THE EDUCATIONAL REVIEW.

FOR THE ATLANTIC PROVINCES OF CANADA.

VOL. XII. No. 5. ST. JOHN, N. B., OCTOBER, 1898. WHOLE NUMBER, 137.

The Educational Review.

Devoted to Advanced Methods of Education and General Culture.

PUBLISHED MONTHLY. ST. JOHN, N. B., OCTOBER, 1898 $1.00 PER YEAR

G. U. HAY, Editor for New Brunswick.

A. McKAY, Editor for Nova Scotia

THE EDUCATIONAL REVIEW.
Office, Room 9, Bayard's Building, Prince Wm. Street, St. John, N. B.

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

Always Read this Notice.

THE EDUCATIONAL REVIEW is published about the 10th of every month. If not received within a week after that date, write to the office.

The REVIEW is sent regularly to subscribers until notification is received to discontinue and all arrearages paid.

When you change your address, notify us at once, giving the old as well as the new address. This will save time and correspondence.

Beginning with February and March the number on the wrapper with your address tells to what whole number of the REVIEW the subscription is paid.

Address all correspondence and business communications to EDUCATIONAL REVIEW, St. John, N. B.

CONTENTS:

THE article in another column, on Oceanic Phosphorescence, reads like a "fairy tale of science." It has a special interest, as the experiments described there ought to be easily performed by those living near the sea.

INSPECTOR MCCORMAC, of P. E. Island, furnishes the REVIEW with a concisely written and interesting sketch of the history of education in that province.

THE annual convention of the Protestant teachers of Quebec will be held in Montreal on the 13th, 14th and 15th of October.

THE October number of the *New Brunswick Magazine* is at hand as bright and fresh as any of its predecessors. The second paper by Jas. Hannay on Our First Families is another valuable contribution to our local history. In his fourth paper on At Portland Point, Rev. W. O. Raymond makes a comparison of the times when the Loyalists carved homes for themselves on the rocky hillsides of St. John and the busy scenes of to-day. His language is that of the poet as well as the historian. In this issue we form a better acquaintance, too, with the editor, there being several articles from his pen.

THE Northumberland County Teachers' Institute met at Chatham on Thursday and Friday, September 22nd and 23rd. Inspector Mersereau, who presided, said he "had found teachers more concerned about getting over the quantity of work prescribed for the year than about the development of the pupils' faculties through the medium of that work;" and Dr. Cox, who followed, thought "the evil complained of by the inspector was one that had its roots in the training or lack of training of the teacher, and suggested that it must be grappled with in the Normal School." We expect to have a full report of this institute for our next number. The suggestions thrown out by these leaders should be earnestly grappled with. They furnish a text for something more than discussion.

THE death of Dr. Wells, formerly editor of the *Educational Journal* of Toronto and recently editor of the *Canadian Baptist*, took place at Toronto on the 18th of September. He was a native of Harvey, Albert Co. He graduated from Acadia College in 1860, and devoted nearly twenty years to teaching, seventeen of which were spent as the associate of Dr. Fyfe in the Canadian Literary Institute, now the Woodstock, Ont., Baptist College. The work that he performed as editor of the *Educational Journal* was creditable to him and to Canadian education. The article that he wrote for last month's REVIEW on Moral Training in Schools was probably his last contribution to educational literature. In a letter to the writer he referred feelingly but cheerfully to his impaired health. He retained to the last that spirit and intellectual vigor which always characterized his writings.

THE profession of teaching seems to be a kind of waiting room, in which the young girl waits a congenial

ulterior support, and the young man a more advantageous position. In fact the teaching body is so fluctuating that the rank of a profession is often denied to teachers. In the Atlantic Provinces from 800 to 1,000 new teachers are required every year. Of these less than thirty per cent receive any professional training.

The Archbishop of Canterbury, in a recent speech, said he had been for many years engaged in teaching, and long ago he came to see that no man could teach who had ceased to learn. A man must be a learner to the end of his life if he had to teach. He should prepare every lesson by careful study; otherwise his lessons would be flat, stale and unprofitable. The student teacher had a freshness in his teaching which nothing else on earth could give him. If what he taught was stale to his own mind, it became stale to the minds of pupils. Much, very much, depended on the way in which things were put; and the successful teacher was one who produced in the scholars an aptitude and love for learning.

On the 28th September a monument to Champlain was unveiled in Quebec, that historic city which he founded 290 years ago. None of those intrepid explorers who braved the perils and difficulties of discovery in Canada and Acadia are more deserving of recognition than Champlain. Large hearted, courageous, generous, he devoted himself to his work with a patience and ability worthy of the highest rewards. He stands out the greatest historic figure of early Canada, and one whose memory French and English delight to hold in grateful remembrance.

Our correspondents this month ask some very interesting questions in the 'Round Table Talks. That department of the Review is one which can be made very helpful to teachers as well as to the editors. It may show what teachers are doing and what they are attempting to do, and it gives hints to us how to make the Review more and more valuable to its increasingly large number of readers. But we have these suggestions to make: Very often questions are asked which have been answered in previous numbers. It would be well for subscribers to preserve the Review and have it bound, so that they can have it for reference. Again, teachers should use every effort possible to solve questions for themselves, especially in mathematics, before asking assistance; and finally, those who send questions under a *nom de plume*, must give their real name in confidence, or no notice can be taken of their communications.

Management of School Libraries.

Lt. Governor McClelan, in his address recently at the public meeting of the Albert County Teachers' Institute, said there were two faults which needed attention in connection with our public schools. One is irregularity of attendance. The other is looseness in the management of school libraries. Books purchased in part by public funds had become dispersed, and were not now available for school purposes. He had no reason to think that such looseness was general, but that it existed at all was a serious matter, and likely to affect injuriously the moral tone of a school.

The Board of Education contributes in part to the purchase of books for school libraries out of the provincial funds, and it has the right to expect that such funds shall not be wasted. The school trustees, whether the district's share of the money for the maintenance of the library has been assessed or raised by school entertainments, are equally interested in keeping it intact. The Lt. Governor, as president of the Board of Education, spoke with authority on this matter; and though the loose management he speaks of may not be general, it is well to direct public attention to it in time, so that there may be a more rigid supervision of school libraries and their management in the future, both by the inspectors of schools for the government and the boards of trustees for the district. The teacher is responsible for the proper care of the library while he is employed by the district, and if the school is vacant the secretary of trustees has, we presume, this charge. Now it is plain that in districts where a change of teachers is frequent, it is a matter of some difficulty to keep the run of the books. They may be taken out by pupils and not returned through lack of a proper system of management. Yet these pupils and their parents would resent any imputation of dishonesty in the matter. But it is a noteworthy fact that many people are very careless, to put it mildly, about returning borrowed books, and that is a good reason why a school library should be managed with as much system as the public library of a large city. Such a systematic management would be of educational value to every child in the district; and if it led to a keener sense of the doctrine of *meum* and *tuum* among older people, whose memory, as we have intimated above, is sometimes at fault about the ownership of books, there would be a distinct gain to whole communities.

In addition to the regular government and local supervision recommended above, would it not be well for trustees and teacher together to appoint as librarian for the school a young person of approved good character, methodical habits, and certain literary as well as business qualifications? Such a one would probably be found among the older scholars or among the recent graduates, and should receive a small salary—perhaps nominal—from the district, and should be held responsible for the proper care and preservation of the books.

TALKS WITH TEACHERS.

Some one remarked the other day that "Washington and Lincoln never enjoyed the school equipments of the present day and what was good enough for them would suffice for him." That may be, but I think if by any chance Washington and Lincoln could reappear upon this earth, the first thing they would find it necessary to do would be to attend school under the tuition of some modern school mistress. I wonder what either of them would think of a war-ship of the present day? What would they think of the expedition and the means employed in bringing to a conclusion the late war with Spain? But the cost? Well, what of the cost? It came high, but by employing modern improvements, the struggle was ended in a few months and it may be added that the resources of the United States were out of all proportion better able to incur the cost than during the struggles of Washington and Lincoln.

So it is with the schools. Those of the present are to those of the past as the modern warship is to that of ancient times. They may cost more but they confer benefits greatly out of proportion to the money expended upon them and woe be to the country that neglects them. This is well instanced by the recent struggles in Cuba and in Egypt. England and the United States won their victories first in their public schools. They lie at the root of the whole matter. The natural and applied science instruction gained in the schools has not only rendered many modern improvements feasible but has induced an appreciation of them among the people which renders our present civilization possible. It is very common to look back to the past, but who does as his grandfather did? Let us respect the past, believe in the present and have faith in the future.

School and village improvement societies are becoming very common in the United States, and are doing much good not only in the ornamentation and improvement of school grounds and village streets, but in supplying schools with pictures and good literature. Something has been done in this direction here, but we must have a care lest we be outstripped in the race. Mothers are everywhere meeting with the teachers as "friend to friend" to co-operate and assist in the work of the schools. Let us make the first advances when necessary. Teachers' Associations should be formed in every parish.

"What is luck, Uncle Jim?" "Luck? Well, it is when a boy turns out to be as smart as his grandmother said he was."—*Detroit Free Press.*

For the Review.]

Milestones in the Educational Progress of P. E. Island.

By Inspector G. J. McCormac.

In August, 1767, Prince Edward Island was divided into townships and granted to individuals having claims upon the British government. Each township was to furnish a glebe lot of 100 acres for a clergyman and a lot of thirty acres for a schoolmaster. In 1834 the legislature petitioned the king to allow that body to appropriate to the support of education the clergy reserves and the school land, as it was impossible to dispose of them according to the original intention.

