

17743

The Educational Review.

Devoted to Advanced Methods of Education and General Culture.

PUBLISHED MONTHLY.

ST. JOHN, N. B., JUNE, 1887.

VOL. I. No. 1.

A. H. MacKAY, B. A., B. Sc.,
Editor for Nova Scotia.

PRINCIPAL ANDERSON,
Editor for P. E. Island.

G. U. HAY, Ph. B.,
Editor for New Brunswick.

SUBSCRIPTION PRICE:
Twelve Numbers, \$1.00
Single Copies, 10 cents

Subscriptions payable in advance. Send money by money order, or by bank bill in a registered letter. All remittances acknowledged by postal card. Address all business communications and send subscriptions to EDUCATIONAL REVIEW, St. John, N. B.

For further particulars see *Special Announcement*, page 18.
The REVIEW is issued from the office of Barnes & Co., St. John.

CONTENTS:

EDITORIAL—	1-4
Announcement—(Special Announcement, p. 18)—Industrial Education—Nova Scotia Summer School—Mount Allison University—New Brunswick School of Science—Prince Edward Island Schools (p. 9).	
NATURAL SCIENCE SERIES, No. 1—	5-8
Ferndale School; a Cocoon.	
SELECTED ARTICLES—	
The Stars of Summer—Kindness to Animals (p. 14).	
EDITORIAL NOTES—	10
LITERARY NOTES—BOOKS AND EXCHANGES—	11, 12
PERSONAL NOTES—	12
QUESTION DEPARTMENT—SCHOOL AND COLLEGE—	15
EDUCATIONAL INSTITUTE OF N. B.—	15
CONTRIBUTED ARTICLES—	16, 18
Educational Advantages for Girls in the Maritime Provinces—School System of Newfoundland—Educational Convention.	

ANNOUNCEMENT.

To issue a journal that will meet the wants of educationists of the Atlantic Provinces of Canada has long been contemplated. We believe that the time is fitting to launch the enterprise, and the first number is issued with the confidence that it will lead to a closer union in educational work in these Provinces, and that there is here a field for the support of a live educational journal.

The many letters of encouragement that we have received justify the hope that the REVIEW will meet with a favorable reception. Let us briefly announce the aims of its managers, and how they hope to make it, before all other educational periodicals, the one which will be the most worthy of the support of our teachers.

It will be devoted to the interests of Maritime Province teachers in the fullest sense. Educational questions will be approached and discussed in a fair and impartial spirit. A free, yet just and careful criticism of our educational systems and administra-

tion will be made when necessary. It will note improved methods in education and seek to keep its readers informed upon them. One object which its promoters have in view is to make it invaluable to teachers in supplementing deficiencies of text books, especially in regard to the natural science subjects required to be taught in our schools, and these will be illustrated by *native objects*. Better methods of teaching English are called for. Industrial education will receive that attention which its importance demands.

The REVIEW will aim to be helpful and instructive. It will discuss in a practical way questions of school management, discipline, methods—and would here invite teachers to make this department of the paper a place where they may give and receive assistance. Short, practical and pointed articles will always be welcome.

There are several articles of special interest to educationists, which we are obliged to hold over for another issue. As this is the season for teachers' conventions, summer schools, and college re-unions, a large portion of our space is given up to these topics in which a general and lively interest is felt.

INDUSTRIAL EDUCATION.

"What are you doing in technical education in your Province?" was the oft-repeated question put to those who had charge of our school exhibit at the Colonial Exhibition in London, last season. Experienced educationists examined our school system, our courses of instruction, the photographs of school-rooms and apparatus, and the scholars' work which accompanied these; and the examination was evidently satisfactory, to judge by the comments that appeared in English and American journals. One of our school systems was referred to by a high authority as "*theoretically*, the best in America"; by another as "one of the most perfect, *in its principles at least*, to be found in any State or country." The italics are our own. But the practical Englishman who has been waking up to the importance of industrial education, and who sees England's greatness—nay, its very existence—threatened by the improved methods

of manufacture in Germany, Switzerland, Belgium, France,—the direct outcome of industrial education in those countries—asked, “What are you doing in technical education?”

Now, what *are* we doing in industrial education? Nothing. Have we any industrial schools, or are there any departments in our colleges devoted to technical training in arts and manufactures? None whatever. Do our schools give boys and girls any special training that will fit them for industrial pursuits? We are compelled to answer this also in the negative. And yet our schools are, taken as a whole, excellent, and in results compare favorably with those elsewhere that seek to give a good elementary training in the rudiments of knowledge. And so far our common schools do an excellent work, and the high schools and colleges complete the training and equip our youth for their vocations in life. But what vocations? The graduates of our high schools and colleges are taught to look to some profession, or to mercantile pursuits, as the only occupations which they are fitted by education to fill. The consequences are apparent. The professions are overcrowded, and for every vacancy in a merchant's office or behind a counter, there are applicants by the score. And very often such positions are filled by those who are not at all adapted for them, but who would, if efficiently trained, have won success, and perhaps distinction, in some mechanical pursuit, and have added so much to the wealth of the country.

But this special training cannot be had in our schools and colleges. The student has to go abroad for it. He sees there the advantages that are presented to him: new and improved methods of manufacture, the social elevation to which ambitious and industrious artisans may attain, a greater stimulus to invention, and other advantages. He will probably not return, and thus the country loses some of its best mechanical talent.

Now what is the remedy for this state of things. It seems clear that the one remedy is—greater attention to industrial education. Wide-awake and far-seeing business men declare that we have come to a standstill in our development; that the building of wooden ships is a thing of the past; that the lumber industry is waning, and that the energies of the people must be directed into new lines and new pursuits, if we would not be distanced in the march of improvement. To compete successfully with other countries, industrial education must receive encouragement. If the permanent prosperity of these Provinces is to be secured, attention must be directed to the raw material—the undeveloped resources which are so abundant—and the conversion of this raw

material into the best products. To do this successfully, educated labor and technical skill must be brought into play. Industry, directed by intelligence and skill must be applied, if we would have a place in the markets of the world, and if we would retain among us our best minds and attract thither an intelligent and desirable class of immigrants. That technical education will attract capital to a country is proved in the case of Switzerland, notably in the canton of Zurich, whose splendid system of technical education was the subject of an able and interesting address delivered some time ago by Dr. MacGregor, of Dalhousie College, in several localities in these Provinces. When recently it was proposed in the Council of Zurich to lessen the grant for technical education—“The manufacturers showed by undeniable evidence, that this single institution (a technical school conducted at government expense) had in a few years been the means of bringing capital to the country to the extent of millions of pounds sterling.”

But we have already carried this article beyond the limits designed. That there is a demand here for technical education goes without saying; that the longer provision for it is delayed the longer will our interests suffer. A technical and an agricultural school established in each Province, either independently or as a department of some college, would be a great boon. Such institutions, established on an economical basis, would no doubt be looked upon as fit objects of endowment by liberal and enterprising men who have the prosperity of the country at heart. The influence of these schools in directing and stimulating industrial drawing, study of agriculture, practical mathematics, and other common school studies, would be very great. Nova Scotia has already taken the initiative, in establishing an agricultural farm in connection with its normal school. This has been placed under the charge of Prof. Smith, of Truro, whose zeal and scientific knowledge will stimulate industrial education in Nova Scotia.

We shall refer to this subject again. In the meantime the columns of the REVIEW are open to those who would discuss it in a practical and intelligent spirit.

We feel sure that the article in another column on education in Newfoundland will be read with great interest. The writer has had ample opportunity of judging, from many points of view, of the system that prevails in the sister colony, and he has the courage of his convictions. We trust before long that Newfoundland will hasten to cast off its present cumbrous and expensive system and fall into newer and more progressive lines of educational development.

NOVA SCOTIA SUMMER SCHOOL OF SCIENCE.

Our advertising columns contain an announcement of the Nova Scotia Summer School of Science. The object of this institution is, we understand, the training of our teachers in the natural history of our country, and the science of common things, the better to enable them to carry out the spirit and intention of the provincial course of study in its entirety. The date of the introduction of this course of study, defective as it necessarily must be, will in the future be referred to as an important epoch in our educational history. Under the old system, the teacher might be a hermit, acquainted with only his books and the configurations of his paper lined cell. His pupils might be brought up under the anchorite rule corrupted by the freedom of modern civilization. His writing, his spelling, his arithmetic, his Euclid and his Latin might be most accomplished. But while these all would give him a knowledge useful in the world, it gives only a part. In the struggle for existence, an observant and intelligent understanding of every phase of nature which may present itself gives the individual a tremendous advantage. Our teachers are *now* required to train the child to observe accurately, to read the meaning in some of the least obtrusive hieroglyphics of nature, to understand the orderly action of the forces which environ him, and in the midst of which and subject to which he must earn his daily bread. The teacher must know what he has to teach. As the text book cannot effectively acquaint him with the mysteries of his environment, he seeks the assistance of those who know a little more than himself. Hence the summer school, with its elementary but practical science teaching. The work which such an institution can do is yet to be demonstrated. In the Pictou Academy, science clubs have been in operation with varying success for several years. In Halifax last winter, a very successful school of science under the presidency of the Supervisor was formed. Geology was taken up, and with the splendid collections in the Provincial Museum, it goes without saying that the work was thoroughly done.

The inception of this Provincial School of Science is due to the Alumni Association of the Provincial Normal School, the energetic secretary of which did not rest until the scheme outlined by it was submitted to the Educational Association of the Province, by which it was approved.

The site of the school is in one of the most pleasant and most interesting parts of Nova Scotia. The governors of Acadia College have with great public spirit placed their fine buildings and apparatus at

its disposal. From this point as a centre excursions to interesting localities of continental fame are arranged for. On the whole it appears to us that the study of science under such conditions will be as exhilarating and recreating as a fortnight of picnics, while at the same time there are the best opportunities given for scientific work. And last, though not least, Wolfville, no doubt due to the literary and scientific influence of Acadia College, is one of the most cultured communities in the Province, not excepting the metropolis. Its appreciation and support of the higher education are monumental. We trust the summer science school may draw much inspiration from such propitious surroundings.

THE UNIVERSITY OF MOUNT ALLISON.

The closing exercises in connection with the educational institutions at Sackville took place a few days ago. The public exhibition of the Male Academy was held in Lingley Hall on Monday, the 30th ult.; the public closing of the Ladies' College in the same place on the following day; and the Convocation of the University on Wednesday, the 1st inst. These exercises always draw large audiences, and this year the capacity of the Hall was too limited to hold all seeking admittance. The public school system has had some effect on the attendance at the Male Academy, but the present indications, we are informed, point to a large increase the ensuing year. Mr. T. T. Davis, B. A., will continue in charge as Principal of the Male Academy, and will have around him a staff of good and energetic teachers. Great success has been attained at the Ladies' College. The Rev. B. C. Borden, M. A., is Principal. While no efforts have been spared to keep a high standard in sound and solid education, a very great advance has been made in fine arts, music, and modern languages. Prof. Mack, Prof. Chisholm, and their assistants, have succeeded in working up the musical department to a high state of efficiency. Miss Mack—a pupil of Patti—has proved herself an accomplished instructor in vocal culture. The attendance at the Ladies' College last year more than taxed the capacity of the building—additional dormitory accommodation had to be provided. During the year 140 were in attendance. The largest attendance at any one time was 84 resident students and 40 from outside.

