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MISSING

The Educational Review.

Devoted to Advanced Methods of Education and General Culture.

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EDITORIAL NOTES.

THE next number of the REVIEW—a double one—will be published about the 10th of September.

IN response to pressing requests representing some hundreds of our subscribers, we take up larger than the average space for reference to insects which are at present more or less malevolently disporting themselves among us.

The 33rd annual session of the institution for the deaf and dumb, Halifax, was closed with public exercises on the 28th ultimo. 331 deaf mutes were admitted during the 33 years. The attendance this year was 59. Written examinations were held, on the results of which prizes and class standing were awarded. Both the sign system and oral teaching are employed. Principal Hutton is assisted by four teachers, Mr. Lawrence, Mr. MacDonald, Miss Mosher and Miss Bateman. The pupils are very expert with the pen, which has to take place of the tongue with them to a very great extent. They are, to a remarkable degree, taught to speak, but as they cannot hear their own speech, it must be with them an exercise of faith. A forcible contraction of certain muscles of the mouth and throat appears to them to carry in some mysterious, telephonic way, their thoughts to a distant person. The slightest variation in any one of the elements of this, to them, noiseless sound, destroys the magical effect of their throat gymnastics, and the thought is not conveyed. We can understand the reason. Their idea will probably be very different. Let these children of a silent world have an idea of mathematics, history and geography, as well as your language. They have also shown fine specimens of drawing and design, painting in monochrome, modelling in clay, needle-work, etc. In no institution of the kind in the world do we believe better work to be done. Our government has made it a part of the free school system. If any deaf and dumb who have not been educated are known to our readers, a blessing may be invoked on the effort they make in giving the address of such a one to Principal Hutton or the Nova Scotia editor of the REVIEW.

THE conference of the heads of colleges, which was inaugurated at St. John during the Interprovincial convention, was held this year at Halifax, in the library of Dalhousie College. An agreeable feature of this year's meeting was the courtesy extended to its members by the Hon. John F. Stairs. Next year the superintendents of education of the different provinces are to be invited to the conference to discuss fully a uniformity of matriculation standards for the different Atlantic Province colleges.

OUR readers will be pleased to learn that Principal Cameron of Yarmouth, our astronomical editor, was elected a member of the "Astronomical Society of the Pacific" at the meeting of its directors held at the Lick Observatory on May 31st last. At the same meeting other members widely known to the astronomical world were elected, such as Dr. Gill, Astronomer Royal at the Cape of Good Hope; Prof. Prichett of Washington University, St. Louis; and Dr. Kohl of Denmark. The Astronomical Society of the Pacific was founded in February, 1889, stimulated into existence by the great Lick Observatory, perhaps the most remarkable in the world. Those who have assisted in supporting the REVIEW must have no small satisfaction in seeing that in our department of science at least it is winning not only a high character for itself, but no mean credit for our country.

THE N. B. EDUCATIONAL INSTITUTE.

The N. B. Educational Institute met this year at Moncton—the first year in its history in which a meeting was held outside of St. John or Fredericton. The Moncton Board of Trustees, teachers, and people generally, vied with each other in extending to the visitors a cordial welcome. And Moncton has something to show in educational progress which has quite kept pace with her advance along other lines. If she is not already the second city in size and population in New Brunswick, she soon will be. She is ambitious, too, and fondly hopes to eclipse St. John somewhere during the twentieth century, if not sooner. Whether this hope will be realized, or not, history will tell. It is sufficient to note that the strides she is making in education will soon place her, in that respect, in the front rank of New Brunswick cities. She will soon have ready for occupation, the finest school building in the province, outside of the Victoria and Centennial in St. John. The Board of School Trustees is composed of some of the most public-spirited of her citizens, and Mr. C. R. Palmer, who fills the office of Secretary and Superintendent of schools, brings to his work an intelligence and progressive spirit that has already brought Moncton rapidly to the front in her educational development.

In spite of the dull weather, the Opera House was crowded to the doors on the occasion of the public educational meeting held on the evening of the first day on which the Institute was in session. A fine musical programme was carried out with excellent taste and spirit. Supt. Crocket, who presided, made an able and thoughtful address on education, in reply to Mayor Sumner's address of welcome to the teachers. President Harrison, of the N. B. University, in a strong and earnest plea on behalf of that institution, successfully replied to the attacks made recently upon it. President Inch, of Mt. Allison, impressed strongly upon teachers the nobility of their calling, and the high claims it had upon the people. Other addresses were given by Dr. Bailey, Mrs. MacFarland, Mr. Robinson, chairman of the Moncton Board of School Trustees, and Hon. D. L. Hanington.

Nearly all the work of the Institute that was laid down in the programme was accomplished in one day. Some excellent papers were read, and the discussions following them were suggestive and pointed. We are sorry that brief space compels us to give only the mere outline of the proceedings that is found in another column. To carry out such a programme in so short a time required tact and judgment on the part of the presiding officer, and brevity and good sense in those who read papers and debated questions. Both requisites were not lacking, and the result was one of the most successful institutes ever held in the province. There was much in the addresses that teachers could carry away with them and think over. Without enumerating those fully, it may be said the paper of Inspector Bridges, followed by the address of Principal Cox, on the cultivation of patriotism in schools, although delivered at a late hour in the proceedings of the institute, were heard with a fixed attention, and received at the close such a round of applause that there was no doubt but a responsive chord was touched in the popular heart. These two companion addresses should be published in full. They are of interest to Canadians everywhere.

MEDICAL MATRICULATION.

We have on a previous occasion referred to the raising of the standard of the Preliminary Law Examination and its adjustment to the public school course prescribed by law. We are sorry not to be able to say so much for the Medical Matriculation Examination. There is no reason in the world why a medical student in Nova Scotia should not complete the High School Course before he enters on his medical studies. As it is, a boy who has not the scholarly qualifications of a second class teacher, can enter the profession. In the olden time, when there were no facilities for obtaining an education, and when the profession was not crowded, there might be an excuse for it. There is none now; even should Yankee or European Medical Colleges still continue the practice. If they come to our provinces, let them first show their ability to pass our Matriculation Standard before registration. A boy who cannot master the mysteries of our High School Course at a reasonable age is not old enough to enter upon a profession of such transcendent mystery and responsibility as that of medicine.

HELIGOLAND, Etc

Heligoland, it appears, is no longer to be part of the British Empire. In 1807, Helig Land (Holy Land) was captured from Denmark. The rock itself which is fast wearing away, together with Sandy Island formed an area of about three quarters of a square mile, with a population of 2,000 Frisians. About 15,000 Germans and others visit it annually during the bathing season. It is only twenty-five miles from the mouth of the Elbe. In return the Empire is enlarged by the virtual admission of Zanzibar, distant twenty-five miles from the West coast of Africa, with an area of 614 square miles of extraordinary fertility having

a population of 200,000, a capital with a population 80,000. The annual trade of the Island is represented by $4,000,000 of imports, and $6,000,000 of exports. But in addition nearly the whole African coast north of Zanzibar to the Gulf of Aden has come virtually into the Empire, which on the whole is increased by about twice the area of the German Empire itself. Mutual concessions between the British and Germans have been made in Central Africa. The Portuguese territory is co-terminous with much of the German boundary. It remains to be seen if after some further experience the Portuguese will find the Germans more considerate neighbors than the long suffering Britons whom they are now so angry with. Our maps must be altered.

The Halifax Academy closed on June 27th, with a musical and literary programme in five languages: English, Latin, Greek, French and German. The large convocation hall was packed with about eight hundred people. The Hon. J. W. Longley, attorney general, Robert Taylor, Esq., chairman of school commissioners, Judge Motton, Rev. D. M. Gordon and Rev. President Forrest, who were present on the platform, highly eulogised the institution. The chairman of the school board was also congratulated on the rapid improvement in all grades of the public schools in the city under the present supervisor.

The musical and other excellencies of the entertainment were specially due to the genius and energy of Miss Mackintosh, of the academic staff.

Mr. W. F. Ganong, instructor in botany at Harvard, will conduct Dr. Goodale's class next year while the latter is absent in Europe.

The indications are that the attendance at the summer school, to meet at Parrsboro on the 21st inst., will be greater than ever before.

Plant Study in July.

Among the plants that should be looked for in July are the two Sundews—*Drosera rotundifolia* and *D. intermedia*, var. *Americana*. Both are found in damp soil, by the way side, or in sphagnous swamps. Both have rosettes of leaves, beset with small reddish spines, which are tipped with a little drop of a clear, glutinous fluid which glistens in the sunlight like dew—hence the common name. This rosette of leaves as it lies open on the ground, with its glistening points, is a trap for unwary small insects. They alight upon the leaves and if they are weak and small—like mosquitoes and black flies, for instance—they fail to release themselves in spite of all their efforts. The bristles begin to enfold them, and the leaf after a few hours bends over, entombing the unfortunate insect. It is interesting to watch this process. Take up a plant with plenty of earth attached, place it in a saucer in the window, and tempt its appetite by a mosquito, or if you are too humane to make a living sacrifice, take a small piece of raw beef. Watch results. The process by which these insectivorous plants—for so they are called on account of their habits—retain and digest their food is an interesting one to watch, lasting several days.

The most common—the round-leaved sundew—is found everywhere in New Brunswick and Nova Scotia, the other form with longer spatulate leaves is less common but should be looked for. Both send up in July and August from the centre of the leaves a scape bearing a one-sided raceme of flowers.