Very little attention was directed to education until Charles Douglas Smith became governor of the province, and then preparations were made for the opening of the national schools in 1821. An act of the parliament of 1830 authorized the appointment of a board of education of five persons. The board was required to meet every three months. Shortly after the passing of this act the appointments were made. At present the board of education consists of the members of the executive council, the principal of Prince of Wales College and Normal School, and the chief superintendent of education, thus containing eleven members.

To promote classical education the Central Academy was opened in January, 1836. The management of it was vested in a patron and nine trustees. Rev. Charles Loyd and and Mr. Allen Brown, formerly teacher of the grammar school, were its first teachers. Each of them received a salary of £150. Mr. Loyd soon retired, owing to ill health, and was succeeded by Rev. James Waddell, of Truro, N. S. In 1843 provision was made for the employment of an additional teacher. In 1837 the first official inspector of schools for the province was appointed in the person of Mr. John McNeill. His first report was published in October, 1837, and gave a graphic description of the educational conditions of the country. Many of the teachers seem to have been people who had proved unsuccessful in several other occupations; often they were of poor character, and still poorer scholarship. They received all kinds of marketable and, perhaps, unmarketable articles as remuneration for their services. They believed in the transferring of knowledge to the child by the imposition of hands, as well as by application of the birch. The teacher received his board by going from house to house, and spent the most of his leisure in chopping firewood, rocking cradles and nursing babies. Mr. McNeill held the situation of inspector for ten years, during which time he effected much improvement. In 1837 there were fifty-one schools and 1,649 scholars. When Mr.

McNeill vacated his position in 1847, there were about 125 schools and over 5,000 scholars. At this time the schools were supported by voluntary contributions, aided by partial assessments and legislative grants.

By the report of 1851 the number of schools had increased to 135, with a total enrolment of 5,366. At this time there were three inspectors, one for each county, viz.: Mr. John McNeill for Queens County, Mr. John Ross for Kings, and Mr. John Arbuckle for Prince. In October, 1853, Mr. John M. Starke was appointed visitor of schools for the whole island. He was a graduate of Stowe's Normal School, Glasgow, Scotland.

In 1852 the Free Education Act was passed. This is the basis of our present school system, which has conferred an inestimable blessing on the country. On October 1st, 1856, the Normal School at Charlottetown was formally opened by Governor Daly in presence of a large assemblage. Several interesting addresses were delivered. Inspector Stark's remarks, in reference to moral instruction in schools, gave rise to a great agitation on the propriety of Biblical instruction in the schools, and resulted in his early resignation of the office of inspector of schools.

In 1859 there died a man, who always took a very deep interest in promoting education, the Right Rev. B. D. McDonald. He established many district schools, also a convent, where young ladies receive a superior education. In 1855 he opened St. Dunstan's College, which is now one of our leading educational institutions, the only one in the province which confers degrees.

During the session of 1860 several acts were passed relating to education. One provided for an additional teacher in the Normal school; another declared the introduction of the Bible into all public schools to be legally authorized; while another provided for the establishment of the Prince of Wales College. In 1879 the college was amalgamated with the Provincial Normal School. All our public school teachers receive their training here. The curriculum includes Latin, Greek, English language and literature, French, mathematics, physics, chemistry, agriculture and agricultural chemistry, natural history, physical geography, physiology, map drawing, history, music, and the principles and practice of teaching. This institution has an excellent staff of teachers under the principalship of Dr. Anderson, a thorough disciplinarian and an excellent instructor.

According to the census of 1861 there were 280 teachers under engagement then. The schoolhouses numbered 302. In 1870 the total number of schools was 372, and of scholars, 15,000. In 1874 the number of schools was 403; of scholars, 18,233. The salaries of teachers ranged from $113.56 to $324.44. To-day we have 467 schools, employing 579 teachers, and having an enrolment of 21,845 pupils. The salaries paid teachers range from $130 to $783.

The English Alphabet as it Ought to be Taught.

By Inspector J. Coyle Brown, Peterboro, Ont.

Symbol.	Name.	Keyword to Name.	Symbol.	Name.	Keyword to Name.
a	a	aim	v	ve	venial
b	be	being	w	woo	wooing
c	ke	kedron	x	ex	exit
c	se	cedar	y	yi	
d	de	deist	z	ze	zenith
e	e	eat	oo	oo	ooze
f	ef	effort	au	au	author
g	ge	geese	aw	aw	awful
g	je	genius	ou	ou	outer
h	he	hero	ow	ow	owlet
i	i	ice	oi	oi	oil
j	ja	Jacob	oy	oy	oyster
k	ka	Kali	ch	che	cheese
l	el	elbow	ph	fe	phenix
m	em	emmet	qu	kwe	queen
n	en	enter	sh	she	spear
o	o	open	th	the	theme
p	pe	period	th	the	these
q	ku	curious	wh	hwe	wheel
r	ar	arrow	ck	ek	beck
s	es	essay	gh	af	laugh
t	te	tea	ng	eng	length
u	u	use	tch	etch	fetch

Theoretic Objections and Remarks.

1. No names indicative of their sounds are given to the single vowels, *a*, *e*, *i*, *o*, *u*, when they are short. It is contrary to the genius of the English language to use the short sounds of most of these in a detached way, and on the whole no advantage is gained by attempting it.

2. *C*, *g* and *th* have each two names. There is no way of overcoming this, without changing the form of the characters, and this is not desirable.

3. *Au* and *aw* have the same name; so have *ou* and *ow*; so, also, have *oi* and *oy*. This occasions no difficulty either in pronouncing words or in oral spelling. "What can't be cured must be endured."

4. *Ch* (che) and *tch* (etch) have the same function; so have *f* (ef) *gh* (af) and *ph* (fe); so, also, have *c* (ke), *k* (ka), *q* (ku) and *ck* (ek). This is a drawback in teaching, but not a great one. It cannot be avoided without changing the appearance of the written and printed page.

5. Many of the symbols have irregular uses; for example, *oo* is sometimes short, as in foot; sometimes like *o* long, as in door; and sometimes like *u* short, as in flood; *ch* (che) is often like *c* (ke), as in charm; and sometimes like *sh* (she) as in chaise. When the regular uses of the symbols are thoroughly established in the minds of the learner, the irregularities are mastered with comparative ease.

ADVANTAGES OF PROPOSED CHANGE.

It will lessen the time of learning to read by one-half.

It will lessen the teacher's labor by more than one half.

It will enable many subjects to be *learned* that hitherto have had to be *taught*.

It will enable a foreigner to acquire a knowledge of the language in a much shorter time.

It will do much to make learners acquainted with the regularities and irregularities of the language, and thus lead to many absurdities in spelling being dropped.

It will do more than any other pedagogic movement to make the English language the language of the world.

NATURE STUDY.[1]

A Talk About Water-Drops.

BY PROF. A. WILMER DUFF.

What is a water-drop? To experiment is to try for yourself, and as this is the surest way of learning anything, we shall begin with an experiment. Dip your finger into water and withdraw it, and you will be able to see the shape of the drop that forms at its end. It is round like a glass bead except just where it hangs to your finger, and if you watch it carefully you will see that, just when it gets free from your finger, it is nearly perfectly round. If you let it fall on a piece of glass it will form a circle. If you could see it while it is falling you would find that it is nearly a perfect sphere. If I let water from the end of a stick gather and form a drop, while the end is in a glass of paraffin oil, you will be able to see a much larger drop hanging from the stick and you find that it is nearly quite round.

Such, too, is the shape of a rain-drop while it is falling. You may try this the next time it is raining by holding a sheet of paper so as to catch some of the drops. We can, however, learn still more from the drops formed at the end of the finger. Watch a few and you will see that each drop seems to have some difficulty in tearing itself away from the water that remains. The drop has to grow quite large and heavy before it can by its weight pull itself free. It is evident, then, that water holds together with considerable force. It is, in fact, this force which causes the drops to become round, for it makes the particles draw as closely together as possible. You can see another interesting example of the same thing if you hold the square end of a stick of sealing wax in a flame, for you will find that, as it becomes liquid, the sharp corners disappear and the whole end becomes round like the water-drop. This force which holds particles of liquid together is called cohesion.

Now, you all can tell me what will happen to a water-drop if it is left for some time where it falls. It will vanish. The first one which we allowed to drop on glass may already have done so. What has become of it? No one saw it go away, and if any one looked at it, he merely noticed that it seemed smaller each time he looked. But has it left nothing whatever behind? If you look closely enough you will probably discover that it has left a thin film or crust. Whatever this crust is, it must have been contained in the water-drop. You should see whether all kinds of water leave the same crust. Try, for instance, drops of spring water, river water, rain water, and also, if you can get them, a small piece of snow and a small lump of ice. We shall not, however, in this lesson, attempt to make a study of the crust that a drop leaves behind. Leaving it for another occasion, let us ask again what became of the water itself. Some of you will be able to tell me that it has become vapor or steam and is scattered in the air around us. It escaped in small particles that were invisible, and in this invisible form they are called water-vapor or steam. To this you may object that the steam formed by a boiling kettle is not invisible, but look closely and you will find that just where it issues from the spout it is invisible and only becomes visible a little farther on. It is true water-vapor that issues from the spout and what we see a little farther on is not water-vapor, but a little cloud of water-drops. Try putting a spirit flame beneath this cloud, and you will find that the drops are again turned into invisible vapor.

