

**PAGES**

**MISSING**

# The Educational Review.

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THE

## PLACE

TO GET ALL

SCHOOL

AND

COLLEGE

TEXT-BOOKS

IN THE

MARITIME PROVINCES

HALL'S BOOK STORE,  
FREDERICTON, N. B.

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### THE EDUCATIONAL REVIEW.

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A NUMBER of questions remain on hand to be answered in our next or in future numbers of the REVIEW. We hope to "catch up" soon.

THIS number closes the Seventh Volume of the REVIEW.

The PROGRAMME of the Educational Institute of New Brunswick, will be found in another column. Such an interesting array of topics, with the names of those who are to discuss them, should draw to St. John a large representation of the teachers of the Province.

THE Board of Education of P. E. Island, at the request of the Educational Association, has agreed to allow, with the consent of the trustees, any teacher who attends the Summer School of Science an additional week holidays in July. Encouraged by the concession on the part of the board, many teachers of the province should arrange to attend the school. They should see that the matter be mentioned at the annual meeting of the school section, and the consent of the people obtained.

MANY of our readers will hear with regret of the death of the Rev. Dr. McKnight, Principal of Pine Hill Presbyterian College. The writer has known him intimately for over twenty years, and has never met his equal intellectually. He was a profound scholar and an eloquent speaker. He was most unassuming in his manner, a warm-hearted friend and a very entertaining companion. In educational thought he was in advance of his times.

The P. E. Island Legislature at its recent session amended the Education Act, making the maximum amount of supplement paid by the government to teachers \$25 instead of \$150 as formerly. This is a backward step, affecting the best schools of the Island.

The many friends of Chancellor Rand, of McMaster University, Toronto, will be glad to learn of his recovery from his recent illness. He presided at the commencement exercises of the University, May 1st-3rd, and it is hoped that this indication of returning health and strength is the signal for many years yet of active work.

### NATURE STUDY IN THE SCHOOLS.

Although nature study in our schools is far from what it ought to be there are signs that it is improving and one of these signs takes form in enquiries from teachers for further articles on nature study in the REVIEW, and for books that may assist them to make up deficiencies in their own early training. Teachers must see that nature study has come to stay in the schools, that the only way to teach the subject with success is, not from text-books, but from nature.

A writer in *Science* discussing this subject recently says that every well equipped academy and normal school should have one or more specialists, adapted to the work and thoroughly equipped for it. "But," the writer says, "There are many schools in which the question of economy must regulate matters, and many schools which are not large enough to require the services of a special teacher. Shall these schools, then, 'drop the subject altogether from the curriculum?' We answer decidedly not. Intelligent teachers, by reading and by study and use of material, should be able to fit themselves to do good work in this as well as in other lines. There are plenty of recent publications for their benefit, some of more, others of less, value. There are occasionally helpful lectures, and sometimes regular instruction at teachers' institutes. Every year the helps grow more numerous and are within easier reach. Current educational literature on this subject is not yet so abundant as it ought to be, but the demand will bring the supply.

### INSPECTOR BRIDGES AND THE FREDERICTON BOARD.

The Fredericton School Board is aggrieved at the reflections contained in Inspector Bridges' last report to the Chief Superintendent, concerning its action in reducing some of the teachers' salaries by which indirectly the service was impaired. It is stated that the trustees regard the matter so seriously that they have presented a memorial to the Board of Education asking that a retraction be made. The following is the objectionable paragraph:

"The new building, in appearance and appliances for school work, is certainly a credit to the city, and is fully the equal of any in the Maritime Provinces, but if it has been erected at such an expense as to compel the Board of Trustees to lower the salaries of some of their most efficient teachers, as well as increase their work, it would seem to have been promoted rather in a spirit of show than of wisdom. The Board have this satisfaction, however, of knowing that their action in this regard has been universally condemned, both on the

street and in the press, and it is the more to be regretted, as it will furnish pretext for parsimonious District Boards, and, unfortunately, there are such, to attempt to lower salaries that are already far too small."

The Fredericton Board is composed of very reputable gentlemen, who are well disposed toward what they regard the best interests of the schools under their control, but they must bear in mind that the schools are a public trust and as such their action is open to legitimate criticism.

Another feature which trustees very often lose sight of is that the schools are not entirely supported from sources under their control, but that the Province and counties bear a large share of the expense.

It is one of the duties of an inspector to see that these moneys are expended in the best interests of the service.

The Board moreover, in the matter complained of, has not as yet been able to show to the public that its action was justifiable; and as far as has been observed, has been condemned both inside and outside its own city of Fredericton.

Such being the state of public opinion it was not only Inspector Bridges' privilege but his duty to refer to the matter. It is not surprising that his report should confirm the opinion of the public regarding the action of the Board, and its extreme sensitiveness under it goes still further to confirm the idea that its action was impolitic. It would seriously impair the efficiency of public officers if they were constrained by the sentiments of private parties from reflecting on their performance of public duties.

### P. E. ISLAND SCHOOL REPORT.

The annual report of the schools of P. E. Island has been received. The report indicates progress in educational matters in the Province. In the number of schools, teachers and pupils in attendance, there has been an increase during the year. While there has been an increase of teachers, the number of the third or lowest class of teachers employed was less than in the previous year, making the increase of first and second class teachers still greater. This is a hopeful sign. The average attendance was less than during the previous year. This is attributable "to the prevalence of measles and scarlet fever in the rural districts." Comparing the percentage of attendance with the other provinces of the Dominion, P. E. Island is placed first with 58 per cent.; New Brunswick 57.94; British Columbia 57.80; Nova Scotia 57; Ontario 52. The average increase, however, is small. In 1877 the percentage was 57.75. From that date to the present there has been varying increases and decreases, and in the present year the in-

crease is but a fraction of 1 per cent. Bunbury school leads the Province with 95 per cent. Of the city schools Prince street school, Charlottetown, leads with 82.6. Eleven schools made 80 per cent. and over; twelve between 75 and 80 per cent.; thirty-three between 70 and 75 per cent.

"It will be seen by the above statement," remarks the Superintendent, "that for the year ended 1893 the increase in the number of schools that have made seventy per cent. and over is nearly thirty per cent. more than that of the previous year. This is the most encouraging feature in connection with our educational work for the year."

Referring to the number studying the different subjects the report says;

"It is pleasing to note the general progress. The increase in the number under instruction in reading, writing, composition and orthography is very gratifying. Another noticeable feature is the large addition to the number studying the subjects of the high school course. In geometry there is an increase of 359. There is also an increase of 289 in the number studying algebra. The increase in the number under instruction in French is 586. In Latin there is an increase of 337 for the past year."

Superintendent McLeod thus summarizes the needs of the Province educationally: 1. A change in our primary methods of instruction is necessary. 2. Our normal and model schools should be put on a more efficient basis. 3. A kindergarten class should be established in connection with the normal school. 4. Greater attention should be paid to English composition, drawing and penmanship. 5. Instruction in English grammar should be more practical, and that it should be taught orally up to the fifth reader class. 6. The pupils of many of our schools are advanced too rapidly in reading without due regard to the progress made in the other branches of study. 7. A truant officer should be appointed for the city schools.

#### TALKS WITH TEACHERS.

Should a child be kept in one grade more than two years? Unless he has been prevented, by illness or absence, from advancing I think not. It may be said—what is the next teacher to do with him if he is not up in his work. She will probably do much better with him than the teacher whom he has left. After a pupil has been two years in a grade he has outgrown it, as it were. All his first associates have departed, and he rapidly falls into a condition of indifference or discouragement. Work that furnishes no novelty is not very interesting. Pass him on to the next teacher; he may not do the best class of work, but the old teacher has had enough of him. Let another have a trial.

Why do teachers continue to worry over incorrigibly dull pupils? After giving a conscientious effort to correct this, do not carry the trouble outside the school room. You cannot supply ability. It is folly to expect all your pupils to grade. From fifteen to twenty-five per cent of an ordinary class will lag. Working up dull pupils after school hours may do very well for a time, but it is wearing. Grading the whole class spoils school boards. They will not increase your salary on account of it, but they will set a very high standard for your successor.

Should epileptics and foolish children be admitted to the schools? To those unacquainted with many of the schools in the Province, it would be surprising how many pupils of this character are to be found. It cannot be doubted that they are a positive injury to the school, and often a danger as well, but their parents are rate-payers, and the attacks of the disease may be intermittent. Another embarrassing feature in the affair is dealing with the parents in such cases. It is difficult to approach them, and you will in most cases find both father and mother entirely unconscious of any defect. What to you seems lack of intellect, to them appears as precocity.

Report the matter to the trustees. If they are not disposed to furnish relief, your position is difficult indeed.

I propose in this and other talks to speak of some school devices which have come under my notice, and if any of my readers have any to suggest, and will send them to the REVIEW they will receive due attention.

I propose just now to speak of a cure for tardiness that I saw working very successfully in some grade schools. It consisted of a beautiful silken banner held by the room making for the preceding month the most regular attendance with the least tardiness. The teachers told me that tardiness had greatly decreased since the plan had been adopted.

Observe Arbor Day—not as a holiday, but as a day to be devoted to the outside and inside interests of your school house. Get the parents interested if you can.

#### MAY.

Here is May, sweet May,—all love her!  
Scatter apple-blossoms above her!  
Joyous May! She gives a nest  
To the waiting yellowbreast.  
Wheresoe'er her footsteps pass  
Blue-eyed blossoms deck the grass.  
At her voice the woodlands ring  
With the music of the spring.  
Fast the brooklet runs to meet her,  
Leafy sprigs bend down to greet her.  
Listen now!—She comes this way.  
Bud and blossom! 'Tis the May!