The University, under the management of its able and distinguished President, Dr. Inch, has had a very successful year. From the President's report it appears there were 95 in attendance. Of these 7 were seniors, 7 juniors, 15 sophomores, and 21 freshmen

regularly matriculated, and 46 taking special courses. It is proposed to increase the present very efficient faculty of the University by the addition of Mr. Tweedie, who, as Gilchrist scholar, for the past four years has been pursuing his studies in London, Edinburgh, and Germany. Mr. Tweedie, it is expected, will take the department of English literature, philology, etc.

The success of these institutions of learning is highly gratifying; it indicates a growing desire for advanced education among our people. The exercises of the Alumni and Alumnae societies, at which Dr. Alward delivered an oration on the jubilee year, and Mrs. Woodbury read an essay on the higher culture for women, gave great pleasure and satisfaction to the large audience present. We cordially extend our best wishes for continued success to our educational friends at Sackville in their important work.

N. B. SCHOOL OF SCIENCE.

In 1883 the N. B. Natural History Society held its first summer camp at Bocabec, in Charlotte County. This was followed in 1885 by a second, held at Frye's Island, St. George, which was more largely attended than the first. The object was to develop an interest in natural history among the younger members of the Society, and especially among teachers and students. Mr. W. F. Ganong, who has been studying the invertebrate zoology of our southern coast for several years, has each year been accompanied by a small but zealous band of students. In a letter written from Harvard in May last he says: "I hope that another summer will not be allowed to go by without a start being made in a summer school of zoology for N. B. teachers."

On further communicating with Mr. Ganong, and with members of the Natural History Society of New Brunswick, we are in a position to announce that arrangements are in progress for a summer school of science to be opened in St. John on Friday the first of July, and to continue one week; that the rooms and museum of the Natural History Society will be placed at the disposal of the summer school; that no expenses, except for board, need be incurred by teachers attending the school. Further announcements will be made as soon as arrangements are perfected; and a complete programme of work will be presented at the first session of the Educational Institute, on Tuesday, June 28th. Those who wish to join the school may communicate with G. U. Hay, St. John, Cor. Sec. of the Natural History Society, or H. C. Creed, Secretary of the Educational Institute, Fredericton.

The advantages of a summer school of science are very fully set forth in another column, in connection with the N. S. summer school, the excellent programme of which is an indication of what is intended to be accomplished by our fellow-workers across the Bay.

A few words regarding the teachers and methods to be employed: Mr. Ganong is an earnest and enthusiastic naturalist. His enthusiasm is catching, as those well know who have felt the influence of his teaching. He is a distinguished graduate in science from the N. B. University, and is a resident Fellow at Harvard University, where he is pursuing a special course in invertebrate zoology. Mr. G. F. Matthew has more than a Canadian reputation as a geologist, and it must be a source of gratification to those who may avail themselves of the advantages of the summer school, to know that he has consented to give instruction in a subject on which he is a recognized authority. The departments of botany and ornithology will be under the supervision of other members of the Society.

It is desirable that the work shall be as practical as possible, and include a considerable amount of field work. No place could be chosen to combine interest and variety more than St. John. Its geology and botany are particularly interesting, and within a short distance of the city a considerable variety of forms in marine zoology may be found. A practical feature in the school will be microscopic work, and the careful examination of specimens collected. To do this effectively a field day may alternate with one for practice in the laboratory. If those who attend (and we trust the number will be large) only become possessed of a few leading principles—be stimulated to observe, to study, to work—an incalculable good will be accomplished for practical education in this Province.

A GLANCE at the advertising pages of the REVIEW will be instructive. Publishing houses and institutions of learning have seen the advantages of this medium and have availed themselves of it. A limited number of advertisements from other business houses have been inserted, and may be studied with advantage. Our regular advertising space is the 1st, 2d, 23d and 24th pages, leaving twenty pages of reading matter. To meet the requirements of advertisers for this issue we are reluctantly compelled to extend that space, but hope in the next issue to keep the advertisements within the limits above named, in order that the twenty pages devoted to reading matter may not be encroached upon.

FERNDALE SCHOOL.

No. I. A Cocoon.

TEACHER. (*Stroke of bell*). Books aside. Position first. Lesson on Nature. What day of the month is it? Any one?

CHORUS. First of June.

TEACHER. Of the number of specimens you have brought me to-day, I select these for our lesson. Now, who brought them?

SCHOLARS. (*Two hands up*).

T. Where did you find this, Johnnie?

JOHNNIE. I found it on the limb of an apple tree.

T. Where did you find yours, Tommy?

TOMMY. I found it on the limb of an apple-tree, too, when I was looking to see if the blossom buds were opening.

T. Well, we are lucky to have two of the same

kind. I shall put one in this glass jar on the window-sill, where we can watch what may become of it in the warm sun-light, without any danger of its getting away from us. The other, which I show you here, we shall take to pieces and examine. What is this stick which you see in it? Any one?

CHORUS. The twig of the apple-tree on which it grew.

T. What is it, Johnnie?

JOHNNIE. A sort of a nest, I suppose.

T. Well, it is not exactly a nest. We may as well give it the correct name. It is a *cocoon*. I write the name on the board. Now, I blot it off, and shall see if every one can spell and pronounce it properly. Together.

CHORUS. C-o-c-o-o-n, co-coon.

T. The French call it *cocon*, which means, in their language, a little shell. Now, with this sharp penknife, I shall cut open the little shell to see what is inside; but, first tell me what you can observe on the outside? How long is it?

S. Over three inches, I think.

T. How broad?

S. Over one inch, I would say, in the thickest part.

T. What is the color—you?

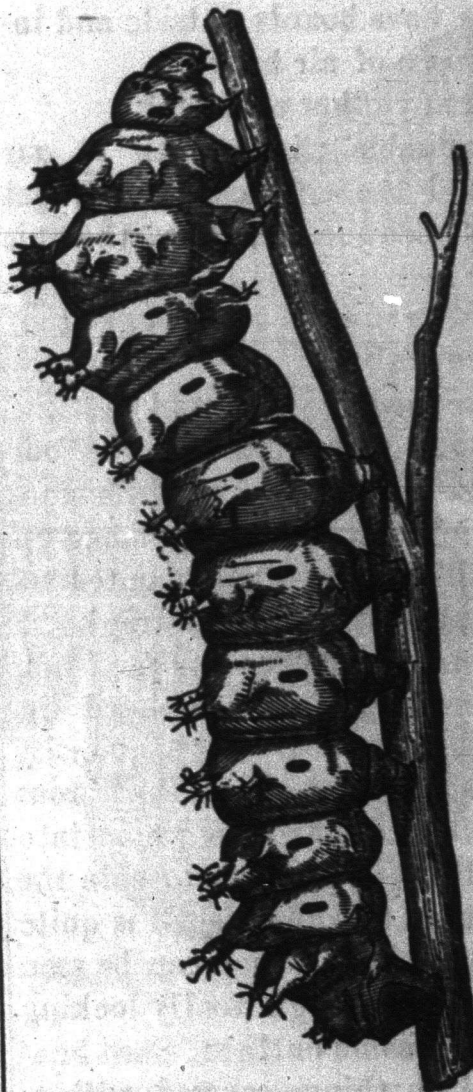
S. Grey. *Another*—brown—greyish brown—brownish grey.

T. Yes; all of you are partly right. It is a greyish brown. Take it in your hand and tell me what its substance looks and feels like.

S. It is like a thin, stiff and tough kind of paper; but it is as hairy as some kinds of cloth—more hair in some places than in others.

T. Correct. These hairs are really fibres of a kind of silk. A very large green caterpillar, like this, three or four inches long, and thicker than your stoutest finger, spun this cocoon last fall. Sometime

next September or October you may see this huge caterpillar sluggishly creeping along the limb of some tree or bush, looking for a proper place to commence the construction of its cocoon. You will, of course, capture it, and put it in one of our glass jars, with a piece of twig, if you like. In a short time afterward you may have the pleasure of seeing it at its work. The silk is stored in a liquid condition in two large glands in each side of the caterpillar. These glands have a common opening near its mouth. You will simply see the insect raise its body and touch its mouth to one point



THE LARVA.

of the jar, and as it draws it away a fibre of silk is drawn out, which is attached to another point, and so on. By looking carefully at this figure you will see that it has three pairs of small feet on three front segments, and four pairs of broad sucker feet on middle segments. The large warts on the third and fourth segments are coral-red, the others on the back are yellow, except those on the two last segments, which are blue, like the small warts on the sides. We must be on the lookout for this caterpillar in the fall. That is why I now tell you what it is like.

Let us proceed with the examination of our cocoon.



THE COCOON.

I cut this outer shell with my sharp knife. What do you see inside?

S. There is another woolly looking shell inside.

T. How much vacant space is there between the two shells?

S. An eighth of an inch—no, it is about a quarter of an inch, I am sure. It is not completely vacant, as there are a few silky fibres which keep the smaller shell exactly in the middle of the larger.

T. What use would such a space serve, supposing our caterpillar to be living within the inner shell all winter.

S. It would help to keep the cold out.

T. How? Have you seen any other creature use double walls to keep the cold out?

S. Yes. Our houses have boards outside and inside the frame, with a space of air between.

T. Can you think of any other example?

S. Yes. They put double windows on in our house during winter, and the cold can hardly get across the air space between them, so that there is hardly ever any frost on our inner windows.

T. Very good. But who would have thought that the caterpillar knew so much?

S. (*Hand up, teacher nods*). You said that the caterpillar spins its cocoon with fibres of silk, but the outer shell which you have just taken off is more like parchment, or a thin skin, than cloth made up of fibres. How could all the fibres be cemented together to form this complete skin-like covering?

T. When you capture your caterpillar next fall, you will find that as soon as he has completed the fibrous covering of his shell he pours out a quantity of soluble silk which fills all the meshes of the fibrous structure, and soon drying cements the whole into one continuous sheet. He then proceeds to spin the inner shell. You see that this inner shell is quite heavy. There is something in it which can be seen to move. Let us cut open the tough woolly looking shell. There! see what has come out!

S. A big, oval, blackish thing, covered with a shining and ornamented surface. And it is alive. It moves.

T. Here is some rubbish found in the inner cocoon with this black living object. What is it?

S. Why! they are fragments of the skin of a caterpillar—of its head—and of its feet.

T. Correct. After the caterpillar completed its inner cocoon it had no further use for its feet, mouth, spinners, etc. These parts were moulted off, and its whole body became contracted into the roundish form covered by the sculptured skin you see surrounding it.