The sphagnous swamps in July and August will furnish some of the rarest and most beautiful orchids to be found in our country. These swamps "crave wary walking," too, but with a strong pair of boots, and by avoiding the softer and more yielding places, one can get along very safely and comfortably. The Pitcher-plant (*Sarracenia purpurea*), with its purple, nodding flowers, on long scapes, with its circle of hollow, pitcher-like leaves spreading from the root, is a conspicuous object in July, in bogs and on the wet borders of lakes. This is another catcher of unwary insects. Look at the inner face of the rounded, arching hood at the top of the leaf, and there will be seen a beautifully variegated surface, with *stiff* bristles pointing downward. Then look down into the curious pitchers, half filled with water and drowned insects. Very little observation will show the road to this pit, from which, apparently, no insect traveller returns. The inner surface of the hood apparently exudes a sweetish substance, sipping which the insect unconsciously and pleasantly travels on, and when he suddenly sees the pit before him, the stiff hairs, pointing downward, prevent return. (These peat bogs and sphagnous swamps give us material for moral lessons, too, do they not?) Now, for what purpose is this wholesale slaughter of insects? Is it to provide the plant with nourishment? That is possible, but not probable. The store of food in these pitchers, perhaps tempt larger insects to drop their eggs in them, so that when hatched there may be abundance of food for the brood. The writer has seen pupa cases in the putrid remains of old leaves. The subject needs further investigation. Let us examine more fully this summer. Do not fail to examine carefully the wonderful structure of the flower, as well as the leaves of the pitcher-plant

Some beautiful orchids will be found in sphagnous swamps, in July. You will be sure to notice two, which are common, and very beautiful: *Arethusa bulbosa* has a single, rose-purple flower, on the top of a sheathed scape, which rises from a solid bulb buried in the sphagnous moss. *Calopogon pulchellus* also rises from a solid bulb buried in the moss, has a grass-like leaf, and bears two or more pink purple flowers. The white fringed orchis may also be found in swamps, with other handsome orchids. Remember that July and August are the months for orchids—our most beautiful and showy plants. Many are rare as well as beautiful. The showy Lady's Slipper—*Cypripedium spectabile*—will give you such pleasure that the remembrance will last for a life time. Look for it in cedar swamps.

Good teachers must be left free to work out the required ends in their own way. Freedom and responsibility in the teacher are a cardinal element of the new educarion.—*Supt. Geo. A. Littlefield.*

FERNDALE NOTES.

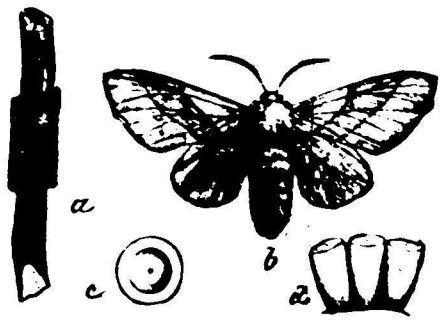
Caterpillars on the Rampage

Cold news for me,
Trees are my blossoms blasted in the bud,
And caterpillars eat my leaves away
—*H* [illegible]

LEPIDOPTERA.

1. Forest Tent Caterpillar.

One or other of the below mentioned [illegible] caterpillars have been troublesome in orchards about this season of the year, have defoliated many square miles of forest occasionally, and in their migration across railway tracks have often stopped trains on up grades on account of the grease like effect of their smashed bodies on the rails. We give first the species which we have generally observed in northern Nova Scotia [illegible] the Forest Tent Caterpillar.



a the Moth [illegible] Eggs, and b a ring about a small twig of a tree in the fall [illegible] and a view of the Egg magnified: d side view of these Eggs magnified.

Larva or Caterpillar of the same.

Life History:—Eggs between 200 and 300 in a firm ring around a small twig. In May the eggs hatch out and the larvæ feed on the young leaves. In a month and a half they are full grown, about an inch and a half in length, or more, of a pale blueish color, thickly spattered with black. Ten or eleven oval white spots form a row along its back. In the next species there is a continuous line of white instead. Pale yellow broken lines, with gray, are found on its sides. The hair is fox colored, mixed with coarser whitish hairs. It then spins a cocoon, whitish yellow in color. In about three weeks, or in July, the perfect moth comes out ready to deposit its eggs again. There are several insect enemies of this species: a tachina fly, an ichneumon fly or two, some large beetles and a fungoid growth. The best preventative is a close search for and destruction of the small rings of eggs in winter or early spring.

2. American Tent Caterpillar.

Clisiocampa Americana, the American Tent Caterpillar, has a very similar life history.

This species differs from the other in the moth stage, by being of a redder brown, the two wing bands being whitish, instead of a dark brown, the space between the bands being also paler than in the other. The ring of eggs is more spindle shaped, instead of being cylindrical. The eggs are also more conical than cylindrical as in the other species. The larva

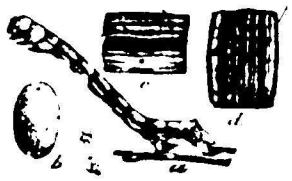
a and [illegible] Larvæ. [illegible] Ring of Eggs. d Cocoon.

has a white, continuous line along the back, not a row of oval or diamond shaped white spots.

3. The Spring Canker Worm.

Here we give a cut representing the different phases and parts of *Anisopteryx* [illegible] (the Spring Canker Worm).

Male Moth [illegible]. Female [illegible] wingless with its Egg Placer magnified at *c*. A segment of the body is magnified at *d*, and shows two rows of [illegible] oval spines on it. A portion of the antenna is shown magnified at *e*.



Larva at *a*. Eggs at *b* some magnified. Side of a segment of the larva magnified at *c*. Back of segment magnified at *d*.

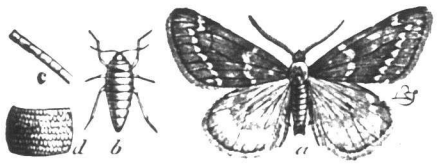
Life History.—The eggs are generally laid in small masses, in crevices of the bark, by the wingless female, which has to walk up the trunk of the tree from the ground, where it passed its pupa state. The young caterpillar is of a dark olive green, or brown, with a black shining head, and a black plate on the next segment. They are variable in the color of the bands and mottlings when older. It is hatched in time for the young leaf in May. By the end of June they are an inch long, and if numerous, have destroyed much foliage. The caterpillars, having no feet under the middle of their bodies, move by a looping motion, and are therefore called "loopers," "yard sticks," "measuring" or "geometrid" caterpillars. They

next fall from the branch to the earth by means of a silk spider web-like thread, go from two to six inches into the soil, spin a cocoon, change to the pupa, and come out as perfect moths with the first warmth of spring. The male is winged. The wingless female can deposit no eggs on the tree if a band of paper and tar, or other obstruction, be placed around the stem near the ground to prevent its ascending.

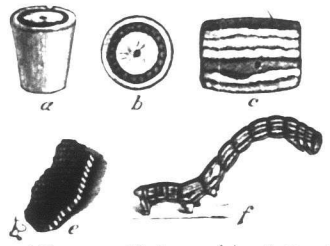
4. The Fall Canker Worm.

Anisopteryx vernata (the Fall Canker Worm), has a similar appearance and history. The principal difference being its habit of emerging from the pupa state in the fall, when the female deposits its eggs on the trees, all ready for the influence of the spring sun.

The difference between the species is most readily shown by a comparison of the following cuts with the former ones.



Male Moth, *a*. Female, *b*. Portion of antenna magnified, *c*. Segment of body magnified, *d*.



Side and end view of Egg magnified, *a* and *b*. Segment of body magnified, *c*. A sheet layer of eggs, *e*. The larva, *f*.

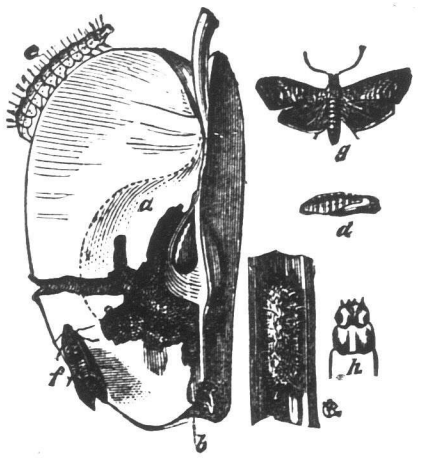
Prevention: Bands covered with sticky tar around base of trunk, tar filling crevices of bark so as to admit of the passage up of neither the female nor minute lately hatched caterpillars from below. If they are already in possession, spray the tree in May when the buds commence to open (and the eggs to hatch), with paris green (one ounce to fifteen gallons of water). Repeat the spraying as the petals fall from the blossoms in June.

5. The Codling Moth.

Carpocapsa pomonella (the Codling Moth) is another destroyer. Here is shown a specimen of its work and a sketch of its stages. It has destroyed $10,000,000 worth of fruit anually in America. Came across from Europe about 90 years ago.

Life History: Moth, with fore wings streaked with grey and brown, and a brownish spot and streaks of gilding on the inner hind portion. Hind wings and body are of a satin yellowish brown. Just as the apple-blossom opens the female deposits a tiny yellow egg right in its centre. One moth may treat fifty blossoms in this manner in a week or two. In one week the egg is hatched, and the larva begins to dig its way into the core of the apple, where it stays for about a month. It then eats its way out, swings itself to the ground by means of a fine thread of silk, or perhaps crawls down the trunk. It then selects a crevice or shelter, spins a minute cocoon; in a fortnight the moth comes out and proceeds to deposit the second crop of eggs. Many of the second brood do not leave the apples until after they are barrelled, where their cocoons may in a short time be found in crevices and under the hoops.

Prevention: Spray the tree with a well stirred paris green mixture of one ounce of the poison to fifteen gallons of water, just as the blossom is falling. The eggs are just then being



The Moth at *f* and *g*. The Larva at *e*. Its head magnified at *h*. The Cocoon at *i*. The Chrysalis at *d*; and its work at *a*.

hatched and the smallest particle of the poison eaten by the larva is death to it. Put bands of cloth around the tree for the larvæ to place their cocoons under. Take the bands off weekly and destroy the cocoons.