—Harriet F. Blodgett, in *May St. Nicholas*.

For the REVIEW.]

## NATURE LESSONS.

GOLDFINCH (*Spinus tristis* L.)

"Oh! the yellow bird!"

"A canary!"

"No, it is the American goldfinch. It comes here after the middle of May from the south. Is this the first you have seen this summer?"

"Yes. They are later some years than others, are they not?"

"Of course."

"What a beautiful bright yellow its body is! And how well the black trimming on its head, wings and tail looks! Don't you notice the white bars across its black wings?"

"I do. But by September all that bright gold and jet black will be toned down to dull quaker's dress of olive browns and grays. This bright uniform of gold and black is the full dress of the male during spring and summer. The plumage of the female is not brilliant at any time, much like the male's in winter, but more greenish olive in spring and summer."

"How curiously it flies, in low, rising curves, one after the other, with its short song *dee-ree, dee-ee-ree*, every time it rises!"

"Yes, its flight is very peculiar. Do you see that yellow on the yellow flowered spike of the mullein plant there. He looks like a part of the flower cluster itself."

"Why, yes, I wouldn't have noticed him if you hadn't pointed out the exact place. Isn't that one there plucking out thistle-down from that large thistle there."

"Of course. They are known to be so fond of the thistle seed that it is called the "Thistle bird" as often as it is called the "Yellow bird." And its bill like that of all the sparrows and finches, to which family it belongs, is quite stout enough for shelling any of those little seeds. But if we can find its nest we will find that it is probably lined with this fine,

silky down. They make exquisitely comfortable nests by this fine lining of the more substantial part of the structure."

"When does it begin to build?"

"Strange to say, not until about July, although the male and female may be together from the end of May in the place. But they have dainty eggs, a very pale greenish blue-white, four or five of them in the little cup shaped, silk lined nest, often placed in tall bushes or low trees."

"Are the little chicks golden colored?"

"No, not at all. They are quite brown. They are safer I fancy by being not conspicuous. They are very noisy sometimes when learning to fly. They follow the old bird, screaming *tweet-ee, tweet-ee, tweet-ee*. The old bird, with exquisite sweetness, in his swinging flight, soothes them with the strains, *bay-bee, bay-ee-bee*. It has a variety of chattering notes, but sometimes sings nearly as well as a canary, to which it is closely related."

"It is very strange, is it not, that the bright color of the male birds changes so much in the fall when it goes south to pass the winter, and that in spring when it returns to us its brilliant color should return again. But another yellow bird comes here in May, does there not?"

"Yes, the summer warbler is chiefly golden yellow. There are many species of these little warblers. The yellow-rumped warbler, bluish-ash streaked with black, has a yellow patch on its rump, crown, and sides of the breast. The black and yellow warbler has its rump and under parts yellow, but its head is ash colored, its back and side of head black, and a white stripe behind the eye. But there are seven or eight warblers without any conspicuous yellow. But the warblers are neither sparrows nor finches and we shall have a look at them again."

For the REVIEW.]

## Flowers of Forest Trees.

Many of the forest trees on or before Arbor Day will have put forth their blossoms. These blossoms are so inconspicuous that they will not be noticed, or if noticed their true nature will not be known unless the children's attention is directed to them. Very many of our trees have their flowers clustered in spikes, called catkins. The willow, poplar, alder, birch, hazel and many others have such flowers.

The soft, delicate catkins of the willow are clusters of many hundreds of simple flowers, some of which (the staminate) have two stamens growing from the base of a little bract, others (the pistillate flowers) have one pistil also growing from the base of a little bract. How simple are such flowers! And yet they

are as deserving of our notice as the more brightly colored ones, for they fulfil the office that all flowers fulfil, namely, produce and bring to perfection the seeds. Examine a catkin that has just been put forth from a willow branch. If you find that it contains staminate flowers, all the flowers on that tree will be staminate. Examine other willow trees near. If you find one with pistillate flowers, then all flowers on that tree will be pistillate. The willow is dicœcious—its staminate and pistillate flowers grow upon separate trees.

Next, study a birch, an alder, or a hazel, where the staminate and pistillate flowers grow upon the same plant (monœcious). Here is a picture of the branch of a hazel. The three long catkins are staminate. Picking one of

these, take with the point of a knife, or a needle, one of its small flowers and examine it with a magnifying glass. It will be seen to consist of a stamen with a short filament adhering to a bract, as in *b*; the inconspicuous pistillate flowers are seen on the same branch at *c*, and of them enlarged is seen at *d*. The principal objects in these pistillate flowers of the hazel are the long, red stigmas, which are quite noticeable when they are ready to receive pollen. The ovary which we might expect to find at their base, as in the case of the fertile flowers of the willow, is not developed until later on. Examine birches and alders for pistillate as well as staminate flowers.

What a world of interest will be opened to your pupils if you put them on the track of finding out just what kind of flowers are produced by each tree, for nearly all are in flower early, most of them before their leaves are put forth, and nearly all of them of the same simple and inconspicuous character as those described above. If your pupils ask you hard questions about them, or you are in doubt as to their characteristics, the REVIEW may be able to assist you if you will ask.

These flowers in the long pendulous catkins secrete abundance of pollen, and about the time the REVIEW makes its visit this pollen will be shedding, and scattered far and near by the winds, to fall on the stigmas of the pistillate flowers, to ripen and turn into seeds the ovules which are contained in the ovaries. This pollen is scattered in such abundance that often streams and pools of water in the vicinity are covered over with this sul-

phur colored dust. (The willow catkins, you will find, are visited by bees and other insects, which carry the pollen to fertilize the ovules in the flowers of the pistillate catkins. All the other trees are, it is supposed, wind-fertilized).

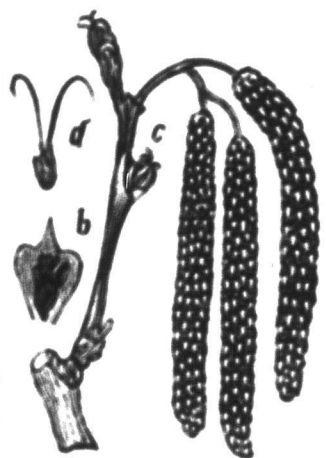
Do you see the importance of these trees producing their flowers before their leaves? It is that their pollen may have free play and find its way to the pistils unobstructed by leaves.

For the REVIEW.]

#### A Lesson on Snails.

Snails, being insignificant little animals, are generally overlooked. But, although small, they are none the less interesting in their food, habits, structure, etc. They are abundant in summer, the fresh water ones being found in stagnant pools, adhering to blades of grass, pieces of wood, etc. While the land snails on the other hand inhabit damp woods, and are easily found by lifting up decayed logs of wood, also under the leaves and twigs which strew the ground. Our snails are mostly of small size, but farther south they get larger, until in the tropics they attain all their beauty of color, size, etc. They are vegetable eaters, as is seen by the damage they inflict on our forest trees, and occasionally in gardens. They are slow creatures, secreting a milky fluid while crawling, which enables them to proceed with greater rapidity. This mucus is secreted from all parts of the body, as is seen when the snail is annoyed. The snails, when winter comes, hibernate or become torpid, that is they lie as if dead until the spring, when as the snow melts they gradually come out. Snails are oviparous, or produce their young from eggs. They are said to possess great vitality, having been seen frozen in blocks of ice and when put in a hot place have come to life again. Slugs are often confounded with snails but belong to a different family, having usually no visible shell, though a rudimentary one is often present, either obvious or concealed beneath the mantle.

The external structure of a snail may now be noticed. The lower flat part is the so-called "foot" of the snail, but includes the stomach and digestive organs, and as on the foot the animal crawls, it explains the name of gasteropod or "belly-footed" by which this group of animals is known. Near the front of the foot is situated the mouth, and on either side of this the tentacles or horns of the snail, by which he investigates the nature of surrounding objects, or feels his way through the world. At the base of the horns are situated the eyes, sometimes borne on little stalks. Under the shell is seen the orifice of the lung, through which the snail breathes. We will now notice the parts of a shell. The mouth



of the shell is called the orifice, and sometimes bears upon its side one or more tooth-like processes, as in the species *Helix monodon* of our woods. From the base containing the orifice the shell winds upward like a gradually lessening tube, describing in its course a greater or less number of turns or whorls, forming the "spire," at the top of which is the apex. This, however, is not the last but the first part of the shell to form. The latter gradually enlarges downwards as the animal grows and needs a more commodious home. The spire may be narrow and thin, like a church spire, or broad and open, the angle between the sides of the spire being constant in each species. In one species of snail the whorls are striated with small lines, and it gets the name of *Helix striatella*. By the forms, color, etc., of the shell we have a means of identifying species. Snails belong to the mollusca, one of the branches of the animal kingdom. This is divided again into groups, namely (1) the Cephalopods, including those forms usually without a shell, as the squids, cuttles, etc.; (2) the Gasteropods (as stated above), and (3) the Bivalves, or those molluscs having the shell composed of two pieces, as in the oyster, clam, etc. The snail then is in the gasteropod group. This again is divided into orders, the snail being in the order pulmonata, or lung breathing molluscs. They are also divided into families, genera and species. Our snails are mostly comprised in the family Helicidæ, but there are various genera and species, the species being determined largely from external markings. Thus we classify a snail as in the following table:

Branch—Mollusca.  
Class—Gasteropoda.  
Order—Pulmonifera.  
Family—Helicidæ.  
Genus—*Helix*  
Species—*Striatella, monodon, etc.*

Fredericton, N. B.