S. (*Hand up.*) Do all caterpillars go through such changes?

T. They all go through similar if not the same changes. In some there are no outer cocoons—only this thin, tight-fitting, ornamental covering which in some species shines like metallic substances. Some species shine like gold, hence the Greeks called them the *chrysalis*, which meant in that ancient language *golden colored*. We have, then, before us, the *chrysalis* stage of the caterpillar. I write the word on the board, and shall then see if you all can spell and pronounce it properly.

But I am going to open this chrysalis case, and we shall then see the living transformed caterpillar. I break the thin case away carefully with the point of my pen-knife. There it is. What do you see?

S. A large, wet-looking, juicy body, with small wings no bigger than a bumble-bee's, laid flat on its side and meeting over its back. Two long feathery things from its head are also folded back over its body, and it has six feet crumpled up under the front part of its body. The greater part of its body is very plump, like the body of a huge moth.

T. Correct. This chrysalis is the stage before the moth. I will give you a more common name than *chrysalis*, however. As we have seen, this stage is not always accompanied with the golden color which the word *chrysalis* implies.

Little boys and girls present are called *pupils*, from the Latin word *pupus* a boy, *pupa* a girl. From *pupus*, comes the Latin *pupilla*, a little girl. The French shortened it to *pupille* (pronounced in two syllables). The English still further shortened it to *pupil*. But pupils become eventually full grown men and women. And this *chrysalis* in the ordinary course of nature would have become a full grown moth. Naturalists therefore call the chrysalis stage the *pupa*. Pupils should therefore be able to remember the meaning, spelling and origin of the word. The pupa is the young, the immature, the growing stage of a moth, a butterfly, a beetle, a house fly, or any insect. When the pupa comes out of its chrysalis shell, it is all at once a full grown, finished animal.

S. (*Hand up near the window*). There is a noise going on in the cocoon in the jar, and there is something coming out at the lower end.

T. Hurrah! The luckiest thing in the world! Just what we are wanting to see. The moth, under the influence of its warm surroundings, is coming out of its cocoon. I place the jar here, and let us watch it. What do you see?

S. The lower part of the cocoon appears to be moistened, and little bushy feet are pushed out in front, and the moth is pulling itself out by them.

T. What does it look like?

S. Its head and fore part of the body are covered

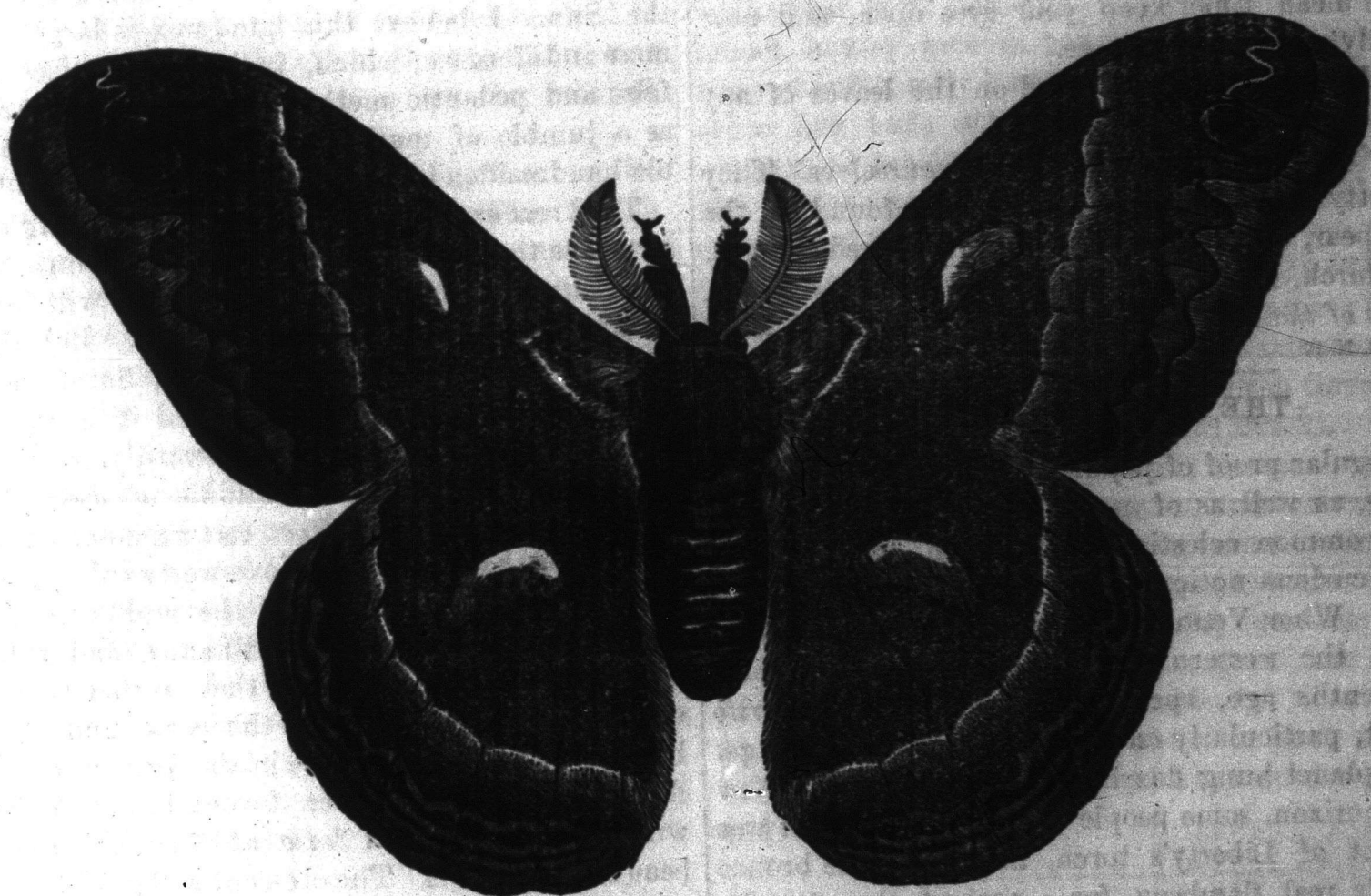
with a coat of very fine, silky fur, brownish red with bands of white. Two large, feathery horns are pressed back over its head. Now the horns are out and standing up.

T. These two feathery horns are called *antennæ*. When the antennæ are simply like two bristles with a knob on the end of each, the insect is known as a butterfly; but when they are feathery or thickened in the middle they are called moths. So this is a true moth.

CHORUS. It is all out. What an ugly thing! Such a big, soft, wet looking thing, and such absurdly small, wet-looking wings! See how it clings to the under side of its cocoon, and appears to be trying to spread its wings.

These scale feathers appear only as colored dust to the naked eye.

When the female is at liberty, in a short time she begins to deposit her eggs, of which she has between two and three hundred, on the underside of the leaves of plants. The eggs are about the size of a head of a pin, of a dirty white color, with a reddish mark near the middle. The eggs are generally glued on to the leaves in pairs. In a week, or week and a half, the eggs are hatched and out comes a small, black, knobby caterpillar, which naturalists call the *larva* of the moth. Larva is the Latin word for a mask. And no one will dispute that the Cecropia Emperor-moth is completely masked when it appears as a caterpillar. This black larva eats voraciously,



THE CECROPIA EMPEROR-MOTH. (*Platysamia Cecropia*.—Linn.)

T. Watch its wings.

S. Oh! they are growing larger. You can see them growing.

T. Yes, and in half an hour you may see them measure half a foot from tip to tip. They will be nearly full grown before our lesson is done. While watching our moth completing its pupa stage and becoming the perfect insect—or *imago*, as the naturalists call it in Latin—we shall note the balance of its life's history. Here is a sketch of the form it will have in a very few minutes. General color, greyish brown, variegated with shades of white, red and black. The colors are in the minute scales which cover the membranous skin of its wings instead of feathers.

and casts its skin several times, each time becoming nearer in size and color to the large pale green caterpillar, three or four inches long, with its curious knobs in red, yellow and blue.

S. Do they eat much?

T. One or two placed on a young apple tree will in a short time strip it of all its leaves.

S. And one moth may produce 200 or 300 of them?

T. Yes.

S. Suppose 100 of these to become perfect female moths by next summer, then one moth this summer might produce over 20,000 caterpillars by the end of next summer, any two or three of which could strip an apple tree.

T. Yes, if they had no natural enemies and plenty to eat they would in a few years cover the earth at this rate.

S. Do they do much damage?

T. Not so much as many other insects.

S. And are they found in every part of this country?

T. They may probably be pointed out in every school section in Nova Scotia, New Brunswick and Prince Edward Island.

S. What are their natural enemies, then, which keep them so much subdued that we suffer so little from their depredations?

T. Very insignificant looking, but very powerful ones. We shall consider them in some future lesson. In the mean time keep your eyes open, and note carefully everything you see.

S. Does the caterpillar feed on the leaves of any other tree than the apple tree?

T. You must try to observe that yourselves. They are pretty general feeders, having been found on the plum, pear, cherry, maple, willow, lilac, red currant, hazel, birch, elm, honey locust, hawthorn and elder.

(*Stroke of the bell.*)

A. H. M.

Pictou, N. S.

THE STARS OF SUMMER.

A singular proof of popular ignorance of the starry heavens, as well as of popular curiosity concerning any uncommon celestial phenomenon, is furnished by the curious notions prevailing about the planet Venus. When Venus began to attract general attention in the western sky in the early evening some two months ago, speculation quickly became rife about it, particularly on the great Brooklyn Bridge. As the planet hung dazzlingly bright over the New Jersey horizon, some people appeared to think it was the light of Liberty's torch, mistaking the bronze goddess's real flambeau for a part of the electric-light system of the metropolis. Finally (to judge from the letters written to the newspapers, and the questions asked of individuals supposed to know something about the secrets of the sky), the conviction seems to have become pretty widely distributed that the strange light in the west was no less than an electrically illuminated balloon, nightly sent skyward by Mr. Edison, for no other conceivable reason than a wizardly desire to mystify his fellow-men. I have positive information that this ridiculous notion has been actually entertained by more than one person of intelligence. And it is not improbable, that as Venus glows with increasing splendor in the serene evenings of June, she will continue to be mistaken for some petty artificial light instead of the magnifi-

cent world that she is, sparkling out there in the sunshine like a globe of burnished silver. Yet Venus as an evening star is not so rare a phenomenon that people of intelligence should be surprised at it. Once in every 584 days she re-appears in the sunset sky—

"Gem of crimson-colored even,
Companion of retiring day."

