

# THE EDUCATIONAL REVIEW.

FOR THE ATLANTIC PROVINCES OF CANADA.

Vol. II.

SAINT JOHN, N. B., APRIL, 1889.

No. 11.

*JUST PUBLISHED.*

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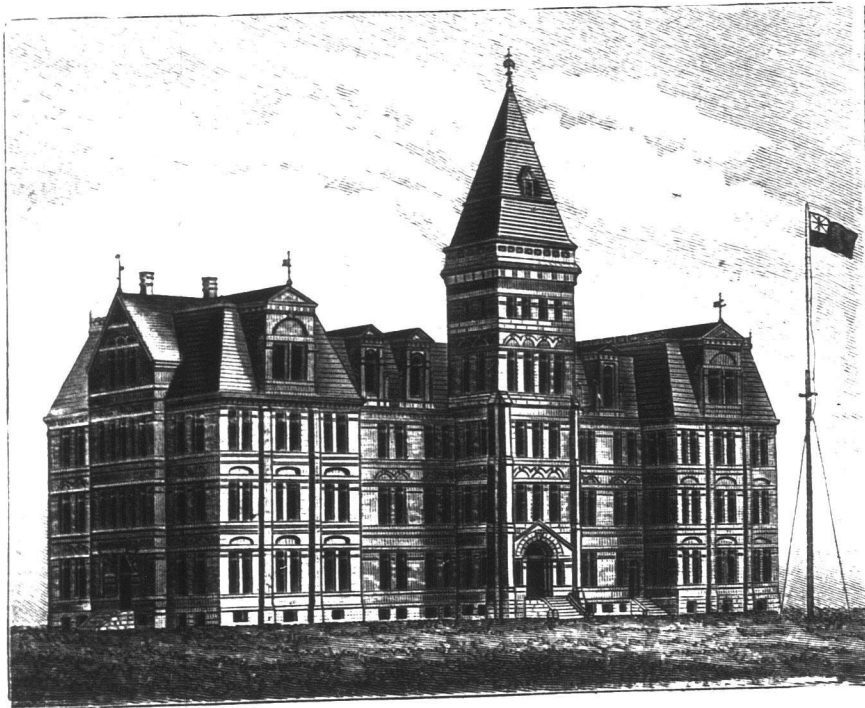
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# The Educational Review.

Devoted to Advanced Methods of Education and General Culture.

PUBLISHED MONTHLY.

ST. JOHN, N. B., APRIL, 1889.

VOL. II. No. 11

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**Notice of Change of Address should be promptly sent to EDUCATIONAL REVIEW, St. John, N. B. The former as well as the new address should be given.**

## EDITORIAL NOTES.

WE have received sufficient copies of REVIEW asked for in our last issue. We can now supply a few complete sets of Vol. I. Price, one dollar. Single numbers, ten cents.

WE publish in another column the interesting programme of the New Brunswick Educational Institute, to be held in Fredericton the last week in June.

THE next issue of the REVIEW, which brings to a close the second volume, will be issued about the 25th of April. We direct the attention of our subscribers to the special notice in another column.

THE Pictou News has an article from James MacKinley, Esq., honorary President of the Pictou Academy Ornithological Club, in favor of the now much maligned English sparrow. The expediency of its extermination is yet a moot question in Nova Scotia.

THE REVIEW and *Forum* together for \$5.00. See advertisement in another column.

MISS MARY A. HAMILTON, one of our most successful teachers, and late assistant of Miss Woodcock, in the Provincial kindergarten school at Truro, has been appointed to the new public school kindergarten of Dartmouth. The best manner of affiliating the kindergarten system to our public schools has yet to be worked out. The Dartmouth school-commissioners have secured one who can give their particular plan the most successful trial possible. We shall be interested in observing the results.

HERR L. BOBER, Professor of the German language in the Berlitz Schools, St. John, will shortly visit Halifax and Truro, to prepare the way for the introduction of the system there. Herr Bober has been most successful in St. John and Fredericton in arousing an interest and enthusiasm in the study of his native language. With pleasing manners and fine scholarly attainments he combines a genius for imparting instruction. Several of his pupils in St. John and Fredericton have acquired such a mastery of the language in less than a year as to be able to write and speak with considerable fluency.

AT the end of this month, in Nova Scotia, probably over 650 teachers will exchange school sections, and 100 will leave the profession for the time being. Nearly 200 new teachers will ally themselves with the 650 migratory and 1400 stable, to carry on the education of the 87,000 preparing to take charge of the country a few years hence. We wish you all a very happy and useful summer term. Those who change, we hope, will not forget to intimate the fact, as directed at the head of our editorial column, without loss of time. Whoever may forsake you, or be forsaken, we hope it may not be the REVIEW. Those who remain, we hope, may more than ever be disposed to remain true to the grand ideal of earnestly helping each other to develop a nobler and more intelligent manhood in our own native heritage, while helping ourselves.

IN previous numbers of the REVIEW we have given the names of Atlantic province men studying abroad. It must not be understood that in doing so we commend such a course in every case. Within the dominion are institutions in many respects guaranteeing higher scholarship and sounder training than many very popular ones in the "States." Especially distinguished exception must, however, be made in favor of the post graduate courses in the Johns Hopkins University. We find there this present year five graduates of the Toronto University, one of Trinity, one of Albert, and three of Dalhousie. The Atlantic provincials are:

1. D. A. Murray, B.A., Truro, N. S., formerly Munro Mathematical Tutor in Dalhousie.
2. James S. Trueman, B.A., St. John, N. B., formerly Classical Tutor in Dalhousie.
3. Wm. R. Fraser, B.A., Pictou, N. S., formerly Classical Master in Pictou Academy.

Murray, who is a *Scholar*, is making a specialty of mathematics. Trueman, who is a *Fellow*, is studying Greek and Sanscrit. Fraser is specially devoting himself to Greek.

LAST month Miss Woodcock of the Provincial kindergarten at Truro addressed a meeting in New Glasgow called for the purpose of considering the formation of a school in that town. Considerable funds have already been raised for the purpose.

In Pictou the school commissioners have offered a school-room and janitorial attendance free for a kindergarten in the town.

IN the list of students from the Atlantic Provinces at McGill University, published in the March REVIEW, the names of A. W. Strong and J. P. Tuplin should be credited to Summerside and New Annand, P. E. I., respectively, instead of Halifax and Pictou.

THE St. John *Sun* issued on Wednesday last a twenty-four page paper with excellent illustrations and descriptions of St. John—its commercial history, its industries, etc. It is a cyclopædia of information on the business development of the metropolis of New Brunswick, and is invaluable for study and preservation.

WE feel sure that our readers will unite with us in wishing that the gentleman who has contributed the article on "Numbers," in another column, will again favor the REVIEW with others on the same subject.

WE have received Professor W. J. Alexander's recently published work on the "Introduction to the

Poetry of Robert Browning," by Ginn & Co., Boston. A review of the work will appear in our next.

WE have received the report of the above institution, situated in Halifax. Its principal, J. Scott Hutton, M. A., has more than an American fame as one of the most successful educators in this department of education. He is assisted by a staff of eight instructors. The attendance during the year was *seventy-two*, viz.: forty-one boys and thirty-one girls. The report is replete with information interesting to all. The picture of this happy, transient home for the sons and daughters of silence, where all their faculties are expanded by an education which places them in better touch with the world than many of their speech-gifted brethren, is most delightful to contemplate. By an Act of the Nova Scotia Legislature, Nova Scotian deaf mutes are admitted free. Those from New Brunswick, Prince Edward Island, and Newfoundland, are admitted on favorable terms. An institution of the character of the one presided over by Mr. Hutton, is justly a source of honest pride to the province of Nova Scotia. Newfoundland sends eight, New Brunswick six, and Prince Edward Island seven, of the seventy-two above referred to.

WE have received from Geo. S. Milligan, Esq., LL.D., of Newfoundland, the report of the schools of that Island, under his supervision. He reports better educational results than have been attained in former years; an increase of capable teachers, more systematic courses of study, and consequently, more effective teaching. One hundred and twenty-five teachers were employed for the year ending December 31st, 1888, an increase of eleven. To these was paid in salaries, the aggregate of \$20,119.63, a much larger sum than has ever been paid for that object. The aggregate attendance at school and college (*i. e.*, under Methodist Boards, etc.), was 1,387,382, with a percentage of attendance of 69.57. This is certainly a creditable average. Commenting upon it, Dr. Milligan states, that without the advantages resulting from the better school systems of the sister provinces, they are able to show a higher average attendance.

The report, throughout, shows that educational work is being stimulated and encouraged by improved methods, better appliances, and an increasing public interest. Dr. Milligan, alluding to the advantages resulting from teachers' conventions elsewhere, asks, "whether, on a *non-denominational* basis, an association might not be formed that would prove of immense advantage to all teachers in the colony, and to public education?" It is certainly worth the experiment.

## WHAT SHALL WE STUDY?

In determining the scope of the studies to be pursued in the schools which are intermediate between the elementary school and the university, we must be guided by the same general principle on which we based our statement of the subjects which ought to engage the attention of pupils in schools of the elementary grade. The education must, in a large degree, depend upon the prospective avocations of the scholars. In our former paper we expressed our conviction that true education consists in a just and thorough recognition of the fact that training is of more importance than the bare acquisition of knowledge, and of the consequent necessity of so directing the work of the school that the pupils shall leave it with a fair degree of intelligence, and have implanted in their breasts the elementary principles of morality. The farmers and mechanics who in this way are prepared for the duties of life, will not only approve themselves good and skilful workmen, but acquit themselves as citizens with integrity and enlightenment.

In the intermediate schools are found some who, while purposing to return to the farm or learn a trade, are anxious to obtain as good an education as is within their reach, but by far the larger number of the scholars intend to become teachers, doctors, clergymen, lawyers or merchants. To the majority the high school or the academy marks the close of their scholastic life. There their assisted studies end, and thence they proceed forth into the world with such equipment as has been provided for them, in the knowledge which they have acquired, the habits of thought in which they have been disciplined, their desire to augment their scientific or literary stores stimulated, and, in some degree at any rate, their ambition directed to worthy aims. The remainder complete their literary studies at the university, preparatory to entering upon their professional preparation for the career of their choice.