HYMENOPTERA.

6. The Currant Worm.

Nematus ventricosus (the imported Currant Worm) is very destructive to our currants and gooseberries. It came from Europe in 1858. It is a four-winged fly about as big as a house fly (Our cuts, we regret, did not arrive in time to go to press.) The body of the fly is black, with a few dull yellow spots above, the under side of the abdomen being yellowish, and the legs bright yellow. The veins of the wings are blackish. The female is yellower and larger than the male. They are active only during the hot portion of the day. The female deposits the eggs on the under veins of the leaves in rows only 1-30 of an inch in length. They afterwards increase in size, and in a week and a half are hatched and appear about 1-12 of an inch in length. They soon become about ½ of an inch in length, and of a green color, with black dots. They then form brown papery cocoons on or under ground, or under leaves, from which they emerge in early July as the perfect four-winged fly, ready to repeat another cycle of insect life This caterpillar must not be confounded with the currant span-worm, which is known by its "looping," and is the larva of a geometrid moth.

7. The Larch Saw Fly.

Nematus erichsonii (the Larch Saw Fly) is the newest immigrant into our province. It is very much like the last, as would be expected from its belonging to the very same genus *nematus*. In 1880 it was noticed first in the vicinity of Boston; in 1882 in Quebec, then in Maine and New Brunswick; in 1888 in western Nova Scotia; in 1889 it made further progress westward; and in the September Review of last year, its arrival in the larch forests of central Nova Scotia was predicted. Its presence will be first announced by defoliated larches, which will look as bare as if their leaves were scorched off by fire. In the absence of our cut, we can only refer our readers to a four-winged fly of about the size of a small house fly. The larvæ are not unlike those last discussed,

and the cocoon can be [illegible] worms, with some [illegible]

DIPTERA.

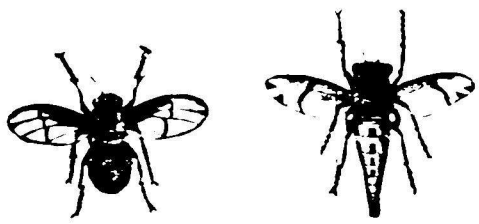
8. THE OX GAD FLY

Here we have a magnified [illegible] the Ox Gad Fly (*Hypoderma bovis*), the Ox Gad Fly

It is found tormenting the cattle, from June to September, in endeavoring to place its eggs on the hairs of the cattle. When the egg is placed, it is soon hatched, the maggot burrows under the skin, grows large during the winter, making lumps under the hide. By June or July it enlarges the hole in the hide, tumbles out to the ground, becomes a pupa in a hard, black covering, and in a month becomes a fly, leaving the cattle as did its parent.

9. THE HORSE BREEZE FLY.

Gyrostopis the Horse Breeze Fly [illegible] of the last. Here are figured the male and female



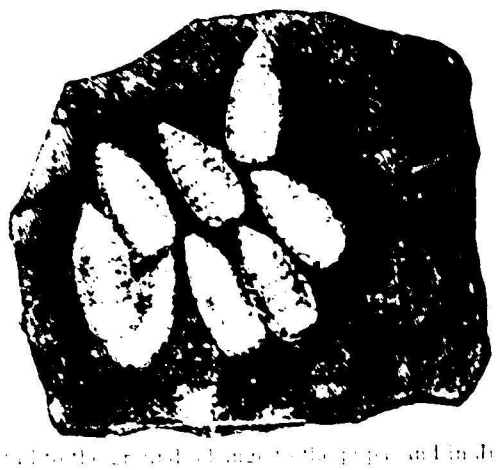
Male Female

The female attempts to place its eggs on the hairs of the

Eggs of the Horse Breeze Fly [illegible]

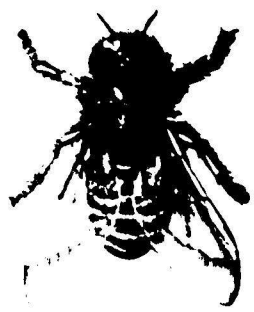
horse. On touching the hair the natural cement hardens rapidly. It is placed by the insect's instinct where the horse is most likely to scrape with his teeth. The egg [illegible] in the horse's mouth, is swallowed, and when hatched the larva clings to the stomach as shown on the portion of the same

[illegible] through the



[illegible] in June or

10. THE SHEEP BOT FLY



[illegible] is caused by [illegible] above the [illegible] in June and [illegible] in SA[illegible]

It appears from the decision of Judge Bain that the Legislature of Manitoba was not acting *ultra vires* in abolishing separate schools in that Province.

In the report of the Public Schools of Newfoundland under Roman Catholic Boards for the last year, the amendments to the Education Act passed at the last session of the Legislature are summed up as follows:

"1. Increasing the amounts of the votes, under sections four and seven, from $3,000 00 and $2,607 00, respectively, to $5,000,00 each, [illegible] the year 1890, inclusive;" (2) determining the date of expiry for certificates of grade granted previous to the passing of the Education Act of 1887, to be five years from May of that year; (3) imposing upon teachers certain duties in relation to the observance of an Arbor Day; (4) making some important alterations in the arrangements connected with the "Newfoundland Jubilee Scholarship" examinations. These matters will be referred to somewhat more in detail under the appropriate headings.

The Halifax Ladies' College closed on the 24th. Over 200 were in attendance during the year, of which 50 per cent were boarders.

Astronomical Notes.

Conjunction of Venus and Saturn.

Look out for the conjunction of Venus and Saturn on July 17th. Also for the cholera, earthquakes, and other things that are to follow.

Perhaps these things won't follow. Let us hope they won't. Perhaps the sky won't be clear. Let us hope it will.

About the conjunction itself there is no perhaps. That's where astronomy has the advantage over meteorology and astrology.

A "conjunction" is defined by Newcomb as "the nearest apparent approach of two heavenly bodies which seem to pass each other in their course. They are commonly considered as in conjunction when they have the same longitude." Those who need a completer or preciser definition are usually able to make one for themselves.

A conjunction of Venus and Saturn is not a very rare phenomenon. It is only ten months since we had the last one, and we shall have the next one in fourteen months more. But they are not all equally interesting to the star-gazer. In order to see the one last year you had to stay up all night, or turn out before sunrise. The one next year won't be visible at all. This year we can look at it in the afternoon or evening. And this year it will be better worth looking at than usual. Last year the nearest approach of the two planets was over half a degree. Next year it will be about the same. But this year they will approach nearer than a tenth of a degree—this nearest approach however will happen at our mid-day.

The conjunction will take place near Regulus, the the star at the end of the handle of the Sickle. So did the conjunction of September last. During the ten months between then and now, Venus has been all round the zodiac, while Saturn has advanced only three degrees beyond where he was then. This three degrees is not all the travelling Saturn has done in the meantime. For four months and a half he was engaged in that retrograding business that we have been watching Mars at lately, and which is such a puzzling thing to the young star-gazer. It takes him three months more to make up the ground which he lost while backing, and thus he has only four and a half months left out of the twelve in which to make headway on his journey among the stars. And as he is a very slow old chap at the best, he does very little in that time. We have had him near Regulus for several months past. Now he is moving off to the east, and he won't get back to Regulus again until about 1920.

Venus has had no backing to do since she passed Regulus in September last. If she had she would not have got round so soon again. But her turn is coming in the fall. Then she will have to double and twist and turn and zigzag like the rest of them, and, instead of coming round to Regulus in less than ten months as she has done this time, it will take her more than thirteen months to do so.

No one needs to be told where to look for Venus in the evening. But it is not always necessary to wait until evening in order to see her. For more than three months back she has been bright enough to be seen at mid-day with the naked eye. During this time she has been growing brighter, and will so continue until the end of October. And so, on any clear day between now and the middle of November, there will be but little difficulty in picking her up in daylight. The little difficulty will be in finding out where to look for her. This is easiest done when she is on the meridian, that is when she is due south. Your almanac should tell you at what time of the afternoon this happens, and also, what the declination of Venus is. From the declination and your latitude you can find how high she will be when on the meridian. Then, if you know where your meridian is, go out at the given time, and look up at the proper altitude, or as near there as you can guess. Having once found her, note her position from your standpoint with respect to a chimney, or a steeple, or something. Then, next day about the same time you will find her about the same place, and so on from day to day, as long as she is visible. Seeing Venus with the naked eye in the day-time is not at all so rare a thing, and by no means so difficult a thing, as is generally supposed.

But you must not expect to be able to see Saturn in day-light with the naked eye. There may be eyes that can perform this feat, but they must be unusually sharp ones—that is, to see Saturn as he is at present. The afternoon of the day of conjunction (July 17), or of a day or two before or after, will be a good time to try him as a test, either of your eyes or your glass. He will then be near Venus (for how near, and in which direction see next paragraph) and having found her you will know just where to look for him. If you can't manage to see him in the afternoon you might find some amusement in trying how early in the evening you can pick him out.

About the time of their conjunction Venus is gaining on Saturn a little more than a degree a day. On the evening of July 12th, the distance between them is 5°, Saturn being that far to the left of Venus. Next evening the distance is about 4°, and the evening after it is less than 3°. At 8 p. m., (60° time) on the 15th, they will be $1\frac{3}{4}$° apart. At the same hour on the 16th, there will only be 42′ between them.

Saturn being still on the east side of Venus. The nearest approach will occur at noon (60° time) on the 17th. Saturn will then be 5′ less than a tenth of a degree north of Venus. Both planets at this time will be two and one half hours east of the meridian in longitude 60°, and three hours east of it in longitude 68°.