No eye can fail to note her, and as the nearest and most beautiful of the Earth's sisters it would seem that everybody should be as familiar with her appearance as with the face of a friend. But the popular ignorance of Venus, and the other members of the planetary family to which our mother, the Earth, belongs, is only an index of the denser ignorance concerning the stars—the brothers of our great father, the Sun. I believe this ignorance is largely due to mere indifference, which, in its turn, arises from a false and pedantic method of presenting astronomy as a jumble of mathematical formulæ and a humble handmaiden of the art of navigation. * * *

The reader will find it both interesting and instructive to watch the movements of Venus through the summer. On June 1st, Venus will be near Saturn in the constellation Gemini. But the two planets will rapidly part company, Saturn sinking toward the horizon day by day until it is no longer seen, while Venus, moving eastwardly, rises higher every evening. About the middle of July, Venus, having reached her greatest eastern elongation, will turn upon her track and move westwardly, setting a little earlier every night. At the middle of August she will attain her greatest brilliancy, and will be a superb phenomenon. Being then in that part of her orbit which passes between the earth and the sun, her illuminated disc will be in the form of a crescent. A good field-glass, under favorable circumstances, will show this crescent form of Venus, and a most beautiful sight it is. The crescent will grow larger and narrower in proportion as Venus approaches nearer to the line joining the earth and the sun, and, as she approaches that line, of course she will draw closer to the horizon, until about the end of August, she disappears from the evening sky, to reappear in the east as a morning star in the autumn.

Jupiter will remain in the neighborhood of Spica in Virgo throughout the summer. The surface features of this majestic planet are far beyond the reach of an opera or field-glass, but some of the members of his little family of four moons may occasionally be caught sight of. With an opera glass not more than one or two of these can be seen as excessively minute dots of light half-hidden in the glare of the planet. If you succeed under favorable circumstances in seeing one of these moons with your

glass you will be all the more astonished to learn that there are several apparently well-authenticated instances of one of the moons of Jupiter having been seen with the naked eye.

With a field-glass, however, you will have no difficulty in seeing all of the moons when they are properly situated. If you miss one or more of them, you may know that it is either between you and the planet, or behind the planet, or buried in the planet's shadow, or else so close to the planet as to be concealed by its radiance. For the convenience of the beginner, I will indicate the positions of Jupiter's moons for several evenings in June, based upon the "Nautical Almanac" predictions; the time of observation is supposed to be 10.30 o'clock, p. m.:

* * * On June 8th two of the satellites will be on one side and two on the other, the two on the west being close together, while those on the east are widely separated.

On June 14th two will be close together on the east, while one is visible on the west, and the fourth, the outermost of the system, is passing just above the north pole of the planet, and so close that it will probably be beyond the ability even of a powerful field-glass to detect it.

On June 17th there will be a very good opportunity for the inexperienced observer to see all four of the satellites, as two will be on each side of the planet, and all will be well separated.

On June 22d one satellite will be on the east of Jupiter, and the other three on the west, all in a bunch, and close to the planet.

Of course, since the motions of the satellites, particularly of the inner ones, are very rapid, their positions are continually changing, and their configurations are different every night.—*Garret P. Serviss in Popular Science Monthly.*

THE P. E. ISLAND SCHOOLS.

The report of Mr. D. Montgomery, Chief Superintendent of Schools for P. E. Island, is interesting and instructive. We make several extracts from it, noting with pleasure the progressive character of the work that is being done across the way.

As evidences of advance Superintendent Montgomery notes with satisfaction the readiness and intelligence with which the teachers enter into every forward movement connected with school work.

Referring to two most important practical subjects—English composition and drawing—he refers to the marked increase of pupils studying the former, the importance of giving greater attention to the

latter, which is so closely connected with industrial pursuits.

Remarking upon the diligence and faithfulness which has characterized the work of inspection, the Superintendent believes that it would be of very great service to appoint an additional Inspector, and closes with the gratifying announcement that "the year just closed has been one of the most successful in the history of our public schools." This seems to be borne out by the following statistics condensed from the report:

"There are at present 431 school districts on the Island, distributed as follows: 172 in Queens County, 139 in Prince, and 120 in Kings. There were but ten districts in which there was no school, against 74 in the year 1876. In eight of these ten districts new school houses were in course of erection, while one was not sufficiently large to support a school and the other had been attached to other districts. The number of teachers employed during the year was 498. Of these 55 were of the first class, 137 of the second and 306 of the third class. The number of pupils enrolled was boys 12,317, girls 10,097, total 22,414, an increase of 431 over the number for previous year. The average percentage of attendance was about 56. The total expenditure by the Government on education, for the year, was \$111,992.21. Of this, the sum of \$101,536.56 represents the amount paid in statutory allowance, supplements, and bonus, to the teachers. \$11,873.37 was the amount paid as supplements by trustees. During 1886 the teachers received as salaries \$112,331.93, an increase of \$1,997.19 over 1885. The total expenditure for education by the Government and the districts was \$148,778.96, an average of \$6.64 for each pupil enrolled. The highest salary paid to teachers was \$900, and the lowest \$130."

We need organization among teachers to secure a better public sentiment. Teachers need to begin by creating a sentiment for improvement among the pupils. Trees, and shrubs, and flowers, and walks, and nooks in parts of the yard, fences and convenient gates, shades and light ornaments for the rooms, a water service of pitcher and waiters, convenient places for the care of apparatus—all these the teacher of forty children can secure. And every addition of the kind is an addition to the moral forces of the school. Amid such surroundings it becomes natural to learn politeness, care, consideration for others; to condemn selfishness, rudeness, slovenliness; to appreciate the beauty of truth, duty and love.—*Western School Journal.*

EDITORIAL NOTES.

INSPECTOR GUNN says: "At no time in our educational history has there been more interest manifested in popular education, than during the present year."

WILL those who receive copies of this issue, and who may not be sufficiently interested in its contents to subscribe, kindly hand it to others who may become subscribers.

PROVINCIAL examiners must note that Nova Scotia is moving in the direction of reform in English spelling. The Council of Public Instruction prescribes "Gage's Physics," which shortens such old forms as "height" to "hight"—one step in the direction of the universally longed-for orthographical millennium.

IN sending out such a large issue—5,000 copies—of the first number of the REVIEW, some omissions and mis-directions are unavoidable. If those who receive the paper hear of such omissions, by which persons interested have not received it, they will kindly inform us so that a copy may be sent without delay.

WE UNDERSTAND that on account of the Queen's jubilee celebration in Halifax, the contemplated exhibition is postponed to next year. Principal H. S. Congdon, of the Dartmouth schools, has been the presiding genius in these movements. His intelligence and energy are bringing Dartmouth prominently to the front in educational reform.

WE are glad to announce that arrangements are being made by the Secretary of the N. B. Educational Institute to secure *free return* tickets up to and including July 6th. Members travelling by the N. and Western Railway or by any division of the N. B. Railway must purchase Society return tickets which will be sold at the principal stations. Without these, certificates of attendance will be useless.

INSPECTOR MACDONALD of Antigonish says: "The change made in the 'Trustee's Return,' adapting it to the course of study, is a step from which I expect the very best results." So say we all. The administration of educational affairs in Nova Scotia has of late years been very felicitous. No catastrophic elimination of defects has overturned the old world. But there is the steady noiseless evolution of a new cosmos, which painlessly absorbs the imperfections of the old.

OF OUR teachers, Inspector Roscoe says: "They are becoming alive to the fact that new modes and improvements are being introduced at a rapid rate; and to keep in line with the best and surest methods of

accomplishing this important work committed to their charge they must examine and use these methods as far as practicable in the schools they are teaching. The Provincial Normal School leads in these improvements, and to it must we look as a beacon light to guide us in matters so important."

INSPECTOR H. CONDON, of Halifax County, in his annual report, says of Dartmouth: "The industrial exhibition, held in the Christmas holidays of last year (1885), was a great success, and more than fulfilled the anticipations of its promoters. As a consequence, preparations are already being made for a Provincial industrial exhibition, to be held in Dartmouth the ensuing August. Those interested expect that a valuable impulse will be given to the cause of education throughout the Province. Special efforts will be made to draw the attention of the public to the merits of kindergarten system, and, among the attractions offered, classes will be conducted in which Fröbel's principles will be practically illustrated."

J. H. MURRAY, LL. D., formerly President of the Philological Society of Great Britain, who is now editing the new historical dictionary of the English language—the greatest philological work of the age, is a spelling reformer. He says: "The question of etymology was long ago settled and done with by philologists. It is pitiful to see the expressions of Archbishop Trench, uttered just a quarter of a century ago, when English philology was in its pre-scientific babyhood, and scarcely anything was known of our language in its earlier stages save the outward forms in which it had come down to us in manuscript or print, quoted against the rational reconstruction of our spelling. But it is also unfair to Dr. Trench himself, who then stood so well in the front of philology, that we may be perfectly sure, that, if leisure had been given him to keep pace with the progress of the science, he would now have been second to no one as a spelling reformer. For philology has long since penetrated the mere drapery and grappled with 'the study of words,' not as *dead marks*, but as living realities, and for these living realities it first of all demands, 'write them as they are; give us facts and not fictions to handle.'"

A LITTLE boy at a village school had written the word "psalm" in his copybook, and accidentally blotted out the initial "p" with his sleeve. His little sister sitting at his side burst into tears over the disaster, but the spelling reformer defiantly exclaimed: "What if I did leave him out? He didn't spell nothing, and what was the good of him?"

LITERARY NOTES.

THERE will shortly be published in neat and convenient form a small volume designed to meet the requirements of the natural science course prescribed for the schools of New Brunswick. It has been written by L. W. Bailey, Ph. D., Professor of Natural Science in the New Brunswick University. It treats respectively of minerals, plants and animals, with illustrations of the three kingdoms. It contains valuable references to the natural products of the Provinces. It is written in an easy and pleasant style, so characteristic of the author. Its appearance will be looked for with much interest. Dr. Bailey has for years been a teacher of natural history, and his connection with the Dominion Natural History Survey has given him peculiar advantages for observing the occurrence of the geology, flora and fauna of the Province. It has been prescribed for use in schools by the Board of Education, and is being prepared for publication by J. & A. McMillan, which is a guarantee that the mechanical execution will be excellent.

PRINCIPAL CALKIN, of the Nova Scotia Normal School, who has found leisure in the midst of many duties to write several valuable text books for schools, will shortly publish in a convenient volume, his lectures on school organization and management, general principles and methods of teaching. The book is intended for the use of student teachers at the normal school; and from the large experience of Mr. Calkin, and his ability as a thinker and writer, teachers will welcome the appearance of this addition to our educational literature. It will probably be published by D. H. Smith & Co., of Truro.

A THOUGHTFUL and suggestive paper in the June *Century* by the Rev. T. T. Munger, considering the true aim and the best methods of education, bears the title, "Education and Social Progress." It is in the nature of a protest against the tendency to specialization and false utilitarianism in contemporary college instruction.

BOOKS AND EXCHANGES.

THE POPULAR SCIENCE MONTHLY. The June number of this periodical is filled with many interesting and valuable educational articles, among which is a paper of great economical interest on "Industrial Education and Railway Service," summarized from a report made by Dr. W. T. Barnard to the President of the Baltimore and Ohio Railroad Company, on the feasibility of establishing shop-schools for apprentices in railway arts. The "Higher Education of Women" is discussed in the Editor's Table; the question of compulsory Greek in the college course receives another word; and the important announcement is

made that with the July number the Hon. David A. Wells will begin a series of articles on causes of the depression of trade and industry. New York: D. Appleton & Co. Fifty cents a number, \$5 a year.