G. BAILEY.

[For the REVIEW.]

#### The Backward and Forward Motions of the Planets.

An article in the last number of the REVIEW intimates that some of its readers wish to be enlightened upon the backward and forward motions of the planets. In connection with this intimation there seems to be a request that I should furnish the light. What amount of light is wanted—whether a flood or a mere flicker—is not stated, nor am I told what are the specially dark nooks that need lighting up. As to the latter I shall have to risk a guess; as to the former it will be best, I think, not to try to supply any readymade light, but just to scatter about a few splinters of flint and a few scraps of tinder, from which the reader may peradventure manage to strike a light for himself if he will take the trouble to apply the steel of his own thought to them.

As the observer watches the planets from hour to hour on a clear night he sees that they—in common with the sun, the moon, and the stars—mount up from the eastern horizon to their highest point in the sky, and then drop down to their setting in the west. This is not the motion that concerns us at present, and the reader will do well to dismiss it for the time being from his thoughts.

As the observer watches the planets from night to night, and compares their positions with those of the stars near them, he sees that the planets are moving among the stars. During this present month of May 1894, Saturn and Uranus may be seen moving in this way from left to right, Venus and Mars from right to left. Three months ago Venus was moving the other way, and Mars will be doing so five months hence. Saturn's left-to-right motion will continue until near the end of June, and will then be reversed; and Uranus will follow suit a month later.

These are the planetary motions that concern us here. They have puzzled the brains of observing and thinking people for thousands of years. In the olden time it was the learned in astronomy who were puzzled, now it is the learners. The old problem was—given the motions as we see them, with all their seemingly lawless turning and twisting and toing and froing and zigzagging and looping, to find what are the real motions corresponding to these apparent ones, and what the laws that govern them. This problem has been solved, and now every one knows—or think he knows—that all the planets are moving around the sun in nearly circular orbits, and always in one direction. With this much of book-learned knowledge on the subject many people are quite satisfied. But there are others who actually take the trouble to look at the planets with their own eyes and watch their motions. After a while it begins to dawn upon them that what their eyes tell them about these motions is—or seems to be—inconsistent with what they read in the books about them. This is what I suppose to be the case with those REVIEW readers who are looking for light on the subject.

The ancient and now obsolete puzzle to the learned in astronomy was to work their way from the observed facts of the apparent motions to the theory of the real motions. The modern and ever new puzzle to the learners in the science is the converse of this. They wish to be able to feel their way from the theory of the real motions as delivered to them in the books to the apparent motions as they see them in the heavens. What they want to know is—if the real motions are what theory says they are, how comes it that the apparent motions are what our eyes tell us they are? But this question covers a great deal more than is asked for in the present case. Only one of the many puzzling facts in connection with the apparent motion is mentioned, and so the particular puzzle at present is only this: If the planets are really moving always in one direction, how comes it that we see them sometimes moving one way and sometimes the opposite way?

It looks as if Theory and Fact were at loggerheads. And as

"Facts are chieils that wunna ding,  
And downa be disputed,"

it is to Theory we must look for an explanation. But let us approach him with all due respect, for otherwise he might get on his high horse and tell us that he was evolved by the best human thought from very facts that are now set up against him, and that if we are too ignorant or too stupid or too lazy to think out for ourselves the connection between him and the facts, we had better make an act of faith and accept him without question. He won't storm thus if interviewed in a respectful way, and if assured that we are anxious not to find fault with him but to learn from him. He has often helped such enquirers before now, and here follows what he said on one occasion to a number of them. In speaking of himself he usually imitates Cæsar, but sometimes lets a 'me' or a 'my' slip from his lips.

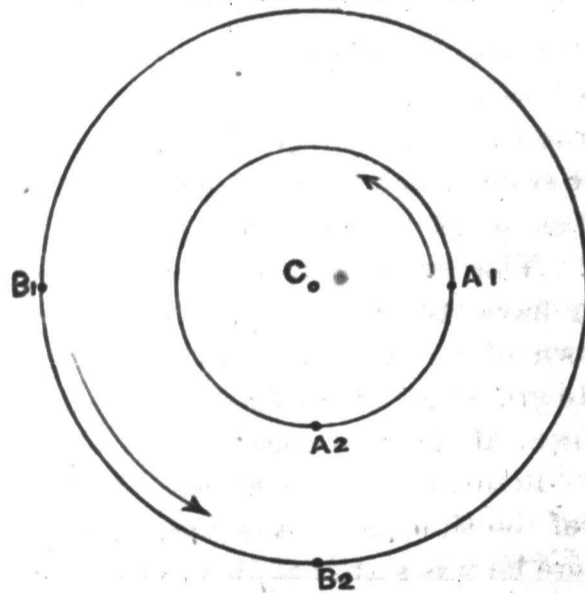
"When you say that Theory says the planets all move in one direction you ought to remember that Theory is speaking of their motions as you would see them if you were looking at them from the sun, which, according to Theory, is the fixed centre about which these planetary motions are described. Now, you are not on the sun, but on the earth, and, according to Theory, this earth of yours is itself one of the moving planets. If you will be good enough to give due consideration to these points, you will see that it is unreasonable to expect that the motions of the other planets as seen from the moving earth should look exactly the same as if you were viewing them from the sun."

He was proceeding to enlarge upon this, and to illustrate it by references to a circus and a skating rink; but his interviewers begged him not to take any more trouble with that part of the subject. Some of them said they had not been guilty of that particular bit of unreasonableness. Others admitted they had, but wished to be allowed to work out the illustration for themselves without further help. He seemed much pleased at this and continued,—

"Well then, it only remains for me to try to say something that will help you to see that the motion of the earth changes the continuously forward motion of the planets as seen from the sun into the alternately forward and backward motion that you see from the earth.

"Take a sheet of paper and make two concentric circles on it. Let them represent the orbits of two planets, and let the common centre represent the sun. Call the planet on the inner circle A, the other B. If the radius of the outer circle is made a very little more than two times the other, then B will take just three times as long to complete a revolution as A does. This is a consequence of one of the laws of the solar system, a law which was first discovered for me by my friend Kepler. There is no real need to put your A and B under Kepler's law. They would help you out of your difficulty if A was moving faster than B under any other law. The chief thing to note is that an inner planet always moves faster in its orbit than an outer one. There are some conveniences connected with making the one move three times as fast as the other, and that is why these rates are recommended for the planets on your diagram. Of course, from what has been already said, you will understand that these rates are rates of angular motion, that A moves over an arc of 30 degrees while B is moving over one of 10 degrees.

"Now, you are to suppose that A and B are moving round their circles at these relative rates, and in the forward direction. You are aware that when Theory speaks of the forward direction he means from right to left as seen from his stand-point, the sun. If a fly were to alight on the centre of a clock dial and to set himself to watch the outer end of one of the hands he would see it move slowly round from left to right. That is forward for your clocks, but it is backward for the planets. Some of you look as if you would like some explanation of this use of 'forward' and 'backward,' but as one of your own writers says 'that's another story.' You don't need any explanation of this for your present purpose, and that purpose will be best served by attending to it only.



"You have been watching—with the eyes of your mind—A and B moving round their circles. Sometimes they are both on the same side of the centre and sometimes they are on opposite sides. Let them halt for an instant when A is at the point A1 and B is on the other side of the centre at B1. Suppose an observer placed on each, with instructions to watch the other. Start them again, and let the motion be so smooth that each observer is quite unconscious that his own planet is moving at all. To a third observer at C, as he looks first at one and then turns round to look at the other, both A and B are seen moving forward from right to left. Just at first C will hide each of them from the other, but A's swifter motion will soon remedy that. How will each of these then be moving as seen by the observer on the other?"

"Since the rates of A and B are as 3 to 1, A will move from A1 round to A2 in the same time that B takes to move from B1 to B2. Now they are both on the same side of the centre and again in line with it. Seen from C, they are both of course still moving forward. For an instant the nearer one will hide the farther from a spectator at C, but the next instant A's swifter motion will have carried it out of line with B. Now, how will each of the planets seem to be moving to an observer on the other who is unconscious of the motion of his own?"

And then Theory bowed his interviewers out with a few parting words to the effect that, if they studied their two circles well, they would get light on many other planetary puzzles besides the single one they had consulted him about.

A. CAMERON.

Yarmouth, N. S., May, 1894.



For the REVIEW.]

## New Brunswick Schools of the Olden Time.

BY W. O. RAYMOND, M. A.

(Continued.)

## THE MADRAS SCHOOL SYSTEM.

We come now to the consideration of an extremely interesting feature in the early history of New Brunswick schools, namely the rise and decline of the Madras system of education. With its introduction the name of Lt. Governor Geo. Stracey Smyth\* is inseparably connected. He was from the first its warm friend and devoted patron.