To provide an education which shall be suitable to persons intending to follow these different pursuits is not so difficult as it at first sight appears. All ought to be affected in much the same way by the education they receive. It should make them capable and cultured human beings. Whatever talents a youth possesses, it is the province and duty of education to evoke them, and once made conscious of his natural endowments and proclivities, it becomes the anxious care of the teacher to lead him to such sources of knowledge, and employ such instruments of culture, as shall develop to the fullest extent those faculties and tastes.

The studies in the intermediate schools ought to be threefold—literary, scientific, and commercial. Under the first are classed the study of languages, literature, and history; the second comprises pure and applied mathematics, chemistry, physics, astronomy, and natural history; while under the third are embraced such subjects as are specially requisite for commercial pursuits—short-hand, book-keeping, etc., and, we may add, music and drawing, which will, undoubtedly, not only prove highly advantageous for those who have a special talent for them, but greatly beneficial in many ways to all, by cultivating the ear, the eye, and the hand.

There can be no question that the most important of all the literary studies to which students at this period can be directed is that of their own language. The more irksome, and therefore the least interesting stage of the study has passed. Here selected classics are with great advantage read and studied. The mind of the student can now grasp the meaning of a passage, analyze the thought therein expressed, and even thus early the promising pupil can be led to observe characteristics of style which may influence the formation of his own. By paraphrase and original composition he should acquire a facility in expressing his thoughts in language with whose meaning he is familiar, and in a form, clear, concise and coherent. And he may be made conversant with the English language at various periods in its history, by listening and reading carefully chosen passages from the writings of the authors which afford the best illustration of the condition of the language at the time the works were produced. The stimulating power of such a course of study as this cannot be overestimated, provided the teacher is gifted with a clear understanding and an enthusiastic appreciation of the literature which he opens up to the student. Unless the teacher himself is in sympathy with the author, he will in vain seek to produce an enduring impression upon his class, and few, if any, will feel irresistibly impelled to read for themselves. And this last is one of the most valuable results of literary teaching.

There is not the same unanimity respecting the study of Latin and Greek. The time was, and that not very long ago, when, in England, and nearly to the same extent in Scotland, these were almost the only subjects studied in grammar schools and academies. A change, however, has been effected, and the work has been modified so that it, to some extent, responds to modern demands. The usual result followed the agitation against exclusive classical teaching in the high schools of the country. To carry their object, the opponents of the traditional system had exaggerated its evils to such a degree that

the most unreasonable demands came to be made for the entire excision of classical studies from the high school curriculum. Such a consummation had not been anticipated by the earlier and more cultured advocates of modern ideas in education, and certainly was not desired by them. Latin and Greek, therefore, still remain in these schools most important branches of study, and, alongside of them, mathematics, physical science, and English.

On this side of the Atlantic, classical study has been prosecuted with some success, but it has never occupied the peculiar position which was accorded to it in England. Yet this has not protected it from the onslaught of the educational reformer, who would erase it from the curriculum as absolutely worthless, and insert in its place modern languages or science. "Dead languages!" "smattering of Latin and Greek!" are expressions which are bandied about, and caught up by every illiterate who wishes to record his opinion respecting that of which he is entirely ignorant. Professor Max Muller said the other day: "We are told that we teach dead languages, dead literatures, dead philosophy, as if there could be such a thing as a dead language, a dead literature, a dead philosophy! Was Greek a dead language? It lived, not only in the spoken Greek—it was like fire through the veins of all European speech. Was Homer, was Æschylus, was Sophocles a dead poet? They lived in Milton, Racine, Goethe, and I defy any one to understand and enjoy even such living poets as Tennyson and Browning, without having breathed at school, or at the universities, the language and thought of these ancient classics. Is Plato a dead philosopher? It is impossible for two or three philosophers to gather together without Plato being in the midst of them. I say, on the contrary, that all living languages, all living literature, all living philosophy, would be dead if one cut the historical fibres by which they cling to their ancient soil."

"A smattering of Latin and Greek!" One would imagine from the satisfaction with which it is uttered that there could not be "a smattering of French," or "a smattering of science." From what we know of the teaching of these subjects, we would be inclined to prefer as an acquisition, the smattering of Latin and Greek to either of the others. But really, it depends upon how the subject is taught. Elementary science, intelligently taught, is a valuable possession to the youth, and so is the Latin grammar. We have already expressed our opinion of the great assistance which it renders to the pupil in the comprehension of grammatical principles, and we maintain that it is of still greater service to him as he advances in his studies. We do not accept the word "smattering"

as an adequate expression of what we wish to convey by the Latin and Greek, or Latin alone, which ought to be acquired by students before entering the university. Such a superficial acquaintance with these languages is neither satisfactory as a basis upon which to rest future attainments, nor does it afford the intellectual exercise which is the most valuable of all the benefits to be derived from linguistic study. Surely to be trained to habits of accuracy, observation, and induction, is not one of the least profitable of the results of the occupations of school life. But this is only accomplished by painstaking and thorough teaching, and diligent and intelligent study. Then, and only then, when Latin and Greek are taught as they ought to be, when the thinking powers are called into exercise as well as the memory, and when the knowledge gained by the study of these languages is made available to assist the pupils in understanding their own language, shall the reproach be removed from the teaching of Latin and Greek.

(To be continued.)

#### N. S. Summer School of Science.

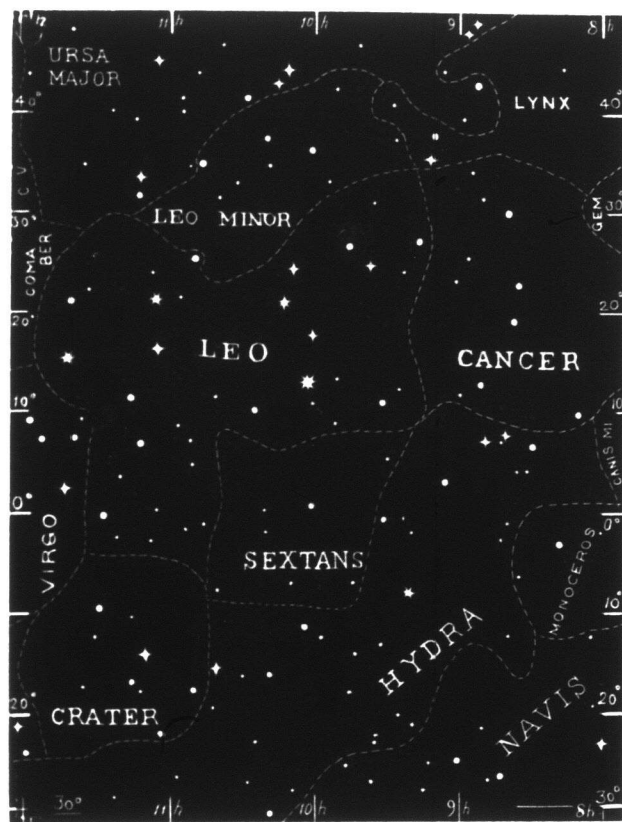
At a meeting of the directors, held in Pictou, it was decided to add elocution to the course of study. Prof. J. Burwash, D. Sc., Mt. Allison College, will be the instructor in that subject. Further arrangements have been made, by which the school will have the benefit of a course of public lectures during the next session. These lectures are designed to present scientific subjects in a popular manner and give completeness and finish to the work of the school.

The lecturers for 1889 are as follows:

David Allison, Esq., LL. D., *Superintendent of Education*.  
A. W. Sawyer, LL. D., *Acadia College*.  
N. McNeil, D. D., *St. Francis Xavier's College*.  
Charles McDonald, M. A., *Dalhousie College*.  
J. Burwash, D. Sc., *Mt. Allison College*.

The third session of the school will take place at Parrsboro, commencing July 22nd, 1889.

Elaborate preparations will be made for the entertainment of teachers and others who may avail themselves of the privilege of visiting this town at the meeting of the school of science. We fully expect to outdo Wolfville, not only in natural attractions, but in hospitality, interest and good will. Nature has been lavish of her gifts, and there is no branch of natural history which may not be studied to advantage here. It is to be hoped the school may become a permanence in Parrsboro, in which case a suitable building would be provided with lecture rooms, etc., and soon a museum could be started.—*Pars. Cor. Hc. Chronicle*.



### AMONG THE CONSTELLATIONS.

#### No. XII. Leo and its Neighbors.

The hosts of stars, that in the spangled skies  
Take their bright stations and to mortals bring  
Winter and summer; radiant rulers, when  
They set; or rising, glitter through the night.

ÆSCHYLUS.—*Agam. I.*

In the early evenings of April Leo will be in the south, and our map will represent a broad strip of the sky, from  $15^\circ$  above the horizon, from which Hydra rises, to the paws of Ursa Major, in the zenith. Our readers will remember that the projection of our map widens the distance comparatively between the stars, in its upper part. They will also notice that we mark all the stars of the first *five* magnitudes—the first magnitude, eight-rayed; second magnitude, six-rayed; third magnitude, four-rayed; fourth magnitude, the larger round points; fifth magnitude, the smaller points. This leaves only the sixth magnitude stars, the smallest generally visible, unmapped. In moonlight, the sixth magnitude, and, near the moon, even fifth magnitude stars, become invisible.

#### The Sun's Track.

The equinoctial line is always that marked  $0^\circ$  on the sides of the map. The ecliptic passes diagonally from Gemini through Cancer, just below Regulus (the first magnitude star in Leo-Alpha), and cuts the line 12h. right ascension, and the equinoctial in the

same point in Virgo. The ecliptic is the sun's annual track. The sun is on the boundary of Gemini and Cancer about the 20th of July. On the 21st of August it is exactly about half a degree below Regulus—only its own breadth. And on the 22nd of September it is at the autumnal equinox, where 12h. right ascension cuts the equinoctial.

#### Leo.

The *Sickle* stands vertically on its handle, facing Cancer. Alpha (Regulus), of the first magnitude, forms the end of the handle; Eta, of the second magnitude, directly above it, marks where the handle joins the curved blade, which is outlined in order by Gamma, of the second magnitude, Zeta, of the third, Mu, of the fourth, at the highest part of the curve, and Epsilon, of the third magnitude, at the point. The sun, curiously enough, comes directly to the end of the handle on the 21st of August. It is reaping time with us in the northern hemisphere when the sun takes the Sickle in Leo by the handle.