Thus we see that one way of turning water into vapor is to heat it, and that heat can overcome the force of cohesion, which holds the particles together. It would seem, however, that this is not the only way, for if we watch a little cloud from the kettle, we shall see that it gradually turns back again into invisible vapor, which spreads itself throughout the room. Sometimes, however, the cloud rises much higher than at other times, and it seems much less ready to turn into vapor. You will find that this is the case when the kettle has been steaming for a good while in the room and the doors have been closed. Now, this evidently means that vapor forms less readily when there is already a good deal of vapor in the room, and more readily when there is but little vapor in the air.

You may see the same thing on a much larger scale if you look at the puffs that come from a locomotive drawing a train. Sometimes there is very little smoke mixed with the steam, and the cloud that rises is like the cloud from the spout of the kettle. Look carefully and you will probably find that there is a space between the top of the smoke-stack and the cloud where nothing can be seen. Just above it is cooled by the air, and it shrinks into separate drops of water. If you could see inside the boiler you would find that the steam above the water is quite invisible water-vapor, and the same thing can be shown by boiling water in a thin glass flask such as chemists use. Notice the clouds thus formed by a locomotive, and you will observe that on some days they hang lazily in the air for quite a long time, and on other days they fade away quite rapidly. Observe what the days are like on which they disappear rapidly, and what the other days are like on which they disappear slowly.

[1] Teachers are recommended to use this material—first, as suggestions to their pupils for observation and experiment; second, to make their observations the basis of a lesson. If used in this way there is sufficient material here for several lessons.

It will help you to understand the matter if you will try some experiments to find how fast water will turn into invisible vapor. Turn a saucer upside down and you will see a shallow depression with a rim around it. Put the saucer with the bottom up somewhere out of doors where it will not be disturbed, and pour enough water in the hollow to fill it. Then find how long it takes the water to dry up. Do this on several days, and put down in a little note book the length of time it takes in each case. Note also in your book whether the day is cloudy or sunny, warm or cold, windy or still, and see if you can find any connection between these things. If you wish, you may use a wet rag hung from a clothes-line instead of the saucer. Always use the same rag and hang it up without wringing. Find as before how long it takes to dry.

[*To be continued next month.*]

Bird Notes.

Chamberlain in his "Some Canadian Birds," in speaking of the *winter wren*, says that very few nests of the bird have ever been found. During the present summer some of my former pupils at Point Wolfe found two nests. On the 29th day of July, while I was visiting there during vacation, I was fortunate enough to see one of them. Although it is a shy bird, the nest was close to the mill pond where the men were continually passing and but a few feet from the main road.

The position chosen was a bluff. Some of the rocks at the edge had fallen over into the pond leaving the earth, which was held together by roots, hanging over like the eaves of a house. Under this eave was the tiny nest, close up to the top where no sun could reach it. The nest contained four chicks partly fledged.

I, with some of the boys who found it, sat down upon a log, and for half an hour we watched the parent birds, who seemed to have lost all their shyness, as they went and came bringing food for their tiny brood.

A. D. JONAH.

Alma, N. B., September 24th, 1898.

How many of our readers have seen the Winter Wren whose nest was noticed by Mr. Jonah? How many birds have your pupils learned to distinguish this summer? Have they learned the notes and how to know by sight six common birds? twelve? twenty? If they know well only *six*, they have made a good beginning, and this knowledge will be an incentive to know more next year. Do they know the Junco, who shows two white tail feathers in flying? the black-capped chicadee, who is so friendly these days that there is no trouble to get acquainted with him? or Tom Peabody who does not sing so much as in summer and who has donned a more sober suit for autumn? If you have no book on birds turn to back numbers of the REVIEW for descriptions and drawings.

"The world is full of beauty,
Like to the world above;
And if we did our duty
It might be full of love."

Plant Work for October.

1. What flowers are in bloom in October?

2. Notice that the catkins of the alder, containing next spring's flowers, are already prepared for the winter.

3. What other deciduous trees have their flowers in catkins? Ask your scholars to find out and bring catkins from other trees.

4. Why are these trees in such haste to get their flowers ready for winter?

5. Is it any advantage to these trees to put forth their flowers in very early spring?

6. Notice the different shades and tints of color in maples. *It is said* that those maples which have a brilliant coloring in autumn preserve their distinct colors from year to year even if transplanted. Get your pupils to test this by making careful notes of color, pressing the leaves of certain trees and marking them for comparison next year.

7. What trees turn red, which turn brown, which yellow in autumn? Get your scholars to observe and make notes of these changes, and which are the first to change, which last. What is the cause of the change? (See "'Round Table Talks" in another column.)

8. Do evergreen trees keep the same leaves from year to year? Ask your pupils to examine, this month, the pines and other so-called evergreens and report the result of their investigations to you.

9. Is the tamarack an evergreen?

10. Get your pupils to observe the leaves of deciduous trees, (1) just as they are ready to fall, (2) the mark left on the branch or twig after they have fallen, to find proofs for the statement made in "'Round Table Talks."

11. What is just *above* the spot where the leaf has fallen?

12. Examine many trees to find out whether they have next spring's buds upon them *now*.

Autumn.

The morns are meeker than they were,
The nuts are getting brown,
The berry's cheek is plumper,
The rose is out of town.

The maple wears a grayer scarf,
The field a scarlet gown;
Lest I should be old-fashioned,
I'll put a trinket on.

—*Emily Dickinson.*

"The autumn time has come
On woods that dream of bloom,
And over purpling vines
The low sun fainter shines.

"The aster flower is falling,
The hazel's gold is paling,
Yet overhead more near
The eternal stars appear." —*Whittier.*

Oceanic Phosphorescence.

Nature dazzles the eye of man with many wonderful phenomena, but perhaps never more so than when she turns the gloomy night waters of the sea into a sheet of silvery fire. At these times every movement of the wave, every cleavage of the water by oar or prow, reveals in its dark depths a hidden fire which scintillates and sparkles with weird and mysterious light. The spectacle is one of absolute fascination, for the Spirit of Enchantment rests upon the waters and reality becomes fairyland. The ancients, keenly alive to a sense of the supernatural, saw in this luminosity a manifestation of some unknown power, and wondered; the ignorant read in it a portent of judgment and terror; while in all ages the curious and the searchers after knowledge have speculated as to its cause. * * * It is only lately that any very serious effort has been made to study this phenomenon, but the research has been abundantly rewarded, for it is now pretty certain that the luminosity is due to the presence in the water of various kinds of bacteria.

Now, bacteria are the very smallest living organisms of which we have cognizance. Millions of them can lie on a penny; therefore, to produce the gleaming appearance recognized by us as phosphorescence, they must be present in numbers too enormous even to contemplate with our finite minds. It would be immeasurably easier to reckon with the stars for multitude than with these phosphorescent bacteria. They are colorless, rod-like bodies, only known to us in the land revealed by the highest powers of the microscope, and careful comparison shows minor differences among them. For instance, some of them are capable of independent motion—we can hardly call it swimming—others are non-motile, some are enclosed in a jelly-like covering. Others are without this sheath. Their power of motion is probably due to excessively fine hairs at their extremities, which, moving to and fro in the water, act the part of oars. These cilia have not been found in all forms of bacteria which move, but their presence is inferred, since every advance in the study of motile forms increases the number of bacteria which are seen to possess them. These light-producing bacteria are known as photo-bacteria, and so far some half-dozen varieties have been distinguished and named. That they lie at the bottom of the matter—that phosphorescence is due to their presence—has been and can be proved in several rather pretty ways. It is not sufficient, of course, that we should always detect them in any examination of luminous sea water; to prove that they are the cause of light, we must be able to procure luminosity by introducing them into water that did not previously show this quality, and this can be done thus: Place a few of these tiny organisms into sea-water or broth prepared from fish, and keep at a suitable temperature; they can then be cultivated without much difficulty, and as they spread and develop phosphorescence appears, so that the removal of the vessel into another room shows unmistakably the glow of the familiar light. It only appears, however, at the surface of the liquid, where the oxygen of the air has free access to the bacteria; if, for experiment's sake, the supply of fresh air be cut off—that is, if no oxygen be allowed to come near them—then the little colony of bacteria loses its fascinating power and remains dull and shorn of its glory. But restore the air, and the microbes again recover their normal condition and luminosity seems a natural corollary. There is a tale told that a lady, whose husband made bacteria a study, took a leaf out of his book, and cultivated these bacteria on gelatine in such a way that as they developed they shone out the message, "Hommage à M. Pasteur." The shining letters were then photographed and the picture sent to the great bacteriologist, thus conveying in graceful form the warm appreciation in which he was held by those following in his steps.—*Knowledge.*

Albert County, N. B., Teachers' Institute.

