,000, and is convenient and well fitted up in every respect. The staff of teachers, of which Mr. G. B. McGill is principal, and the people of Middleton and surrounding country are to be congratulated on the completion of such a fine building.

Miss Mary McKay, daughter of Supervisor McKay, after five years' service as principal at Bedford school, has sent in her resignation. She has been presented with a handsome lady's dressing case, which was obtained through the efforts of her pupils.—*Halifax Chronicle*.

The amalgamation of weak and small country districts to form a graded school is something to be greatly desired. The St. Stephen, N. B., *Courier* states that at a meeting of the ratepayers of school district No. 6, in the parish of Saint David, a resolution was passed to unite with two or more contiguous districts when they, in like manner, shall so decide, in one district for the purpose of establishing a central school under the graded system, with manual training in addition to the ordinary course of study; and the conveyance of the children living at a considerable distance to and from such school.

### RECENT BOOKS.

THE BRITISH NATION.—A HISTORY. By Geo. M. Wrong, M. A., Professor of History in the University of Toronto. Cloth. Pages 616. Price \$1.00. Geo. N. Morang & Company, Limited, Toronto.

The author has accomplished a difficult task, that of presenting in a remarkably concise and interesting form the salient features of the history of the British Empire. That he has done this well a careful survey of the book will show. Due attention is given to Scotland, Ireland and Wales, as parts of the British nation; great eras and events are treated as fully as could be expected in a volume of this size; and nowhere is to be found that dull treatment which comes from the mere recital of details. The most interesting feature of the book to the general reader is the attention given to the development of social life, and this phase of his history the author presents in a most interesting way as a relief to the more solid features of the volume. Another excellent feature is the variety of the illustrations, many of which will be new to the Canadian reader of British history. The portions of the work dealing with the colonial development of the Empire and the progress of Canada, Australia, India and South Africa, are written in a clear and interesting manner.

CANADIAN ALMANAC. Published by The Copp Clark Company, Toronto. Price 35 cents.

This is the 57th year of publication of this useful work. It is so full of information of the kind that is needed for every day use that it is difficult to imagine how one can do without it. The teacher and student will find it invaluable as a work of reference and a constant companion.

BACTERIA, YEASTS, AND MOULDS IN THE HOME. By H. W. Conn, Ph. D., Professor of Biology in the Wesleyan University, Middleton, Conn. Cloth. Pages 293. Illustrated. Price \$1. Ginn & Co., Boston.

The work is a popular treatise and not a scientific discussion, free from many technical terms, and admirably adapted to the needs of the housewife, the student of domestic science, and all others interested in home economics.

Tennyson's THE CUP and Palgrave's GOLDEN TREASURY. Price 2s. 6d. each. Cloth. Macmillan & Co., London.

These books are edited with notes and introduction and will prove of great interest to students of English literature.

EVERYDAY ENGLISH. Book II. By Jean Sherwood Rankin. Cloth. Pages 342. Price 50 cents. Educational Publishing Company, Boston.

The author has shown considerable industry and care in the preparation of this book and in gathering the large number of selections used.

A NEW SCHOOL MANAGEMENT. By Levi Seeley, Ph. D. Cloth. Pages 329. Hinds & Noble, New York.

The young teacher we have always with us, and this work on school management seems adapted to young teachers and especially those in small schools. Its plan is modern and the treatment of the various subjects interesting and instructive.

THEORETICAL GEOMETRY FOR BEGINNERS. Part III. By C. H. Allcock, Senior Mathematical Master at Eton. Cloth. Pages 113. Price 1s. 6d. Macmillan & Co., London.

The third part of this book contains the substance of Euclid; Book II, propositions 1-14; Book III, propositions 35-37, and Book IV propositions 10-16, with other important propositions.

A NEW GEOMETRY FOR JUNIOR FORMS. By S. Barnard, M. A., and J. M. Child, B. A. Cloth. Pages 306. Price 1s. 6d. Macmillan & Co., London.

This volume has been prepared for the use of pupils beginning the study of geometry in schools. It is practical, beginning with introductory exercises instead of formal definitions, and setting the pupil to find out, by his own work with rule and compasses, the truths of geometry.

Goethe's DAS MARCHEN and Campe's ROBINSON DER JUNGERE. Edited with Notes and Vocabulary. D. C. Heath & Co., Boston.

These two books—Goethe's "Tales" and the famous German "Crusoe" story—have been produced in Heath's *Modern Language Series* to meet the demand for elementary texts that are easy and yet full of action and interest.

Scheffel's DER TROMPETER VON SACKINGEN. Edited by E. L. Milner-Barry, M. A. Cloth. Pages xxii+280. Price 3s. 6d. Macmillan & Co., London.

This poem achieved such a complete success in Germany that Säckingen, the scene of the poem, has become a place of pilgrimage for many an educated tourist. It is published in the Macmillan's *Siepmann Series*.

ACCOUNTING AND BUSINESS PRACTICE. By John H. Moore and George W. Miner. Cloth. Ginn & Co., Boston.

The practical character of this system of bookkeeping causes it to be readily adapted to the requirements of classes and schools of all kinds. In addition to the text-book there are blank forms for business practice, and currency where the practice requires the handling of representative money.

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**ELEMENTARY GERMAN FOR SIGHT TRANSLATION.** By Richard Clyde Ford. Cloth. 43 pages. Mailing price, 30 cents. Ginn & Co., Boston.