The *trapezium* is a configuration of four stars in the eastern half of Leo. The lower one, of the second magnitude, is Beta (also called *Denebola*), near the lion's tail; the fourth magnitude, above it, is "93 Leonis"; the second magnitude star, in the upper angle, next the sickle, is Delta; and the third magnitude, below it, Theta. There are two nebulae in a southeast line from and close to this star. The sickle is in the lion's breast, the curved blade rising into the head.

#### Cancer.

The *bow* in Cancer is outlined by its four largest stars, all only of the fourth magnitude. It is concave towards Leo. Their names, beginning with the upper, are, Iota, Gamma, Delta, and Alpha. Gamma and Delta are near each other, and nearly midway between them, in the centre of the *bow*, is a remarkable cluster of small stars, visible to the naked eye as a large nebula.

This is "Praesepe," or the beehive, in Cancer. It has often been taken for a nebulous comet, by persons not accustomed to observe the skies. An ordinary field glass or telescope will show it to be a cluster of stars. Galileo, after his invention of the telescope, counted thirty-six stars in it. At the Washington observatory over one hundred and fifty stars, between the sixth and eleventh, have not only been seen, but have had their positions measured and catalogued, in this faint patch of light to the naked eye.

#### Leo Minor and its Neighbors.

This constellation, just above Leo Major, is outlined by its three fourth magnitude stars, which, reading from left to right, are, 46 Beta, and 21 of Leo Minor. Right above this arch is the

couple of third magnitudes in Ursa Major's paw, Lambda and Mu, reading from above downward. Near Leo Minor's tail is the couple of a third and fourth magnitude stars in the other hind paw of Ursa, Nu and Xi. While right above the tail of Lynx is the third couple of third magnitude stars, Iota and Kappa, in one of Ursa's fore-paws.

#### Sextans

has only one fourth magnitude, and six fifth magnitude stars.

#### Crater,

the cup, has one third magnitude (Delta), four fourth magnitudes, reading downward and to the right, Theta, Gamma, Beta, and Alpha. This latter is called *Alkes*, and is remarkable on account of its red color. Near by, across the boundary, is Nu, of Hydra. Beginning at the top, these stars make the outline of a cup or dipper, Theta and Delta forming the handle.

#### Hydra,

the water serpent, is one of the longest constellations, stretching for more than one hundred degrees from west to east. Its principal star, Alpha (called also Alphard), is of the second magnitude, and down in its body. It is, therefore, also called *cor hydræ*, the heart of the water serpent. Zeta and Epsilon are the two third magnitude stars in its upraised, crested head.

### Astronomical Notes for April.

*Mercury* is near the sun, in *superior* conjunction, on the twenty-fifth, from which time it becomes an evening star.

*Venus*, which, as a brilliant evening star, was moving eastward towards Taurus last month, becomes stationary during the second week of April, about five moon-breadths north of Epsilon Arietis, a double star of the fourth and sixth magnitudes. It then proceeds westward to meet the sun and is more and more robbed of its glory by the growing twilight until on the last day of April at 11 p. m., 60th meridian time, it passes the sun to the west about seven or eight sun diameters to the north of him, and a few days after it will make its appearance with growing brilliancy as a morning star. As Venus is then nearly directly between us and the sun this is called its *inferior* conjunction. It takes place not far from the centre of the constellation Aries.

*Mars* will be evening star in Aries, passing Venus in the third week of the month some distance to the south, and at the end of the month will be entering Taurus.

*Jupiter* is morning star, nearly stationary the whole month in Sagittarius, moving eastward during the

whole month only about one moon-breadth. It is low down in the southern horizon and will be on the meridian about 4 A. M.

*Saturn* will be actually stationary about the middle of the month in Cancer opposite the Sickle in Leo, near where the line 9h right ascension is intersected by 18° north declination in our star map. Gamma and Delta Cancri are its nearest neighbors to the west, a little higher up than the planet. These are the pair of fourth magnitude stars in the centre of Cancer in our map, Delta being the lower one. Just west of these and nearly between them is a very interesting cluster of stars called the "Praesepe" which looks like a faint nebulous comet.

In fact it has often been mistaken for a comet. Within the last year or two, a writer in one of our daily metropolitan papers announced this discovery. There was a bright planet in the neighborhood as at present. First, he saw the nebulous patch of light distinctly, night after night. Second, he noticed that it was changing its distance from a bright star. (?) It must, therefore, be a comet, and accordingly the announcement was made. But, first, it was the bright star (planet) which was changing its position while the little cloud of light was fixed. Second, a mariner's telescope or a good field glass would have shown over thirty small stars in this cloud, and a more powerful glass would show over 150.

*Uranus*, on the 9th, may be readily found two degrees north of Spica Virginis, as a star of the sixth magnitude. A small telescope will transform it into a small sphere of a delicate green tint.

#### Inspector's Notice.

To the Teachers of District No. 10:

I have to compliment you on the success of our Nature Lessons for the winter term. Your intelligence and zeal in placing them before your pupils went far beyond my expectations. Never before, to my knowledge, has the science work of our schools been so systematically and successfully performed. Of 230 teachers, about 10 only have neglected this work. For the remaining few weeks I would advise a general review of the subject, applying the lessons as closely as possible in the direction of cleanliness, effect of impure air and water, and their purification, good and bad diet, some advice about clothing and exercise, etc. Our science work for the summer will be, principally, botany. I hope to send you an outline of that work early in May. I can promise, also, that the REVIEW will lend you a helping hand in the study and teaching of this delightful subject.

Very truly your friend.

E. J. LAY.

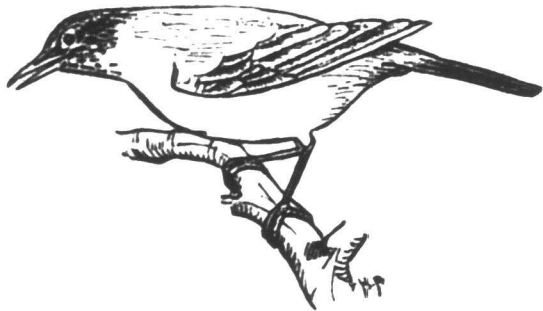
Amherst, April 1st, 1889.

P. S.—School returns were forwarded to Trustees last fall, enclosed in registers.



## FERNDALE SCHOOL.

NO. XXI. THE AMERICAN ROBIN.



*Merula Migratoria*, Linn. (761 A. O. U.)—Natural length, about ten in.  
The Robin, the forerunner of the Spring.

LONGFELLOW.—*Lady Wentworth*, line 113.

T. Here we have a mounted specimen of our Canadian robin. They had nearly all gone south to spend their winter, and in this month of April we shall see them returning. Look carefully at its bill, its feet, its wing feathers, and its color.

Next let us hear what Tennyson says of the robin, and tell me what you think of it:

In the Spring a fuller crimson comes upon the robin's breast.

CHORUS OF S. Our robin has no crimson on its breast.

T. Here is a verse from Wordsworth:

“Art thou the bird whom man loves best,  
The pious bird with the scarlet breast—  
Our little English robin;  
The bird that comes about our doors  
When Autumn winds are sobbing.”

CHORUS. Our robin's breast is not scarlet.

S. Why does Wordsworth call the English robin “the pious bird”?

T. Delia W. Norton, in a poem to the Robin Red-breast, says:

“On fair Britannia's isle, bright bird,  
A legend strange is told of thee—”

S. What is the legend?

T. Hoskyns-Abrahall, in “English Lyrics,” gives it briefly, thus:

“Bearing His cross, while Christ passed forth, forlorn,  
His God-like forehead by the mock crown torn,  
A little bird took from that crown one thorn.  
To soothe the dear Redeemer's throbbing head  
That bird did what she could; His blood, 'tis said,  
Down dropping, dyed her tender bosom red.  
Since then no wanton boy disturbs her nest;  
Weasel nor wild-cat will her young molest;  
All sacred deem the bird of ruddy breast.”

S. Is the story true?

T. Oh, you should know that much. It is a pretty, poetic picture, suggested by the blood-red breast of the little bird.

S. But our robin's breast is not blood-red.

ANOTHER S. Nor is it a very little bird. Ten inches long is a pretty fair size for a bird.

T. You are right. Our robin is altogether different from the robin of the songs and stories of England. The color of the breast of our robin is—

S. Chestnut, or reddish orange.

T. Correct. And it was called the robin by the first settlers, because it had a reddish breast and frequents the neighborhood of man, and migrates to the south in winter, returning in spring, something like the robin in their home country. It belongs to the thrush family of the song perchers, however, and its scientific name means “the migratory thrush.”

S. But it is different from the English robin?

T. Very. The English robin belongs to the warbler family of the song perchers, and is something of the size and shape of our warblers, which are so abundant in May. Its breast is of a much brighter and purer red than that of our robin, also.

S. Are there many different kinds of birds of the thrush family in the province?

T. Five or six, perhaps. Wilson's thrush, Olive-backed thrush, and the bluebird, belong to the family.

S. How can we know a thrush from other birds?

T. Count the number of quill feathers on the last great joint of the wing—the primaries, as they are called.

S. There are ten; but the first is very short.

T. Correct. Examine the tarsus—the bare part of the leg.

S. It is covered with one continuous plate, like a boot, instead of several small plates or scales.

T. Yes. That is what is called a “booted tarsus.” Which is longer, the tarsus or middle toe?

S. They are very nearly the same in length; at least, the tarsus is not much longer.

T. How is the bill?

S. Not stout like the Grosbeak's; rather slender, with the slightest curve, and a small notch near the tip of the upper.

T. Very good. Have you ever noticed what they feed upon?

S. Berries, worms, caterpillars and other insects.

T. They are useful, therefore, you see, and we should encourage their multiplication.

S. When feeding, or hopping on the ground, it repeats quite friskily, *pwee-sht, pwee-sht, pemp-pemp*.

T. What is its nest made of?

S. Of fine twigs, covered inside with mud, then lined with very fine grass fibres. They are often saddled on the branches of trees.