WHERE ARE WE, AND WHITHER TENDING: This is a small book, costing but one dollar. The author is the Rev. Moses Harvey, F. R. G. S., St John's, Newfoundland. As a writer Mr. Harvey has been very prolific, and very favorably received. Several of the school books of Newfoundland, histories, sketches and geographical descriptions, have been written by him, from his splendid large history of the Island and his contributions to the *Encyclopædia Britannica*, down to the shorter articles appearing in some of our Canadian and United States papers. For such work he has lately been elected a Fellow of the Royal Geographical Society. But he is also a scientist of world wide reputation, having brought to the light of scientific investigation some of the wonders of the Newfoundland seas. His clerical training, combined with his extensive scientific reading and observations, make his opinions on the drift of modern civilization and modern thought of intense interest. The reader cannot help feeling the power of the conviction that we are changing, and yet, that with the loss of much of the long cherished notions of the past, our future promises to be better, in spite of the dreams of the pessimist. It is a book which any reader can enjoy, and when he finishes he feels that he has learned something of permanent value, and that he understands the world in which he lives more fully than before.

PATHFINDER PHYSIOLOGICAL SERIES: To meet the demands of the school law of New York and several other States, the Pathfinder series of text books on anatomy, physiology, and hygiene, with special reference to the influence of alcoholic drinks and narcotics on the human system, has been issued in three volumes. No. 1—an exceedingly attractive little book full of lively description and apt illustrations, is intended as an introduction to the study of the science—suited to children in the primary grades. In No. 2, the principles of the science are more fully announced and illustrated; while in No. 3, prepared for high schools and academies, the principles which underlie the preservation of health and the formation of correct physical habits are treated in a more elaborate manner. We will be glad when just such books are placed in the hands of every student in the Maritime Provinces. Published by A. S. Barnes & Co., New York.

SCIENCE, (a weekly); SCIENCE AND EDUCATION, (a monthly), and THE SWISS CROSS, the monthly magazine of the Agassiz Association, are all issued by the Science Company, New York. They are valuable publications, fully abreast of the age, and filled with matter that educators can hardly do without.

GIANTS AND PIGMIES: This is a charming history of the giants and pigmies which disported themselves in the lands and seas which afterwards developed into the present Maritime Provinces of eastern Canada—New Brunswick, Nova Scotia, and Prince Edward Island. It is a popular history of the succession of life through the geological ages of these Provinces. The author, however, extended his original idea by comparing our record with that of other portions of the world; so that the little book of 100 pages or so really contains a splendid outline of the Palæontological record of the world. This is just the book for the amateur geological student. The author is the Rev. David Honeyman, D. C. L., F. R. S. C., F. S. Sc. (Lond.), Provincial Geologist, Nova Scotia. The book can be procured for one dollar, from the author (Province Building, Halifax), or from the booksellers, we presume.

ECONOMIC ENTOMOLOGY: If any of our teachers, horticulturists, or others, wish to get a book plainly describing and illustrating, with cuts such as those in one of our articles, all the ordinary insects affecting our fruits injuriously, together with their life history, some of their more important parasites, and the best method of treating them, they can get it in a lately published Canadian work which has no superior in any country. The author, William Saunders, F. R. S. C., London, Ontario, who has for a number of years been President of the Entomological Society, of Ontario, and editor of the *Canadian Entomologist*, is one of the ablest, most widely known and highly esteemed entomologists in America. His book, *INSECTS INJURIOUS TO FRUITS*, contains 436 pages, and 440 woodcuts so highly executed as to enable the veriest tyro to recognize his specimen. It costs but \$3.00.

GUIDES FOR SCIENCE TEACHING: To those teachers who desire to practically instruct classes in natural history, the Guides for Science Teaching, published by D. C. Heath & Co., Boston, will be found most valuable as a supplement to the prescribed text books on Natural Science. Being intended solely as aids to teachers, any attempt to use them as text books would defeat the object of publication.

I. Hyatt's About Pebbles,	\$0 10
II. Goodale's Concerning a Few Common Plants,	10
III. Hyatt's Commercial and other Sponges,	20
IV. Agassiz's First Lessons in Natural History,	20
V. Hyatt's Corals and Echinoderms,	20
VI. Hyatt's Mollusca,	25
VII. Hyatt's Worms and Crustacea,	25
VIII. Crosby's Common Minerals,	30
IX. Richards' First Lessons in Minerals,	10

PERSONAL NOTES.

We congratulate Professor George Lawson, Ph. D., LL. D., of Dalhousie College, on his election to the Presidency of the Royal Society of Canada. In his election honor is done to Nova Scotia; and in his person the Royal Society has for president a most accomplished gentleman, a scholar of unusually extensive acquirements, and a man who has left the imprint of his scientific knowledge in the industrial development of every part of the country, one might nearly say. The honor is well merited.

Mr. W. F. Ganong will spend some weeks this summer at Frye's Island, studying the development of *Ascidians*. He will continue also the study of the surface fauna of that region, begun last summer by him in conjunction with Dr. J. W. Fewkes, of Cambridge. Mr. Ganong hopes also to get some stages in the development of the Basket-fish (*Astrophyton Agassizii*), and the Sun-star (*Crossaster papposa*), two very important forms, of which the embryology is entirely unknown.

A Philadelphia correspondent of the *Carleton Sentinel* says that Mr. Charles Hay, son of Mr. Hugh Hay, of Woodstock, studying medicine at the University of Pennsylvania, passed his second year examination, leading his class and making 299 out of a possible 300. Mr. Hay is considered one of the ablest, if not the ablest, of his class, and is now taking special courses in certain branches of his profession.

The teachers of the Halifax schools have formed themselves into an "Amateur School of Science," under the direction of that indefatigable man of iron, Supervisor McKay, whom no amount of work appears able to break down. He cannot last forever, though. The city of Halifax will not find his equal again, when that comes.

The Lunenburg, N. S., *Progress* gives an admirable sketch of a most interesting and instructive lecture on "Prehistoric Man," by E. H. Owen, A. B., on the 17th ult. Mr. Owen was for a number of years Principal of the Lunenburg Academy, and has acquired no small reputation as a writer for the Provincial press.

W. Bliss Carman, M. A., of Fredericton, whose poems in the *Atlantic Monthly* and elsewhere have recently attracted much attention by their merit, is now at Harvard studying for the degree of Ph. D.

The degree of LL. D. has been conferred on A. A. Stockton, Esq., M. P. P., of St. John, by Victoria University, Coburg, Ontario, after a course of study

prescribed by the faculty, supplemented by a rigid examination. Dr. Stockton is one of the few who find time amid active public and professional duties to seek honors in literature. The example of a busy professional man devoting his leisure to the study of philosophy and kindred subjects, while taking a lively interest in all public questions, is one worthy of imitation. Dr. Stockton also holds the degree of Ph. D. from Illinois Wesleyan University, as well as that of D. C. L. from the Mount Allison College. We congratulate him on his triple and well deserved honors.

Mr. L. E. Wortman, M. A., has been appointed to fill the new chair of modern languages at Acadia College, the appointment to take effect on the first of January, 1888. Mr. Wortman is a gentleman of scholarly attainments and large experience as a teacher.

Mr. W. L. Clay, of Summerside, P. E. Island, who recently graduated B. A. at McGill University, and won the Prince of Wales gold medal in mental and moral philosophy, made a higher record than that of any previous graduate of that institution.

Rev. Dr. Sawyer, of Acadia College, was recently made the recipient of a handsome cane, accompanied with an address, by the students of the senior class.

Professor Eaton, of the Normal School, has been elected a member of the Municipal Council of Truro. This speaks well for both the Normal School and Truro.

D. A. Murray, Esq., B. A., late Munro tutor in mathematics, Dalhousie College, is rustivating in the north of the Province. He intends going to the John Hopkins University next fall.

C. H. Livingstone, M. A., of the Gramercy Park Polytechnic school, New York, is among his friends in St. John enjoying a well earned vacation.

A. F. Emery, M. D., has received the appointment of resident physician in the St. John Public Hospital. Dr. Emery, who was one of the most diligent and progressive teachers in the St. John schools, is a distinguished graduate of Bellevue College, New York, standing fourth in a class numbering several hundred.

The project to unite Woodstock College and Toronto Baptist College in one institution under the name of McMaster University, is an accomplished fact. Dr. T. H. Rand displayed characteristic ability and energy in aiding to bring about this affiliation.

J. G. MacGregor, D. Sc. (London), Professor of Physics in Dalhousie College, has gone to Edinburgh to superintend the issue of a work on Kinematics and Dynamics, which he has been preparing and which will shortly be published.

A NOBLE WORK.

The New Brunswick Society for the Prevention of Cruelty to Animals, which was organized six years ago, has accomplished a great amount of good. In addition to its practical work of preventing cruelty, and of prosecuting persons who are known to have been guilty of causing needless pain, it has for the past two years had a very active Ladies' Educational Auxiliary Committee, who have full charge of the Band of Mercy movement in connection with the society's work. This movement, which is for the purpose of inculcating into the minds of the young the principles of kindness, had its origin in England, but has met with the universal approval of the young all over the world.

In Germany, Russia, Switzerland, France, and the United States of America, the bands exist in large numbers, and in the two last named countries have been received into the public schools, and now form part of the educational work of these nations. At the sitting of the Bureau of Education of the United States of America, in 1883, George T. Angell, Esq., President of the American Science Association, read a very interesting paper showing the importance and value of Bands of Mercy as a means of the prevention of crime. At the conclusion of the address the Bureau passed a resolution expressing a desire that such Bands should be welcomed in all the public schools. In the last three years upwards of 6,000 Bands have been organized on this continent, with a membership of 600,000 children and adults.

The attention of the teachers of all the public schools and Sunday Schools in the Maritime Provinces is directed to this noble work of teaching children to be kind and gentle towards God's dumb and dependent creatures, in the hope that they may see the importance of the work, and be led to organize Bands in their respective schools.

The Royal Society in England issue (at first cost) a beautiful badge or medal of membership, which was specially designed by the society's chief patron, HER MOST GRACIOUS MAJESTY THE QUEEN, and is intended to be used by all members of Bands living under the British flag. It is made of yellow (guinea gold colored) metal, and mounted on deep garnet silk, with pin attachment, and is sold only to members, price seven cents each.

Miss F. M. Smith, Carleton Street, St. John, N. B., is the Secretary of the Ladies' Committee, and will be glad to answer any correspondence in regard to the work, and furnish free of charge some reading matter with book of information, "How to Form a Band." The Diploma of the Royal Society, which is a

beautiful work of art, in a handsome frame, measuring 30x22 inches, has been sent out to the Ladies' Committee, by the order of Lord Aberdare, and will be offered for essay competition at a later date, notice of which will be duly given through the medium of this paper.

COM.

St. John, N. B.

That the lower orders of creation suffer, there can be no doubt. I recollect reading not long since an incident in the life of Cuvier. He was watching a pair of swallows. The male was seized by a hawk. He shot the hawk, and wounded the swallow. He dressed the wound with all possible tenderness, and replaced it in its nest, while the hen fluttered sadly around, uttering cries of distress, and for three days left the nest only for food. Three days after the male was wounded it died. From that time the hen refused food. She died five days after her mate.