But that is hardly definite enough to enable any one to find them. Well, try the following plan. The first thing is to find out whether your glass will show Saturn in daylight. On the 16th, Venus will be on the meridian, and about 60° high, at 2.36 mean time, which will be 3 (60° time) to places in longitude 60°. Even if you have only a rough idea of the location of your meridian, and only a rough idea of an altitude of 60°, your eye ought to be able to find Venus with a very little seeking. Find her, and then try with your glass for Saturn. At that time he will be nearly a degree to the left of Venus—a degree is twice the breadth of the full moon. If your glass shows Saturn, then wait until evening. Go out between 9 and 9.30, and find Gamma Aquilæ. It is the small star above Altair. About nine you will find Altair quite high up in the south-east. It is a first magnitude star, and is easily known by its having a small star on each side of it, the one above nearer and brighter than the one below. The one above is Gamma Aquilæ. Note the position of this star very carefully at 9.30 (60° time), or still better, the position at that time of a point about as far above Gamma as it is above Altair. Very nearly in that same spot on your sky, you will find Venus at noon (60° time), on the 17th, when she and Saturn are closest together. But the glass that showed Saturn on the afternoon of the 16th, may perhaps fail to show him when so close to Venus. However there is no harm in trying.

By the evening of the 17th, the planets will be a third of a degree apart, and now Saturn will be to the right of Venus. Next evening the distance between them will 1½°, and will be increased by rather more than a degree each evening after. By the evening of August 1st, Venus will have left Saturn 16° behind.

When watching a close conjunction such as this is, one naturally gets a-wondering if the planets will hit and what would happen if they did so. What would happen would probably be something very unpleasant for the inhabitants of the planets—if they have inhabitants. But there is little chance of a collision in the present case. It is true that at the moment of nearest approach there is little more than five minutes of arc between Venus and Saturn in the sky—as we see them. And it is true that this distance is no more than the length of one inch as seen from a distance of about eighteen yards. But they seem so close only because we happen to see them nearly in the same line. If we could change our point of view—if for instance we could at the time of conjunction jump from here to the sun and look at Saturn and Venus from there, we would see them separated by 5°. Or suppose we could get across the hundred million miles that separate us at present from Venus, and, standing on the side of Venus nearest to Saturn, should try to toss a biscuit over on to Saturn as we pass him. As the two will look from here on the 17th, this will seem quite an easy feat—the tossing of a biscuit from one to the other I mean, not the getting from here to Venus. But to get from one to the other, that biscuit would have to be tossed eight times as far as from here to Venus, for at the time of conjunction Venus will be 100 million miles from here, and Saturn will be 800 million miles beyond Venus. So there is not much chance of a collision between them, however close the shave may seem to us.

A. CAMERON.

P. S.—Belcher's and McMillan's Almanacs are at it again. Speaking of July, they say "by the end of the month Jupiter is hidden in the sun's rays." That brightest star in the sout-east in the evening is Jupiter. Watch him at the end of the month.

A. C.

Educational Notes.

The teachers of Amherst have begun work in botany, and hope to have the required number of specimens ere the Summer School begins.

A late Friday afternoon, Grade VIII. had a good programme, consisting of readings, recitations, and singing, accompanied by the cornet, violin, piccolo, and whistling. This was no show for outsiders, but in connection with the regular work.

Grade VII. did not wish the other grade to win all the laurels, so they have hired a piano, and the following afternoon they rendered a good programme.

The Friday afternoon promises to supply a missing link in the education of the children. In this way, they are being trained to find pleasure in literary and musical entertainment, and not only that, but they are led to produce it themselves. Can not the teacher by judicious management thus train our children, so that the greatest pleasure of our future citizens will be musical and literary entertainment? The teachers report that it has a beneficial effect on the regular work. Will it not be training in temperance?

AMHERST.

For the REVIEW.]

On Collecting, Preserving and Studying Marine Invertebrate Animals.

BY W. F. GANONG.

*(Continued from May number.)**

It will interest all of our readers to know that the naturalist's dredge, now so well known and important an implement of scientific research, was systematically used for the first time in America, in our own waters. Dr. William Stimpson must enjoy the distinction of having introduced it. In the summer of 1852 he spent three months in dredging about the Island of Grand Manan, and as a result gave us one of the most important works that has yet appeared on the natural history of Acadia.† Its form has undergone but little modification since that time.

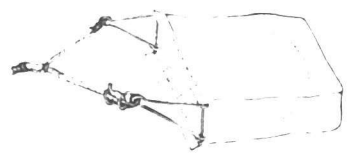


FIG. 3. THE DREDGE.‡

The figure presented herewith shows so well its form that we need hardly add any details except as to size and materials. The frame is of iron and can be made by any blacksmith. It is from eighteen inches to two feet in length, by six inches in breadth, the former length being the best for ordinary work. The top and bottom pieces are alike, of thin iron bars two inches broad, which are beaten to an edge along one side and bored along the other with a row of holes for the attachment of the net. The end pieces are round, three-fourths of an inch in diameter, and so welded to the top and bottom pieces that the latter diverge somewhat, making the scraping edge an inch wider apart than the edges to which the net is fastened. Double bars, a foot long, run forward for the attachment of the rope, as shown in the figure, and these are so made as to fold within the frame for convenience in transportation. The net should be of the finest meshed (hand-made preferably) that it is possible to buy, and if the meshes are so large as to allow a lead pencil to be pushed through without forcing, they should be interwoven with waterproof twine to make them smaller. The net is so sewn together as to form a bag about two feet deep; and outside of it should be placed a bag of strongest canvas, which is to prevent the net from being caught and torn on the rocks. The canvas bag should be six to twelve inches longer than the net and have no bottom in order that the water may flow freely through, and net and canvas should be securely sewn to the frame with copper wire. In the figure the dotted line represents the outlines of the net, the canvas being outside. This is the complete dredge, and when made of the best materials it should not cost more than the sum one would pay for a week's board in a modest country house by the seaside. But if one wishes to be—or rather, if one must be economical, both net and bag can be made of the coarse canvas of which potato sacks are made, and they will give good results, if used intelligently. The material of which his heart and head are made is of more importance to the dredger than the exact material of his dredge.

Abundant and rich in life as the shore is in places, still more does it abound and thrive below the reach of the lowest tide. Indeed, in favorable places, where level gravel bottoms are swept by gentle currents of purest water, the sea-bottom is probably paved with living animals almost as thickly set together as the grass and flowers of a meadow. And there is every variation found in this condition up to the comparative barrenness of muddy bottoms in impure water, and the total barrenness of rocky channels swept clean by powerful currents. It is therefore a needful preliminary to profitable dredging to obtain some knowledge of the bottoms and currents in a region, information which can be supplied in part by the Admiralty chart, and in part by the local fishermen. One can learn, after a short experience, what regions are likely to yield a good harvest and what but empty dredges. Undoubtedly the best dredging-grounds in Acadia are to be found in Passamaquoddy Bay, L'Etang Harbor, about Grand Manan, and particularly in Eastport Harbor. The latter as a collecting-ground is rivalled by but one other locality on the Atlantic coast of America, and is exceeded by none.

The dredge can if needful be worked from a row-boat, but not profitably. It is much better and will pay in the end, to hire a good sail-boat with a competent man to manage it; and the latter is very important. He can usually supply an abundance of rope for the dredge, and will usually take the greatest interest in its successful working. Having reached the proper dredging ground towards low tide on a day when there is but a light breeze, one prepares to let go the dredge by attaching one end of the rope to one of its bars, and tying the second bar to the first by a piece of stout twine. The use of this device will become clear if the dredge catches on a rocky ledge

* Owing to a mistake the MS. of this article did not reach the editors in time for insertion in the June number.

† Synopsis of the Marine Invertebrata of Grand Manan. Published by the Smithsonian Institution, Washington, 1851.

‡ This figure has been in part copied from that in Emerton's "Life on the Seashore."

the twine will break and the instrument can be drawn out sideways. Then the boat is brought up in the wind or "luff her up," the boatman will say, and the dredge is let go, the dredger being careful not to allow the bag or net to become entangled in the frame. Some dredgers place a weight on the rope several feet in front of the dredge in order to keep it near the bottom, and window-weights are excellent for this, though stones will do.

It is impossible to dredge against the tide; one must dredge with it, or across it. Enough rope must be allowed, when dredging, to make an angle of from 45 to 30° with the surface, according to the nature of the bottom. On a smooth and hard bottom the latter angle can be safely used, but on soft mud much less rope must be allowed as the dredge has a tendency to bury itself and anchor the boat. It is however, a matter which is quickly learned by experience, and a day's mistakes and successes will teach the reader more than I could in writing if the editors of the REVIEW were to give up to me this entire number for the purpose, something they are far too wise to do. One very quickly learns to judge the character of the bottom from the feeling of the dredge rope, which by the way, the dredger ought always to hold in his hand. The tight rope acts as a sort of a telephone wire and communicates to him a pleasant smooth grating when the dredge is on gravel, an irregular not jerky pulling when on mud, and abrupt jerks and leaps when amongst ledges and boulders. The other end of the dredge rope should not be fastened to the boat but to a wooden buoy so that if a squall comes up, or the dredge becomes fast on the bottom at a time when wind or tide are not favorable to releasing it by tacking back over it, the whole may be thrown overboard, and picked up at a more convenient time. Ordinarily, the time the dredge is left down depends upon the character of the bottom, and the way it is working, but in general it is profitable to draw it up every fifteen or twenty minutes. Pails and tubs full of salt water are to be ready for its contents. Experienced dredgers use a set of sieves for sifting out its contents, but these are not needed at first.