T. And you have seen their eggs?

S. Yes. Generally about five, of a beautiful sea-green, a little longer than an inch the longest way.

T. Are the young birds colored like the old birds?

S. No. There is not so much reddish, and there is more black and white speckling.

T. Is it good fun to get a robin's nest and to take away the eggs or the little chickens?

CHORUS. No. It would be cruel.

JIMMIE. How would a boy like a great eagle to come and carry off his little brother or sister?

T. Have you seen any ladies with *wings* of birds on their hats? How did they get them?

S. They must have paid some one for killing the birds; but I don't think they ever thought of it.

T. But hundreds of thousands of our rarest, prettiest and most useful song birds are being yearly killed—and some kinds are nearly exterminated already by the demands of some women; and all the scientific people, and all you, I hope, are trying to stop the slaughter.

JACK. I just saw a woman on the street who seemed to be as proud of the bird's wing on her hat as a red Indian of the olden time with a white man's scalp on his belt.

JIMMIE. It would serve her right if a big, ugly eagle came down and pulled off her natural wig to fix up the nest for the little eagles.

[The cuts of birds used in this and the March number of the REVIEW were made from drawings of specimens in the Provincial Museum, Halifax, N. S.]

ACCORDING to Mr. A. R. Wallace, birds' nests may be divided into two classes: those which are exposed or imperfectly concealed, and those which are covered or so placed that the sitting bird is effectually hidden. With but few exceptions, Mr. Wallace finds that birds of conspicuous color build concealed nests, while in species where the female is dull the nest is fully exposed.

#### Home Thoughts From Abroad.

Oh, to be in England, now that April's there,  
And whoever wakes in England sees, some morning, unaware,  
That the lowest boughs and the brushwood sheaf  
Round the elm tree bole are in tiny leaf,  
While the chaffinch sings on the orchard bough  
In England—now!  
And after April, when May follows,  
And the white-throat builds, and all the swallows!  
Hark, where my blossomed pear-tree in the hedge  
Leans to the field, and scatters on the clover  
Blossoms and dewdrops—at the bent spray's edge—  
That's the wise thrush: he sings each song twice over  
Lest you should think he never could recapture  
The first fine careless rapture!  
And though the fields look rough with hoary dew  
And will be gay when noontide wakes anew  
The buttercups, the little children's dower—  
Far brighter than this gaudy melon-flower.

—ROBERT BROWNING.

#### Plants in their Homes and in the School-Room.

##### No. III. Dioecious and Monoecious Plants.

How strange are some of the habits and ways of living of our brother organisms, the plants! They go to sleep and awake; some close up their leaves or flowers at the approach of rain; some are addicted to animal food; some love to frequent the abodes of man; others love solitude. Some would seem to be unsocial in their habits. Such are *Dioecious* plants. The word means in *two households*. Others prefer the same home. These are the *Monoecious* plants. They live more on the communistic plan—in *one household*.

Examine the alder tree which is just now in flower, its catkins drooping gracefully from the summits of the branches. Pick off a branch, examine one of these closely. On the same branch, just underneath the catkins, you will find small reddish flowers, usually in clusters of three. These flowers have no blossoms. Take one of the drooping catkins; by the aid of a knife and a small magnifying glass you will be able to see that it is composed of a great number of *stamens*, but with no conspicuous calyx, and no corolla or pistil. These are the *staminate flowers*. Next look at the inconspicuous reddish flowers. Detach one from a cluster, examine it with a glass. It is quite different from the stamens in the large catkins. These are the *pistillate flowers*. They are not very beautiful, but they are hardy. They have braved the storms and cold of winter without any covering.

Let us examine another early flowering plant—a willow. Its flowers were comfortably tucked up during winter. Now the soft downy catkins emerge from the bud and the "pussy" willows are out.

If you have put some branches in water, as directed in the last REVIEW, they will be ready to study now. Pick off a catkin, notice that the silky down appears from a little reddish bract. With a knife carefully separate one from the catkin; propped up against this bract is a little flower, with no calyx or corolla. It may be a conical shaped body, with two divergent lobes at the top. If this is the case it is a pistil, and all the flowers on that catkin and all other catkins from the same tree will be pistillate. Examine the catkins of other willow trees in the neighborhood. Alongside of the downy bracts you may discover another kind of flower, each consisting of *two stamens*. These are the *staminate flowers* and they grow on a separate tree from the pistillate flowers.

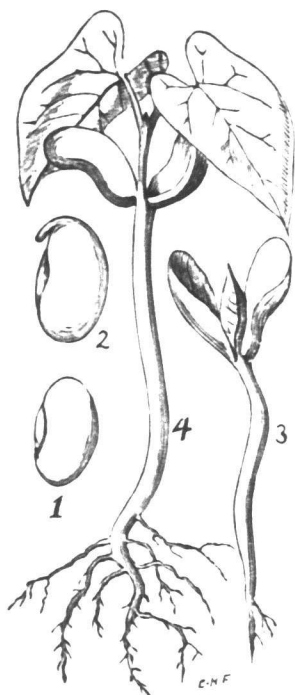
Notice the way the buds are disposed on the willow branch, and read the chapter on Phyllotaxy in Gray's "How Plants Grow," also on "Staminate and Pistil-

late Flowers." A number of other trees and shrubs have these kinds of flowers which come out early in spring. Get the pupils to search for them and bring them into the class-room.

**Part IV. Two Great Divisions of Flowering Plants.**

The seeds that were started a month ago, and those that have been planted at intervals since will now be ready for study. If your pupils have planted these and cared for them as directed in the last REVIEW, they have begun their work in plant study in the right way, and they will have an interest in the succeeding lessons that no mere study of a text-book could give.

Take the bean plants for the first lesson, and have, if possible, some in the pod, as well as two or three that have been placed in warm water a day or two



before. Drawings should be made of the different stages of growth, as represented in the annexed diagram. The cotyledons or seed-leaves, and their uses should be carefully explained and the pupils asked to write about them. It will take much ingenuity and some little time before they will understand the difference of structure and shape and the uses of the pairs of leaves that appear on No. 4 of the drawing. These, with other features were so fully explained in the April issue of the REVIEW, of last year, that we shall refer our readers to them.

The teacher, after two or more lessons on the bean plant, may tabulate the following characteristics:

- (1) It has two seed leaves.
- (2) It has netted-veined leaves, irregular in outline.
- (3) These have exogenous stems (outside growing) with usually separate bark.
- (4) They have the flower usually on the plan of five, sometimes four, and less frequently three.

Let us take next the seed of corn that has been

planted. Unlike the seed of the bean it does not split open on being soaked in water. The seed remains in one piece. After soaking it in water for several days (longer than the bean), remove the seed covering. Growing from one side of the seed will be seen rudimentary leaves neatly folded round a short axis—the caulicle (from the leafy end grows the plumule or ascending axis). Growing from the other end of this caulicle, after it has broken through its sheath, is the descending axis or root. What nourishes the young plant in the early stages of its growth? Where is the food laid up?



Looking at the larger plant of several weeks' growth, we find the leaves have unfolded, the roots have grown longer, and sent rootlets in different directions. How does the young plant now derive its nourishment? The leaves will now show distinctly the parallel veining. After drawings have been made, and all the parts of the young plant carefully studied, the following facts should be written out as the basis of future study of a second great class of flowering plants:

**MONOCOTYLEDONOUS** plants, such as Indian corn, oats, grasses, etc., have:

- (1) One seed-leaf to the embryo; (this seed-leaf is not easily found, but in Indian corn it may be detected after long soaking, closely surrounding the caulicle, and furnishing it with the food stored up in the kernel).
- (2) Have (usually) parallel-veined leaves, sheathing the stem.
- (3) Have the parts of the flower in threes, sometimes fours, but never fives.
- (4) Have endogenous (or inside growing) stems with inseparable bark.

**To the Botanical Club.**

The sylvan powers  
Obey our summons; from their deepest dells  
The Dryads come, and throw their garlands wild  
And odorous branches at our feet; the Nymphs,  
That press with nimble step the mountain thyme  
And purple heath-flower come, not empty-handed,  
But scatter round ten thousand forms minute  
Of velvet moss or lichen, torn from rock  
Or rifted oak or cavern deep; the Naiads too  
Quit their loved native stream, from whose smooth face  
They crop the lily, and each sedge and rush  
That drinks the rippling tide; the frozen poles,  
Where peril waits the bold adventurer's tread,  
The burning sands of Borneo and Cayenne,  
All, all to us unlock their secret stores  
And pay their cheerful tribute.

J. NAYLOR, Norwich, 1818.

For the REVIEW.]

### New School Building at Springhill.

The new school building at Springhill, Cumberland County, Nova Scotia, was completed on February 20th, 1889. Springhill now boasts of having one of the best school-houses in the province. It is an educational pile, as the *Springhill News* puts it, costing \$10,000. It is seventy-two feet square and occupies a prominent height overlooking the town—facing the west, and is enclosed by a picket fence. Inside the building there are eight rooms—four on the ground floor and four upstairs. These rooms are 33x28 and each will accommodate upwards of seventy pupils.

Eight teachers and over five hundred pupils occupied this building for the first time on Thursday, February 21st. The formal opening took place on the afternoon of the following Tuesday, February 26th. A large number of parents and visitors availed themselves of the opportunity given to see the new building, and the teachers and pupils engaged in their work.

The principal of this school is D. W. Byers, a first class graduate of the provincial normal school. The other teachers are: J. A. Purdy, Miss Maggie A. Grant, Miss Cassie M. Bacon, Miss Jennie Peers, Miss Ella Fletcher, Miss Clarissa P. Hunter and Mrs. Logan.

The teachers highly appreciate their new quarters and have entered upon their work with renewed efforts. The scholars, too, with their youthful countenances beaming with delight, seem to find the change agreeable.

The old building, though forsaken, is not yet forgotten. Although *Ishabool* adorns its walls there are some who will cherish its memory for many years to come.

For the REVIEW.]

### On First Lessons in Number.

#### A NORMAL SCHOOL EXERCISE.

What is number? Apart from all consideration of size, shape, color or material of the individuals which compose it, every group of objects has a special character which we designate *number*. Number is, therefore, a sort of quality or property which we find in every group of objects. This may not be an adequate definition, but, at least, one side of the truth is expressed.

How then should ideas of number be taught? In much the same way as ideas of other properties and qualities are taught. To get ideas of color children must see, handle and compare colored objects. So, too, *number ideas* can only be obtained from objects

properly presented in groups. It is no more absurd to attempt to teach red than 5 without objects.