Before speaking of the Madras schools as established in this Province, a short account of their origin may be of interest. The system has been variously termed the Madras, the National, the Bell or the Lancaster system, and at one time much controversy prevailed as to the merits of the claims of its rival founders. The originator of the system however, appears to have been Dr. Andrew Bell, who was born at the town of St. Andrews, Scotland, in the year 1753. He graduated at the famous university of his native town, afterwards spending several years in America. Returning home he was ordained to the ministry of the Church of England, and went out to India where he was stationed in 1789 as chaplain of the garrison at Fort St. George, and minister of St. Mary's Church in the City of Madras. In connection with the duties incident to his position, he particularly interested himself in the education of the orphan children of the Military Asylum. By reason of a scarcity of teachers he was obliged to introduce the system of mutual tuition among the scholars. He found the plan to answer so well that he became convinced of its universal applicability and after his return to England, elaborated his ideas on the sub-

\* In the south transept of the Cathedral at Fredericton is a marble tablet erected to the memory of Major General Smyth. A fine medallion at the top displays the strong features of the rugged old soldier and the sword in the back ground recalls memories of the field of Waterloo. The inscription below tells "This tablet was erected by the express desire of an orphan daughter and son to testify their grateful remembrance, and to record the virtues of their lamented father, Major Gen. George Stracey Smyth; who died on the 27th day of March, 1825, in the 56th year of his age, and whose remains are interred in the vault beneath." After referring to other public services the inscription goes on to record the efforts of the late Lt. Governor in "zealously promoting and liberally encouraging every institution that could benefit the Province and improve the rising generation. Nor did he slight the captive and oppressed Africans, evincing his humane attention to their welfare by establishing and upholding schools for their instruction and civilization."

In an eloquent sermon preached by the Rev. James Somerville, M. A., Principal of the College, at Fredericton, on the occasion of the death of Major General Symth, occurs the following passage, "The unwearied exertions which he made for the education of the youth of the country, particularly those of the lower orders, are known through the whole extent of this Province. Through his means, aided by the bounty of the Legislature, it is now the power of the poorest and meanest in the country to give their offspring a religious and a moral education."

ject in a small pamphlet which he published in 1797. The following year, Mr. Lancaster opened a school in London on the same lines and met with marked success.

Joseph Lancaster, who divides with Dr. Andrew Bell the honor of establishing the Madras or National system, was the son of an English soldier who served in the Revolutionary war. He was born in Southwark, London, in 1778. In the year 1801, he established a large school in Borough Road, London. Inability to hire assistants led him to employ older scholars to teach the younger. The school, comprising a thousand boys, was divided into small classes, each under the care of a monitor. A group of these classes was superintended by a head monitor, and the quasi-military system of discipline and gradation of ranks caused the whole establishment to assume an orderly, animated and very striking appearance.

Lancaster admitted that in the organization of his school, he was indebted in the first instance to Bell's pamphlet for the idea, but contended that the details subsequently worked out were his own. In a very interesting pamphlet which he published in 1803, he describes the manner in which his staff of monitors taught reading, writing and arithmetic by a method of drill and simultaneous exercise. Lancaster had the personal advantages of an especial aptitude for teaching and winning the confidence of children; but there were attending disadvantages which served in some measure as an offset. He was poor, and in consequence the equipment of his school was of the most meagre kind. The younger children used large flat desks covered with a thin layer of sand for exercise in writing. Sheets from a spelling book were pasted on boards, placed before a class and pointed to till every word was recognized and spelled. Passages from the Bible were printed on large sheets and sufficed for reading and Scripture lessons.

Lancaster devised an elaborate system of punishments, including the use of shackles, tying of bad boys to a pillar, etc.: in some cases offenders were slung up to the roof. He also employed divers marks of disgrace in the manner suggested by mediæval pictures of Saint Sebastian, together with emphatic appeals to the boys' sense of shame. For their encouragement he instituted degrees of rank, badges, offices and order of merit. Whilst these things undoubtedly made the school attractive to lads of ambition, it is questionable whether they did not tend to discourage the backward, as well as to render the clever boys vain and self-conscious.

It was an essential part of Lancaster's plan to enlist the most promising of his scholars as monitors or teachers, and prepare them to become school-

masters. Of the day's work he was wont to say, "Let every child have for every minute of his school time something to do and a motive for doing it."

The scholars taught by Lancaster were from amongst the poorer classes of London and his work in consequence received a very great stimulus when King George III gave to it his patronage and that of the royal family at the same time saying, "It is my wish that every poor child in my dominions should be taught to read the Bible."

The recognition of the merits of Lancaster's system by the Sovereign and its adoption by the non-conformist element of the population in England led the prominent members of the established church, clerical and lay, to call upon the Rev. Dr. Bell to organize a similar system of common school education. In consequence schools on the Madras or Bell system were established at several centres about the year 1807, and they soon became wonderfully popular. Bell's system, like that of Lancaster, was a mutual or monitorial method of instruction in which the older scholars were employed to teach the younger. By means of an elaborate system of mechanical drill the rudiments of reading, writing and arithmetic were taught to large numbers at the same time. The results in many instances were surprisingly good. The little monitors were often found to make up in brightness, tractability and energy for lack of experience, and to teach the arts of reading, writing, and computing with surprising success.

Bell regarded a school not merely as a place to which individual pupils should come for guidance from teachers but as an organized community whose members have much to learn from each other. He sought to place his scholars from the first in helpful mutual relations and to make them feel the need of common efforts for the attainment of common ends.

As in the case of Lancaster's schools the materials of teaching were often scanty, comprising in some cases a few leaves torn out of spelling books and pasted on boards, some slates and a desk covered with a layer of dampened sand on which the children wrote with their fingers.

The public were carried away with the novelty of the system. Its interesting exercises and quasi-military discipline possessed a certain fascination which captivated the admiration of the visitor and disarmed criticism. The *Edinburgh Review* in 1810 probably only voiced public sentiment in describing the Madras system as "a beautiful and inestimable discovery, a plan now brought very near to perfection, by which education can be placed within the reach of all classes."

The opinion expressed by the *Edinburgh Review*, it is needless to say, was decidedly *couleur de rose* and the test of time has shown the necessity of training teachers in the art of teaching in order to the attainment of the most enduring and satisfactory results. Dr. Bell's faith in his method however, continued to the last and he bequeathed his fortune of £120,000 for the propagation of his views. At his death in 1832 he was honored with a tomb in Westminster Abbey. His life was written by Southey.

The remarkable success achieved by the schools organized by Bell and Lancaster led to the foundation in the year 1811 of what was known as the "National Society for the education of the poor in the principles of the established Church." Through the instrumentality of this Society a training school for teachers was established at Baldwyn's Gardens, London. Here masters and mistresses were trained in the theory and practice of the Madras system and sent out as fast as qualified to take charge of schools in town or country. The National Society received many benefactions and legacies in addition to some state aid and was in consequence enabled to contribute towards the erection of school houses both in England and in the British Colonies. In conjunction with the Society for promoting Christian Knowledge, elementary school books were in many cases furnished by the National Society free of cost, and it is worthy of note that the primary step in the introduction of the Madras system in the Maritime Provinces was the sending out to Halifax early in the year 1814 of a donation of 500 sets of books used in the Madras schools for gratuitous distribution amongst schools in Nova Scotia and New Brunswick.

For the REVIEW.] "Near to Nature's Heart."

A question which naturally suggests itself to a city teacher at this season of the year, is— "Where shall I spend my summer vacation?" and it is one of no small moment, for on this question largely depends the success of the ensuing term.

How shall I spend it so as to resume my work with renewed physical and mental vigour, with a higher ideal of my vocation, and in sympathy with the poet who said, "Children are poetry?" I would reply, "Near to nature's heart."

Lay aside social and professional (if the word is allowable) conventionalities, get in touch with the heart of nature, "uninjured by inimitable art." Yield yourself to her moods, follow her dictates, and you will feel with Wordsworth, that—

"An impulse from a vernal wood  
May teach you more of man—  
Of moral evil and of good,  
Than all the sages can."

Last summer, one of our most prominent and successful teachers remarked that he never felt happier then when "One with nature, in view of the quietly grazing cattle, the gently murmuring river—and among the gatherers of the new mown hay."

How many fellow teachers have felt that "Such scenes have power to quiet the restless pulse of care." Those who have not hitherto enjoyed the "benediction" of nature, have deprived themselves of one of life's enjoyments and greatest advantages.

We read in the Bible of nature's educative power; and is it not as potent now as of old? How true, how frank, how pure, how generous and sympathetic are nature's pupils! Who would not be taught by her?

Let us then go to Nature's school, and we shall come out broadened in sympathies, heightened in faith, deepened in love, and invigorated in body; nay, more—breathing the prayer—

"Oh! to be noble as thou noble art;  
Oh! to be true and generous and brave;  
Oh! to forget myself and suffer all  
That love calls forth,  
My fellow-man to save." L.

#### A Notable Book and a Notable Life.

"Legends of the Micmacs," by the Rev. Silas Tertius Rand, D.D., D.C.L., LL.D. Published by the Department of Comparative Philology, Wellesley College, Mass. No greater example has ever been presented in these provinces of scholarly research and untiring industry than that of the late Dr. Rand. For forty years a missionary among the Micmac Indians of Nova Scotia, he labored zealously, not only for the moral welfare of that people but to rescue from oblivion their language and literature. Dr. Rand died in 1889. During his life he translated into Micmac almost the entire Bible, compiled a dictionary in that language of nearly 40,000 words, and furnished to philologists a vast amount of material concerning the life and literature of the people among whom his life was mainly spent, and whose confidence he possessed to a wonderful degree.

The volume here presented consists of eighty-seven legends, covering 450 pages, with an introduction of forty-six pages. The stories were related to Dr. Rand in Micmac by the Indians, treasured in his marvelous memory, and then translated and written down by him in English. After the death of Dr. Rand the legends, with other valuable Micmac and Maliseet manuscripts, were purchased for the Library of American Linguistics, Wellesley College, and placed in charge of the Department of Comparative Philology,

under whose auspices the Legends have been published in the handsome volume before us, which contains a portrait of the author.