Harvey Corner, the place selected for holding the Albert County Teachers' Institute, which met September 8th and 9th, has few rivals in the province for the beauty and variety of scenery in its vicinity. Approached from the westward by the Salisbury & Harvey railroad, which joins the Intercolonial at the first named place, one soon reaches Hillsborough, a beautiful and prosperous village, overlooking from its commanding site a wide view up and down the Petitcodiac River. Here are the plaster mills, and near by the plaster quarries, the seat of an important industry, managed by C. J. Osman, Esq., M. P. P. Further along are the Albert mines, in the vicinity of which is the celebrated underground lake, the beautiful winding vale through which runs the Demoiselle Creek, and not far off the red sandstone rocks of Hopewell Cape, which the ever restless tides of Shepody Bay and the Petitcodiac River have channelled into cave, pillar and arch—the delight and wonder of every tourist. Approaching Harvey the railway describes a curve some five or six miles in length; and there meets the view a scene that is perhaps unique even in this province of varied scenery. On the inside of the crescent is a broad meadow, miles in extent, oval in shape, covered with grass or stacks of hay, dotted here and there by busy workers, for it was the haying season; encircling this amphitheatre are ranges of hills, irregular in outline,

rising to the right, on the outside of the crescent, to Shepody Mountain, nearly 1,000 feet in height, and broken just in front of us by an arm of the Bay of Fundy, toward which there winds the ever present, ever muddy "Crooked Creek;" skirting the base of these hills, like a fringe, are five villages—Hopewell Hill, its white cottages nestling at the base of Shepody Mountain—Riverside, which contains Government House, the residence of Lt. Governor McClelan—Albert, the business centre of the group of villages—Harvey Corner, two miles distant from Albert and opposite to it—Harvey Bank, a busy place in the days of Gaius S. Turner and wooden ships.

Mary's Point, with Grindstone Island opposite, is one of the most interesting places in the vicinity of Harvey, on account of the freestone quarries and the many features of geological importance to be met with there. The natural history excursion on the afternoon of the first day of the Institute combined pleasure and instruction in a most agreeable way. Many of the people of Harvey joined in the outing, and placed carriages at the disposal of the visitors. At various points along the route interested groups listened to Prof. Andrews as he gathered testimony from the rocks of the probable age of the world and other interesting problems, or to Mr. Hay, as he pointed out the chief features of the plants met with, from the seaweed found on the rocks to the highest orders of the flowering plants.

The work of the county institute, it is admitted, should be practical, with a minimum of talk and a maximum of work, illustrative of good methods of teaching. In this respect the Albert Institute was admirably conducted. There was but one paper read. The rest of the time, during the four sessions of two days, was given up to exemplifying how best to teach certain subjects of the course of instruction. Classes, drawn from the Harvey public school, made this illustrative work very effective; and Inspector Steeves, under whose guidance the Institute was conducted during the first day, and the committee who arranged the programme, had cause to be satisfied with their efforts in the earnest attention that prevailed and the animated and critical discussions that took place.

Prof. Andrews, of Mount Allison University, gave an outline of a course of lessons in practical chemistry, beginning with the burning of a match and requiring no expensive apparatus. [Prof. Andrews has consented to give in detail a series of illustrated lessons in the REVIEW on this subject.]

Miss Helena B. Atkinson gave a lesson on Color to a grade three class, excellent in illustration of how to teach this interesting subject. Miss Matilda M. F Fillmore showed to a grade five class the mysteries of divisions of fractions, making clear the reasons for "inverting the divisor"—that Chinese puzzle to young arithmeticians. Principal A. C. M. Lawson showed with a clearness that left nothing to be desired the extraction of cube root. With chalk and blackboard he expanded $(a+b)^3$, illustrating, with a knife and a cube cut out of a turnip, how to cut up this larger cube into blocks corresponding to a^3, $3a^2b$, etc. Principal W. M. Burns' paper on English Grammar called forth a spirited discussion, the gist of which was that the best study of English was that which gives plenty of practice in writing English. G. U. Hay, editor of the REVIEW, gave a lesson on the plant leaf, showing from a great number of specimens that its various shapes and positions on the stem were adaptations to secure exposure to light.

Space does not permit giving even an outline of the addresses at the largely attended public meeting held in the Harvey Baptist Church. Lt. Governor McClelan presided, and the other speakers were Inspector Steeves, G. U. Hay, Rev. C. Comben, and Prof. Andrews.

The following are the officers of the Institute for next year: A. Ryder, president; Miss H. B. Atkinson, vice-president; Miss M. L. Daley, secretary-treasurer. W. M. Burns, Miss A. Smith, additional executive. The next Institute will be held at Elgin on the last Thursday and Friday in September, 1899.

Notes of a Maine Teachers' Institute.

Inspector Carter sends the REVIEW the following impressions of his recent visit to a Maine Teachers' Institute: Mattawamkeag is not by any means a large town at the junction of the Maine Central and the Canadian Pacific Railways, yet it comfortably provided for the very large number of teachers assembled there, and some of the people said they could have done as well for twice as many. Some of our teachers in New Brunswick may not be aware that the county institutes in Maine meet twice each year, and that they spread them over the territory as far as possible. There are no fees demanded and no enrolment made, and it is needless to say no expenses of any kind, as the various towns regard the entertainment of the teachers as a privilege. The expenses are paid by the state. Notwithstanding the fact that no record is kept of the attendance, as far as I could observe, all who *go, attend,* punctually and regularly. Another feature which impressed me very forcibly was the presence of so many school committeemen and local superintendents. It seemed at times as if there were as many of them in

attendance as teachers. This must have a very potent influence upon the conduct and progress of the schools The chairman was prompt and tactful, the executive aimed at ten minute papers, and few exceeded that length. They were bright and forceful, and method in enunciation and delivery was a marked feature of many of them. The programme was carried out to the letter, and no one whose name appeared upon it failed to respond. The failure of the lady teachers to take part in the discussions was even more apparent than with us, and discussions of all kinds were more meagre than in my opinion is desirable. This drawback was atoned for in some degree by the interest taken in the "question box," which was opened at the end of each session, and the answers given in a most succinct and felicitous manner by the state superintendent. Another feature of Maine institutes, which we should be prompt to imitate, is the discussion of school questions by laymen, introduced in the form of a debate. The subject debated at the Penobscot meeting was "Union of towns for the purpose of securing expert supervision." A half dozen laymen and the superintendent participated in a most profitable and interesting discussion. Much ingenuity and eloquence were displayed by the laymen, and I take it that grange and other society meetings so numerous in Maine are the training ground for the numerous orators that that state produces.

Music was a special feature of the programmes, as well as recitations, and judging from those given, the study of elocution receives much attention.

State Superintendent Stetson, who is so favorably known to many of our teachers down here, was present and left a strong impress upon the meeting. He has few equals as a speaker, and his strong individuality and industry are making themselves felt in a marked degree all over the state. He is evidently regarded as the right man in the right place, and seems to command the regard, not only of the teachers, but of the public. It was my privilege to meet two lady superintendents, Miss Mary S. Snow, of Bangor, and Mrs. (Dr.) D. H. Kelly, of Mattawamkeag, and they acquitted themselves of their duties in a manner that might be envied by all members of the "male persuasion." Miss Snow was introduced as the "brightest woman in Maine," and after hearing, at one of the public meetings, her spirited and eloquent address upon "Co-operation of Home and School" I concluded that the chairman had been indulging in no empty compliments. I sincerely hope that Miss Snow may be induced at an early date to give the same address in the provinces. I need not add that the utmost kindness and courtesy was extended to the "stranger within the gates," if indeed any Canadian visiting the United States at this time can in any way experience the feelings of a stranger. The British flag was much in evidence, and "God Save the Queen" was rendered with a fervour that made all present seem Canadians. The Maine people seem to have a high opinion of the schools of New Brunswick, gathered largely, I imagine, from former residents and migrating teachers of this province. It was certainly most gratifying to me to hear these opinions expressed. I hope that we deserve them and will continue to live up to our reputation. I had the pleasure of meeting in the capacity of Superintendent of the Danforth schools, Dr. R. J. Howe, a former New Brunswick teacher, and a native of Charlotte County. Dr. Howe not only enjoys a high reputation in his profession, but is regarded as a most progressive educationist as well.

There are some conditions existing among the Maine schools that seem strange to us in Canada. The proportion of trained teachers is as yet small, they being engaged after the manner followed here fifty years ago. There are now, however, four Normal Schools, and about twelve hundred teachers have undergone the state examinations during the last two years. I was surprised to learn that the amount of state aid given the schools is much in excess, proportionately, to that given here. Notwithstanding this, the time the schools are operated is very considerably shorter, many localities having schools during only twenty weeks in the year. This produces much derangement in school work, and must result in the course of time in other states outstripping her, as "the mill will not grind with water that has passed." While there is some sort of supervision in many places, some good, some perhaps bad, there is as yet no definite expert supervision. The present cost is, perhaps, greater than if experts were employed, and no one outside the large towns gives exclusive attention to the work. The state has now passed important legislation on the matter, and there seems a very strong feeling in favor of it.

While there is considerable "home talent" employed here, the practice prevails much more extensively in Maine. When I innocently indulged in some mild criticism of the custom, I struck upon a discordant note; all were very goodnatured about it, however, and admitted the general application of the criticism, but expressed doubt as to particular cases.

Taken all in all, while I think we do some things better here than they do in Maine, we can yet learn many things from them.

I feel under obligation to our own chief superintendent for kindly granting me leave of absence to go to Maine; and any feeble assistance I may have rendered them is but a small return for the privilege enjoyed, and for the co-operation and assistance that the teachers of my district have received at all times from teachers and school officers of Maine, especially those of Washington County.

Which was the Strong Teacher?

Having noted the nickel figure two on the door, I entered the room quietly, and unannounced—which, perhaps, was not quite fair.

As it happened, I was especially inopportune. Miss Primall was evidently in the midst of a curtain lecture.

I was just in time to catch an ominous "Thirty minutes after school," before she was aware of my presence.

"You may take out your books. One!—two!"

I thought I heard the tap of a ruler as accompaniment, but no; it was just Miss Primall's military precision of voice, admirably seasoned by twenty years' experience.

Forty little hands drew as many books from their respective places and laid them, noiselessly, with the exactness of well regulated machines, in the centre of each desk, while forty pairs of anxious round eyes were fixed with painful intentness on the severe, rigid figure before them.