Where should one begin in teaching number to children five years old? As in all other subjects, just where the child's knowledge ceases to be definite and complete. This will, of course, differ very much with different children. Many on entering school do not know number beyond 3, while others can count, at least, as high as 10.

Is ability to count numbers, say, up to 10, a guarantee of adequate knowledge of those numbers? By no means. Counting implies at least only a knowledge of the *order* in which numbers occur. 6 is known, for example, only by the fact that it comes next after 5. Thus, in learning to count, only a single fact is learned about each number—that it is 1 more than the number just before it. Counting is liable to be little more than a succession of names to be given one after another to the objects in a group. It is a very great mistake, therefore, to spend time teaching children to count up to high numbers until they have thoroughly learned the lower ones.

What then is it, to know a number as it should be known? A number is fully known only if it can be identified by any one of the facts which may be learned concerning it, and if, when once so identified, all the other facts can be stated.

What are these facts? Illustrate by the numbers 5 and 9. The number 5 is made up of 4 and 1, of 2 and 3, of two 2's and 1; while the number 9 should be known as made up of 5 and 4, of 6 and 3, of 7 and 2, of 8 and 1, of two 4's and 1, of three 3's, of four 2's and 1.

Should *all* of the facts involved in any one number be learned before another is introduced? Certainly no attempt should be made to teach numbers beyond 10 until all the numbers up to, and including 10, are known in the complete way just indicated, for the reason that any real knowledge of numbers greater than 10 is impossible unless this foundation is laid. As to the numbers below ten, it is not, perhaps, absolutely necessary, though generally it will be the safer way, to follow the plan indicated in the question.

How may a new number be introduced, supposing all of the preceding numbers to be completely known? There are two ways: first, and probably this is the common method, by a process of *synthesis*, so called. If 5 is the number to be taught, the child already knows 4 as well as 1; a group of four objects is presented to him and recognized; another is then added to the group and he is taught to call the enlarged group 5. 5 is thereafter identified as 1 more than 4, just as 4 has been previously learned as 1 more than 3. This is evidently the process of learning

to count. After this process of synthesis, by which the number 5 becomes known, there would follow in thorough teaching the process of *analysis*, by which the child learns that other component parts of 5 are 3 and 2, two 2's and 1.

What is the other method referred to? It is claimed by many that each number up to 10 should be taught as one would teach an apple or a cube, by presenting it as a whole, requiring the child to discover for himself *all* the facts involved in it. Thus, give him a group of 5 objects, tell him that there are 5, and then let him find out by analysis that it includes a 4 and a 1, a 2 and a 3, two 2's and a 1.

But is it possible to learn and afterwards to recognize "at sight" a number presented as a whole? Only by associating with each number a *special arrangement* of the objects in the group from which the number is taught. If the *linear* arrangement of objects is adopted for all numbers, as is the case when they are taught from the ball frame or strings of beads in the kindergarten material, 6 can hardly be distinguished as such, except by counting to see if it is 1 more than 5, or by separating it into the other groups of which it is composed.

What distinctive arrangements other than the linear are possible for each of the numbers up to 10? Arrangements somewhat similar to those found on dice or dominoes. Such arrangements receive the name of *number pictures*.

What special advantages would possibly be gained by teaching numbers in this way? Each number would have an individuality quite independent of the preceding numbers, and could, therefore, be presented as a whole and always recognized in that form at sight. A mental picture, vivid and definite, of each number would be in this way indelibly stamped upon the child's memory. The analysis of each number into its component parts would be greatly facilitated and the facts thus discovered more easily and more accurately remembered.

Would not the child thus taught get the impression that the form or the arrangement of the group was essential? Such an impression would not last long; the child's experience in manipulating his blocks, tablets, etc., would soon obliterate this. Besides, any possible disadvantage resulting therefrom on this score would be more than compensated for by the greater certainty and definiteness of his knowledge of the number and its relation.

What kinds of objects are best for teaching numbers? In teaching to count, and, indeed, for many purposes, the old fashioned ball frame is very useful. Strings of beads or buttons, quantities of pumpkin seeds, beans, little squares or discs of leather are at

the command of every teacher. A simple board, eight or ten inches square, in which are bored little holes in rows, intersecting so as to make squares, say three-quarter inches each way, together with a quantity of shoe pegs form a useful and inexpensive apparatus. If common numbers are to be taught in the second of the two methods above outlined, the main reliance must be at the outset on the number pictures.

How can these number pictures be provided for school use? Charts such as Parker's or Dunton's can be purchased at some considerable expense; but every teacher has a blackboard and can make them for herself. Any simple mark may be adopted, such as dots, circles, crosses and the like. Cubes with the number pictures on them like dice, or tablets like dominoes would be useful for the children at their desks.

Explain somewhat more in detail the use of number pictures. Suppose the number under consideration is 5, teacher presents the picture of it, thus:  $\begin{matrix} \cdot & \cdot & \cdot \\ \cdot & & \cdot \\ \cdot & & \cdot \end{matrix}$  and calls 5; children make 5 on their slates, or find it on their dominoes or cubes, or make it with their pegs, beans or buttons.

When the number itself is thus known as a whole the analysis of it will proceed thus: Separate the group thus:  $\begin{matrix} \cdot & \cdot & \cdot \\ \cdot & & \cdot \\ \cdot & & \cdot \end{matrix}$  or  $\begin{matrix} \cdot & \cdot & \cdot \\ \cdot & & \cdot \\ \cdot & & \cdot \end{matrix}$  that is, into 3 and 2; then thus:  $\begin{matrix} \cdot & \cdot & \cdot \\ \cdot & & \cdot \\ \cdot & & \cdot \end{matrix}$ , 4 and 1; and lastly thus:  $\begin{matrix} \cdot & \cdot & \cdot \\ \cdot & & \cdot \\ \cdot & & \cdot \end{matrix}$  that is two 2's and 1. Children taught to state all the facts they have discovered.

What forms of expression are appropriate in the statement of these facts? The simplest and most natural possible. Especially should the technical term add, subtract, multiply and divide, together with their associates, be avoided. As in the rudiments of all subjects the difficulty of scientific terminology should be deferred till the elementary ideas have been completely appropriated.

What sorts of exercises for practice are desirable? The circumstances of the school and the teachers' own versatility must determine this point. However, besides the varieties already indicated, exercises in measuring lengths, in imaginary buying and selling, in combining and separating the children into groups, illustrating the numbers taught, will all prove interesting and profitable.

What about abstract numbers? The teacher need be at no pains to teach abstract numbers, *so called*. This will come of itself when the minds of the children are ready for it. All the children's thought and reasoning should, in this regard, be upon *objects*, first as actually present; afterwards as brought to the imagination of the child through little *stories* told by the teacher.

How much time should this work take? In the schools which have won recognition as representing

the best methods, a year is not considered too long to lay well the foundation for intelligent, healthful, rational work in arithmetic, in the thorough knowledge of the first ten numbers. If it can be done in less time—by all means do it in less; if more is required give it.

When should figures be taught? In general, the longer they are deferred the better. It must not be forgotten that numbers are not figures, and that the object of the teacher should be to teach the former rather than the latter. Arithmetic practice is too often a mere juggling with figures, instead of reasoning about numbers. In most cases it will be safest, undoubtedly, to defer the teaching of figures until the first ten numbers are thoroughly learned.

Truro, N. S., March 9th, 1889

#### Music in the Schools of Nova Scotia.

Dr. Allison, in his last report, very truly says:

The important subject of music cannot be said to be on a satisfactory footing in our schools, nor indeed to have ever been so. I am persuaded that the reported figures convey an exaggerated impression regarding the amount of attention which this branch really receives, while, of course they are even less reliable as indices of the nature and value of the instruction imparted. The matter has been pretty much left to take care of itself, and teachers and local authorities should not be held to account for the poverty of result accompanying this want of system. It is time that definite attention should be directed to this important instrumentality of culture, and it is proposed to have the whole subject carefully considered at the ensuing meeting of the Provincial Educational Association. Our schools should not be left without some tolerably specific instructions for their guidance.

With reference to the best system of musical notation, he speaks very plainly, and his authorities are very weighty:

The claims of the Tonic-Sol-Fa system of reading music are deserving of careful consideration. This system essentially consists in the substitution for the ordinary staff notation, which is capable of being mastered only by comparatively mature minds, of a much simpler and radically different one, the principles of which are entirely within the grasp of children. It is now in universal use in the Public Board Schools of England, and its advocates claim, with the most satisfactory results. These urge that it appeals more directly and forcibly to the general musical intelligence than the ordinary system, and is, in short, the truly logical and philosophical method of teaching singing. This is a large claim and, as might be expected, is not universally admitted. Such an induction of facts, however, as I have been able to make, leads me to believe that the system is especially adapted to elementary schools, as bringing a scientific knowledge of vocal music within the reach of children to whom this would be quite impossible by ordinary methods.

The coming common school teacher must be able to sing and to teach vocal music. In our best schools Boards of Trustees already insist on this qualification in addition to the provincial diploma.

#### Comparison of School Statistics.

NOVA SCOTIA AND NEW BRUNSWICK.