I know one of the best women of Massachusetts, who, some years ago, to shame her husband for speaking hastily and improperly, answered the call of her little canary bird, (to which she had never before spoken an unkind word), in a violent and angry tone. Within five minutes there was a fluttering in the cage, and when she got to it the bird was dead. I was told at New Orleans, winter before last, by a personal friend of Mrs. Hendricks, widow of the former Vice-President of the United States, that Mrs. Hendricks once killed a favorite mocking-bird in the same way. Other similar cases I have seen reported in various publications. There can be no doubt that great suffering can be caused to many of the lower animals simply by the tones of the human voice.

Concerning the importance of birds to agriculture, what Horace Greeley once wrote is literally true:

"The boy who robs a bird's nest is robbing the farmer of part of his crops. The farmer might as well consent that a strolling ruffian should shoot his horses or his cattle as his birds."

Agassiz believed that there is a future life for the lower animals as well as for us. He died in that belief. It is the belief, in some form, of the majority of the human race. Some two hundred volumes or thereabouts have been written on the subject. John Wesley, Jeremy Taylor, Bishop Butler, Coleridge, Lamartine, and many of the leading clergy of the past and present, have held and do hold this belief. Agassiz taught his pupils to kill fish by a blow on the back of the head as soon as they were caught, that they might not suffer before dying. President Lincoln, walking with a friend one day, stopped and put his hand down through the bushes. "What do you find there, Mr. Lincoln?" said the friend. "Why,"

answered Mr. Lincoln, "here is a little bird fallen out of its nest, and I am trying to put it back again."

"Thanks to my stars," says the celebrated Dr. Channing, "I can say I have never killed a bird. I would not crush the meanest insect that crawls upon the ground. They have the same right to live as I have: they received it from the same Father, and I will not mar the works of God by wanton cruelty."

"I saw a little spotted turtle," wrote Theodore Parker, "sunning itself in the shallow water. I lifted the stick in my hand to kill it; for though I had never killed any creature, yet I had seen other boys, out of sport, destroy birds, squirrels, and the like, and I had a disposition to follow their example. But all at once something checked my little arm, and a voice within me said, clear and loud, 'It is wrong.' I held my uplifted stick in wonder at the new emotion, till the turtle vanished from sight. I hastened home and told the tale to my mother, and asked what it was that told me that it was wrong. She wiped a tear from her eye, and, taking me in her arms said, 'Some men call it conscience, but I prefer to call it the voice of God in the soul of man. If you will listen and obey it, it will speak clearer and clearer, and always guide you right: but if you turn a deaf ear or disobey, then it will fade out little by little, and leave you in the dark without a guide. Your life, my son, depends on heeding that little voice.'"

From Waterton's "Wanderings in South America," I take the following:

TO TAXIDERMISTS.

If by my instructions you should be enabled to procure specimens from foreign parts, in better preservation than usual, so that the naturalist may have it in his power to give a more perfect description of them than has hitherto been the case, it will please me much.

But should they unfortunately tend to cause a wanton expense of life; should they tempt you to shoot the pretty songsters warbling near your door, or destroy the mother as she is sitting on her nest to warm her little ones, or kill the father as he is bringing a mouthful of food for their support, oh, then, deep indeed will be my regret that I ever wrote them.

In conclusion, it is not for me to decide for others. Every one must judge for himself or herself what is their duty in regard to the destruction of any of these lower forms of life which God has created. But whether He cares for His lower as well as human creatures, and how far He will hold us responsible for our treatment of them, are questions worthy the consideration of every human being who believes in God and immortality.—Geo. T. Angell, Pres. Mass. S. P. C. A., in *Swiss Cross*.

To prepare us for complete living is the function which education has to discharge.—Herbert Spencer.

QUESTION DEPARTMENT.

The editors do not bind themselves to answer all questions that may be submitted to this Department, and this refers chiefly to catch questions, the answers to which would benefit no one in particular, and to simple ones that may be answered with a little thought and research. Questions on scientific subjects may be addressed to EDUCATIONAL REVIEW, Pictou, N. S., to whom also all natural history specimens may be submitted for identification; those on ancient classics and mathematics to EDUCATIONAL REVIEW, Charlottetown, P. E. Island, and all questions on general subjects—English, school management, methods, etc.—to EDUCATIONAL REVIEW, St. John, N. B. On technical questions the editors will seek the views of teachers of experience, in order that this page may be of the greatest possible advantage to our teachers.

Questions and Answers.

What are the botanical names of the numbered plants?—B. F.

No. 1 is *Viola pubescens*; 2, *Claytonia Caroliniana*; 3, *Erythronium Americanum*; 4, *Hepatica triloba*; 5, *Uvularia sessilifolia*; 6, *Sanguinaria Canadensis*; 7, *Dicentra cucullaria*.

What are the numbered specimens sent herewith?—M. Y.

No. 1 is a moss, *Bartramia pomiformis*, (apple moss); 2 is a lichen, *Peltigera canina* (mad dog lichen); 3, is a lichen, *Usnea barbata*. (Tree beard).

What is the best book to assist a teacher in giving the lessons on nature in the prescribed course.—B. M. D.

There is no good book adapted to this country. A book written by Dr. Bailey, and prescribed for New Brunswick schools, will shortly be issued from the press of J. & A. McMillan, St. John.

SCHOOL AND COLLEGE.

Six young ladies of the Victoria High School, St. John, were examined last week for admission into the N. B. University.

How would an annual term system work in Nova Scotia? Say an autumn session, from September to Christmas vacation; a winter session to the Easter vacation; a spring session to July, when the school year would end. What is the experience in N. B. and P. E. I. bearing on the question?

Dalhousie College is going to boom next year. Sir William Young has just left about \$70,000, and next fall a magnificent building with all modern improvements, on a splendid site, will be opened. The President will soon surprise the public with the magnitude of the advance made by the institution since his election.

One of the elements, it would appear, which determines the general superiority of the Prince of Wales students at the universities, is the fact that all their teachers corresponding to the Nova Scotian grades B and C, require a knowledge of the ancient classics. Nova Scotian teachers have generally to commence at the rudiments of the classics when they determine to go to college, and consequently are not so likely to be well grounded.

EDUCATIONAL INSTITUTE OF N. B.

MESSRS. EDITORS:

The advertisement in this issue of the REVIEW contains information of the time and place appointed for the approaching meeting of the Provincial Institute. In view of the large attendance last June, and the unusually pleasing character of the proceedings, it is expected that, both in numbers and interest, the gathering in this jubilee year will surpass the most of those heretofore held.

The executive committee has arranged the following

PROGRAMME.

TUESDAY AFTERNOON: Enrolment. Routine business.

TUESDAY EVENING: Public educational meeting. Short speeches.

WEDNESDAY MORNING: (1) *School inspection—its place and importance*; discussion opened by Inspector Mersereau. (2) *School sanitation*—introduced by the Chief Superintendent.

WEDNESDAY AFTERNOON: A. Common school section. (1) *How should English be taught in ungraded schools, and in the first six standards of graded schools?*—discussion opened by Mr. James Barry, Miss E. McLachlan and Miss Grace Murphy. (2) *Domestic economy in schools*—discussion opened by Mrs. M. M. Carr.

B. Grammar and superior school section. Reports of special committees on courses of instruction.

WEDNESDAY EVENING: Observations on *the educational exhibit of New Brunswick* at the Indian and Colonial Exhibition of 1886—by Messrs. E. Mullin, M. A., Jno. March, M. A., and G. R. Parkin, M. A.

THURSDAY MORNING: (1) Report of Grammar and Superior school section. (2) *The teaching of agriculture in the public schools*—discussion opened by Mr. S. C. Wilbur, B. A.

THURSDAY AFTERNOON: (1) *Scientific instruction in schools*—discussion opened by Mr. John Brittain. (2) *The principles of good reading* (with illustrations)—address by Prof. J. Burwash, M. A. (3) Election of executive committee.

THURSDAY EVENING: (1) General business. (2) *Conversations*.

There will be good music at the evening sessions, as usual.

As Professors in the University, and all school officers—as trustees and their secretaries are—equally eligible with teachers, for membership in the Educational Institute, and as the work of several sessions, at least, will be of a character to interest such persons, it is hoped that many of them will be present.

It is probable that there will be brought before the Institute a proposal from the executive committee of the Provincial Educational Association of Nova Scotia, for the holding of a central educational meeting for the Maritime Provinces in 1888. Out of this may grow a permanent inter-provincial conference of teachers, meeting perhaps in alternate years with the Provincial bodies. Such an arrangement would obviously afford many advantages.

HERBERT C. CREED,
Sec. to Educ. Inst.

For the EDUCATIONAL REVIEW.]

Educational Advantages for Girls in the Maritime Provinces.

In view of the great progress that has been made during the last few years in the matter of education for women, it is important to inquire what position is taken in this regard by the educational institutions of the Maritime Provinces.

The question of the higher education of women is no longer a disputed one, and the last half century has witnessed a great awakening both on the part of women themselves, and the foremost educators of our time, as regards the capabilities and needs of women in the matter of education.

In the United States more than half the colleges admit women equally with men, and the number is constantly increasing; while in Europe co-education is receiving more and more attention every year.

London University with its two thousand students, one third of whom are women, confers degrees upon the latter the same as upon the male students.

In Paris, the Faculty of Science and Letters has conferred degrees upon one hundred and thirteen women.

In 1876 the King of Italy opened all the universities of that country to women, and they are now to be found as students in the colleges at Turin, Padua, Bologna, Rome, and elsewhere. So it is in Switzerland, Germany, Scandinavia, and Denmark, which opened the University of Copenhagen to women in 1883. Indeed the women of these northern latitudes are rapidly progressing in the matter of education, and it is said that the "women of Scandinavia are among the best educated in the world." The degree of Doctor of Philosophy was taken a few years ago by a lady at the University of Upsala in Sweden.

Victor Hugo has said that the "nineteenth century is woman's century," and, since education is the essential basis of all true progress, there is every reason to be assured that this prophecy is being fulfilled.

Upon inquiry into the attitude of the various institutions of learning in Nova Scotia, New Brunswick, and Prince Edward Island, with regard to this question, it is gratifying to find that these Provinces are no whit behind the leading nations of the world in recognizing the claim of women to full educational advantages, and in almost all the colleges and universities of these Provinces there exists no distinction on account of sex.

Dalhousie College, in Halifax, has for five years admitted ladies on exactly the same footing as male students, and of the five ladies who have been graduated there every one came off with honors, three winning the degree of B. A., one that of B. Sc., and one that of B. L. But beside these there have been about

one hundred ladies who have taken special courses not leading to degrees. And in examinations in mathematics, philosophy, logic, political economy, history, English literature, and modern languages, the ladies have been first, and many of them are now to be found holding fellowships in the halls of learning in the neighboring Republic, while others are leaders in the didactic profession in these Provinces and in missionary lands. Beside those winning degrees, Miss Ritchie won distinction in philosophy, and Miss Stewart in mathematics.