This is a text planned for the first two years of high school and college work, to be used as soon as classes are able to take up easy reading.

**THE FIRST THREE BOOKS OF HOMER'S ILLIAD,** with Introduction, Commentary and Vocabulary. By Thomas D. Seymour, Professor of Greek in Yale College. Cloth. Illustrated. Ginn & Company, Boston.

This revised edition of a well known text-book contains the results of the active research of the past dozen years, a larger number of illustrations, the insertion of a helpful table of pronouns, and a change of typography in the introduction. In its illustrations and textual arrangement it seems the perfection of the book-makers' art. It is a veritable delight to turn over its pages; and its scholarly and attractive make-up should tempt many to study with fresh interest the world's greatest epic.

### February Magazines.

The February *Atlantic* offers a group of leading articles on subjects of great importance, and treated by men well qualified to discuss them. In addition to these, stories, poems, reviews and a genial Contributors' club unite to make an excellent number of this, the leading American magazine. The readers of the *Canadian Magazine* will find much excellent matter in the February number. Goldwin Smith's article, *Can Canada Make Her Own Treaties?* F. C. Wade's Comments on the Alaskan Boundary, and W. J. London's contribution concerning the National Observatory are of great interest to Canadian readers. *Littell's Living Age* in its weekly issues for Jan. 23rd and 30th, has for leading articles *The Latest View of History*, by G. M. Trevelyan, from the *Independent Review*, and *The United States of Europe*, by Emily Crawford, from the *Fortnightly Review*. Both are timely topics, treated in an able and interesting manner. *The Delineator* for February contains bright stories and interesting articles for grown people, and delightful tales and other amusements to keep little hands and minds occupied. *A Little Garden Calendar*, by Albert Bigelow Paine, tells the story of the second month's development of a garden belonging to two very interesting children. It is instructive as well as entertaining.

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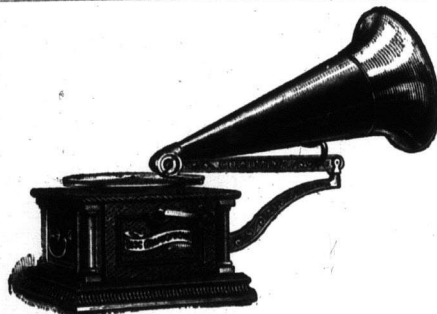
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### EDUCATION DEPARTMENT, N. B.

#### Official Notices.

##### I. SCHOOL YEAR 1903-4—NUMBER OF TEACHING DAYS.

The number of Teaching Days for School Year is as follows:  
 Ordinary Districts 216; Districts having eight weeks summer vacation 206; St. John City 205.

The First Term ends on Friday, December 18th, 1903, and the Second Term begins on Monday, January 4th, and ends on June 30th, 1904. The Second Term has 125 Teaching Days in all Districts except the City of St. John where the number of Teaching Days for the Term is 124.

##### II. DEPARTMENTAL EXAMINATIONS.

The several Departmental Examinations will be held as in former years in accordance with the provisions of Regulations 31, 32, 45 and 46.

The subjects for the Leaving Examinations shall consist of English Language, English Literature, History and Geography, Arithmetic and Book-keeping, Algebra, Geometry, Botany and Agriculture, with any two of the following: Physics, Chemistry, Physiology, Latin, Greek, French—(Nine papers in all).

All candidates for Matriculation shall take the following subjects: Latin, Arithmetic and Algebra, Geometry, History and Geography, English Language, English Literature, Chemistry; also, either Greek or French and Natural History.

All candidates for the Matriculation and Leaving Examinations must send in their applications to the Inspector within whose inspectorate they propose to be examined, not later than the 31st day of May. A fee of two dollars must accompany each application. Forms of application may be obtained from the inspectors or from the Education Office.

The English Literature Subjects for the Matriculation and Leaving Examinations will be the same as for the First-Class Candidates at the Closing Examinations, viz: Tennyson's *Princess* and Shakespeare's *Hamlet*.

##### HIGH SCHOOL ENTRANCE EXAMINATION MEDALS.

His Honour the Lieutenant-Governor has been pleased to offer Thirteen Silver Medals to be competed for by the pupils of the Eighth Grade at the High School Entrance Examinations in June next, and thereafter annually during his term of office.

The examinations will be held in accordance with the provisions of Regulation 46 at the several Grammar Schools and at such of the Superior Schools as shall make application to the Chief Superintendent not later than the First day of June.

One medal will be competed for by the pupils of each County, except that for the purposes of this competition Madawaska and Victoria will be reckoned as one County, and Sunbury and Queens as one County.

The medal will be awarded to the pupil making the highest aggregate marks in each case, provided that no candidate falling below the Second Division shall be entitled to a Medal. The papers of the candidates awarded the highest marks by the local examiners shall be submitted for a final examination to special Examiners appointed by the Board of Education whose decision shall determine the award.

J. R. INCH,  
 Chief Supt. of Education,  
 Education Office, Fredericton, Dec. 7th, 1903

# IMPORTANT ANNOUNCEMENT

## NEW TEXT BOOK FOR PUBLIC SCHOOLS.

### HISTORY OF THE MARITIME PROVINCES

BY JAMES HANNAY.

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