The following statistics, compiled from the recent reports of Superintendent Allison and Superintendent Crocket, may serve to show the status of common school education in Nova Scotia and New Brunswick for the past year. The Nova Scotia year ended 31st October, 1888; New Brunswick school year ended June 30th, 1888:

	N. S.	N. B.
Greatest number of schools in operation,	2166	1542
“ Teachers employed,	2222	1613
Number of different pupils registered for year, . . . . .	105,231	69,063
Proportion of population at school during year, . . . . .	1.41	1.46
Proportion of population at school during either term, . . . . .	1 in 5.0	1 in 5.38
Percentage of pupils daily present, on an average, while schools were in session, . . . . .	57.6	60.0
Percentage of pupils daily present, on average, for full term, . . . . .	55.4	56.16
Average cost of educating each pupil,	\$5.98	\$5.88
Rate per pupil from government, . . . . .	1.71	1.97
“ “ ratepayers, . . . . .	4.75	3.91
Amount of government expenditure for County Academies (N. S.), and Grammar Schools (N. B.), . . . . .	\$13,306.67	\$4,404.02

#### TEACHERS EMPLOYED.

	N. S.	N. B.
Academic Grade A (N. S.), Grammar (N. B.), . . . . .	38	14
First-Class (Male), . . . . .	185	113
“ (Female), . . . . .	140	135
Second-Class (Male), . . . . .	222	181
“ (Female), . . . . .	881	610
Third-Class (Male), . . . . .	161	111
“ (Female), . . . . .	533	415

#### AVERAGE SALARY OF TEACHERS.

	N. S.	N. B.
First-Class (Male), . . . . .	\$439 74	\$526 90
“ (Female), . . . . .	298 11	328 49
Second-Class (Male), . . . . .	253 93	303 66
“ (Female), . . . . .	228 48	225 75
Third-Class (Male), . . . . .	190 21	231 00
“ (Female), . . . . .	161 17	187 47

#### ANNUAL EXPENDITURE FOR PUBLIC EDUCATION.

Provincial, . . . . .	\$180,811 48	\$136,326 45
County Fund, . . . . .	118,485 38	94,501 17
District assessment, . . . . .	300,366 00	175,423 97
Total, . . . . .	\$599,662 86	\$406,251 59

[This expenditure does not include cost of buildings, repairs, maintenance of Normal Schools, cost of inspection, etc.]

### The Nova Scotia School Curriculum.

David Allison, Esq., LL. D., Superintendent of Education for Nova Scotia, comments as follows on the practical results, so far, of the provincial course of study, in his annual report:

The returns included in Table VI. indicate that the regulative influence of the prescribed course of study upon the methods, order, and subjects of instruction in the public schools, is year by year increasing. Certain studies are of a fundamental character; they constitute the true substance of all education. On the intellectual side, the utility of a common school is primarily to be measured by the efficiency with which these branches, sometimes called "instrumental," as furnishing the key to all advanced or special knowledge, are taught. From this point of view it is gratifying to learn on the testimony of our most observant and experienced educators, that these rudimentary subjects were never so well taught in so many schools as since other useful, though in a strictly educational sense, less essential branches, have been incorporated in the working scheme of studies.

The influence of the course of study to which I have referred, is particularly noticeable in the considerable increases reported from year to year in the number of pupils receiving instruction outside of the purely instrumentary branches. A beginning, at least, has been made in teaching in an informal way the elements of science to the pupils of the ordinary grades. Natural science is now occupying a more and more important place in education, and the day predicted by a great writer, "when ignorance of its primary facts and laws will be regarded as a defect second only to ignorance of the primary laws of religion and morality," is probably not far off. If science then means a knowledge of nature, and if it is worth studying at all, it would be difficult to show good reason for excluding it from any scheme of elementary education. Definite instruction in a particular science, with its generalizations and use of technical terms, should not be demanded until the pupil's powers have been gradually unfolded and the way has been led up to it by a course of preliminary training carefully adapted to the end in view. This preliminary training, in the shape of simple object lessons, should begin with the opening of school life; and nothing seems better established than that in this informal untechnical way, the observing and inductive faculties may be beneficially trained, and a good and varied knowledge of important principles and phenomena acquired. In our own case the complete realization of such a system of instruction must be the work of time. Until recently, the training of most of our teachers was exclusively literary, their licenses having been obtained without the mastery of the simplest elements of a single science. This fact itself interposed a serious obstacle to the introduction of scientific teaching. Then many teachers, perhaps not unnaturally, failed to understand precisely what was expected, and augmented real difficulties by inventing imaginary ones. Still it is felt that in view of all the circumstances of the case, a satisfactory beginning has been made. With true professional spirit many teachers have made it a matter of pride and honor to obtain, by special effort, the

necessary qualifications. The curriculum of the normal school and the syllabus of examination have been modified to promote this part of our school work, while outside of our regularly established educational agencies it is proper that I should acknowledge the special stimulus and aid which the movement has received from the Summer School of Science, elsewhere noted in this report, and from the EDUCATIONAL REVIEW, a periodical of a very high order, devoted to the interests of our maritime schools, and marked by the prominence given to science and to experimental methods of teaching its principles.

### Superintendent's Report of Education in New Brunswick.

There is a satisfactory degree of activity and progress in the several aspects of the service. A large number of new school-houses have been built, others substantially repaired, and many supplied with suitable furniture and needed appliances, while many school-grounds and premises have been made places of neatness, beauty and attractiveness. The inner work of the schools, as attested by the inspectors, has been carried on with undiminished efficiency.

This begins Superintendent Crockett's report; and it is encouraging to note the evidence of general progress.

Irregular attendance, and a consequent falling off in the daily average is a matter of regret. The Superintendent shows the loss to parents and pupils, and suggests that teachers use all their influence to secure greater regularity of attendance, especially by frequent visits to parents.

The revised course of study, to which an extended reference was made in the March REVIEW, is printed in the report, and separate copies have since been placed in the hands of the teachers of the province.

In regard to teachers' salaries, it is gratifying to note that the salaries of first-class teachers, both male and female, show a slight increase over the preceding year, and the Superintendent observes: "An efficient school service is not only the best protection to society but it is the cheapest, even at a cost much in excess of the present rates."

Secondary education is provided for by forty-four superior and fourteen grammar schools. The former are represented in an efficient condition, and have awakened in the districts in which they have been established a great educational interest and activity. Of the grammar schools the Superintendent says:

These schools as constituted are teaching as much and as effectively as they can teach, but this falls short in both cases of what it ought to be. My view as to their inadequate

equipment and their failure to meet the wants of modern times were set forth in my last annual report, and need not be repeated here. I would, however, respectfully solicit the attention of the legislature to them, and again recommend that better provision be made for our secondary education.

Concerning a normal school curriculum, there is the following:

Whatever may be the true theory of normal school training we are not yet in a position to dispense with the teaching of academic subjects. Very few of our common schools or even high schools have the facilities for imparting such instruction, both as respects its amount and character as teachers require, and unless their schoolship is supplemented at the normal school, the common schools of this country must suffer. When the province is supplied with schools sufficiently equipped to give the necessary academic training, much of the general instruction which is now given at the normal school may be dispensed with. As it is, less and less attention is being given to such subjects as are at least fairly mastered at the public school; *e. g.* arithmetic, geographical topography, technical parts of grammar, etc.

The Superintendent, after enumerating the increasing duties of inspectors, and the efficient manner in which these have been performed, recommends the appointment of an additional inspector.

Compulsory education is recommended, and the following substantial showing urged in its favor:

The enrolment of pupils was higher for the year 1888 than in any former year except 1879. This is so far satisfactory, but the highest number yet enrolled fails to reach large numbers of the youth of the country. We have fully 15,000 children in our midst growing up in ignorance, and very probably acquiring habits ruinous to themselves and liable to become troublesome to the state. With such facts before us it is clear that some provision ought to be made whereby these children may be brought under the advantages which the state has provided for them. There are, no doubt, difficulties in the way of effectively carrying out a law compelling the attendance of children at school in all parts of the province, but if the legislature is not at present prepared to adopt the principle universally, I respectfully recommend that it pass a measure empowering boards of trustees in cities and incorporated towns at least, to enforce such attendance as shall ensure due attention to the education of all educable children within the limits of their jurisdiction. The Board of Trustees of St. John has repeatedly solicited that such authority be granted them, as likewise has the School Board of St. Stephen; and the Board of Fredericton in their report in Appendix C recommends that "a compulsory attendance clause be inserted in the Common Schools Act, so that no children may be allowed to grow up to manhood without the possession of sufficient knowledge to enable them to become good citizens." The inspectors, too, who are painfully cognizant of the defects in the system in this respect, have time and again recommended the adoption of some remedial measure.

#### Teachers' Salaries.

We commend to all concerned the careful consideration of the following apothegmatic comment upon this subject, which we quote from the report for 1888, of the Superintendent of Education in Nova Scotia. In no other direction can we look for a remedy for the evil of low salaries. The teacher must acquire the skill, that is education and the power of educating. The educational authorities are evidently moving in the direction of stimulating such a development. But no government in this conservative age can compel the people to continue paying for anything, even education, so called itself, more than it is worth. The profession of teaching, to support life, must become a life's work, just as in other noble professions.

In most of the grades there have been slight reductions in the average rate of salary. As the excess of supply over demand has continued to increase, this fact ought not to excite surprise. It is becoming clear to every one who chooses to think on the subject that the most effective way to improve the remuneration of teachers lies in surrounding their work with the pre-emptions and safeguards that are the prerogatives of skilled labor. An elevation of the standards of admission in the direction of a specific professional training would benefit no one interest so much as the teaching body itself. Until a closer equation of supply and demand is brought about, recommendations on the subject of salaries, whether given to employers or employed, can produce but little effect."

We clip the following from the *New York Independent*, so that our readers may judge to what extent our public school courses of study are, in their scientific outline, abreast of the best taught in the republic. The grammar schools in the States correspond somewhat to grades VI., VII. and VIII. of the Nova Scotian "common" schools.

The committee appointed by the American Society of Naturalists to "develop a scheme of instruction in natural science to be recommended to the schools," have made a report in which they say that instruction in natural science should begin in the lowest grades of primary schools and continue throughout the curriculum; that in the lower grades the instruction should be chiefly by object lessons; that a more systematic course should be arranged for in high schools; and that an elementary acquaintance with one or more departments of natural science should be required for admission to college. In the primary and the lower grades of the grammar schools the committee recommend that the study of plants and animals should be the main part of the scientific work. The botanical instruction should commence with such simple exercises as drawing and describing different forms of leaves, and should gradually advance to the easier and more conspicuous flowers, and later to the more obscure and difficult forms of flowers, the fruits and seeds. The committee add:



"The zoological instruction in the lower schools should not attempt a systematic survey of the whole animal kingdom, but attention should be directed chiefly to the most familiar animals, and to those which the pupils can see alive. The common domesticated mammals should first be studied, and later the birds, the lower vertebrates, the insects, crustacea, and mollusks. While the range of zoological instruction must be limited as regards the number of forms studied, those few familiar forms should be so compared with each other as to give the pupils, very early, some conception of the main lines of biological study—morphology, physiology, taxonomy.