There will be still further opportunities for collegiate training for young women afforded by the Ladies' College, of Halifax, which will be opened in September by the Presbyterian denomination. Connected with this college there will also be a preparatory department for students not far enough advanced to enter upon the collegiate course.

Pictou Academy is also co-educational, and furnishes an excellent curriculum extending over a four years' course.

Numbers of young ladies have been graduated from Acadia College, at Wolfville, which furnishes a fine preparatory department in the Acadia Seminary.

New Brunswick also offers the best advantages to women, both at Sackville and at the University of New Brunswick. Superior opportunities of education have always been afforded by Sackville College, which from its foundation has been open to ladies, and there have been numerous instances in which they have been graduated with honors. The first lady graduate in the Maritime Provinces was Miss Stewart, who claims Sackville as her *alma mater*; and Miss Narraway, of the same college, who graduated a few years ago, came off with high honors, being first in the graduating class. Miss Narraway also took the Grammar School License, and received the Lansdowne Medal, and, though still quite young, is filling the position of Chief Preceptress in the Wesleyan College, at St. John's, Newfoundland.

In the case of the University of New Brunswick it is, of course, too soon to pronounce judgment, as it has been so recently opened to women. The young lady who matriculated last year entered third in the class and is making good progress. In Fredericton there is a collegiate school, preparatory to the University, but in St. John such a school is not necessary, since the Young Ladies' High School offers sufficient training for entering the University. The fact was demonstrated a year ago when nine young ladies, who had been instructed in the St. John High School, passed successfully the matriculation examination, though without any direct intention of entering the University.

These students had not undergone special training for the matriculation examination. They were not selected pupils, but were taken as an entire class to test the character of the work done in the higher schools. The result was entirely reassuring on that ground, and reflects great credit both upon the school system and upon the teachers in those grades.

Prince of Wales College, in Prince Edward Island, is also open to women, and the names of sixty-six ladies are on the list of students for last year, and very favorable reports are given of the character of the work done.

In view of all these facts it is certainly no fault of the powers that be if the girls of the Maritime Provinces do not show a great advancement in education in the future. There are now no hindrances to their progress, and it only remains for parents to direct their daughters in the pursuit of knowledge and encourage them to take advantage of their opportunities. There is no longer any need for parents to send their daughters from home to be educated. Our own institutions offer as good advantages as can be found elsewhere, and our own people should show their appreciation of these advantages by encouraging their children to remain at home and patronize our own schools and colleges.

When it is more generally acknowledged that education and enlarged interests can alone render girls less frivolous, we shall see greater numbers devoting their time to those studies and pursuits which have this influence; we shall see more of them in all our schools and colleges, and there will cease to exist any prejudice against the higher education of women.

St. John, N. B.

F.

FOR THE EDUCATIONAL REVIEW.]

SCHOOL SYSTEM OF NEWFOUNDLAND.

Newfoundland makes the proud boast of being the oldest colony of the British Empire, but her educational advance has not kept pace with that in the newer colonies. While New Brunswick, Nova Scotia and Prince Edward Island have for many years been in the van in regard to their school systems, and while from year to year they are perfecting their free public unsectarian method of education, which they were wise enough to prefer many years ago, Newfoundland has distinguished herself by the establishment of a purely sectarian school system. Up to about ten years ago Protestants were united among themselves, but the Roman Catholics refused to unite with them, and the schools fell into two classes, viz.: Protestant and Catholic. At that time in consequence of jealousies among Protestants, in regard to the appointments of teachers and the

management of the Government grants, the system was made more thoroughly sectarian. The public grant for educational purposes was divided up among Catholics, Episcopalians, Methodists, Presbyterians and Congregationalists in proportion to the numbers of each denomination. The denominations have since that date had the control of their own schools. The Government appoints three superintendents of education, a Catholic, an Episcopalian and a Methodist, each of which has oversight of the schools of his own denomination, and, by arrangement, of the few schools of the minor denominations. Each of these principal sects has its college, its training academy, and its primary schools. The Government grant only partially supports the system; school fees have to be charged, and the system is wrought out on strictly denominational lines.

There are to be found men who try to defend the system as the best for Newfoundland. Among these are principally the three well-paid superintendents of education. But a very slight acquaintance with the working of the system shows it to be most defective, and the more one knows of its results, the more disappointing they are seen to be.

A residence of eight years in St. John's enables me to say that the results of the system are "evil and evil continually." I cannot in this short article give at length the reasons for my opinion, but they may be briefly stated as follows:

1. The system is *most expensive*, the threefold superintendency, threefold academy course, and primary schools, involving at least three times the cost of an equally efficient public free school system.

2. The system is *most inefficient*. The necessity of erecting so many school buildings and paying so many teachers and officers, eats up the money that ought to go to secure a better class of schools and a higher grade of teachers.

3. Teachers are consequently cheap men—men who cannot afford to educate themselves, and who are contented to eke out a precarious existence on a starvation allowance.

4. Whilst primary education is fairly good in large centres, it becomes defective and in some cases impossible, where the denominations are separately too weak to raise their share of school expenses.

5. There are many localities unable to keep a school open more than a few months in the year; others are without a teacher for years together.

6. Whilst primary education is thus defective, and to many of the children practically impossible, higher schools and academies are crippled. Though the churches are making herculean efforts to erect and furnish their separate colleges, the proportion of

youths who ever get more than the merest smattering of education is extremely small. An academy with a staff of half a dozen teachers or less, publishes a syllabus of subjects taught that would eclipse a university with its staff of thirty professors.

7. The public schools instead of being seminaries of patriotic and liberal sentiment, become sectarian centres, the children of one sect being taught from infancy to look with jealous and unfriendly eye upon those of another sect. The seeds of bigotry and narrowness of view are implanted at an early age, which the teachers of religion and patriotism find their efforts vain to uproot.

8. The utter failure of the old, cumbrous, expensive system, in this age when the schoolmaster is supposed to be abroad, is evidenced by the fact brought out by the recent census, that in a population of less than 200,000 over 50,000 above ten years of age were to be found who could neither read nor write.

Newfoundland has many attractions as a place in which to live. It has a very moderate and temperate climate, is comparatively free from fogs on land, being much maligned in this respect. It has a population second to none in natural ability, the sturdy descendants of good English, Irish and Scotch stock. Its mercantile classes are solid and substantial; men of public spirit and with the good of their adopted home at heart; and though much fettered by a wretched supply system that has been inherited from the past, they are foremost in public affairs, one of them, Sir Robert Thorburn, being at present Premier and recently knighted by the Queen. Its fishing population, the "bone and sinew" of the country, hardy, enterprising and worthy of a better fate. But with all the many advantages and resources of the country—piscatorial, mineral, agricultural and human—the place is, for want of education, at least fifty years behind the age. What Newfoundland wants most is a system of education such as we have in New Brunswick, where the sons and daughters of the poorest can get without money and without price as good a common school education as the children of the millionaire. The government that shall have the courage to abolish two of the superintendencies, amalgamate all the colleges into one university and training school, and pass a free unsectarian school act for the colony will deserve well of all future generations of Newfoundlanders. L. G. M.

St. John, N. B.

CHILDREN should be early taught to see correctly, think clearly, speak accurately, to give close attention and render prompt and willing obedience. Bad habits are easily formed, but are with difficulty corrected.

For the EDUCATIONAL REVIEW.]

EDUCATIONAL CONVENTION.

Let us have a convention of teachers of the Maritime Provinces. Why should we not? In these days of rapid and cheap travel neither the distance from all parts of these Provinces to a suitable central point, nor the expense attending such a trip, is a serious objection. The teachers of the United States meet annually in convention at places as widely distant as Maine and Colorado. This year hundreds of them from the eastern, middle and southern States will meet their western brethren at Chicago.

Why should we have such a convention? Because we want to know our fellow-laborers in Nova Scotia and in the "Gem of the Gulf;" because we may learn much from each other; because our conditions of secondary and primary education and our provisions for the training of teachers are essentially similar; because we feel that we have held aloof from each other too long and we want to break down any unnatural barriers, if such exist, which have hitherto separated us from our co-workers in the adjoining Provinces, and because the spirit of the times in which we live leads those who may be doing the same work to associate in representative gatherings for mutual helpfulness.

The opinion of the Educational Institute of New Brunswick will be taken at its next meeting as to the desirability and practicability of holding a conference of the teachers of the Maritime Provinces in 1888, and a committee could be appointed, if desired, to co-operate with similar committees of the Nova Scotia and Prince Edward Island bodies, to arrange the details of time, place and programme. Will our brethren in the sister provinces take the same or similar action at the approaching meetings of their associations or institutes?

E. M.

Fredericton, N. B.

SPECIAL ANNOUNCEMENT.

We want 2,000 subscribers by the first of next month. Can any of our teachers afford to be without a good educational journal devoted especially to their interests, when it can be had for about *eight cents a month*, or one dollar a year? The REVIEW cannot be sent to any one without it is ordered. So that intending subscribers will see the necessity of filling out the blank order enclosed with this paper and returning to us at once, accompanied with the amount of subscription—one dollar. All money letter should be registered. If not convenient to remit the money at once, order the paper, and send the money at the first convenient opportunity. Write the address plainly.

All subscriptions will be acknowledged by postal card. Address, EDUCATIONAL REVIEW,

St. John, N. B.

The attention of Principals of County Academies and other High Schools in Nova Scotia is particularly directed to the following:—

MATRICULATION STANDARDS IN CLASSICS, ADOPTED BY THE COLLEGES OF NOVA SCOTIA, and Prescribed by the Council of Public Instruction as a Course of Classical Reading for County Academies and High Schools. FOR 1887.

LATIN SUBJECTS: Cæsar, *De Bell. Gall.* Book I. Ovid, as for 1886. (Acadia College will also require Cicero (*Pro M. Marcello*.)

GREEK SUBJECT: Xenophon, *Anabasis*. Book II. (Dalhousie College will also require for "Munro Exhibitions and Bursaries," Xenophon, *Anabasis*, Book III.)

PROSE COMPOSITION: Latin.—Smith's *Principia Latina*, Part IV. Chapters I-XXXV. (or Arnold's *Latin Prose Composition* through the Passive Voice).

Greek.—The rendering into Greek of simple English sentences such as are found in the English-Greek Exercises in Smith's *Initia Græca*, Part I.

FOR 1888.

LATIN SUBJECTS: Cæsar, *De Bell. Gall.* Book I. Virgil, *Aeneid*. Book I. (Acadia College will also require Cicero's *Second Philippic*.)

GREEK SUBJECTS:

Xenophon, *Anabasis*. Book III. (King's and Dalhousie for "Munro Exhibitions and Bursaries," will also require Xenophon's *Symposium*—edition published by John Allyn, Boston.)

PROSE COMPOSITION: As for 1887.

FOR 1889.