Then with what eagerness we watch for its appearance as we and our boatmen draw it slowly to the surface, and how our hearts bound when it comes over the side half-filled with the clean salt-water life. There is a perennial cleanness, brightness, and suggestion of healthiness about salt-water animals from clear water. In such places we may find bright orange and pink star-fishes, five, ten, or twelve-rayed Ophiurans of brilliant and variable colors, or Asterophytons with their thousand slender arms. There may be those exquisitely colored Asteridians which the fishermen call Sea-peaches, and the naturalists Cynthias; Sponges, Sea-anemones of brighter hues than their namesakes of the land; Spider-crabs, and Hermit-crabs in borrowed shells, Molluscs, with bivalve shells of divers form and texture, and Gasteropods with coiled and sculptured shells, and some with no shells at all; great colonies of Hydroids, with branching stems, feather-like, tree-like, and spiral, but always perfect in their symmetry; colonies of Bryozoa encrusting the rocks; writhing worms and their aristocratic relatives the Brachiopods, dozens upon dozens of forms of life of all sizes, shapes and colors, imitating almost every known object on land, or in the skies, are brought from the bottom of the sea by the naturalist's dredge. It is useless to attempt to describe it; the healthy delights of dredging must be experienced to be understood, and once experienced, one loves them for ever more.

There is yet a fourth method of collecting which should be added to these. Forbes, in his inimitable work, "History of British Starfishes," thus indicates it:—

"The stomachs of fishes are often zoological treasuries. The haddock is a great conchologist. In his travels through the countries of the mermaids, he picks up many curiosities in the shell way. Not a few rare species have been discovered by him; and the ungrateful zoologist too frequently describes novelties without an illusion to the original discoverer. . . . . Like the haddock, the cod also is a great naturalist; and he, too, carries his devotion to our dear science so far as occasionally to die for its sake with a new species in his stomach, probably with a view to its being described and figured by some competent authority."

The best way to get these often abundant treasures from their efficient but hapless collectors, is to enlist the services of the fishermen and ask them to save the stomachs. The work of opening and searching these is not nearly so disagreeable as would be imagined, and all conchologists must sooner or later come to it. There will be many disappointments, but also there will fall to the searcher's lot many rare shells and echinoderms, particularly of small forms, which the dredge would never bring up. The method has the advantage also of being inexpensive, and it can be followed at all seasons.

So much for collecting sea-animals. If we may tax the patience of the readers of the REVIEW a little longer, we shall in the next number endeavor to tell them how to preserve their spoils, and how profitably to study and use them.

Harvard University,
Cambridge, Mass., May 2.

For the Review.]

Notes for Teaching Music by the Tonic Sol-Fa Notation.

Seventh Paper.

In the first step we dealt with the notes of the DOH chord, in the second with the notes of the SOH chord, and in the third with the notes of the FAH chord. On looking at the modulator we see that these chords have two tones between the first and third, which is called a major third, and so these are called major chords. The other chords, RAY, ME, LAH and TE, have one-and-a-half tones between their first and third, or three semi-tones. This is called a minor third, and these chords are called minor chords. The major chords sound smoother and sweeter than the minor chords. It is well to let the class feel this, if the class can be got to sound the notes of a major, and then of a minor chord, in sections, one section listening, the other singing and giving the chord.

Fourth Step.

We may now go on to the fourth step, which takes up *Transition*, that is, passing over in the course of a piece of music from one key to another, and then generally returning again to the original key. The simplest form of transition is when the bridge note in which we pass from the original key to the new key is the key note or the d of the new key. The mechanical part of this form of transition is gone through when we pitch a tune using the scale of C as the standard scale. Thus, for key G we strike C^1 and sing d^1 s, and call s doh, then sing the chord of the key of G, doh, me, soh, me, doh, soh_1, doh. For key F we go to fah, call it doh; for key E we go to me, and call it doh, etc. Remember this and it will make the first part of the lesson on transition simple. Give the class C^1, and get them to pitch and give the chord of the keys G, F, E and A. Keys D and B may be left out meantime, as it is slightly more difficult to pitch them. Note that the difficulty in transition is the difficulty of *thinking*; think carefully what you have to do and most probably you will do it correctly.

Teach transition always from the modulator and you will teach it simply and naturally.

The commonest and simplest form of transition is that corresponding to the passing from key C to key G and back to key C.

The change from key G to key D, from key A to key E, from key D to key A, from key E to key B, and from key B to key F sharp, are similar to that from key C to key G.

Let the teacher point on the modulator such an exercise as the following:

Key C.

d m f s d^1 t l s

Leave the modulator and tell the class to think Doh, the firm, bold note to that sound, and sing d; then go to the modulator and point on the right hand column d m r d t_1 d, and the class will sing these notes in the key of G. The class has mastered the first part of transition. Let the class do this several times. Then try another similar exercise, changing s into d. The return step may be mastered also easily. After singing the d leave the modulator, tell the class to think and sing Soh to this sound, and point now in the middle column s m r d t_1 d. After this has been done easily with several similar exercises, let the teacher put the music on the black board, explain that 'd is the bridge note, tell them just to sing shortly soh and doh prolonged, to establish the key in the pupils' ears.

DOH	f
TE	m
LAH	r
SOH	d
fe	t_1
FAH	l_1
ME	l_1
RAY	s_1
DOH	l_1
t_1	m_1
l_1	r_1
s_1	d_1

The exercise will appear thus:

Key C.

d m	f :s
d^1 :t	l :s

Key G.

'd :m	r :d
t_1 :—	d :—

Key C.

'd :m	r :d
t_1 :—	d :— ‖

The next step will be to write the music in the other form in which it is often found. The one given is the better method.

Below the notes underlined let the teacher write the notes

s :t	l :s
f e :—	s_1 :—

and ask the pupils to sing the exercise several times each way.

J. Anderson.

The teacher must know how to enter into the hidden recesses of the youthful mind, and from that point work outward and upward. The pupil is like a treasure in the sea, and the teacher like a diver who goes to the bottom to bring it up. If you do not descend and ascertain first exactly where the child's mind is, you will not bring him up where you are. The descent of the teacher is essential to the ascent of the pupil.

For the Review

The Kinder-Symphony Club

Anything with *kinder* attached falls pleasantly on my ear, so in spite of rain and a thunder storm I gladly availed myself of a kindly escort and attended the rehearsal of this interesting club, composed of children ranging from *four* years old. The larger number would be from eight to twelve. The *kinder-meister* was a lad of fifteen, who conducted with an interest in his work so absorbing as to rule out self-consciousness—the bane of art. When I entered they were in full swing on a symphony of Chawtska's, which, while adapted to a child's comprehension and executive ability, was correct and finished.

Now for the instruments composing this unique orchestra: eight violins were played by boys, and four by girls; the unpropitious weather probably accounted for the absence of the cello and bassoon; the trumpet of four notes in C, quite a small one, rang out its solo notes of invitation with vim and precision, and from time to time penetrated the waves of sound with its clear, upspringing tones. A toy flute, a tube of six inches long, each end covered with thin parchment, added a soft, rich bass, not unlike that of a good *stop diapason* in a pipe organ. All these were accompanied by bells, rattles, triangles and castanets, swung, shaken, and struck in rhythmic cadence by children too small or uninstructed to use more ambitious instruments, but not too young to enjoy, as *who's*, the music to which they intelligently brought their little share *con amore*. Two others, shall we call them instruments? in addition to the piano, were used: they were a "sleigh" and "whip," so called, the simplest contrivance possible. The "sleigh" consists of two pieces of wood, covered with stiff cartridge paper, the back of each furnished with a small wooden knob to hold it by. The effect produced by rubbing them together is like that of gay, dancing feet on a sanded floor, and was capital in the dance part of the symphony. The "whip" consists of two polished pieces of wood about 15 inches by 3, hinged securely at one end, each side having a brass handle in the middle, by which it is held. It is opened and shut more or less widely, and with varying rapidity, so as to adapt itself to the rhythmic progression of the music, which gains wonderfully by these appliances, so simple that any handy person could easily make them.

Three points struck the mind with peculiar force:

1. That while musical expression is confined to a small and privileged class, and restricted to a certain conventional routine, we shall never begin to understand its infinite richness and diversity. To know what music really is we must study with painstaking care the sounds, common and uncommon, of the world around us, and learn to eschew that vulgar fallacy which rejects the small and unpretentious. Of all the arts, painting alone, at present, takes the commonest materials—for what are the best pigments but dirt dug out of the earth—and glorifies them by appropriate use at the hand of genius.

2. That no art can attain its grandest development that does not rest on a basis simple and broad enough to be a medium of expression for the great mass of the common people.

Music has *sex*, and art, to be full-blossomed, must deal out its portion, in due season, to the weakest and smallest capacity. However high art may soar, the roots that nourish it must penetrate down into the humble earth and draw its sustenance from the most primitive elements.

3. That in the great world of musical art there is a place for the *tots* of *six*, and that without his feeble efforts, gaining strength and beauty by repeated attempts, art itself misses something which impairs its full expression and creates a sense of loss. But to avail ourselves of that free inventiveness which the child, once fairly started, will bring to music, we must condescend wisely and tenderly to their low estate, and adapt ourselves with humility to his comprehension. What treasures remain hidden in the unexplored field of childhood we have yet to learn. Suffice it to say that those who know most intimately child nature are those who respect it most profoundly.

When we looked into the kindly, earnest, German face of Mr. Trost we saw one reason for the success of this club in his patient assiduity. From Mrs. D. T. Ballard's fertile brain and loving heart sprung the idea of this "Kinder-Symphony Club." With womanly insight she believes in the child and its capabilities. Through her the comfortable hall in which they practice was swept and garnished for their occupation. The club gives a symphony concert next Friday, June 24th. It is to be hoped that a large and appreciative audience will reward the efforts of these small but clever performers. C.

The true value of a teacher is determined, not by what he knows, nor by his ability to impart what he knows, but by his ability to stimulate in others a desire to know.

The teacher whose mind shall not become a desert, must drink daily from the fountain of his calling. Forty eager pupils cannot quench their thirst for knowledge by looking at an empty vessel.