"Special prominence should be given to the study of plants and animals which are useful to man in any way; and the teacher may advantageously, from time to time, give familiar talks in regard to useful products of vegetable and animal origin, and the processes of their manufacture.

"Attention should also be given to the more obvious characteristics of the kinds of minerals and rocks common in the region in which any school is situated, and to such geological phenomena as are comparatively simple and easily observed.

"The subject of human physiology and hygiene is of so immense practical importance, and so few comparatively of the pupils ever enter the high school, that we regard as desirable some attempt to teach the rudiments of the subject in the grammar, and even in the primary schools.

"We would recommend the introduction of exceedingly rudimentary courses in physics and chemistry in the highest grades of the grammar school.

"We would recommend as perhaps the most desirable branches of science to be included in the classical courses in the high school, and to be required for admission to college, physical geography, phænogamic botany, and human physiology. The first is suggested as tending to keep alive in the student's mind a sympathetic acquaintance with nature in its broader aspects; the second, as affording unequal opportunities for discipline in observation; the third, as affording knowledge of the greatest practical importance.

"The rudiments of physics and chemistry, which we propose for the grammar schools, will enable physical geography and physiology to be intelligently studied in the early years of the high school course."

THE thanks of the Truro Kindergarten Committee are tendered to Mr. E. Steiger, of New York, for his kindness in presenting a portrait of Fröbel. It was placed in position with a few suitable remarks to the children about the good and great man who loved them so dearly that he devoted himself to their service. Any one visiting New York should call at 25 Park Place for the special purpose of inspecting kindergarten material and literature. We saw parcels addressed to Russia, Denmark, Schleswick-Holstein, and Sweden, and on expressing surprise were informed that Mr. Steiger could supply, in some cases, a better article at a cheaper rate than the European manufacturer.—[COM.]

#### St. Francis Xavier.

For some time past it was becoming apparent that additional accommodation would be necessary in the near future, if not at present, to meet the requirements of the yearly increasing number of pupils seeking admission to the Antigonish Academy. This necessity was faced by the proper authorities with characteristic promptness and liberality, by the erection, in the course of the summer and fall, of a very handsome brick and stone edifice, sufficiently large to meet the wants of those seeking higher education in this part of the Province for generations to come. The old structure was all removed with the exception of one wing, which was found to be not inconsistent with the unity and general effect of the architectural design followed in the construction of the new building. It is certainly one of the finest, most commodious, and best appointed of the kind in this Province.—*Report, Inspector MacDonald.*

#### Educational Institute of New Brunswick.

ELEVENTH REGULAR MEETING, TO BE HELD AT THE PROVINCIAL NORMAL SCHOOL, FREDERICTON,  
JUNE 26th, 27th, 28th—1889.

##### Programme.

1ST SESSION, TUESDAY AFTERNOON.—Enrolment. Election of Officers. Report of Executive Committee. Other business.

2ND SESSION, TUESDAY EVENING.—Public meeting. Address of welcome by the Mayor of Fredericton. Addresses by other prominent speakers. Music by a special choir.

3RD SESSION, WEDNESDAY MORNING—1. Paper on "The demand which the Common School is making on the Common School Teacher," by Eldon Mullin, M.A., Principal of the Normal School.

2. Paper on "Composition and critical reading *versus* the formal teaching of English Grammar," by George U. Hay, Ph.B., Principal of the Victoria and Gir's' High School.

4TH SESSION, WEDNESDAY AFTERNOON.—Paper on "Compulsory attendance at School," by Frank H. Hayes, Superintendent of the Portland schools.

5TH SESSION, WEDNESDAY EVENING.—Paper on the question "Is the Common School meeting the demand for Practical Education?" by P. G. McFarlane, B.A., Principal of High School, St. Stephen.

6TH SESSION, THURSDAY MORNING.—1. Paper on "The Superannuation of Teachers," by S. C. Wilbur, B.A., Principal of High School, Moncton.

2. Paper on "A Programme of School work for Friday afternoon," by George J. Oulton, Master of Superior School, Dorchester.

7TH SESSION, THURSDAY AFTERNOON.—1. Paper on "Public School education—Its relation to the Political, Social, and Moral tendencies of the Times," by Philip Cox, B.A., Principal of Harkins School, Newcastle.

2. Election of Executive Committee.

8TH SESSION.—THURSDAY EVENING.—Paper on the question "What provision might be made for Technical Education in the Province" by W. S. Carter, M.A., Inspector of Schools, St. John.

Arrangements have been made for discussions to follow the reading of the several papers. The names of the leading speakers will be published later. There will be opportunity for the introduction of business at several of the sessions. The usual travelling arrangements will be made.

HERBERT C. CREED,  
Secretary.

THE *British American Citizen* newspaper offers seven prizes for competition among people now resident in Nova Scotia, New Brunswick, Prince Edward Island, and Newfoundland, as follows:

\$10.00 for the best Essay on any of the following subjects:

1. Nova Scotia's mineral resources as an investment for capital.
2. The Maritime Provinces and their possibilities for farming and fruit growing.
3. The development of the fisheries of the Provinces, and their worth as an investment.
4. The early settlers of the Provinces, from New York, Massachusetts, and Connecticut.

FOR YOUNG PEOPLE.

\$5.00 for the best Essay on either:

1. The botany of the Maritime Provinces.
2. The salt water and fresh water fishes.
3. The common birds and their habits.

All must be in before May 1st. *British American Citizen*, 7 Bromfield Street, Boston, Mass.

PERSONAL NOTES.

Inspector Mersereau is visiting the graded schools of Newcastle and Chatham this month.

Inspector Carter is examining the schools of the city of St. John this month.

Miss Mary J. Copp, and Minnie A. Copp, twin sisters, are teaching in adjoining districts, Coverdale, Albert County, N. B.

James E. Creighton, B.A. (Dalhousie, 1887), who won a fellowship at Cornell University last fall, has been appointed Instructor in Philosophy in the same university. Mr. Creighton is a Pictovian, and was a Munro exhibitioner in the University of Dalhousie, from which he graduated with first-class honors in mental and moral philosophy.

Mr. A. W. Macrae, St. John, has been successful in passing the intermediate examination for the de-

gree of Bachelor of Laws, in London University, England. Mr. Macrae, who is a graduate of Dalhousie College, N. S., is the first Canadian to pass examination without studying in an English university.

The Providence (Rhode Island) *Journal*, of a recent date, refers to an interesting paper on "The Rhode Island Emigration to Nova Scotia," by Prof. Ray Greene Huling, who visited Hants County a few months ago for the purpose of historical research. This paper, after introductory remarks, deals particularly with the settlement of the townships of Falmouth, Newport, and Sackville (N. B.), by Rhode Island loyalists in 1760. Prof. Huling showed that these emigrants had played an important part in building up the fortunes of New Brunswick and Nova Scotia.

QUESTION DEPARTMENT.

Questions and Answers.

The excellent monthly, THE EDUCATIONAL REVIEW, published at St. John, is doing good work in the publication of star tables, and in awakening interest in astronomical knowledge generally. Is not, however, "the first point of Aries" mentioned as coincident with the vernal equinox, now a merely technical expression? Sayre tells us that this coincidence began in the year 2450 B. C. We believe "Precession" carries the real equinoctial point backward one sign in 2151 years. Consequently it would, we suppose, have retrograded to the sign Pisces nearly 300 years before the Christian era, which accounted for the prevalence of the fish on Christian tombs in the catacombs of Rome. If this be correct, the sun's place at the vernal equinox would now be in Aquarius, as it was in Taurus before 2450 B. C., which accounted for bull worship among the Chaldeans and Egyptians. Will the St. John EDUCATIONAL REVIEW tell us whether or no we are right.—*The Critic* (Halifax).

The intelligent and patriotic tone of our contemporary has always inspired us with the best feelings towards it; yet it shows us no mercy. However, the questions mooted are fair, and we shall attempt them.

1. The "first point of Aries" is a real point in the ecliptic—where it is crossed by the equinoctial line. The centre of the sun was exactly over that point last month, March 20th, at 5h. 48m. 8s. in the morning, 60th meridian time. Suppose that point on this occasion to be marked by a star. The sun moves eastwardly from this point with a daily motion of from 57 to 61 seconds of arc, according to the earth's position in its orbit. In the sidereal year of 365d. 6h. 9m. 9.6s. the sun's centre would be again over our initial star. But the first point of Aries would not be there. During the year the equinoctial line was slowly moving westwardly, so that the sun would have to cross it about 50.1 seconds of arc on an

average before it came to the star. The *tropical* or common year would be completed upon the sun's arrival at the intersection of the equinoctial and the ecliptic, 50.1 seconds of arc, or 20m. 19.9s. of time before it could reach the initial star. So that by adding 365d. 5h. 48m. 49.7s. to the date given above, we find when the sun is at the first point of Aries in 1890. In 20m. 19.9s. more it would arrive at the star where the first point of Aries was in March 20th, 1889. It would take 25,868 years for this average difference of 50.1" annually to amount to 360°. The motion is so very slow that lines of declination and of right ascension, which change their position with the equinoctial, will leave these lines on our star maps practically correct for some years into the next century.

2. A *sign* of the zodiac always means a length of 30° on the ecliptic. It therefore follows that every sign is slowly moving westward along the ecliptic; and in one-twelfth of 25,868 years, that is, in 2,156 years, Aries will cover exactly the stars at the beginning of the period covered by Pisces.

3. The *constellations* of the zodiac gave the names to the *signs*. These *constellations* as they have been delimited for us by Argelander, cover the ecliptic, but are irregular in shape and even unequal in length, some being as short as 19°, and others as long as 48°; while theoretically they should be each 30°. It is evident that when the present order of *signs* was established they must have approximately coincided with the *constellations*. When was that time?

4. During the last month the brilliant planet Venus could have been seen passing a little below a pair of stars, one of the second magnitude, the most westerly of the third magnitude. These are, respectively, Alpha and Beta, of the constellation Aries. About 128 B. C., when that great ancient astronomer, Hipparchus, was developing the science, the *vernal equinox* was near Beta Arietis (beside Venus, on the 7th March,) which was nearly on the western boundary of Aries, contiguous to Pisces. The *signs* and *constellations* were then coincident, so far as they could be from the irregular boundary of the constellations. Since then 2017 years have passed away. Shortly before the time of Christ, the vernal equinox, or the first point of the *sign* Aries moved westwardly into the *constellation* Pisces. It is not yet in the constellation Aquarius, nor will it be for at least 300 years to come, as Pisces is one of those constellations which is longer than the average 30°.