LATIN SUBJECTS: Virgil, *Aeneid*. Book I. Cæsar, *De Bell. Gall.* Books II and III. (Acadia College will also require Cicero's *Second Philippic*.)

GREEK SUBJECTS:

Xenophon, *Symposium*. (King's and Dalhousie for "Munro Exhibitions and Bursaries," will also require Xenophon, *Anabasis*. Book IV.)

PROSE COMPOSITION: As for 1887.

PROVINCIAL EDUCATIONAL ASSOCIATION OF NOVA SCOTIA.

The eighth annual meeting of the Provincial Educational Association, will be held in Assembly Hall, of the Normal School, Truro, on Wednesday and Thursday, 13th and 14th July.

Papers will be read by

Rev. A. W. Sawyer, D.D., President of Acadia College, on "The Register as an Index of the Teacher's Success."

Prof. Chas. G. D. Roberts, A. M., of King's College, on "The Teaching of English."

Prof. Burwash, A. M., of Mt. Allison College, Sackville, N. B., Subject to be announced.

P. O'Hearn, Esq., Principal of St. Patrick's High School, Halifax, on "Economy in Education."

E. M. Chesley, Esq., A. M., on "Spiritual Science as related to Physical Science."

Miss A. G. Jackson, on "The Advantage of Skilled over Unskilled Labor."

Further particulars will appear in the Report of Proceedings of last meeting of Association, to be issued later.

In behalf of Executive Committee.

ALEX. MCKAY,
Secretary.

Halifax, April 30th, 1887.

TO TEACHERS AND SCHOLARS.



Every teacher and scholar in the schools of New Brunswick should be provided with Waterproof Garments, as there is not any more fruitful source of sickness than sitting in wet or damp clothing. As we make a specialty of Waterproof Clothing, for men, women and children, we can supply the most desirable kinds.

Price Lists mailed, if requested. Wholesale and Retail.

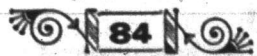
ESTEY, ALLWOOD & Co.,

68 Prince Wm. Street, Saint John.

JAMES S. MAY. W. ROBERT MAY.

JAMES S. MAY & SON,

Merchant Tailors,



Prince William Street,
ST. JOHN, N. B.

P. O. Box 303.



OFFICE:

Western Union Telegraph Build'g
KING STREET,
Saint John, N. B.

Illustrations of all kinds carefully prepared. Send photograph or drawing for estimate.

S. P. C. A.

THE LADIES EDUCATIONAL AUXILIARY COMMITTEE, together with the BOARD OF MANAGEMENT of the NEW BRUNSWICK Society for the PREVENTION of CRUELTY to ANIMALS, desire to draw the thoughtful attention of the teachers of all the Public Schools, and the superintendents and teachers of Sunday-schools, (of all denominations), to the BAND OF MERCY movement in connection with their work.

The object is to inculcate into the minds of the young the need and importance of kindness to God's dumb and dependent creatures. A beautiful badge of membership in yellow (guinea gold coloured) metal, mounted on garnet silk, with pin attachment, and designed by HER MAJESTY THE QUEEN, is issued (to members only) at cost price (seven cent-).

For the pleasure it will afford the children, and the good it must accomplish, organize a Band in your school. Write for reading matter and book of information, "How to Form a Band," sent post free on application to Miss F. M. Smith, Secretary of Auxiliary Committee, Carleton Street, St. John, N. B.



BUCKEYE BELL FOUNDRY.

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

VANDUZEN & TIFT, Cincinnati, O.

NEW RETAIL DRUG STORE

Will be opened on June 18th, at 185 Union St., between Charlotte & Sydney, with a Complete Stock of

Analyzed Drugs & Chemicals.

Also, a full assortment of Hair, Tooth and Nail Brushes, Combs, Perfumery, choice Soaps, Sponges, Toilet Articles, etc.

WILLIAM B. McVEY, Dispensing Chemist, 185 Union Street, St. John, N.B. School Chemicals supplied at reduced prices.

WESTERN ASSURANCE CO.'Y.

Fire Insurance Solicited on all Kinds of Property.

R. W. W. Frink, General Agt., St. John.

Grand Square and Upright

PIANOFORTES AND CABINET ORGANS,

By the best makers. B. Shonniger & Sons make the only Pianos and Organs that have a full chime of bells. A special discount given to School Teachers. Write for terms to the Head Office, 66 King Street, St. John, N. B.

WILLIAM CRAWFORD.

SUMMER SCHOOL OF SCIENCE, Wolfville, N. S.

July 23th to August 5th, 1887.

THE Programme of the SUMMER SCHOOL OF SCIENCE has been prepared with special reference to the preparation of Teachers for the teaching of the *Lessons on Nature* in the prescribed course of study. To obtain suitable illustrations for the various lectures, excursions will be made taking in Horton Bluff, Beech Hill, Gaspereaux Valley and Blomidon. These delightful rambles in localities renowned for their charming scenery, and the necessity for a more general diffusion of scientific information, will doubtless lead many of our more progressive teachers to avail themselves of the advantages offered by the school.

Programme:

ZOOLOGY.

By A. H. MacKay, B. A., B. Sc., F. S. Sc.,
Pictou.

LECTURES—1: On the observation, collection, and classification of animal forms—introductory to general work. 2: The Protozoa, Coelenterata, Echinodermata, and Mollusca, with dissection of a "local mollusc." 3: The Annulosa and Arthropoda—class Crustacea with dissection of a lobster. 4: The Arthropoda—class Insecta with dissection of a "grasshopper." 5: The orders of Insecta with a special reference to species affecting the industries of Nova Scotia. 6: The Vertebrate structure illustrated by the dissection of a "frog." 7: Nova Scotia Vertebrata.

Text books recommended, "Hand-book of Zoology," by Sir William Dawson, (Dawson Bros., Montreal, \$1.25); and "Practical Zoology" by Colton, (D. C. Heath & Co., Boston, \$1)

Each Student should be provided with a lens, and a dissecting knife (a good sharp pocket knife will do), a small pair of forceps and scissors, also insect nets, mounting boxes, pins, etc. (Some of these may be prepared at the School).

MINERALOGY.

By A. J. Pineo, A. B., Kentville.

LECTURES—1: Introduction—Crystallization: examination and description of minerals; specimens required, Pyrite, Quartz, Linonite, Gypsum, Feldspar, Steatite. 2: Principal characteristics of Minerals. 3: Classification of Minerals. 4: On the Determination of Minerals—use of the blow pipe. 5: Useful Minerals of Nova Scotia; specimens required, Chalcopyrite, Galenite, Hematite, Siderite, Pyrolusite, Stibnite, Gypsum, Calcite, Barite. 6: The varieties of Quartz, Pyroxene and Amphibole. 7: Mica, Feldspar, and the Zeolites. 8: On Rocks.

Text book, "Common Minerals and Rocks," (D. C. Heath & Co., Boston, 60c)

Each Student should provide himself with the mineral specimens required, a blowpipe, small steel chisel, and a hammer. Best reference book, Dana's Manual of Mineralogy and Lithology.

BOTANY.

By E. J. Lay, Esq., Inspector of Schools,
Amherst.

LECTURES.—1: Analysis of a few such plants as can be easily obtained, such as *Ranunculus repens*, *Taraxacum dens-leonis*, *Lysimachia stricta*, etc. 2: The relations of the parts of the flower. 3: How to use the Key to the Orders. 4: A few of the principal orders of Nova Scotia Plants discriminated. 5: Nova Scotia Trees. 6. Cryptogamous Plants—a dozen of the more important, named and labelled.

Text book, "How Plants Grow," Asa Gray, (Mackinlay & Co., Halifax, 80c.)

Each student should have a pocket lens, forceps, a knife-trowel, a supply of blotting-paper, and a tin box to preserve specimens until they are examined.

CHEMISTRY.

By Prof. F. H. Eaton, A. M., Normal
School.

LECTURES—1 and 2: To illustrate and explain how much chemical knowledge can be taught with the simplest apparatus. 3 and 4: To familiarize students with the use of such terms as "acid," "base," "salt," "chemical equations," "atomicity," "quantivalence" and chemical nomenclature.

PHYSICS.

Same Lecturer and Plan as in Chemistry.

Text books, Chemistry and Physics Primers.

URANOLOGY.

By Prof. A. E. Coldwell, A. M., Acadia
College.

Out-door demonstrations; the use of star-maps; precession of the equinoxes, parallax, right ascension, declination, etc.

PHYSIOLOGY.

By Prof. H. W. Smith, B. Sc., Normal
School.

LECTURES—1: Human anatomy. 2: Minute structure of the tissues. 3: Physiology of Nutrition and Respiration. 4: Structure of the Brain and Nervous System, and its bearing upon Psychology and mental development.

NOTE.—Circumstances may require some modifications to be made in this programme. It was thought by some members of the Science Committee that it would be a mistake to crowd much work into the first year's course. For this reason, partly, Geology is omitted, although it is hoped that the Lecturer on Mineralogy will not lose sight of so important a subject.

Students are expected to send in their names to the various lecturers AS SOON AS POSSIBLE, in order that they may be able to make provision for suitable material, etc.

As Acadia College will be placed at the disposal of the School, the opportunities for improvement will be exceptionally good.

For further particulars apply to H. S. Congdon, Principal of the Dartmouth schools, or to the Lecturers.

DETAILED PROGRAMME.

HOURS FOR LECTURES.

Monday—20½—21½, Opening Address by the President.

Tuesday—8-9, Mineralogy; 9-10, Chemistry; 10-11, Zoology; 12:19, to 19:47 excursion to Horton Bluff; 21-22, Uranology.

Wednesday—8-9, Botany; 9-10, Mineralogy; 10-11, Chemistry; 11-12, Zoology; 15-17*; 19-20, Uranology.

Thursday—8-9, Mineralogy; 9-10*; 10:52-18:08, excursion to Kentville; 19-20, Chemistry; 20-21, Botany; 21-22, Uranology.

Friday—8-9, Botany; 9-10, Mineralogy; 10-11, Chemistry; 11-12, Zoology; 15-16*; 16-17, Physics; 20-21, Uranology.

Saturday—8-9, Mineralogy; 9-10*; 10-11, Zoology; half holiday.

Monday—8-9, Botany; 9-10, Mineralogy; 10-11, Physiology; 11-12, Zoology; afternoon on way to Blomidon.

Tuesday—Visit Blomidon, collect Trap Minerals, rare Plants, etc.

Wednesday—8-9, Botany; 9-10, Mineralogy; 10-11*; 11-12, Zoology; 15-16, Physics; 16-17, Physiology.

Thursday—8-9, Botany; 9-10*; 10-11, Physics; 11-12, Physiology; afternoon, Excursion; evening, Public Lectures.

Friday—8-9, Botany; 9-10, Mineralogy; 10-11*; 11-12, Zoology; 12-13, Physiology.

* During these hours some attention may be given to local Geology with the help of Prof. Coldwell, or to an extension of the Physics, Chemistry and Physiology, as the Lecturers on these subjects have scarcely time to do justice to their topics.

ALEXANDER MCKAY, on behalf of the Programme Com.