In the introduction to the Legends there is a sketch of Dr. Rand, which he himself gave in response to one who asked him for the story of his life. Concerning his school life he says:

"I was educated in the greatest university of all time, ancient or modern—a building as large as all out doors, and that had the broad canopy of heaven for a roof. My father taught me to read—and he taught me more thoroughly to work on the farm—when I was a small boy. My father and grandfather before me had been bricklayers, and when I was eighteen years of age I commenced a seven years' apprenticeship to that honorable and muscle-developing profession. When I was a small boy I went to school, such as schools were then, for a few weeks to Sarah Beckwith, Sarah Pierce and Wealthy Tupper, respectively. None of them amounted to much as teachers, and Wealthy Tupper could not write her own name; but there was one thing she could do—she could and did teach and show us the way to heaven. During the evenings of three winters I went to school taught by a man, and 'graduated' when eleven years of age. Seven years later I determined to study and master the science of arithmetic. This I did with the aid of a book.

"I took my first lesson in English grammar when twenty-three years of age from an old stager named Bennett. I paid him three dollars for this lesson, and after learning it, started and taught a couple of classes of my own at two dollars per pupil. Next I studied Latin grammar four weeks at Horton Academy, when Rev. Dr. Pryor, now living in Halifax (1836), was principal of that institution. Then in the spring of 1833 I returned to the work of a stonemason and the study of Latin. There was then no 'ten hour system' in existence. It was manual labor from sunrise to sundown. But I took a lesson in Latin upon going to work, studied it while at work, took another lesson at dinner, and another at night. I should have told you that my first lesson in Latin was taken the first night of the four weeks I spent in Horton Academy. I heard a fellow student, the late Rev. Wellington Jackson, repeat over and over again the words, *opus* and *usus*, signifying 'need' require the ablative, as *est opus pecunia*, 'there is need of money'. That rule, and the truth it contained, was so impressed upon my memory and was such a perfect illustration of my own circumstances that I never forgot it." H.

Children have too many hours in the school-room, especially in the primary grades. Three morning hours in the school-room and two afternoon hours spent in study by the teacher, would greatly enhance the quality of work done.—Col. Parker.

The bottom of the Pacific between Hawaii and California, is said to be so level that a railroad could be laid for 500 miles without altering the grade anywhere.

## From the Inspector's Note Book.

[Gleaned from the Chief Superintendent's Report, N. B., 1894.]

The general appearance of the school houses and premises could be very much improved in many districts by a small outlay of money and a little labor. Little, however, is done in the way of improvement unless specially recommended. The idea that school rooms and school premises should be made pleasant and attractive is an idea that seems to enter into the minds of trustees and ratepayers very slowly.—*Inspector Smith.*

There is also a tendency observable in many schools to advance the pupils too rapidly in reading and arithmetic. This is done at the expense of thoroughness. It is urged in regard to reading that the pupils get to "know all the words," and that they then lose interest in the lesson, read carelessly and too rapidly. It has always appeared to me a difficult matter to teach reading until the pupil does know the words. The skill of the teacher is then brought into requisition to lead the pupil to express the meaning of the piece, to teach him to see how, by attention to articulation, pitch, tone, emphasis and rate of utterance, he may best convey that meaning to others. The exercise will then become one of thought, not one of imitation and routine. There can be no proper reading where the pupil cannot pronounce correctly a large number of the words, or understand their meaning. *Hearing* a reading class may be a pastime, but teaching the subject demands skill. In arithmetic more attention to principles and less to rules would be advisable. As a matter of education the *why* is more important than the *how*.—*Inspector Steeves.*

There should be more thought and power of expression of thought developed in our teaching. Teachers should realize, to a greater extent, that it is rather their duty to direct the work of the pupil than to do it for him. \* \* \* I would suggest that some slight instruction be given in the Normal School in the subject of forestry. The trees are generally poorly selected, and very bad taste as well as judgment are displayed in setting them out. They are often placed too close to each other and too near the school house. In such cases if they grew they would soon become a nuisance.—*Inspector Carter.*

The work in the ungraded schools, as carried on in the County of York, is, I think, improving, attributable, perhaps, to the fact that there has been less changing about among the teachers than in former years. The teaching of primary reading and number,

and the slate work in connection with these subjects, is certainly better than formerly. The new grammars have been introduced in nearly all the schools, but have been in use too short a time to report upon the work in this regard. There has been more teaching the literature in the readers, and greater interest displayed in the subject of composition.—*Inspector Bridges.*

In No. 9 the pupils seem averse to exertion. They wish the work made *easy* and *interesting*, if not done for them altogether—clearly a result of the unintelligent application of our modern methods. \* \* \* No. 14 is a hopeless case. After being aided in the erection of a school-house to the amount of \$50 from the school-house grant, they stubbornly refuse to open the school. There is only one man in the district in favor of a school, so dense is their ignorance. \* \* \* In No. 3 the trustees are very remiss in the performance of their duties, and the attendance fell off very considerably in consequence. During the coldest weather, a pane and several parts of panes of glass were out of the windows and nothing substituted to keep out the cold. The fuel was fir—wet and soggy—seemed like half dried fence rails. The new out-houses, built a year ago, had one door torn off the hinges, and other evidences of neglect. While all these things points clearly to careless trustees, I cannot hold the teacher entirely blameless.—*Inspector Mersereau.*

Arbor Day was observed by sixty-eight districts in this inspectorate (Victoria, Madawaska, Kent). Two hundred and eighty-two trees and eighty-nine shrubs were planted. Ninety-seven flower-beds were made. School-rooms and play-grounds were cleaned, and in many cases papers dealing with plant culture were read, and appropriate songs and recitations given by the pupils.—*Inspector Meagher.*

## Arbor Day.

\* \* \* In most cases the teacher, with a little tact, will be able through the children and otherwise, to arouse such enthusiasm in at least some of the parents, as to secure their co-operation with teams and tools on Arbor Day. In most country schools young trees, shrubs, wild plants, etc., can in this way be procured in abundance. The tactful teacher will at the same time consult and direct the taste of the boys and girls with regard to the form and amount of decoration most suitable for the particular locality. That teacher will make a serious mistake, and lose a fine opportunity, who fails to make such use of the holiday as to have the school-room, or rooms, made tidier and prettier, the grounds and surroundings more tasteful, and the whole aspect of things more inviting, than ever before.—*Toronto Educational Journal.*

### To be Read to your Pupils.

We do not relate the following anecdote because it concerns a queen, but because Queen Victoria represents the best womanhood of England and the highest type of Christianity that royalty has exemplified in this age.

As is well known, when she was a girl of but eighteen years, she was told that she was to rule over the mighty kingdom to whose throne she was heir. There are few persons either old or young, who would not at least have felt a momentary elation of pride at such an announcement. But there was no expression of exultation in Victoria's face, or words or heart.

Though she had from infancy been destined to the honor, to her nature distrustful of itself the announcement brought a feeling of responsibility that was overpowering, and she sank on her knees, clasped her hands, and faltered out: "God help me to be good!"

Her prayer has been heeded. Help has been given her, and to her purity and loyalty have been added glories and honors and powers enough to satisfy the highest earthly ambition. Later in her reign, when she was asked for an explanation of England's greatness, she said: "It is the Bible and Christianity." When she began to rule, England had a lower standard of court life than it knows to-day. But the personal influence of its good Queen has done much to give the English Court and nation the enviable place they hold to-day in European civilization.

It is worth while to remember the simple earnest words with which the true-hearted monarch of the proudest kingdom in the world assumed her diadem, "God help me to be good!"—*The Youth's Companion*.

[It will do our school children good to be made familiar with the good qualities of her whom we have so long delighted to honor as the Queen of the grandest state that ever existed.

We Canadians are specially fortunate in being able to look up with pride and affection to the noble man who now presides over the government and society of our own beloved Canada—the greatest dependency of the greatest kingdom in the world.

The Earl of Aberdeen, and his noble Lady, are winning the affections of the good and the true—not on account of their high position, but for their sterling moral qualities—their genuine desire to do good to all with whom they come in contact.

Nearer home, we have in General Montgomery Moore and his Lady, noble examples of a real interest in the educational and moral well-being of the society of which they are the ornaments and the leaders. Their influence for good has been largely felt in the schools and charitable societies of Halifax. Fortunate is the country whose rulers are leaders in good works rather than in fashions and frivolities.]

### Dogwood Blossoms.

Like a drift of tardy snow,  
Tangled where the trees are low,  
Scented dogwood blossoms blow.

Dainty petals spreading wide,  
Heart-shaped, lying side by side,  
Not a leaf the flowers to hide.

Every petal bears a scar,  
Where the crumpled edges are,  
And the centre holds a star—

A pointed star of radiant sheen,  
Yellow, tipped with dainty green,  
A crown for April's snowy queen.

—*Mary Wilson in The Housekeeper.*

### School Incentives.

Mrs. D—'s experiment with written spelling was successful enough to be worth telling about, and may be tried with like effect in connection with other studies.

She began in September to dictate ten words a day, five of which were the day's spelling lesson and five review. These were written by the children upon sheets of paper, which were collected at the close of the exercise.

Mrs. D— took the papers home every day, cancelled words incorrectly written, and separated those upon which the spelling was perfect, and the writing showed effort. These she filed, having first affixed to each, according to neatness, etc., a gilt or a silver star. The stars thus used were bought by the box at a stationery store for a trifle.

The next day she returned to the owners all papers bearing misspelled words, with directions to study those words.