Forty—did I say? No; the thirty-ninth, a wee maid in the far corner of the room, having pushed her reader to the upper corner of her desk, and being made aware of her transgression by the piercing reproach of her teacher's eyes, reached a fat little hand to correct herself.

The book fell on the floor, and was recovered after a scramble, intermingled with blushes, and a few tears.

"Forty minutes wasted, Miriam," was the grim comment. "A minute for every child you have kept waiting."

I spent half an hour in the room, enduring the sense of suffocation which assailed me, through stronger motives of curiosity. I went forth a wiser and sadder being, leaving the little beings of a still more active organism to a further two hours of the process, after which, I felt sure, their mental wardrobe would be properly starched and ironed to send home to the parental roof.

Miss Primall confided in me that children were very trying. It was only by the motto of eternal vigilance that she accomplished anything. They were so exuberant—so full of life.

"Why if I should allow it—if I gave them a single indulgence, they would run all over me! I am ashamed to have you find the room in such confusion."

"Albert!" sharply, "Don't let me see you look off your book again."

"The frost, perhaps, (it was October) gives one such a live feeling," I suggested mildly.

"Well, maybe," dubiously, "but there is no excuse for it."

Just what was inexcusable, I did not quite decide.

"Are you troubled with whispering?" I ventured rather guiltily, for I had seen none.

"Whispering!" she echoed, horrified. "They get a demerit if they even turn around."

"A Class, in reading! One! Two! Three!"

"Must you go?" as they obeyed the signals, rising like ranks of miniature soldiers, and I, also, arose to go.

"Come in again,"—and so I left them reading about the "frisky squirrel," with all the animation of bisque talking dolls.

Mr. R.—, the principal, met me in the hall.

"So you have been visiting our model room," he exclaimed. "A very fine teacher! An unusual teacher, I might say. We were most fortunate in securing her."

"Indeed she is an unusual teacher—I trust,"—I added to myself.

The theme was evidently a pet one. He rolled it like a choice morsel under his tongue.

"They went in there regular harum-scarums—into everything. A very weak teacher last year! Miss Primall soon had them in marching order. You don't see any more of that now."

"Another primary room? Oh! Oh! yes. The first grade. But I'd really rather you wouldn't visit it this morning. It will be such a disappointment after the work you have been seeing. A young teacher, you know—enthusiastic and pleasant, but full of notions. She has some good qualities though, and I think she'll improve in time. But her order is dreadful! There simply isn't any."

However, I went in. I was not surprised to hear her called "Miss Love."

If ever a name fitted!—but you should have been there to see for yourself. There was a small tidal wave of rapture just as I entered, which entirely ignored my presence.

"Oh! see—see! There comes its wings?" shrilled an ecstatic little voice, forgetful of all convention.

"It is our very first moth from the cocoon," explained Miss Love, turning a smiling face to show me the rough brown cradle from which the trembling visitor was slowly freeing its drooping wings.

"The children are *so* happy over it."

"But we won't frighten our little friend with our big voices, will we?" she said softly. And the tender hush that fell upon the shining baby faces was sweet to see.

"Let us sing our cocoon song to the pretty moth," and as she spoke she wrote "Moth" in large letters on the board.

How softly, without any suggestion, the clear voices crooned the lullaby!

"This kind of moth cannot eat. They have no long tongue to suck with as other moths. So he will be quite happy to spend his little life in our warm room, and we can get better acquainted."

"Ralph, show me how he moves his wings. Why do you suppose he quivers them so? Yes, to get them unfolded. They were folded in the cocoon like a fan.

"You may all show what he will do when they get firm and strong."

It was only because, at last, all the children went home to lunch that I went too.—*Adapted, from Alice J. Ormes in N. Y. School Journal.*

Color Device.

In a third-year room are four large windows on the south. Every sunshiny morning two prisms are propped on the window-sills and the spectra glow on the opposite wall. So great a return of happiness for such a small outlay I have never before found. Little faces are lifted to the colors with positive thankfulness throughout the morning. Every night the prisms are locked in the case, and if from any cause I neglect to take them out in the morning, I always hear, "Please may I take the prisms?" Every bright day during the year some child remembers them, and reminds me of their absence.

While it is a novelty, draw a line of chalk around the spectrum, and notice in half an hour, or longer, how far it has moved, thereby proving the rate of revolution of the earth on its axis. Move prism rapidly to prove that light travels only in straight lines and with great rapidity. In time, pupils unconsciously learn the invariable position of colors, and the blending of red and yellow into orange, and yellow and blue into green. Have pupils sing the scale from the seven colors. Use the seven names in constructing first sentences containing series. Develop necessity for the use of the adjectives, gorgeous, radiant, glowing, beautiful, and vivid in describing the quality of the colors.

Ask why plants grown in the cellar are pale and white; where the many-colored flowers obtain their dyes; if we can have a spectrum in a dark room or on a cloudy day; if anywhere else in nature may be found similar combinations (rainbow, soap-bubble). Finally give the quotation: Color is the darling child of light."

Teach, in connection with the above, "The Rainbow Fairies," from "A Child's Garden of Song," by Wm. L. Tomlins.—*The School Journal.*

Margaret Fuller speaks of the effect of a certain teacher upon her: "All the dreariness that had hitherto been associated with the schoolroom was gone; the things he taught us were a part of his life; it was no longer drudgery to learn."

Scholastic Wit.

The scholar, said Eli Perkins in a Yale College lecture, gets amusement from all wit, both sensuous and intellectual. He can see the sensuous fun in the circus with his eye just as well as the fool, while the fool cannot enjoy intellectual wit which has to be taken in through the brain.

I asked a bright schoolboy one day why he called his rooster Robinson?

"Why, sir," he said, his eye gleaming with fun, "because he crew so." (Laughter.)

Now, what can a fool boy get out of that?

Dr. Elliot, of Harvard, when a young man ordered a bottle of hock in a Boston restaurant, saying as he did so:

"Here, waiter, bring me a bottle of hock—hic, haec, hoc."

The waiter, who had been to college, smiled, but never stirred.

"What are you standing there for?" exclaimed the professor. Didn't I order some hock?"

"Yes, sir," said the waiter, "you ordered it, but you afterwards declined it."

They tell a good story on our Wm. M. Evarts, our old Secretary of State. One day he was reading Virgil in Professor Thatcher's class, "Three times I strove to cast my arms about her neck, and—that's as far as I got, professor."

"Well, Mr. Evarts, I think that was quite far enough." (Laughter.)

The wit of the old Greek philosophers, Solon, Socrates and Aristippus, continued the lecturer, consisted in proving a big lie by the sophistry of a syllogism like this:

"Anything whose sun never sets, Cato, is immortal," said Aeschines.

"Yes, that is true, Aeschines."

"A hen's son never sets."

"True, too."

"Then a hen is immortal," said, the satirist, laughing.

To illustrate the wit and wisdom of the Greeks, I translate a few passages from Aeschines, the satirist:

"What good does education do a man, anyway?" asked the ignorant but proud Clinos.

"An educated man," said Aeschines, "can associate with himself (think, imagine and meditate)."

"Why do you say it is better to be poor than to be ignorant?"

"Because the poorest beggar can beg money and get it, but the fool will beg in vain for brains.

"What will you charge to educate my boy?" continued Clinos.

"Sixty drachma," said Aechines.

"That is too much. With sixty drachma I can buy a slave."

"Then go and buy one, and you will have a pair," said Aeschines, laughing.

Current Topics.

"The Union Jack flies over the grave of General Gordon." This is the result of the brilliant victory won by General Kitchener over the Khalifa's forces at Omdurman. The particulars are now familiar to all our readers. The "Charge of the Lancers" will pass into history with the "Charge of Balaklava" as a superb display of military valour. No word was given for the charge, nor did it have any direct bearing on the issue of the day. The Lancers, 320 strong, came suddenly upon a force of 2,000 of the enemy on ground which had not been examined by scouts. They were but 200 yards from the dervishes who were placed ten or fifteen deep. There was no time for the Lancers to turn. They dashed forward and into the thick of the enemy. When they got through, they had lost forty men in killed and wounded. Those who were killed had their heads, necks and limbs slashed to ribbons by their savage foes. There were many stirring incidents and scenes of valour:

With one exception no man who was once actually unhorsed was again seen alive. The single exception was Sergeant-Major Ginches. His horse was brought down to the ground and the officer fell among the furious dervishes. Sergeant-Major Brennan, who was riding ahead, saw the major's peril, and gallantly returned to his assistance. After a tough fight, in the course of which Brennan killed several dervishes, he succeeded in getting the officer on to his own horse and back to the regiment. Sergeant-Major Geo. Veysey got a slash from a dervish sword which severed his nose, and almost simultaneously a spear was thrust into his chest. Blood streamed from his wounds, but he still rode firmly in his saddle and continued to cheer on his troop till the fight was over. Sergeant Freeman received a terrible wound from a sword in his face, but like Veysey he went on fighting, and only sought the aid of a surgeon after he had carried his men through the action. Before the Lancers could get at the dervishes they had to jump the water course, and they did it in splendid style.

The Lancers' Charge at Omdurman.

Out leaped our lancers from heel-rest,
"Forward!" The cry in our ears,
"Charge!" and we swept them before us,
Onward, like chaff from the ears.

Gordon rode ever beside us,
Dark with the blood of his tomb,
Aye, and the devils that slew him
Here paid the debt for his doom.

