

# THE EDUCATIONAL REVIEW.

FOR THE ATLANTIC PROVINCES OF CANADA.

Vol. III.

SAINT JOHN, N. B., MAY, 1890.

No. 12.

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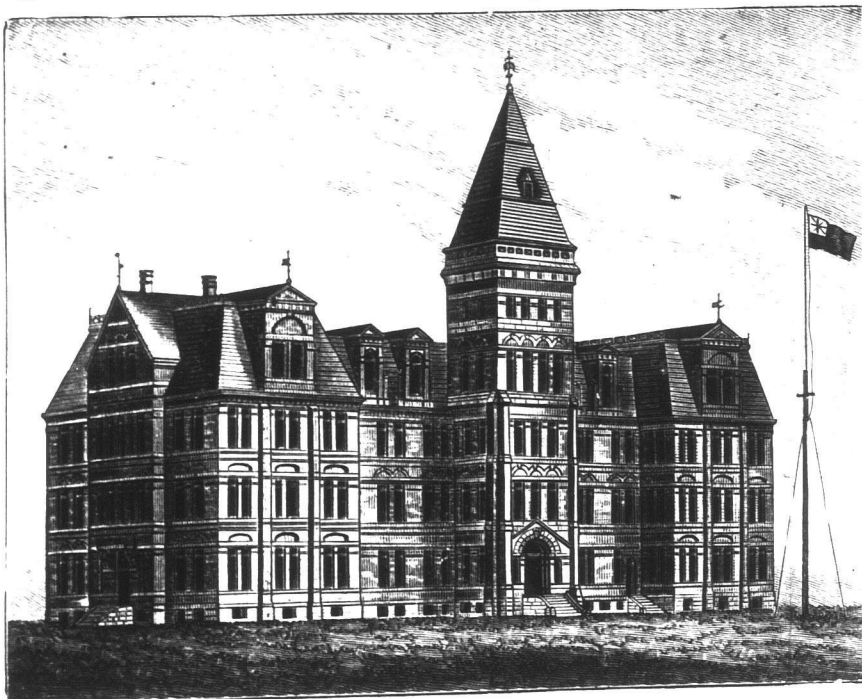
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# The Educational Review.

Devoted to Advanced Methods of Education and General Culture.

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## EDITORIAL NOTES.

THIS number finishes the third volume of the REVIEW. The encouragement that has been extended to it since its publication gives assurance that its monthly visits are welcome. We hope to make it doubly valuable to our readers, if they will assist us, and they may do it in several ways: By taking a personal interest in their own educational paper; by sending to its columns something bright and helpful to others; by suggesting, if it does not meet their requirements, something that will add to its value; and—what is very important to the paper and its subscribers—by not allowing themselves to get in arrears in their subscriptions.

FRIDAY, the 16th of May, has been selected as Arbor Day for New Brunswick. We hope the day will be observed with enthusiasm and that the aim will be steadily kept in view to make more beautiful

and pleasant the surroundings of every school building throughout the province. The little that is done every year, in cleaning up school premises, in planting trees and protecting and fostering the growth of those already planted, will repay all the effort that is put forth.

THE Annual Convocation of Dalhousie College and University took place at the Halifax Academy of Music on Thursday, April 24th, and the proceedings were of more than usual interest. The degree of B.A. was conferred on seventeen, and that of B.L. on eighteen graduates—perhaps the largest number that the institution has turned out in any previous year. This is a matter of congratulation, not only to the president and faculty, but to the province at large. Dalhousie deserves its popularity, and has room within its ample halls and class-rooms for many more students. With its endowments, the excellence and variety of its courses, it should send out three times as many graduates in the near future.

THE teachers of St. John have a warm feeling of attachment and respect for the trustees who have just retired from the School Board. Mr. Boyd, the Chairman of the Board, has long been a welcome visitor in the schools, where his presence was always an inspiration and encouragement. The active and intelligent interest that Mr. Ellis has never ceased to manifest amid the absorbing duties of his profession will always be a source of grateful recollection to the teachers of St. John.

WE have been fortunate enough to be able to inspect the work of the students at the Victoria School of Art and Design in Halifax at the closing of the winter term. The staff, consisting of headmaster George Harvey, A. R. C. A., assisted by J. T. Larkin, Esq., Engineer, Chas. H. Hopson, Esq., Architect, and Miss L. Cornelius, are to be congratulated on the superior character of the accomplished in each of their departments. There were most gratifying evidences of genius in the handiwork, the marble statuary, clay modellings, painting from nature, monochromes from statuary, designs, machinery drawings, and general constructive drawing, archi-



lectual drawing, etc., etc. The province has at length a most valuable institution fairly inaugurated. Four *free* scholarships are open for competition to our county academies and high schools on the syllabus of drawing prescribed for the high school course. Four free scholarships open for competition to Halifax, were won respectively by Miss Perry and Miss Smith of the Halifax Academy; and Miss O'Brien and Miss Mahoney of St. Patrick's Girls' High School. To the public spirit of a few Halifax ladies and gentlemen, who spared no effort to arouse public interest in art education, is the finding of funds to found this institution; and them especially will be due the thanks of a grateful country and posterity.