At the end of each month she tied together with baby ribbon each child's perfect papers and returned them to the owner. There were very few of these in September, but the number has increased with each month, so that in December three-fourths of the class had starred papers to take home, and some had as many as there had been school days in the month. The children were doubly proud to take home and show these testimonials, because the prize was the work itself. The giving out of the December papers was made a part of the Christmas rejoicing.—*School Journal*.

A good teacher of arithmetic must combine the following qualities:

1. Quickness in mental operations.
2. Correctness in calculation.
3. Power rapidly to form new examples, especially in concrete numbers.
4. Knowledge of algebra and geometry.
5. Ability to teach objectively and find illustrations.
6. Patience with slow pupils.
7. Thoroughness everywhere.

To improve in teaching arithmetic, he or she must improve in all these qualities.—*Mathematical Teaching*.

## The Difficult Seed.

## I.

A little seed lay in the ground,  
And soon began to sprout;  
"Now which of all the flowers around,"  
It mused, "shall I come out?"

## II.

"The lily's face is fair and proud,  
But just a trifle cold;  
The rose, I think, is rather loud,  
And then, its fashion's old.

## III.

"The violet is very well,  
But not a flower I'd choose;  
Nor yet the canterbury bell—  
I never cared for blues.

## IV.

"Petunias are by far too bright,  
And vulgar flowers beside;  
The primrose only blooms at night,  
And peonies spread too wide.

## V.

And so it criticized each flower,  
This supercilious seed;  
Until it woke one summer hour,  
And found itself a weed.

—Mildred Howells, in *May St. Nicholas*.

The period of infectiousness of contagious diseases, according to the state health board of Pennsylvania, is:

Small-pox—Six weeks from the commencement of the disease, if every scab has fallen off.

Chicken-pox—Three weeks from the commencement of the disease, if every scab has fallen off.

Scarlet Fever—Six weeks from the commencement of the disease, if the peeling has ceased, and there is no sore nose.

Diphtheria—Six weeks from the commencement of the disease, if sore throat and other signs of the disease have disappeared.

Measles—Three weeks from the commencement of the disease, if all rash and the cough has ceased.

Mumps—Three weeks from the commencement of the disease, if strength is re-established.

Typhus—Four weeks from the commencement of the disease, if strength is re-established.

Typhoid—Six weeks from the commencement of the disease, if strength is re-established.

Whooping Cough—Six weeks from the commencement of the disease, if all cough has ceased.

Under judicious treatment the period of infectiousness may be considerably shortened, but no child suffering as above should be admitted to any school after a shorter period of absence, and then should be provided with a medical certificate, that he or she is not liable to communicate the disease.

## American Schools as seen by an English Lady.

[Miss E. P. Hughes in *Educ. Times*, London.]

I will now briefly describe a visit I paid to a fairly typical good American school. The educational level in that district was high, and the superintendent had great power, and was an able man. The building was excellent, furniture and apparatus most excellent, and the walls were decorated with good engravings. Blackboards stretched round every room, and many of them showed capital drawings, the work of teacher and class. There was an historical room, containing pictures of famous Americans, fac-similes of important American documents, and, of course, the stars and stripes. It is interesting to notice the kind of welcome one gets in an American school. Everyone seems welcome, especially a teacher—more especially an English teacher. Instead of having to persuade an unwilling assistant mistress to allow you to hear the lesson, the American teacher is quite willing to teach before you, and is pleased if you wish to stay for a second lesson; and neither she nor her pupils show any shyness or self-consciousness. The relation between teacher and class struck me very much—it was very natural and most friendly. The discipline was good. As a rule both teacher and children are extremely fluent. The gift of speech is carefully cultivated, and in America the children contribute more to an oral lesson than is the case with us. They are taught how to gather their raw material from books, etc., and they are also taught carefully to express their knowledge in spoken words. The American teacher is not satisfied with one sentence for an answer; she wants many sentences—in fact, a whole paragraph. While the American certainly excels us in spoken language, I think our written work is far better than theirs, with one exception. They illustrate their written work admirably. All through their text-books one comes across delightful pen-and-ink sketches and clever illustrations of all kinds, pictures, maps and diagrams. I think it is partly because the South Kensington system of drawing is not really educational that English teachers and pupils, who are supposed to have learnt to draw, so seldom use the language of drawing.

When we had seen something of the building of the school which we were visiting, we assembled in the central hall, and several classes sang to us some of their patriotic songs. One was struck with the apparently religious fervor with which they went through the Battle Hymn of the Republic, and similar songs. Such exercises are certainly calculated to develop much enthusiasm for their country. I next heard an admirable lesson in literature. This sub-

ject is very highly valued in America as a means of education. Much more attention is paid to it in the universities, and it is far more taught in schools, and it is better taught than with us. The text itself is studied rather than notes. Instead of a detailed study of one play or poem, more ground is covered, and, certainly, the children are taught to love literature, to read literature, and to form an independent judgment of their own. I was much struck on several occasions by the keen appreciation which children showed for certain parts of literature. I next heard part of a history lesson, but, as it dealt chiefly with the iniquities of the British Government one hundred years ago, the class and teacher were evidently hampered by my presence, and I moved on. I examined some of the drawings of the school. A good deal of time and energy was devoted to design. The child first drew a natural flower, and studied it botanically before she used it conventionalized in a design. The child first made a crude design of its own, and its skill was developed partly by practice, partly by learning the principles of design, and partly by seeing excellent specimens. Towards the end of school-life, it learnt the chief points in the history of design. Drawing as a language is admirably understood in the best American schools, and is constantly used. In the colleges, the history of art is very frequently studied, and cultivated Americans, who have travelled, usually appreciate art keenly, and know something of it. I next had an opportunity of seeing something of the "nature study" which seems to be replacing "object lessons." The aims of such study appear to be: first, to teach the child to work alone, and in class; second, to teach it to observe keenly, and to profit by the observations of others; third, to record its observations in drawing, painting and modelling, in written and in spoken language. Many Americans think we teachers have overdone our oral teaching, and that children are finding it difficult to work alone, without the stimulation of a class. In this nature study each child works alone at first, and, after expressing in drawing and in written language the result of its individual work, then comes an oral lesson, when all contribute their observations, and, after the teacher has arranged and systematized them, then, and then only, does she contribute knowledge. The first crude records of the children are retained by the teacher, care is taken to remove false impressions, and finally the child once more works alone, incorporating in a careful record, which he keeps, all the knowledge he has gained from various sources.

Teachers were ready to answer questions, load visitors with printed matter, and explain the exhibits.

I returned through Canada, and had the good for-

tune to meet three or four of the leading Canadian educationists. I found that, in the province of Ontario, the organization of education was decidedly on a higher level than anything in the States. It is much to be regretted that British teachers know very little of the educational development which is taking place in the various sections of our great empire. Our political problem is, in many ways, more difficult even than that of America. The extent of our empire is greater, oceans roll between the different sections of it, and, if it is to be maintained, we, like the Americans, must use a common education as one of its powerful links, and its teachers must take an interest in the educational work of the whole empire.

#### QUESTION DEPARTMENT.

J. L. A. Please solve from Hamblin Smith's arithmetic, page 101, Sec. VI, Ex. 4:

$$\begin{aligned}
 & 16 \left\{ \frac{1}{5} - \frac{1}{3} \times \frac{1}{5} + \frac{1}{5} \times \frac{1}{5} - \frac{1}{7} \times \frac{1}{5} + \dots \right\} - \frac{4}{239} \\
 & = 16 \left\{ 2 - \frac{1}{3} \times (2)^2 + \frac{1}{5} \times (2)^3 - \frac{1}{7} \times (2)^4 + \dots \right\} - \frac{4}{239} \\
 & = 16 \left\{ 2 - \frac{008}{3} + \frac{00032}{5} - \frac{0000128}{7} + \dots \right\} - \frac{4}{239} \\
 & = 16 \left\{ 200064 - 0026685 + \dots \right\} - 016736 \\
 & = 3.141592.
 \end{aligned}$$

One pound of tea and four pounds of sugar cost 5s; but if sugar were to rise 50 per cent and tea 10 per cent, they would cost 6s 2d. Required the prices of the tea and sugar per pound.

Let  $x$  = the cost of the tea in pence and  $y$  = the cost of the sugar.

Then we have  $x + 4y = 60$ .

After the price has advanced

$$x + \frac{x}{10} + 4y + \frac{4y}{2} = 72\frac{1}{2}$$

$$\frac{11x}{10} + 6y = 72\frac{1}{2} \quad (1)$$

$$\text{But } x + 4y = 60 \quad (2)$$

$$\therefore \frac{3x}{2} + 6y = 90 \quad (3)$$

$$(3) - (1) \quad \frac{4x}{10} = 17\frac{1}{2}$$

$$x = 44\frac{1}{2}$$

$$y = 3\frac{1}{4}$$

$\therefore$  Tea cost  $44\frac{1}{2}$  pence and sugar  $3\frac{1}{4}$  pence per lb.

A person being asked the time of day replied that 2-3 of the time past noon equals 2-9 of the time from noon till midnight, plus 2 2-3 hours. What was the time?

Let  $x$  = the number of hours after noon.

$$\text{Then } \frac{2x}{3} = \frac{2}{9}(12-x) + 2\frac{2}{3}$$

$$x = 6$$

It was therefore 6 o'clock.