5. The prevalence of fish forms in the ornamentation of Christian tombs in the catacombs of Rome are not likely to have any astronomical signification. The Christians of that time were not likely to have

good opportunities or even the leisure to cultivate such tastes. Some of the decorations show figures of the miracles of the loaves and fishes, among other scenes from the history of Christ. The Apostles, too, were fishermen. Fish pictures would, even for these reasons, be expected to appear often in their decorations. But these simple minded men could more easily see a great mystery in the remarkable lettering of the word fish, taken from their Greek testament, than in abstruse astronomical knowledge, so generally unknown even to the comfortable Christian of to-day, who can get it, much of it, even in a free advertising almanac.

The Greek for fish is: *Ichthys*. There were here, in order, the initials of the name above all names—the name of Him for whom they lived, the name of Him for whom they died: *Iesos Christos, Theou Uios Soter*, "Jesus Christ, the Son of God the Saviour." The fish, *Ichthus*, was therefore the emblem, the symbol of the great name, and its attributes, which should not be even lightly spoken.

6. Over 2000 years before the time of Hipparchus, or shortly after the date of the deluge, according to Archbishop Usher's chronology, a little later than 2450 B. C., the vernal equinox would be in the proximity of the Pleiades, near the western boundary of Taurus. Bull worship would account for the honorable titles having been given to the first sign beginning at the vernal equinox.

There is a probability that the constellations of the zodiac may have received substantially their present names at even as early a date as the above. This seems to be indicated by some other curious facts. In the ancient cabala of the Jews the bull is the first zodiacal sign. Among the Persians, who numbered their successive signs by the letters of the alphabet, A stands for Taurus, B for Gemini, and so on. Among the Chinese the commencement of the sun's annual motion is referred to the same constellation. In Thebes the zodiacal signs in a great sepulchral chamber begin with Taurus, and so does the zodiac of the pagoda of Elephanta.

This would seem to indicate that over 2000 B. C. the elements of astronomy had been studied and formulated, and even the same idea of nomenclature, in some points, made common to various peoples. It appears to us most probable that the bull must have been worshipped before he was placed in the sky. His position must have depended on his popular estimation. Once enthroned in the sky, however, the bull's prestige would be in a fair way to be increased.

Another curious coincidence exists in connection with the cluster called the Hyades (the rainers), near Aldebaran, in the bull's eye. When the vernal

equinox was in its proximity, according to the generally received chronology, the great rain of the time of Noah deluged the earth. Their "rainy" character was handed down by tradition to classical times. When did the tradition originate? Of course their heliacal rising opened the rainy season in some countries. We may add that there are some considerations which suggest even a still earlier origin for the names of the zodiacal signs or constellations.

#### BOOK REVIEWS.

SCHILLER'S *JUNGFRAU VON ORLEANS*, edited with an introduction and notes, by Benj. W. Wells, Ph. D. Boston: D. C. Heath & Co., publishers. This is one of the best books with which to begin the study of the German classics. The language is in general clear and simple, and the difficulties that present themselves have been lightened very considerably by the judicious notes and historic facts grouped together by the editor.

A companion volume to the above for advanced students in French is Lamartine's *JEANNE D'ARC*, edited with notes and vocabulary by Prof. Albert Barrère, and published by D. C. Heath & Co. Both volumes are neatly got up and clearly printed.

The Peter Redpath Museum, McGill University, Montreal, has issued a volume of notes (100 pages) on specimens of *Eozoon CANADENSE* and their relations. It is edited by Sir J. William Dawson, who makes the following comment, among others towards the end. "I took some interest in the discovery of *Eozoon* by Sir William Logan and his assistants, and it happened that I was the first to recognize its minute structures in some slices shown to me by Dr. Sterry Hunt, in connection with a paper which he was preparing on the mineralisation of fossil remains. I undertook the examination of the specimens at the request of Sir William Logan, and after offering to the late Mr. Billings, the palæontologist of the survey, to give him all the aid in my power if he would undertake the investigation. This, however, he declined, alleging the pressure of other work and his want of familiarity with microscopic research.

On the completion of my notes on the numerous specimens, not only of *Eozoon* but of *Laurentian* and other crystalline limestones, submitted to me by Logan, I placed them with a number of camera drawings prepared by the artist of the survey, in the hands of Sir William, who was then about to proceed to England. Foreseeing the scepticism with which the announcement of Laurentian fossils was sure to be received, and not wishing to be involved in further labor and controversy, I advised him to place my notes along with the specimens, and his own geological notes and those of Dr. Sterry Hunt on the mineralogical questions, in the hands of Dr. Carpenter and Prof. Rupert Jones with *carte blanche* as to any use which their experts in the study of Foraminifera might be disposed to make of them. I had hoped that the matter was thus finally out of my hands, but the complicated and difficult questions which have since arisen have made it a matter of obligation to devote more time to them than has

been either agreeable or profitable. With the present publication I dismiss the matter finally, and without any feeling whatever as to the ultimate verdict of science with respect to those curious and puzzling specimens."

Sonnenschein's *CYCLOPEDIA OF EDUCATION*; a hand-book of reference on all subjects connected with education (its history, theory and practice). Published by C. W. Bardeen, Syracuse, N. Y. To those engaged in teaching this is a veritable *cade mecum*, every subject of interest in teaching being discussed in proportion to the importance that each demands. Among the writers of articles are Oscar Browning, Sir Philip Magnus, Richard Wormel, and other celebrated specialists in education. Although the treatment of subjects is not exhaustive, there is sufficient in this volume of 560 pages to make it a most valuable compendium of educational knowledge, and adapted to the wants of elementary as well as advanced teachers. Opening the book at random we find treated under T the following subjects: Jeremy Taylor, Teachers' Associations, Technical Education (eight pages), Temper, Temperament, Terms, Text-books, Textual Criticism, Edward Thring, Timidity, Tonic-Sol-Fa Method, Training of Teachers, Truants, Truthfulness, Tuition by Correspondence, Tutor, and other lesser subjects.

*ORTHOEPY MADE EASY*: A royal road to correct pronunciation. Published by C. W. Bardeen, Syracuse, N. Y. The plan of this book of 100 pages is to arrange words, commonly mispronounced, into sentences, followed by a key in which the words are pronounced correctly according to Webster and Worcester. The plan is an excellent one; and if the author had discarded many foreign and technical words, it would have had greater value as a general exercise book in pronunciation. As it is, it is well adapted for high schools and the improvement of private students.

#### BOOKS RECEIVED.

STICKNEY'S READERS, first to fourth, published by Ginn & Co., Boston; NATURE READERS, No. 3, Sea-Side and Way-Side, published by D. C. Heath & Co., Boston; OUTLINES OF LESSONS ON BOTANY, by Ginn & Co., Boston. These and others will be reviewed next issue.

#### EXCHANGES.

The *Forum* for March contained an attack on the public school system, by Cardinal Manning. In the April number Prof. George P. Fisher, of Yale, makes a reply, and points out the necessary conflict between Catholicism, as interpreted by Cardinal Manning, and American institutions, defending freedom of religion and the public school. . . . *Wide Awake* for April, published by D. Lothrop & Co., Boston, is a model number, whether for home reading or for supplementary reading in school. . . . *Popular Science Monthly* for April has an excellent editorial on "Learning to Think." . . . *St. Nicholas* for April has finely illustrated articles, among which, interesting to Canadian readers, is "The Bells of Ste. Anne." . . . The *Bookmart*, (published at Pittsburg, Pa.) for March has an interesting table of contents, the "Essays from

The Forum continues to hold its place as the foremost of our magazines for the variety, the value, and the weight of its contributions.—N. Y. Times

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Elementary Schools" contain some gems.... Dr. Honeyman is still writing on the fauna of the deep-sea cable—an instalment each week—in the Halifax *Presbyterian Witness*.  
.... The *Enterprise* has a two column article on Venus from the pen of Principal Cameron, astronomical lecturer in the Nova Scotian Summer Science School.... The Halifax *Herald*, March 26th, had a timely and forcible article on the encouragement of bird-slaughter by the ladies of Halifax, from the pen of Mr. Harry Piers.... The P. E. I. *Guardian* is showing a good example in having a well written popular scientific article each week in addition to the ordinary newspaper material.... The *Science of Photography* for March has a couple of exquisite photo-engravings, and a very interesting article on the artistic in relation to the prize awards for photographic views.... The *American Geologist* for February contains many interesting articles, among which we would name the following: "Glaciers and Glacial Radiants of the Ice Age," by Dr. E. W. Claypole. "Physical Theories of the Earth in Relation to Mountain Formation," by T. Mellard Reade. Editorial comment—"A New Glacial Theory." It is a fine monthly and is published at Minneapolis, Minn., U. S. A. It has an editorial staff of seven of the best American geologists.... The *Century* for April is a valuable historical number, containing an account of Washington's Inauguration one hundred years ago—admirably illustrated.... The *American Naturalist* for January opens with an able article on the Algo-lichen hypothesis. Its general notes on, 1. Geography and Travel; 2. Geology and Palaeontology; 3. Mineralogy and Petrography; 4. Botany; 5. Bacteriology; 6. Zoology; 7. Entomology; 8. Embryology; 9. Physiology; 10. Psychology; 11. Archaeology and Anthropology; 12. Microscopy, well represent the news of the natural sciences.... The *Bridgetown Weekly Monitor* has an able three column article descriptive of Chili, from the pen of Sr. Don Archibald F. Troop, of the Instituto Internacional de Santiago.... The *Microscope* for March has a fine list of contents under the heads, 1. Original Communications; 2. Proceedings of Societies; 3. Elementary Department; 4. Editorial; 5. Zoology; 6. Botany; 7. Microscopy; 8. Pathology; 9. Miscellaneous; 10. News and Notes; 11. Book Reviews; 12. Correspondence and Queries; 13. Exchanges.

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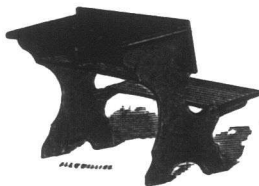
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