N. B. Educational Institute.

The twelfth annual session of the New Brunswick Educational Institute met at Moncton on Thursday, June 26th, at 2 p. m. Chief Superintendent Crocket occupied the chair. At the first session 177 teachers were enrolled as members. The following shows the number of representatives from the different counties: Westmorland, 76; St. John, 35; York, 14; Albert, 14; Northumberland, 12; Kings, 11; Charlotte, 6; Kent, 4; Carleton, 3; Gloucester, 1; Victoria, 1. Further enrolments of members, with trustees and others interested in educational work, swelled the number to over 200. The first afternoon was taken up with routine work. The secretary treasurer's report showed a balance of funds on hand from the past year of $28.92. A communication was read from the Chief Superintendent stating that the Board of Education declined to make any change in Regulation 233, making membership in a county institute a requirement of membership in the Provincial Institute. The committee on change of school terms reported that they had not been summoned to meet the Board of Education. The Chief Superintendent stated that owing to the difficulty of securing meetings of the Board during the year, no opportunity of calling the committee to meet the Board of Education had occurred. The committee was asked to continue its labors. A clause in the executive committee's report, that the election of officers take place at the first session was amended so that they may take place at the second regular session. A resolution, introduced by Superintendent Hayes, conveying the hearty sympathy of the Institute to Inspector Wetmore on account of his serious illness, was unanimously adopted.

The public meeting at the Opera House in the evening was largely attended and enthusiastic. Chief Superintendent Crocket presided. Mayor Sumner, on behalf of the city, extended a welcome to the visiting teachers; and to this the chairman made a suitable reply. Addresses on the various phases of educational work were delivered by President Harrison of the University of New Brunswick, President Inch of Mt. Allison, Dr. Bailey, Chairman Robinson of the Moncton School Trustees, Mrs. MacFarland of the W. C. T. U., and Hon D. L. Hanington. The Moncton Cornet Band, and a select choir under the leadership of Mr. Wetmore, furnished an excellent musical entertainment.

Second Day's Proceedings.

The second session of the Institute met at 9 o'clock, a. m., on Friday. On account of the unfavorable weather it was decided to abandon the excursion to Shediac. G. U. Hay, the New Brunswick editor of the Educational Review, advanced the claims of the organ upon the attention of teachers and trustees, and was followed by Principal Mullin of the normal school in complimentary references to its utility. While it lacked many important things in order that it could be made a paper for all classes of teachers, it is incumbent upon teachers to send literary contributions, criticisms, and in short all that would tend to make it a useful means for the dissemination of educational literature.

The report of the committee on changes in the constitution recommended that the constitution be so altered as to permit Teachers' Institutes, through a special committee, to offer suggestions to the Board of Education, respecting adaptability of text books and qualification and training of teachers, and that the Board of Education be asked to reconsider the decision that only members of county institutes be eligible for membership in the Provincial Institute. This was adopted, and the Chief Superintendent was asked to submit these recommendations to the Board of Education at its first meeting.

J. G. A. Belyea, Principal of the Shediac Grammar School, read a paper on the "Study of English in Advanced and High Schools."

He referred to the neglect of this study in the past, and held that such neglect arose from the mistaken idea that if the pupils knew how to speak English no further study was necessary or educative. It was also a mistake to think that English could best be studied by studying some other language. English required a scientific study and was capable of being thus dealt with, and nothing short of that would do.

The neglect of the study of English is seen in the lack of appreciation of the best class of literature and the mixing into the language of cant phrases, slang, vulgarity and profanity.

He advocated the study of the sentence first, and that sentence to be taken from the reading lesson. As the English is specially adapted to the processes of logical analysis, this exercise can be taken up first. The study of grammar should be taken up with a strong leaning to mercy, as the grammar is better fitted to a language of inflected forms, such as Latin, rather than the differently constructed English. The study of grammar throws no light on the meaning of words or sentences. Analysis does: and it requires the best thought and power of the pupil, and is thus very educative; and a pupil who is in the habit of using such methods has a decided advantage over one not so trained.

The study of etymology was strongly urged as being both interesting and educative, as well as throwing a strong light on the meaning of words. In the higher stages of the study of English the more formal examination and study of English should be taken up, and a careful analysis of the thought and style, and an examination of the history of the author of that portion of literature under consideration, would furnish a highly beneficial series of exercises.

The benefits of such study were clearly shown and the adoption of a text book for higher classes on the history of literature, with the biographical sketches of the principal authors was thought to be of advantage when used in connection with the study of the work of the author.

An interesting discussion followed, in which the following gentlemen took part: Messrs. Hay, Montgomery, McLean, Parlee, Belyea. The points made were that English composition and the reading of good English authors should be begun in the lower grades and carried on to the higher grades without interruption; and that the principles of grammar and analysis should be introduced gradually and without a text book until the higher grades are reached.

At the conclusion of the proceedings of the morning session the members were photographed from the front of the Methodist church, in the basement of which building the sessions of the Institute were held.

In the afternoon a resolution was adopted, moved by Philip Cox and seconded by John Montgomery, that such legislation should be asked for as would enable the Institute to elect annually one or more representatives to the senate of the University of New Brunswick.

A resolution in favor of the Educational Review moved by Charles J. Morrison and seconded by E. A. Pearson was also adopted as follows:

"That we, the members, convened in annual session of Provincial Institute, recognizing the necessity for such a

means for the propagation of educational principles, does express our appreciation of the energy and zeal of the editors and contributors, and urge upon the members of the Institute the advisability of giving to the REVIEW their hearty support and co-operation."

Mr. F. O. Sullivan, of St Stephen, in his paper on "A Scheme for Promoting Pupils in Graded Schools where there is no Local Superintendent, and, Should Advancement be Determined wholly by Written Examinations" said after discussing the several ways in which grading is done, that the young, ambitious and inexperienced teacher, as well as the older ones, want a fair, honest and satisfactory scheme for promoting pupils, a scheme that will be just to the pupil and fair to the teacher of the grading class, as well as the teacher into whose school the class is graded. Such a scheme is that reached when the teacher of the school or grade above examines the class that is expected to grade into his school. Currie, in his manual, says, "The first object of the teacher's questioning is to find out precisely the extent of the pupil's knowledge of the subject. What he has to communicate must be joined on to what the pupil already knows." The teacher in the grade above must be the one to find out where the joint should be made. He has a practical knowledge of what he is doing. He knows where his work should begin and what amount of preparation for it is required of the pupil. He is anxious that the school should in no wise suffer from any negligence or over exactness on his part. It is therefore his aim to see that the best interests of the pupil and the school are properly attended to. With that feeling predominating his examination will not be hurried, but will be such as to fully convince him of the number fitted to grade. In case of a doubtful pupil, the teacher of such pupil may be consulted. The teacher of the school should promote his lower grades.

I take it for granted that every locality has a fixed standard as a basis for grading. That standard must not be too high. It should not be more than sixty per cent. nor less than fifty per cent. Such averages as seventy five or eighty per cent. should never be required as a minimum pass mark.

The importance of written examinations is recognized in the several professions, in all branches of the civil service, in the different colleges and universities, as well as in our normal schools. Knock at the door of whichever of these institutions you may, the first struggle to gain admittance therein is with a written test examination. Through worry and nervousness pupils often fail to do themselves justice, when they have not been accustomed to written examinations. Success can only be gained by practice. It is the aim of our common schools to fit a boy, to a certain extent, for the activities of life; that is, his time should be so employed, and his talents so directed as to be of the greatest benefit to him in order that when he leaves school he make the most of himself. Then with such an end in view, and with a knowledge of the almost universal use of written examinations, practice in them should be begun perhaps as early as the fourth grade of our common school course. In all the grades between the fourth and eighth the written examinations should include most of the subjects laid down in the pupil's grade work for the year. The eighth grade examination should, however, be wholly written, for the pupil will, if he continues his studies, meet test examinations at whatever institution he may attend.

Considerable time is saved by written tests. It would require several days to examine an ordinary class orally. The work would be done by examining the pupils individually. The test would not be so satisfactory. For a look or a hint from a teacher, though it may be involuntary, will often decide the pupil's answer on an oral test. Greater latitude will be allowed in answering orally than in a written answer. The examinations for advancement therefore, should be wholly written as much as this is at all possible because they afford a better test of the pupil's knowledge, they prepare him for future school work and occupy much less time than oral examinations.

The paper elicited a lively discussion by teachers of graded schools, in which Messrs Berry, W. T. Kerr, Belyea, R. P. Steeves, Wilbur Montgomery, and the Chief Superintendent took part.

The following officers were elected for the present year. Secretary, H. C. Creed, Fredericton. Assistant Secretary, Wm. C. Simpson, St. John. Executive Committee, Philip Cox, Geo. U. Hay, Samuel C. Wilbur, James M. Palmer, W. H. Parlee, George J. Oulton, Wm. M. McLean, James Barry, Burton C. Foster, Samuel W. Irons.

A paper on Natural Science illustrated by experiments, was read by John Brittain of the Normal School staff. Mr. Brittain's paper was full of practical suggestions for the proper instruction of pupils in the common plants, animals, and minerals of the provinces. He called attention to the profound ignorance of the great majority of children, and in many cases grown up people, concerning these. He attributed the fault to the fact that our text books are not suited to the times nor is the phraseology of the books adapted to the capacity of the pupils. The reading of some sentences in "Palmer's Teaching of Science" which were only comprehensible by those who had spent years of study in science, provoked considerable laughter, as that text book is supposed to be read and properly understood by pupils from eight to twelve years of age.

During Mr Brittain's address two young ladies, recent graduates of the Normal School, Miss Galt of Moncton, and Miss Hannington of Shediac, prepared and illustrated the properties of carbon dioxide, and Mr Perry, Mr. Robertson, also recent graduates prepared oxygen gas, illustrating some of its properties. These experiments were deftly and intelligently performed. At the conclusion of Mr Brittain's admirable address, addresses were made by Messrs Cox, Hay, and the Chief Superintendent.