For Mr. A. W. HORNER:

(1) If  $q^n = \frac{1 \cdot 3 \cdot 5 \cdot 7 \cdots (2n-1)}{2 \cdot 4 \cdot 6 \cdot 8 \cdots 2n}$ , prove that  
 $q_{2n-1} + q_1 q_{2n} + q_2 q_{2n-1} + \dots + q_{n-1} q_{n+2} + q_n q_{n+1} = \frac{1}{2}$ .

Solution: It will be found that  
 $(1-x)^{-\frac{1}{2}} = 1 + q_1 x + q_2 x^2 + q_3 x^3 + \dots + q_{2n-1} x^{2n-1} + \dots$   
 $(1-x)^{-\frac{1}{2}} = 1 + q_1 x + q_2 x^2 + q_3 x^3 + \dots + q_{2n+1} x^{2n+1} + \dots$

by multiplying these results together we see that  
 $q_{2n-1} + q_1 q_{2n} + q_2 q_{2n-1} + \dots$  to  $2n-2$  terms = the co-efficient of  $x_{2n}$  in  $(1-x)^{-1}$ , which is unity.  
 $\therefore q_{2n-1} + q_1 q_{2n} + q_2 q_{2n-1} + \dots + q_{n-1} q_{n+2} + q_n q_{n+1} = \frac{1}{2}$ .

(2) If the expansion of  $(1+x+x^2)^n$  be  $a_0 + a_1 x + a_2 x^2 + \dots + a' x' + \dots + a_{2n} x^{2n}$  show that  $a_0 + a_3 + a_6 + \dots = a_1 + a_4 + a_7 + \dots = a_2 + a_5 + a_8 + \dots = 3^{n-1}$

Solution: We have  $(1+x+x^2)^n = a_0 + a_1 x + a_2 x^2 + a_3 x^3 + \dots$   
 (1)

Denote the cube roots of unity by 1,  $w$ ,  $w^2$ .

By changing  $x$  into  $wx$ ,  $w^2x$  successively, we have  
 $(1+wx-w^2x^2)^n = a_0 + a_1 wx + a_2 w^2 x^2 + a_3 w^3 x^3 + a_4 w^4 x^4 + \dots$  (2)

$(1+w^2x+wx^2)^n = a_0 + a_1 w^2x + a_2 wx^2 + a_3 wx^3 + a_4 w^2x^4 + \dots$  (3)

Put  $x=1$  in (1), (2), (3), and add the results; then since  $1+w+w^2=0$ , we have  $3^n = 3(a_0 + a_3 + a_6 + \dots)$ ; whence we have the first part of the question.

Multiply (1), (2), (3), by 1,  $w^2$ ,  $w$  respectively, put  $x=1$  and add the results;  $\therefore 3^n = 3(a_1 + a_4 + a_7 + \dots)$  which is the second part of the question

Finally, by multiplying (1), (2), (3) by 1,  $w$ ,  $w^2$  respectively, putting  $x=1$  and adding, we obtain the last part of the question. [Hall & Knight.]

C. L. A.—Would you kindly give the general and detailed analysis of the following in your Review: "While thus I called and strayed—I knew not whither, from where I first drew air and first beheld this happy light, when answer none returned, on a green shady bank profuse of flowers, pensive I sat me down."

Clause.	Notat'n	Relation.	Con.	Subj	Enlarg't.	Pred	Comp.	Extension.
I pensive sat me down on a — bank — flowers.	A	Prin.	.....	I	pensive	sat.	me (= myself.)	(a) down, (b) on a green shady bank profuse of flowers. [place]
While I thus called.	1 a <sup>1</sup>	Adv. to "sat," [time.]	While	I	.....	called.	.....	thus [manner.]
While I strayed, etc.	2 a <sup>1</sup>	Adv. to "sat," [time.]	and while	I	.....	strayed	.....	(a) from the place, etc. (b) whither: I knew not. [place]
Where I first drew air.	1 a <sup>2</sup>	Attrib. to "the place," understood.	where	I	.....	drew.	air	(a) where [place.] (b) first [time.]
Where I first beheld this happy light.	2 a <sup>2</sup>	Attrib. to "the place," understood.	and where	I	.....	beheld.	this happy light.	(a) where [place.] (b) first [time.]
When none returned—answer.	3 a <sup>1</sup>	Adv. to "sat," [reason or time]	when	no one	.....	returned	answer.	

The clause "I knew not whither" seems to be parenthetical, having no grammatical connection with the rest. It may be analyzed thus:

I knew not whither	B	Prin.	.....	I	.....	knew.	whither I strayed.	not [negation]
Whither I strayed.	b <sup>1</sup>	Subst., obj. of "knew"	.....	I	.....	strayed.		whither [direction.]

H. C. C.



B.—Please solve: A makes B a present of \$100 on condition that he shall expend it on cows, sheep and geese: cows at \$10, sheep at \$1 and geese at \$1, so as to have just 100 in the whole. How many of each must he purchase?

Let  $x$  = no. of cows,  $y$  = no. of sheep,  $z$  = no. of geese:

$$\text{then } 10x + y + z = 100$$

$$\text{but } x + y + z = 100$$

$$\therefore 9x - 5z = 0$$

$$9x = 5z$$

$$x = \frac{5z}{9}$$

The first integral value of  $z$  that will make  $x$  a whole number is 54.

If  $x = 5$  and  $z = 54$ ,  $y$  must = 41, which numbers are found to fulfil the conditions.

"H."—What do you consider the best way of parsing the words in such predicates as "was sick," "is hard," etc.?

Decidedly, the only way is to parse "sick" and "hard" as adjectives—predicative adjectives,—and "is" as a verb. The verb *to be* is used here, as it is most commonly, as a *copula*,—merely uniting the attribute "sick," "hard," etc., to the subject, whether affirmatively, negatively, interrogatively, conditionally, or otherwise. The definition given by Meiklejohn (to which the question refers)—"an adverb is a word going with a verb"—is not sufficiently explicit. An auxiliary goes with a verb. So, also, in one sense, does a pronoun or a noun, whether it be subject or object. To consider "was sick" as a verb, is not according to the analogy of other languages, in which adjectives have forms peculiar to themselves, and in which their terminations vary with the gender, number and case of the nouns which they qualify. Again, if we call "was black" a verb, then we must call "was blacker" another verb, and "was the blackest" a third verb. How should the Latin scholar parse *erat bonus, erant boni, erit bona, sunt bonæ, est melius, sumus meliores, estis optimi*, etc. Is each of these a different verb, or are verbs declined, changing their forms for the different genders, numbers, cases and degrees of comparison? The answer is obvious.

It is also asked whether, in a sentence like "He was honest," the adjective "honest" goes with the pronoun "he" or with a noun understood, as "He was (an) honest man." The answer is that the adjective qualifies or is predicated of the pronoun. "He was honest" means "John was honest," the pronoun merely standing for the noun, which is the real object.

### SCHOOL AND COLLEGE.

Mr. W. H. McNally, formerly of teacher of the High School, Summerside, P. E. I., has returned to his home from McGill College, Montreal, where he is studying medicine.

The Summer School of Science for the Atlantic Provinces of Canada, holds its coming session at Charlottetown, P. E. I., that most delightful summer resort. An unusually strong corps of instructors has been engaged, and the best work can be expected in every department. Teachers are going every year more and more to summer schools, because pleasure and profit are so pleasantly combined in these new educational helpers. A very large attendance is anticipated.

Arbor Day for the schools of Charlottetown, P. E. I., will be Friday, the 11th inst. Preparations for tree planting and suitable exercises, are being made by the different schools of the city.

Inspector Carter's new address is 120 Elliot Row, Saint John.

Miss Bessie Young, teacher at Oak Bay, Charlotte Co., has been able to purchase a fine flag for her school house.

The school at Grand Harbor, Grand Manan, N. B., H. F. Perkins, Principal, with the aid of friends of the school got up a concert recently and realized \$25 to be devoted to the purchase of a school library. This is the second school on the Island to begin a library.

Those who purpose taking the music classes, junior and senior, at the approaching session of the Summer School of Science at Charlottetown, are particularly requested to communicate at once with Rev. James Anderson, M. A., 64 Confederation Building, Toronto, Ontario, as the books for the classes are to be ordered from England.

Junior Companion for Teachers, 30 cents; Senior Musical Theory, Part I, 10 cents; the School Music Teacher, 90 cents.

The advanced department of the Harvey school, Albert County, N. B., has been, since last October, in charge of W. A. Alward. Mr. Alward belongs to the class of '93, and is indefatigable in his efforts to make his school an ideal one.

The pupils of the school at Lynnfield, St. James, Charlotte Co., N. B., assisted by the young people of that place, held a very successful concert in the school room on Friday evening, March 30th. The sum of \$19.09 was raised, which will be taken to purchase a school-flag and window-curtains; the surplus, if any, will be used also in connection with the school, which is conducted by Miss Hattie J. Pinkerton.

The National Educational Association of U. S. A., with Hon. A. G. Lane, Supt. Public Schools, Chicago, President, will hold its 1894 meeting at Ashbury Park, N. J., July 6th to 13th, inclusive.

## BOOK REVIEWS.

A CANADIAN MANUAL, ON Procedure of Public Meetings, by J. G. Bourinot, C. M. G., LL. D., D. C. L., D. L., Clerk of the House of Commons, Ottawa. Pages 144. This work is divided into two parts.—1st, An introductory review of the rules and usages of parliament that govern public assemblies in Canada; 2nd, The procedure of meetings of municipal councils, share-holders and directors of companies, synods, conventions, societies and public bodies generally. There is no higher authority in Canada on parliamentary procedure than Mr. Bourinot, and his large work on that subject some years ago not only made it the authority in Canada, but placed its author among the first authorities in the empire on parliamentary procedure. The present work is in response to a demand for a shorter treatise for the government of meetings and societies in general. It is to be hoped that this book will bring about a better management of public meetings. If the rate-payers in every school district would see that a copy is placed in every school library, it would benefit the rising generation and *might* help them (the rate-payers) in the management of school meetings.