Recked we the fire of the foeman?
Heard we the hail of the lead?
Nay, all we knew we were at them,
Paying the debt for our dead.

Into them, over and through them;
Back for our wounded and dead,
Hell was around and beside us,
Crimson and reeking their bed.

Out of them, formed for another
Charge for the heart of the foe.
Ah! they won't let us, however,
Song of our carbines they know.

Singing the song of our victory,
Fierce and avenging of hate,
Lo! They are broken and fleeing,
Fast from the coming of fate.

This is a day to remember!
Joy, and the heat of the fight!
Aye, for the God of our Battles,
Fought with us here for the right.

—*Ethelbert D. Pitt, Niagara Falls Centre, Ontario, in Farm and Fireside.*

Sir Herbert Kitchener, the hero of Omdurman, is only 48 years old. In 1882 he was given command of the Egyptian cavalry, and held the office for two years. After serving in Lord Wolseley's expedition, he was made Governor of Suakim. After holding this office for a couple of years he became Adjutant-General, and in 1890 he was appointed Sirdar. From first to last his energy has been as untiring as his success has been unbroken, and to-day he has the reputation of being a master organizer, capable of doing more with narrow means than any other soldier in the Empire. He exacts from no one as much as from himself. Indefatigable by day and night, with an iron constitution, taciturn, ambitious and proud, he is truly a man of blood and iron. Those who have gained his confidence regard him with unbounded enthusiasm. They believe him to be capable of everything.

Later comes the news that a French force under Gen. Marchand, with an Abyssinian army of 10,000 willing to co-operate with him are in possession of Fashoda, 300 miles from Omdurman, up the White Nile. This French force has been two years working its way thither from the French Congo, and is now within territory claimed by the British. If the French "have come to stay" Gen. Kitchener will find more work cut out for him.

The adjustment of peace between Spain and the United States has been begun by commissioners who are sitting in Paris. The difficulties in the way are not slight. With the departure of the Spanish troops from Cuba, there will be another element to reckon with—the Cubans themselves. These were ready enough to help, or promise help, to the United States, so long as the latter gave them aid, but recent events have proved that they do not like any better the prospect of being governed by the United States than by Spain. In the Philippines the situation is far from assuring. The insurgents are still in arms. The correspondent of the London *Times* writing a month ago says that at that time hundreds from Manila were enlisting daily, and troops were being drilled everywhere. The native troops and the army of occupation are not openly pitted against each other, but their relations are strained. Reinforcement of the American army at Manila has been called for, and two battleships, the Oregon and the Iowa, with other ships, said to constitute the most perfectly equipped naval expedition that ever sailed

under any flag, is on its way to reinforce the fleet under Dewey. Already it is estimated there are 16,500 American soldiers in the Philippines, but it is held that this force must be increased to at least 20,000 in order to hold the turbulent elements there in check.

Mount Vesuvius is now presenting the grandest spectacle since 1872, due to a violent outburst of activity. The central crater and several new mouths are vomiting lava and ashes.

The tiny planet—only about 25 miles in diameter—discovered by the astronomer Witt at Uranda Observatory, Berlin, on August 14, is one of the most interesting travellers of its kind in the solar system. It will occasionally, when it most nearly approaches the earth and sun at the same time, become, the moon excepted, our nearest neighbor in space. It will be only 14 million miles from us, or about one-seventh the distance of the sun. It will thus upon every close opposition shine in our sky as a star of the sixth magnitude, and therefore be visible to the naked eye.

A Joint High Commission, representing England, Canada, the United States and Newfoundland, has been in session in Quebec since August 23rd. Lord Herschell, Ex-lord Chancellor of England, is chairman of the the commission. It was deemed fitting, at a time when the relations between England and the United States were friendly, to consider certain questions which have caused some difference of opinion and even friction. Some of these questions are: The Behring Sea Seal Fishery, the Fisheries of the Atlantic and Pacific Coasts, the Settlement of the Alaska-Canadian Boundary, International Transit of Merchandise, International Mining Rights, Alien Labor Laws Common to Citizens of United States and Canada, Re-adjustment of Customs Duties. Some of the alleged decisions have been made public, but as the sessions of the commission are secret, one must wait for the final report for an "authorized version." The commission will probably adjourn during the first week in October to resume its sessions later in Washington.

The Plebiscite, to decide whether the people of Canada are in favor of prohibition or not, was taken on the 29th September. The result is not such as to justify the government in making a law to stop the importation and sale of intoxicating liquors. The majority in favor of prohibition—about 25,000—does not show an overwhelming public sentiment on which the government could rely in enforcing such an important measure. Quebec gave a very large majority against prohibition. In the Maritime Provinces, Manitoba and the North-West Territories the majority in favor was large. It was small in British Columbia and Ontario, all the leading cities, Toronto, Ottawa, Hamilton, London, giving an adverse vote. In fact all the chief cities in the dominion, except Winnipeg and those of the Maritime Provinces, voted against prohibition.

'ROUND TABLE TALKS.

"Subscriber" is reminded that no notice can be taken of his request to solve questions unless his name is given in confidence.

L. A. D.—Would you kindly answer in the REVIEW the following question? Suppose John Smith had LL.D., M. A., F. R. G. S., etc., etc., to his name, what are the different ways in which a letter could be properly addressed to him?

If you wish to give him all his degree begin with the M. A., then LL. D., etc. That is the only way unless you address him plainly as Mr. John Smith, or John Smith, Esq., ignoring the other titles. There seems to be a tendency to return to the simple address of Mr. instead of Esq., unless the one addressed is entitled to the latter distinction. Of course in writing official or semi-official letters it is better to give the person addressed all his titles unless these exhaust too much of the alphabet. If so give the most important. No man of sense, however, will be offended with simplicity of address.

G. M. P.—1. Can trustees legally deduct teachers' salary when absent on stormy days, on which it was not fit for pupils or teachers to be out?

2. How long would you think a teacher should remain at the school with only two or three pupils?

3. The teacher gets to the school and no pupils come,—stays around some time,—goes away and comes again at one o'clock, and no one there. Will the teacher lose the pay from the district and government?

1. As the district has provided a schoolhouse, which is made comfortable for stormy days, the trustees may deduct salary, if they choose, for such days.

2. For the whole session, or sessions, of course, just as if the school consisted of forty or fifty pupils.

3. She would lose the pay from government. She would not lose pay from the district if she remained in the school during the session or sessions and was prepared to do her work. If she did not remain at her post the trustees would not be legally bound to pay her. If the absence of pupils could be shown to be in consequence of the neglect of trustees to discharge their legal duties, they would be responsible to the teacher both for district and government payment.

T. Has New Brunswick an emblem? If so what plant is it?

We were under the impression that the maple leaf is our emblem, as in Ontario, but an excellent authority on the subject—I. Allen Jack, Esq., of St. John—writes us as follows:

"As far back as November, 1864, the late Alfred H. DeMill informed me that the plant emblem of New Brunswick is the potato, and wrote in doggerel for the

direction of the late Sir Samuel, then Mr. Tilley, in *The True Humorist*—

'Och, don't give your country for Ottawa's playsher,
'New Brunswick's swate emblem in maple leaves drown,
'That praty at laysher they'll skin with their raysher:
'And they'll Cart-yer away and they'll do yer up Brown.'

I am assured that the potato or "praty" is the emblem, though I do not know how, by whom or when it was selected."

A. D. J. Why do leaves turn red, yellow, etc., in the fall? Why do our deciduous trees need no leaves in winter, and why do they need them, and so many in summer?

The leaf is the part of the plant where the raw materials obtained from the soil and from the air are turned into plant food, such as starch, sugar, etc. This is process very active during the summer months, and is carried on in the leaf and other green parts of the plant in the presence of sun-light. At night the starch, formed during the day, is carried in a state of solution to the different parts of the plant for their nourishment and building up. Minute grains of chlorophyll (leaf-green) are scattered in countless numbers through the cells of the leaf, giving it its green color. This chlorophyll is a product of protoplasm or the living matter of plants, and in autumn, at the close of the growing season, is converted into reserve food material and withdrawn from the leaf, stored up in the twigs and branches adjacent, ready for the rapid growth of the buds which are to be leaves, branches and flowers of the next spring. Before the recall of this green living matter from the leaf, it undergoes a chemical change in which oxygen plays a prominent part. The varied hues of scarlet, brown and yellow which make our autumn woods so glorious are, then, the outward signs of a chemical change in the interior of the leaf, burning up waste matter, changing the food material into its most compact form preparatory to storing, just as the farmer gets rid of the surplus straw and chaff, and stores only the ripe grain. The frost has nothing to do directly with this coloring of foliage. Particular trees may be seen to turn long before the approach of frost.

After this food material is withdrawn into the tree the leaf falls. Its fall is prepared for weeks beforehand by layers of separating cells formed at the base from opposite directions, which cutting, finally sever it, leaving a scar—not a wound, since that would admit moisture, to the injury of the tree. Thus the tree is relieved of the incumbrance of carrying leaves in winter, during its season of rest, and is better able to resist the tempests and snow falls of that season.

The brief season of active growth, scarcely more than three months in this country, may account in part for the great number of leaves in summer. Have you noticed that saplings and the newest shoots of our deciduous trees have larger leaves, presenting a greater area to the sunlight and thus securing more rapid growth?

A. D. J. How can we best awaken an interest among children and grown people and give them a proper idea of the sacredness of bird life, thus preventing its destruction through maliciousness or for ornament?