Mr W. H. Parlee on behalf of the committee on the superannuation of teachers, asked for further time to prepare a suitable report.

At the last session of the Institute on Friday evening, a select choir under the leadership of Mr. Wetmore, kindly furnished music. Inspector Bridges read a paper on "Patriotism, how it can be Developed in our Common Schools." He said there were no more patriotic members of any profession to day in the province than the teachers, but among the already lengthened chain of obligations that pressed almost too heavily upon them, the development of the patriotic sentiment among the pupils remained sometimes among those that were unfulfilled, and the object of his paper was to renew within the teachers' mind their duties in this direction. It was through subjects already in our course of instruction such as reading, composition, singing, and emphatically history and geography—that this object was to be accomplished. The pupil should know as soon as he begins studying the history and geography of Canada, that it is of his own country he is becoming acquainted with. British history should always receive careful attention at the hands of the teacher. The children of a people, the majority of whom are descended from English, Scotch and

Irish, and who are united together in this country by common interest, should know the history of their ancestors and their struggles for freedom.

Canadian history had been in our course less than sixteen years, but much progress had been made in the study. Through this the Acadian learned of his ancestry and country, which had been his for generations past. The study of civil government in our schools should be emphasized. Still more was it to be hoped that in the near future only one history might be used throughout the length and breadth of this Dominion. Until this was accomplished, the full development of patriotism through our history as a study would not be attained. For the very same purpose a national reader was a necessity. The benefit of singing good patriotic songs in our schools could not be over estimated. Our pupils should have national songs. Things learned by writing about them are not soon forgotten. The pupil should be made to write compositions from time to time upon periods in our history, and the Montreal *Witness* deserves great praise for its action in this direction.

An accurate knowledge, in the mind of the pupil, of the vast extent of our territory, its illimitable resources, its healthful climate, and the beauty of its natural scenery, was essential to the free development of patriotism in our common schools. So many of our resources have only lately been discovered, and part of the country has grown so rapidly, that our text-book on geography did not furnish sufficient data. The live teacher must then look beyond this to statistics and recent magazine articles. It was estimated that there was in Canada 700,000,000 acres of land fit for cultivation, or a territory about equal to the arable land of the United States. In her wealth of forests and fisheries, Canada possesses resources greater than any other country in the world, and the discoveries of her mineral wealth was hardly yet complete and not begun to be appreciated.

Annexation had gained no foothold among our Canadian people, and it was not for the teacher to refute the spread-eagle oratory of Yankee politicians in this direction. Charles Dudley Warner, in his comments on Canada, spoke as follows: "Annexation if put to a popular vote would make little or no showings in the returns, and there were forces strong enough to keep Canada for a long time on her present line of British connection." Erastus Wiman said, "In no part of the British empire is loyalty to British institutions more pronounced than in Canada, and if there is any one sentiment that universally pervades the Canadian people, it is this sentiment of loyal adhesion to British connection, pride in British traditions and personal devotion to their sovereign."

It would be well for teachers to celebrate in some way our public holidays. The exercises last 24th of May at our Provincial Normal School and the pleasure manifested by student-teachers in their display of love of country and Queen formed a happy incident in this connection, and it would have a great influence for good in inspiring patriotic feelings among pupils if above every school house, upon these public holidays, the flag of our country might be seen floating in the breeze.

Mr. Philip Cox, who was appointed to open the discussion, read a paper which abounded with patriotic sentiment. The state ought to demand in return for the care and education of its children patriotism and protection against the innovation of alienating sentiment. Our text books should have a thoroughly Canadian tone, but not prejudicially so, and some idea of the sacrifices made by our forefathers should be taught.

The Chief Superintendent expressed his hearty approbation of all contained in the papers of the gentlemen, and strongly advocated text books adapted to our especial needs.

Mr. John March of St. John gave an interesting talk on "Hints on Teaching Geography." Mr. March first dwelt on the importance of the study of geography. It should begin as soon as consciousness in the child begins. The individual soon realizes a world outside itself. The school room is its world, then the town or city, then the country, then the nation, and the world, a part of the universe of God. The interest in things about it and use of those things next were dealt with by the speaker. He suggested that teachers make maps; many perforated are now used. He would not use text-books but use newspapers. Hon. Geo. Hibbard's little text-book on geography might be read with considerable interest and profit. He also exhibited an analytical chart made by himself and explained its use.

The executive committee submitted a resolution conferring honorary membership on Sir Leonard Tilley. It was unanimously adopted. Votes of thanks were tendered Mayor Sumner and city council for use of the opera house for the public meeting; to Mr. Wetmore and the Methodist choir for music; to railways and steamboats, to the pastor and trustees of the Methodist church for use of the vestry, and to the writers of papers.

S. P. C. A. Column of REVIEW.]

The Dog-Soldier.

BY DAVID KER.

"Who brought that dog here? Send him back at once."

So spoke, in his deepest and sternest tones, old Colonel Eugene Noirmont, as he rode out of the French fort at Biskra, in the Sahara Desert, at the head of a strong body of irregular cavalry, which had be sent to check the raids of a hostile Arab tribe.

"He is my dog, Colonel," answered the junior Captain, young Alphonso de Picardon, glancing apologetically at the small white poodle that was close at his horse's heels; "and I hope you will not object to his going with us, for it would break his heart to be left behind."

"And whose heart will it break," growled the Colonel, "if the brute begins barking just as we're going to take the Arabs by surprise, and warns them of our coming?"

"It is not for me to contradict you, Colonel," said the young officer respectfully; "but, with your permission, I can soon show you that there is no fear of that." Then he turned to the dog and said sternly, "*Jacquot, silence a la mort!*"

Then, at a sign from the Captain, several of the men began to shout, clap their hands, and make noise enough to set an ordinary dog barking furiously, but Jacquot never uttered a sound.

"Very well," said the Colonel at length, "the dog may go; but remember, Captain de Picardon, that I shall hold *you* responsible for his behaviour."

The young Captain saluted, and fell into his place without a word, and off rode the detatchment.

It was weary work riding over stony ridges and sandy hollows, through the blistering heat and the blinding glare, while the hot prickly dust rolled up in clouds at each step, clogged every pore and choked every breath. Mile after mile of the desert was left behind, hour after hour of the burning, weary, interminable day crept slowly past, but still there was no sign of the enemy, or of any living thing save a wide-winged vulture, which hung poised in mid-air, like a blot upon the bright, scorching, cloudless sky. The soldiers grew impatient, and began to murmur and growl.

But all at once the dog (which was still keeping pace with them) stopped short, snuffed the air uneasily, and then began to run restlessly backward and forward, uttering a low anxious whine.

"Do you think he scents the enemy, whispered Colonel Noirmont to Captain de Picardon.

"I'll stake my life he does," replied the Captain. "I've never yet found him wrong. There must be some hollow here that we can't see. Here, Morel, Barbot, hold fast to each other, while I climb on to your shoulders."

And then, supported by the two burly troopers, he raised himself high enough to make out a dry water course a few hundred yards ahead, in the hollow of which a large number of men might easily be hidden.

"Ah!" cried the Colonel, when he heard this, "they want to catch us in an ambush, do they? Not so fast, my fine fellows! Half a dozen of you dismount, lads, and unsling your carbines, move forward about fifty paces and then fire."

The crash of the volley rolled like thunder along the silent desert, while the Colonel roared, in Arabic:

"Come out, you dogs! We see you plainly."

The effect was magical. Up started, as if rising through the earth, a swarm of savage faces and wild figures, while the flash and the crackle of the answering volley followed as thunder follows lightning; but the Arabs firing hastily and almost at random, only wounded two men.

"Now," thundered the Colonel, "upon them before they can reload."

Down swept the French upon their enemies like a whirlwind, and in a moment were hand to hand with them. The Arabs fought like tigers, but training and discipline soon began to tell, and the battle was over (as one of the French troopers regretfully observed) "almost before one had time to enjoy it."

But when the Arabs began to scatter and fly, the Colonel (whose blood was fairly up) dashed off in pursuit of them so recklessly that he was soon left almost alone, seeing which three of the enemy faced round and attacked him.

Captain de Picardon—who was famous as the best swordsman in the regiment—came dashing up barely in time to cut down one of Noirmont's assailants, while the Colonel himself disposed of another; but the third man was just about to stab de Picardon in the back, when his dog flew at the Arab's throat, and clutched it with such hearty energy that the man fell to the ground bleeding and half strangled.

"Form in line!" shouted Colonel Noirmont, when the fight was over, and all the wounded had been brought in. "My children, you have done well, and I thank you. To-morrow you will be reported for good service to the commander-in-chief himself, and he will not forget you; but I have one acknowledgment to make before that. Captain de Picardon, bring forward your dog."

The four-footed scout was at once produced, and when set down in front of the Colonel, he stood up on his hind legs and made a military salute with his fore paw, to the unbounded delight of the soldiers.

"A soldier who knows his duty so well," said the Colonel, with a grim smile, "must not go unrecompensed, and thus I reward his services."

So saying, he detached from his own uniform the cross of the Legion of Honor, and hung it around the dog's neck amid thundering cheers from the assembled troopers, who declared with one voice that his decoration had been fairly won by their "Dog Soldier."—*Harper's Young People.*

PERSONAL.

We understand from Amherst papers that inspector E. J. Lay has been offered the Principalship of the Mt. Allison Male Academy. This is a very practical comment on our article of last issue. No better appointment for Mt. Allison could probably be made we are convinced. But we hope our public school system is not of the kind which will allow universally recognized merit in one of its officers to be the occasion of his loss to the service, just for the lack of a remuneration which a private institution could afford to offer.