The first step in the investigation of the properties of space is to lay down a system of fundamental properties or axioms from which all others may be deduced. The system should be a full and sufficient characterization of space. There are several such systems and Euclid's is one of them. Given a system, it may be developed in different ways. Euclid's development of his system has many virtues but many defects as well: one of his axioms is tacitly assumed, and others are hidden; there are many redundancies, and the arrangement is arbitrary. Improvements have been suggested by the light thrown on Geometry by modern research; and a modern geometry should incorporate them all.

The "ELEMENTS OF GEOMETRY," by Prof. Halsted, of Texas University, contains as a foundation what is essentially Euclid's system of fundamental space-properties. There are some differences such as the definition of an angle, and that substitution for the twelfth axiom due to Playfair. The work is a "logical re-casting of Euclidian geometry, and the subject is developed in accordance with the results obtained by modern investigators. The propositions are arranged with some regard to their connection with one another. The definition given of "angle" is such as to include "flat" and "reflex" angles; and consequently I. 13 is unnecessary. A right angle is defined as half of a straight or flat angle. The useful term "sect" is introduced to denote that part of a straight line between two fixed points. The theorems of the Second Book are proved by the application of such simple algebraical laws as are true of sects and rectangles. The properties of circles are discussed in a manner to avoid the redundancies and want of continuity of Euclid. Ratios are treated strictly and without limits. Prominence is given to the axiom, tacitly assumed by Euclid, (as in I. 4) that figures may be moved without distortion, and advantage is taken of it to simplify some of the Fourth Book proofs. Figures on a spherical surface may be moved to any other position in that surface without distortion, and hence many properties follow immediately from those that were deduced in the geometry of the plane. Prof. Halsted develops in his ninth book this two-dimensional spherical geometry; and it proves an invaluable assistance as an introduction to spherics.

Altogether, this work contains many things of real value to the teacher of geometry, and the student will find in it the

source of new ideas that will assist him towards a better understanding of the science of geometry. Prof. Halsted has gained fame as a mathematician, and one of his not-least benefits conferred upon us is his translation of Boylai and Lobatchewsky, rendering accessible to the English reader those valuable researches in New Euclidian Geometry. His "Elements" is published by MacMillan & Co., London, and J. Wiley & Sons, New York.

MACMILLAN'S FOREIGN SCHOOL CLASSICS: *Colomba*, par Prosper Merimée, edited with introduction, by G. Eugene Fasnacht. Price 2s. MacMillan & Co., publishers, London and New York. To those who would read in French a story in which murder and revenge are the points on which the interest centres, here is an opportunity. Some of the scenes and characters recall Shakespere's "Othello" and Lady "Macbeth."

CONTEMPORARY FRENCH WRITERS, by Mlle. Rosine Mellé: pp. 212. Publishers, Ginn & Co., Boston, Mass. This is a valuable book for the student of French, embracing selections from the writers of the second part of the 19th century, such as Taine, Ernest Renan, Emile Zola, Paul Bourget, and others. In addition to the selections there is given a biographical sketch of each author, which is in English, (the student would have preferred French) and there are a few well chosen explanatory notes.

MACMILLAN'S ELEMENTARY CLASSIC SERIES: Homer, *Iliad* Bk. XXIV, by Walter Leaf, Litt. D. and M. A. Bayfield, M. A.; *Quintus Curtius' Selections*, by F. Coverley Smith; *Thucydides, Fall of Plataea and Plague at Athens*, by W. T. Sutthery, M. A., and A. S. Graves, B. A. Price 1s. 6d. each. Publishers, MacMillan & Co., London and New York. These are cheap and excellent works, adapted for the use of beginners, with notes, introductions and vocabularies, and well printed pages.

A BRAVE BABY and other stories, by Sarah E. Wiltze; pp. 142. Publishers, Ginn & Co., Boston. A series of interesting stories of child life.

PAGE'S THEORY AND PRACTICE OF TEACHING; pp. 448 paper covers, with biography, notes, portraits and review notes. Published by C. W. Bardeen, Syracuse, N. Y. A convenient and well printed volume, that follows "word for word, the only edition which Mr. Page ever authorized."

RULES FOR ESSAY-WORK, by A. W. Emerson. Price 40 cents. C. W. Bardeen, Syracuse, N. Y. The author in his preface states, "It is a sad fact that the majority of pupils, not only on entering, but also on leaving, our academies and high schools, write poor English." We are afraid that this little book and those like it will never remedy the evil.

PRINCIPLES OF ENGLISH COMPOSITION, through analysis and synthesis, by P. Goyen, Inspector of Schools; pp. 123; cloth. Price 2 shillings, London, MacMillan & Co., and New York. This book recognizes the fact that decomposition and classification are not the sole end of grammar, but that students should be trained to compose, that is, to arrange words, phrases and clauses in their most effective way.

THE SATIRES OF DRYDEN, edited with memoir, introduction and notes by John Churton Collins. Price 1s. 9d.; pp. 188. Publishers, MacMillan & Co., London and New York. The Satires taken up in this volume are Absalom and Achitophel, The Medal, MacFlecknoe, and their publication in this convenient form, with introduction and useful notes, is of great service to the student of Dryden.

**PRACTICAL METHODS OF MICROSCOPY**, by Chas. H. Clark, A. M. Cloth, pp. 219. Price \$1.60. D. C. Heath & Co., publishers, Boston. This well printed and amply illustrated book is professedly for beginners and private workers, affording them means of acquiring necessary training in the use of the microscope. It is an excellent outline of the work that precedes the advantageous use of the microscope as a working tool.

**MORCEAUX CHOISIS** of Alphonse Daudet. Edited and annotated by Frank W. Freeborn, of the Boston Latin School. Cloth; pp. 227. Price 85 cents. Ginn & Co., publishers, Boston. This is a well arranged series of Daudet's sketches, furnishing excellent material for reading for beginners in French. The notes are especially valuable, giving chiefly explanations to the geographical, biographical, historical and literary allusions, in which Daudet abounds.

**SCHILLER'S WILHELM TELL**, edited with an introduction and notes, by Robert Waller Deering, Ph. D. Price 65 cts.; pp. 242. Publishers: D. C. Heath & Co., Boston, Mass. This is a cheap and excellently printed book. It should have a wide circle of readers, for there is perhaps no German play better suited to the needs of students than this one. A map in the foreground, a sketch of Schiller's life and works, and notes on the text make the work well adapted to the needs of the student.

**MATHEMATICS FOR COMMON SCHOOLS**: 1, A Primary Arithmetic; 2, An Intermediate Arithmetic; 3, A Higher Arithmetic. Prices, respectively, 40c., 40c., 75c.; by John H. Walsh, Associate Superintendent of Public Instruction Brooklyn, N. Y. Publishers, D. C. Heath & Co., Boston. This series of arithmetics will prove of great service to teachers in any school. There is little or no theory, but they are filled from beginning to end with multitudes of examples in every variety of form and statement, containing material for systematic drills and reviews that can be pursued with great advantage by the teachers of different grades of pupils. The special features of the work are its division into half-yearly chapters instead of topics, the omission, as far as possible, of rules and definitions, the use of the equation in the solution of arithmetical problems, and the introduction of the elements of algebra and geometry.

### The May Magazines.

The *May Forum* contains "Universities and the Training of Professors," by G. Stanley Hall. "Child Study: A Teacher's Record of her Pupils," by Miss Mary E. Laing. The *Century* for May has an article on "Popular Education in Citizenship." There is in the department of "Lighter Vein" a Cradle song, by Chas. G. D. Roberts. The *Popular Science Monthly* for May has an article "Cause and Effect in Education," and one entitled, "The Guests of the Mayflower," in which it is pointed out that the insect visitors to this plant are slowly producing variations in the flower. Recent numbers of *Littell's Living Age* contain the following articles of interest: "Scientific Problems of the Future," "Egypt 5,000 Years Ago," "Francis Parkman and His Work." The price of the magazine, which has been the favorite in thousands of American homes for half a century, is \$8.00 a year, but as a special inducement, to any who desire to make a trial subscription, the twenty-six numbers, forming the first half of the year 1894 (January to June inclusive), will be sent for \$3.00. To any one remitting six dollars in payment for the nine months, April to December inclusive, the thirteen numbers forming the first quarterly volume of 1894 will be sent free. In the *Atlantic Monthly* for May there is an article "From Blomdon to Smoky," by Frank Bolles. It doesn't picture Nova Scotians as forming the advance guard of progress and civilization, but the descriptions of the country are as charming as they can be, enlivened with touches of color-painting that is suggestive of Ruskin. President W. F. Slocum, in his paper in the *Atlantic* on "The Ethical Problem of the Public Schools," speaks of the possible dangers of the "free element" in education as sapping the independence of the citizen. The article is worth thinking over as the following bit may show: "It has become only too evident that many parents look upon the teachers as if they were servants; demanding everything from the school without any idea that they owe anything in return." The *Delinquent* (Toronto) for June is called the "Summer Number." The article in the College Series describes A Girl's Life and Work at Smith, and is written by a recent and brilliant graduate. There is also a very suggestive and entertaining paper on a Grammar-School Commencement.

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