Much can be accomplished in our schools by interesting talks and lessons on birds, their habits, how to recognize them by outward marks and by their songs; by stories of bird life, showing their intelligence, their care and affection for their offspring, their skill in building nests; their use to the farmer and gardener in destroying noxious grubs and insects. There is an inborn love for birds among children and grown people on account of their beauty, the charm of their song and their many pretty ways. Where would be the summer's gladness without the presence of birds? Too often people are indifferent and cruel to birds, simply from lack of interest or encouragement to study them. They have never been taught to distinguish them by their songs or by their varied plumage. And the first steps are so easy. A little observation, supplemented by intelligent teaching and direction, a sympathy with bird life and a respect for it—and the young student will soon be helped over the first steps.

J. If we cut all the stamens out of a flower and bring in contact with the stigma of its pistil the pollen of some other plant, for instance the pollen of the willow with the morning glory or apple, will it produce the same results as its own pollen would?

No; the pollen of one flower must be applied to the pistil of another of the *same species* in order that reproduction may take place; that is, a plant can only be reproduced from one essentially like it in origin.

C.—If you would kindly publish something in regard to such sentences as "It looks badly," "Draw the string tightly," etc., I would be greatly obliged. There are a number of sentences of this class that I should like to have something about to read to my pupils?

[Want of space in this number prevents our giving the full answer that this question requires. It will appear next month.]

---

1. A. B.—Does timothy blossom twice?

No. Blossoms do not appear twice upon the same stalk.

---

2. A. B.—Does the present Canadian History suit the common school?

[Perhaps some of our readers may be able to give us the results of an intelligent and fair trial of the book.]

E. J. B.—Through the columns of THE EDUCATIONAL REVIEW, please give solutions of the following problem ·

1. If $a+b$ varies as $a-b$, prove that a^2+b^2 varies as ab; and if a varies as b, prove that a^2-b^2 varies as ab. P. 211; Example 18.

Let $a+b=m(a-b)$, where m is constant.

Then $a^2+2ab+b^2=m^2(a^2-2ab+b^2)$;

Or $2ab+2abm^2=m^2(a^2+b^2)-(a^2+b^2)$;

Therefore $a^2+b^2=\dfrac{2(1+m^2)}{m^2-1}ab$

" a^2+b^2 varies as ab.

Again, let $a=mb$, where m is constant.

Then $a^2-b^2=m^2b^2-b^2$

$=(m^2-1)b^2$

$=\left\{\dfrac{m^2-1}{m}\right\}ab$

Therefore a^2-b^2 varies as ab.

---

2. If a, b, c, d be in *A. P.*, a, e, f, d, in *G. P.*, a, g, h, d in *H. P.* respectively; prove that $ad=ef=bh=cg$. P. 291; Example 25.

By Art. 296 we have $ad=ef$.

By the *A. P.* we have $a-b=b-c=c-d$;

Therefore $2(a-b)=b-d$, and $2(c-d)=a-c$;

" $b=\dfrac{2a+d}{3}$ and $c=\dfrac{2d+a}{3}$

By the *H. P.* $\dfrac{1}{a}-\dfrac{1}{g}=\dfrac{1}{g}-\dfrac{1}{h}=\dfrac{1}{h}-\dfrac{1}{d}$

From these equations it may be easily found that

$$h=\frac{3ad}{2a+d}, \text{ and } g=\frac{3ad}{2d+a}$$

$$\text{Therefore } bh=\frac{2a+d}{3}\times\frac{3ad}{2a+d}=ad$$

$$\text{And } cg=\frac{3ad}{2d+a}\times\frac{2d+a}{3}=ad.$$

---

3. A railway carriage will accommodate 5 passengers on each side, in how many ways can 10 persons take their seats when two of them decline to face the engine, and a third cannot travel backwards. P. 306; Example 12.

The seven persons who can sit on either side would be divided into two groups of 3 and 4 respectively. This can be done in $7C_3$ ways. Eack side admits of $\lfloor\underline{5}$ arrangements.

Therefore the required number $=7C_3\times\lfloor\underline{5}\times\lfloor\underline{5}$

$$=\frac{7\cdot6\cdot5}{1\cdot2\cdot3}\times120\times120$$

$=504000.$

---

3. Shew that

$$^{n+1}C_r = {}^nC_r + {}^nC_{r-1}.$$

$${}^nC_r+{}^nC_{r-1}=\frac{\lfloor\underline{n}}{\lfloor\underline{r}\ \lfloor\underline{n-r}}+\frac{\lfloor\underline{n}}{\lfloor\underline{r-1}\ \lfloor\underline{n-r+1}}$$

$$=\frac{\lfloor\underline{n}}{\lfloor\underline{r}\ \lfloor\underline{n-r+1}}\left\{n-r+1+r\right\}=\frac{(n+1)\lfloor\underline{n}}{\lfloor\underline{r}\ \lfloor\underline{n-r+1}}$$

$$=\frac{\lfloor\underline{n+1}}{\lfloor\underline{r}\ \lfloor\underline{n+1-r}}={}^{n+1}C_r$$

SCHOOL AND COLLEGE.

Carleton County Teachers' Institute meets at Hartland on on the 13th and 14th October. Chief Superintendent of Education Dr. Inch will be present.

Rev. Dr. Ambrose, D.C.L., died September 19th at his home in Sackville, N. S. He was one of the founders of the Halifax Institute of Natural Science.

Mr. Frank Allen, who recently resigned the principalship of the Shediac schools to take a position on the Moncton High School staff, was presented by his friends in Shediac with an address, accompanied with a gold-headed cane.

Principal Oulton, of the Moncton High School, was presented with a handsome travelling case by his fellow teachers on the eve of his departure for McGill University, where he is taking a post-graduate course.

Few country school districts present a better appearance, both as to house and grounds, than Chance Harbor, St. John County. Miss Emma Gillies, the capable and energetic teacher, has been instrumental in raising and expending nearly fifty dollars in improvements of various kinds.

Miss Addie Calder, teacher at Fair Haven, Charlotte Co., has recently, by means of a school entertainment, added to her school appliances.

Professor Alexander Graham Bell, the inventor of the telephone, owns a whole mountain of 1,000 acres in Baddeck, C.B., upon which he has expended $200,000 on roads. Upon its southern slope up toward the summit, and overlooking a wide panorama of lake and mountain, he has erected a $35,000 residence, and near it a fully equipped laboratory, where he conducts his experiments in electricity.

Inspector Carter hopes to complete his work in Charlotte County during October. He expects some time during that month to address a public meeting of those interested in the public schools at Beaver Harbor.

There are no papers devoted to education exclusively in Maine, nor is there any means whereby papers of exceptional merit read at institutes may confer benefit upon others. The very excellent paper on "Physical Culture," read before the Penobscot association by Miss Flora Mason, of the Springfield Normal School, should have the widest circulation, according to the opinion of those who heard it.

Ten of the teachers of the Windsor, N.S., schools, at the time of the fire, have been re-engaged, and are teaching in the best buildings to be obtained at present. It is expected that the new school building, which will be one of the best in the province, will be formally opened about the middle of November.

Hantsport has secured Miss Mary Burgoyne in the preparatory department, in place of Miss Maggie Burton, who resigned at the end of last term. To increase the efficiency of the High School department, another department will be opened very soon.

The County Academy in Kentville opened with a large attendance and the prospect of a very good year. Miss Mary McKay and Miss Theresa Farrell, who obtained Class A licenses as the result of the recent examination, have been added to the staff of teachers. These fill the vacancies caused by the resignation of Miss Jennie Ross and Miss Mabel Caldwell. Mr. Angus McLeod is still principal, and Miss Bertha B. Hebb vice-principal.

Miss Bessie Lewis, Class A, has been appointed principal of Maitland High School, in Hants County. Mr. J. S. Layton, who was principal last year, has become principal of Annapolis Academy.

Some of the graded schools in Hants and Kings have secured new principals, as follows: Summerville, Miss Emma L. Stephens; Cheverie, Miss Annie Hennigar; St. Croix, Miss Helen McCurdy; Waterville, Mr. Charles E. Reid; Sheffield's Mills, Miss Angie Lee; Upper Canard, Mr. Percy J. Shaw.

More new teachers are teaching their first term in Hants and Kings, N. S., than for many years past.

Hillsdale, Whale Creek, Georgefield, Vaughan, Five Mile Plain, and Mill Brook, in Hants County, need teachers. It will be in order for any teacher, in need of a school, to apply to the secretaries of trustees in these sections.

The annual meeting of the Prince Edward Island Teachers' Association will be held in Charlottetown on Thursday and Friday, October 6th and 7th. An interesting programme has been prepared, which was published in the September REVIEW.

The Vancouver *World* of a recent date said: Miss Annie Harvey, a Nova Scotia teacher, leaves to-day on the "Aorangi" for Honolulu. Miss Harvey is accompanied by Mrs. E. Wood, whose husband is principal of the Normal College in Honolulu. Mrs. Wood has been visiting her friends in Guysboro County, and Miss Harvey goes with her to meet her affianced husband, Dr. Wood, who is holding a government position in Heela, eight miles from Honolulu. We understand that Dr. Wood has won honors in hospital work, and now holds a most excellent position. He is to be congratulated upon his choice of a young lady who is esteemed very highly both as an efficient and cultured teacher.