We clip the following from our exchanges with very much pleasure:

Ed. Fulton, B. A., 1889, with first rank honors in English and history, and F. J. McLeod, B. A., 1890, with first rank honors in Greek and English, have been awarded scholarships called the "Price Greenleaf Aid" at Harvard. Also A. S. McKenzie, B. A., 1885, with honors in mathematics, a tutor at Dalhousie college during the sessions of

1887 9, has been awarded a fellowship at Johns-Hopkins university in physics Thus doth Dalhousie prosper!

Miss Eliza Ritchie, who graduated from Dalhousie College in 1887, with first rank honors in mental and moral philosophy, and afterwards took the degree of Ph. D. at Cornell University, has just been appointed Associate Professor of Psychology and History of Philosophy at Wellesley College, Massachusetts.

SCHOOL AND COLLEGE.

The closing exercises of the St. John schools took place on Wednesday, June 25th, and were attended by a large number of visitors who manifested a lively interest in the proceedings. The attendance of pupils during the past term has been very large, and under the supervision of Secretary March and Supt. Hayes the results have been in a marked degree satisfactory. At the Grammar School the pupils were reviewed in the work of the term. The Corporation gold medal was won by Frank Green; the Parker silver medal by W. Clark, and the bronze medal by Charles Manning. At the Girls' High School a crowded house, brilliant decorations, and unusually interesting exercises marked the closing. The valedictorian and winner of the Governor General's silver medal was Miss Margaret Morrow. Eleven young ladies of this school entered for and passed successfully the matriculation examination of McGill University, and seven the matriculation examination of the New Brunswick University.

The increased accommodations at St. Francis Xavier College, Antigonish, due to the extension of the buildings described in a former issue, have contributed to make the year just closed one of the most satisfactory in its history.

At the Centenary of King's College Windsor, a great number of complimentary degrees were conferred upon ecclesiastics ond others, among whom we are pleased to notice Professor Kennedy of Kings as a D. S., and President Forrest, D. D., F. S. Sc., (Lond.) as a D. C. L. An increased attendance of matriculates is expected. An effort is also being made to establish a boarding school for ladies coordinate with the boy's school.

Halifax has many private schools of special excellence. Of these we may mention the Arnold School, under Principal Waddell, which closed for summer holidays June 26th. Special training for the various public examinations, such as for the preliminaries of medicine, law, military college, etc., is given here with much success.

The convents of the Sacred Heart and of Mount St. Vincent closed with magnificent exhibitions, the accounts of which filled about two columns each in the daily papers.

Saint Patrick's High School, Halifax, is winning for itself a high reputation for the thoroughness of the work done by it, to judge from the reports of public examinations and the results of competitive examinations.

Acadia College has been made the happy recipient of an endowment to establish a new chair in political economy. The Alumni are establishing a new chair in physics. The friends of Acadia show an intelligence and an energy which would appear to give them the first place as patrons of education in these provinces.

The Governors of Dalhousie have issued an appeal for $50,000 to meet the present annual deficit in the running expenses of the Institution.

BOOK REVIEWS.

First Greek Grammar Syntax, by W. Gunion Rutherford. Publishers, MacMillan & Co., London and New York. This little work aims to take up the main points in Greek syntax, and present them in clear and logical order to the student. The book is well printed, and is a valuable addition to the MacMillan's Greek Series.

Elements of Structural and Systematic Botany, by D. H. Campbell, Ph D., Professor of Botany in the Indiana University. Publishers, Ginn & Co , Boston. This, as the author states, is not a complete treatise of the whole science, but an introduction to the study for use in High Schools especially. It aims, by the selection of types of many plants, especially in the lower forms, and of profuse illustrations of these, to form a basis for the intelligent study of this branch of natural science, One admirable feature about the work is that it aims to give a tolerably full and accurate knowledge of the plant, and how to study it by means of the microscope.

Robert Browning. A Memorial Meeting of the Syracuse Browning Club. Publisher, C. W. Bardeen, Syracuse, N. Y. This pamphlet contains many valuable articles on the study of Browning, viewing him as a Historian, a Religious Teacher, as a Help to Living, as an Artist, Philosopher and Dramatist.

Historische Erzahlungun. Tables from History, by Dr. Friedrich Hoffman, edited with notes by H. S. Beresford-Webb. pp 106, paper. (Boston, D. C. Heath & Co., 1890.) Hoffman's Tables from History, are some of the most interesting episodes written. This small volume will therefore be specially welcome to the German student, as he will be compelled to finish what he began. It contains the following four stories. I. Conradin of Suabia. II. The end of Charles the Bald. III. The Execution of Louis XVI and his Queen. IV. The Franco-German War (1870-1871).

BOOKS RECEIVED.

HARMONY IN PRAISE. D. C. Heath & Co., Boston, Publishers.

THE UNIVERSITY OF KING'S COLLEGE, Windsor, N. S., by H. Y. Hind, M. A., from T. C. Allen & Co., Publishers, Halifax, N. S.

Publications Received.

Popular Science Monthly for July contains the following among other valuable articles: Antiquity of Man and Prehistoric Archæology, by Dr. Andrew D. White; an illustrated account of Greenland and the Greenlanders; Evolution and the distribution of Animals; Insect pests of the House (illustrated); Apparatus-making in Education. *St. Nicholas* for July has a very striking frontispiece illustration and story on The Baby a Prisoner of War, with seasonable articles on Vacation Days, Cycling, Base Ball, How to sail a Boat, etc.

Syllabus of Preliminary Examination for Law Students Nova Scotia.

Latin: Translation, Grammar and Composition. Authors for 1890—CÆSAR, *De Bell. Gall.*, Books II. and III.; VIRGIL, *Æneid*, Book II. For 1891—CÆSAR, *De Bell. Gall.*, Books IV. and V.; VIRGIL, *Aeneid*, Book II. For Virgil, the candidate may substitute either the Institutes of *Justinian*, Book I., or the Commentaries of *Gaius*, Book I.

Greek: Translation, Grammar and Composition. Authors for 1890—XENOPHON, *Anabasis*, Books IV., V. and VI. For 1891—XENOPHON, *Anabasis*, Books V., VI. and VII., or

French: Translation, Grammar and Composition. Authors—VOLTAIRE, *Charles XII.*; MOLIERE, *Le Bourgeois Gentilhomme*, etc. To translate easy authors or newspapers at sight; or

German: Translation, Grammar and Composition. ADLER'S GERMAN READER. To translate easy German at sight.

Mathematics: ARITHMETIC, as in *Hamblin Smith's*; ALGEBRA, as in *Todhunter's* Algebra for Beginners. GEOMETRY, *Euclid*, Books I., II., III. and IV., with easy exercises.

English: Grammar, Analysis and Composition, as in Nova Scotia prescribed text books for the public schools. Critical study of SHAKESPEARE'S plays. For 1890—*The Merchant of Venice*. (Rolfe's edition recommended).

History and Geography: BRITISH and CANADIAN HISTORY, as in Nova Scotia prescribed text books for the public schools; GENERAL GEOGRAPHY, as in the prescribed text book, *Calkin's*.

NOVA SCOTIA SUMMER SCHOOL OF SCIENCE.

The Fourth Annual Session of the Nova Scotia Summer School of Science will be held at Parrsboro, N. S., from July 21st to August 2nd, 1890. Opening address in the Skating Rink, July 21st, 7.30 p. m. The course of study includes:

ZOOLOGY, 8 lectures. By Principal A. H. MacKay, Halifax Academy; assisted by John Brittain, Esq., N. B. Normal School, Fredericton.

BOTANY, 8 lectures. By Inspector Lay, Amherst; assisted by Prin. Creighton, Compton Avenue School, Halifax.

MINERALOGY, 8 lectures. By A. J. Pineo, A. M., Truro; assisted by Miss Mary Dwyer, St. Mary's School, Halifax.

PHYSICS, 8 lectures. By Principal E. McKay, New Glasgow.

CHEMISTRY, 8 lectures. By Prof. A. E. Coldwell, Acadia College, Wolfville; assisted by W. T. Kennedy, Esq., Halifax Academy.

PHYSIOLOGY, 8 lectures. By Prof. Burwash, Mt. Allison College, Sackville.

GEOLOGY, 4 lectures. By Prof. Kennedy, Kings College, Windsor.

ASTRONOMY, 4 lectures. By Principal Cameron, Yarmouth Academy.

TONIC SOL FA. Miss A. F. Ryan, St. Mary's School, Halifax.

ELOCUTION. By Miss H. E. Wallace, Acadia Seminary, Wolfville.

MODERN LANGUAGES. By Herr Lothar Bober, Halifax.

It is only in very exceptional circumstances that teachers and science students can take a holiday excursion so cheap, so profitable, and so delightful and refreshing as that here offered. Class fees from $2.00 to $6.00; board, $6.00, with free or one-third return tickets. For a person living 100 miles from Parrsboro, $15.00 will easily cover necessary expenses including apparatus, etc.

Laboratory and Field work will be made the basis of all the science teaching.

There will be an opportunity of acquiring a theoretical and practical knowledge of Tonic Sol fa.

The talented elocutionist of Acadia Seminary has consented to give a course of lessons on "Voice Culture and the Teaching of Reading."

Herr Lothar Bober, whose classes include the leading educationists of Halifax and Truro, and who is most favorably known in Fredericton and St. John, will illustrate the true method of acquiring a conversational mastery of modern languages.

The attention of teachers and science students in the Maritime Provinces is invited to the professional and practical advantages of this Summer School.

For a calendar giving full particulars regarding text-books, their cost, apparatus, etc., recommendations from the lecturers, etc., address A. McKAY,

Secretary Summer School of Science,

Halifax, N. S.

Halifax, 7th February, 1890.