Dr. Edgar Wood is, or was recently, the principal of the science department of the Honolulu High Schools. It is interesting that the high school where he teaches is located in a palace formerly occupied by Queen Liluokalani. He is a native of River Hebert, Cumberland Co., N. S., and a graduate in arts of Mt. Allison College, and in science of Cornell University. Mr. Wood went to Honolulu about three years ago. His brother, Dr. Herbert Wood, was also a Mt. Allison student, and practised medicine for a year or so at River Hebert. He is now a government officer and general practitioner, with a large and lucrative practice.

RECENT BOOKS.

If in teaching arithmetic the results to the pupil have been confusing and of no educational value, the fault lies in the lack of an orderly and logical method in presenting the subject so that the various processes may fit the development of children's minds. Happily in books recently published[1] there is a distinct recognition of the want of a better scientific treatment of arithmetic, especially in elementary grades, and an attempt made to lay a foundation for better teaching. In McLellan & Ames' Primary school Arithmetic, designed for teachers, there appears to be a clear conception of what is to be done in teaching number and grading it to suit the capacity of children. From the first there is continuous experimenting and measurement to develop the child's number sense, arousing his interest and activity, and leading him from the start to see what an important part number plays in the affairs of life. There are no catch problems, no useless matter. It sticks closely to fundamental principles and the patient and thorough working out of these by clear and practical examples. An excellent feature in the book is its clear, well-printed pages.

Taylor's Elementary Arithmetic, for use in the public and model schools of Ontario, has many advantages over arithmetics now in use, and gives promise of being of great service in securing better results in the art of teaching number. It is admirable for its conciseness; all meaningless and technical words and examples are omitted; it takes up the divisions of the subject in logical order and explains commercial work in clear language and with a variety of practical examples.

Kennedy and O'Hearn have completed their series of arithmetics by adding Part IV which has just been published, for the use of academies and high schools. These gentlemen are to be congratulated on the completion of their work, which gives to the schools of the Atlantic Provinces a well graded series of arithmetics at a low price. We should like to see each part with a neat and durable binding, instead of paper covers, as at present. It could be done with but little additional cost, and it would enhance the value of the work in the minds of children who would like to preserve their school books. The four parts bound together would also be a great boon to teachers.

In the preface to the revised edition of Gage's Physics[1] the author regrets "the tendency to allow enthusiasm for experimentation, for mere manipulation of apparatus, to obscure the importance of an intellectual mastery of the facts and their underlying principles." This is the danger of the "Laboratory Method." While it encourages the pupil to perform his own experiments in all branches of natural science in opposition to former almost universal methods of text-book memorizing and lectures, there is danger that the "mere manipulation" may come to be the all-important part without an intellectual grasp of the principles of the science. This, of course, can be regulated by the discreet teacher whose own training has been a wise combination of both theory and practice. To obviate the danger of too much concentration of effort in the laboratory, the author has issued a separate manual of "Physical Experiments," reserving the text-book for the elucidation of principles, with questions thereon, and such illustrations as shall make them clear. In the revised edition the author has omitted the discussion of certain obscure and imperfectly understood topics, such as absorption, osmosis and crystallization, and has brought the work up to the times by chapters on the Roentgen Ray, the Telephone, Electric Railways, etc.

The edition of Cicero's First Oration Against Catiline[2] in Macmillan's "Elementary Classics" is excellent for its vivid sketch of the life and career of Catiline, the carefully edited text, the judicious notes, well arranged vocabulary, and for the neat form and well printed pages.

The exercises on the First Book of Euclid[3] will furnish any teacher, no matter what text he uses, with a well graded series of deductions from some of the fundamental propositions in geometry.

[1] THE PRIMARY SCHOOL ARITHMETIC, by J. A. McLellan, A.M., LL.D., and A. F. Ames, A.B. Teachers' edition. 12 mo. Pages 265. Price 60 cents, net. Publishers, Copp, Clark & Co., Toronto.

AN ELEMENTARY TREATISE ON ARITHMETIC, by Wilson Taylor, B.A. Pages 218. Publisher, Wm. Briggs, Toronto.

ARITHMETIC FOR SCHOOLS, in four parts, by Kennedy and O'Hearn. Part IV for academies and high schools. Publishers, T. C. Allen & Co., Halifax.

[1] THE ELEMENTS OF PHYSICS: A Text-book for High Schools and Academies, by Alfred Payson Gage, Ph.D. Revised Edition. Pages 381; cloth; mailing price, $1.20. Publishers, Ginn & Co., Boston, Mass.

[2] CICERO: *First Oration Against Catiline*. Edited for the use of schools, by the Rev. G. H. Nall, M. A., assistant master of Westminster School. Pages 75. Price 1s. 6d. Publishers, Macmillan & Co., London and New York.

[3] EXERCISES ON THE FIRST BOOK OF EUCLID, by Wm. Weeks, lecturer on Geometry, St. Luke's Training College, Exeter. Pages 60. Price 1s. Publishers, Macmillan & Co., London and New York.

(Continued on page 92.)

BOOKS RECEIVED.

A MANUAL OF ELEMENTARY PHONETICS, by A. W. Burt. The Copp, Clark Co., Publishers, Toronto.

THE HISTORY OF MANKIND, by F. Ratzel. Parts 27-29. Macmillan & Co., Publishers, London.

N. S. PROGRESSIVE SCHOOL SERIES, with Introduction and Notes as follows: *Milton's Poems, L'Allegro, Il Penseroso, Comus Lycidas*, edited by Principal Cameron; *Macaulay's Essay on Milton*, edited by David Soloan, B. A.; *Addison's Sir Roger de Coverley*. Publishers, T. C. Allen & Co., Halifax.

EASY LESSONS IN VOCAL CULTURE AND EXPRESSION, by S. S. Hamill, A. M., Chicago. Eaton & Mains, Publishers, New York.

OCTOBER MAGAZINES.

Florence Bell's Plea for the Better Teaching of Manners in *Littell's Living Age* for October 1st, is profitable to all who, as teachers or parents, have anything to do with the training of young people. This number of the *Living Age* begins a new series, and appears in a new and attractive dress....A writer in the October *Ladies' Home Journal* shows how easy it is to establish and maintain public libraries even in the small country towns. Co-operation of effort under capable, enthusiastic direction, it is pointed out, will bring the sought-for results. The article details with exact directness the best way to proceed....*St. Nicholas* in its opening article give some interesting reminiscences of the childhood of Wilhelmina, Queen of Holland, and describes her coronation....Everyone should read the article in *The Atlantic* on Botching Shakespeare, by Mark H. Liddell, and to weigh well the conclusion he comes to, "to learn this English we love, and to study deeply its literature in the light of our knowledge . . to learn the language of the people . . to hand on to them (our children) this language the better for our having used it, this literature for our having taught it to them. This will require effort, strong and persistent; it means work for our educational system."....In the October number of the *Century* Prof. William M. Sloane gives Personal and Collected Impressions of Bismarck. Prof Sloane saw more or less of Bismarck while a student of history with Bancroft, when the latter was United States Minister at Berlin. Prof. Dean C. Worcester, of the University of Michigan, who wrote in the September *Century* of The Malay Pirates of the Philippines, from personal experiences among them, in this number discusses Knotty Problems of the Philippines.....The *Canadian Magazine* for October has seven important articles, besides short stories and poems, making a number of unusual interest. Sir John Geo. Bourinot concludes his famous series of the Makers of the Dominion of Canada, and there is an article on Newfoundland and Canada by Principal Geo. M. Grant, which will be read with interest. The review of current events, editorial comment, and notes on books and authors, all from a Canadian standpoint, give additional value to this magazine, and are becoming features that its readers look forward to with pleasurable anticipation.... Alice Carter Cook is the author of a fully illustrated paper entitled Plant Life in the Canaries which appears in Appleton's *Popular Science Monthly*. These "Fortunate Islands" of Lucian, "abounding in luscious fruits and covered with luxuriant forests," are to-day scarcely at all known or appreciated by the general traveller after health or pleasure. A reading of Mrs. Carter's article, however, will give one a most delightful picture of their beauty and interest, as well as a great deal of information of scientific value....The *Chautauquan* has frontispiece engravings of Bismarck and Col. John Hay, late U. S. Ambassador to England, and now Secretary of State. Lovers of beautiful architecture—and who is not—will find pleasure in the initial article upon The Cathedrals of England. The ten illustrations show exceptionally good views of Canterbury, Winchester, Durham, Salisbury, and Ely, and the text accompanying them points out their distinguishing features and gives just enough of the history of each to whet the appetite.

N. B. Education Department. Official Notices.

OPENING OF SCHOOLS.—The schools in all districts not having eight weeks' vacation, will be re-opened on Monday, August 15th In cities, towns and districts having eight weeks' vacation. the schools will reopen on Monday, August 29th prox.

TEACHING DAYS.—The total number of teaching days in term ending December, 1898, is 94 for the country and 84 for the city and town districts *Labor Day is not to be reckoned as a Public School Holiday.*

ENGLISH LITERATURE FOR HIGH SCHOOLS.—Grade IX, Longfellow's Evangeline, any edition. Grade X, Select Poems of Goldsmith, Wordsworth, and Scott (W. J. Gage Company, Toronto). Grade XI, Select Poems of Keats, Shelley and Byron (W. J. Gage Co., Toronto); Shakespeare, Richard II. (Rolfe Edition).

NOTE.—The Select Poems assigned for Grades X and XI are in one volume. Price 60 cents. The same book as used last year

The literature for Normal School candidates, Class I is the same as for Grade XI. Candidates for University matriculation in July 1899, will be examined in the literature subjects for Grades X and XI.

Education Office, July 25th, 1898.

J. R. INCH. *Chief Supt. of Education*