Just as we go to press some important contributions come to hand. Correspondents should remember that to insure insertion their favors should reach us on or before the first of each month.

#### EDUCATIONAL REPORTS.

Chief Superintendent Crocket estimates that 22,000 children in New Brunswick, between the ages of five and fifteen, were not enrolled in the public schools last year. This is over twenty-five per cent of the children in the province between these ages. This fact seems to call loudly for the passage of a law compelling parents to send their children to school for at least a portion of the year.

Concerning the subjects of instruction, Supt. Crocket notices that a larger number of pupils than usual have been instructed in several important subjects, "which, though not of much educative, are of much practical value." Summing up the subjects taught in the course, he says: "It is possible that pupils may pass through the subjects and still be ill prepared to enter upon their duties. \* \* \* There is still too much book work to the exclusion of things, and too little attention given to the connection between what the pupil is taught and the world around him. It is here, I believe, and not in the course, that the defect exists.

We agree with this, and further, we think that the discretion of teacher and examiner should be used in giving more prominence to important subjects and such as shall have a practical bearing on the pupil's after life. If there is too much laid down for the higher grades of advanced schools to accomplish successfully, there should be more attention given to the important parts of the course. If pupils in the higher grades of advanced schools receive constant and careful drill in how to use their own language, and in the ordinary rules of arithmetic, with the

ability to write a legible and fairly rapid hand, it will be of vastly more service to them, either in going directly to business or pursuing a higher course than if they had been *crammed* to an equal degree with all the subjects of the course. The knowledge of geometry, algebra, Latin, Natural Science, that the pupil gains during the last year or two at school is of real service to him or it is useless. The "how many pages have been gone over?" is of little importance; the important question is, *How* have these subjects been taught? "It behooves the teacher," says Supt. Crocket, "to examine his methods and his practice. \* \* \* Now, as the grading time draws near, let the examiner also begin to take an introspective glance.

Chief Supt. Crocket regrets that there is a slight falling off in salaries of teachers. "It is not to be expected that the men and women who are fitted to carry on the work of our schools will have much desire to remain in the profession if their salaries are reduced. When the best teachers leave, the tone of the schools is lowered and the whole service suffers. It is an ill-advised economy that seeks to maintain on the scantiest allowance a service which is essential to the preservation of order and the strength and progress of a country."

We have received the eleventh annual report of Chief Supt. Montgomery, of the P. E. I. schools. He judges that the educational record of the past year is on the whole satisfactory, but regrets the departure from the profession of the "best and most experienced teachers, and the accessions to the profession do not fully make up our loss in any respect except in numbers."

We have received from Geo. S. Milligan, LL. D., Superintendent of Methodist schools in Newfoundland, the report of schools under his jurisdiction for the past year. The results of the year's operations of schools, he states, indicates certain and substantial progress. His recommendations—increase of salaries for teachers, free public schools, and the adoption of a reasonable measure of compulsory education—show that the colony is imbibing broader and more liberal views in education.

We are indebted to D. Wilson, Esq. B. A., Inspector of Schools, for a copy of the report of Public Schools for British Columbia. It is an interesting document, and shows that the Pacific Province is rapidly taking an advanced position in education. Among the leading teachers and school officers are the names of many Atlantic Province students and teachers.



### FREE SCHOOLS IN THE BRITISH HOUSE OF COMMONS.

In the House of Commons on the 21st February last, there occurred a very notable debate. Conspicuous alike by the distinction of the gentlemen who participated in it, and the dignity, good sense and statesmanlike grasp which characterized the speeches, it ought to win our interest and convince us that if the growth of public opinion in Great Britain is slow, yet when a great idea has gained a lodgment in the mind of the people it is sure, sooner or later, to develop into practical form. When free education was advocated by Mr. Chamberlain more than twenty years ago it met with but a cold reception, and when, subsequently, a resolution on the subject was introduced into the House of Commons not more than sixty members followed its proposer into the lobby. But in the interval, from 1870 till the present time, it has continued to grow in favor. As an article of the "unauthorized programme," in 1886, it was urged by Mr. Chamberlain upon the statesmen and electorate of Britain with remarkable ability, lucidity and power, in a series of speeches which communicated an extraordinary impulse to the popular movement in support of it. Last year free elementary education was granted to Scotland, and now both parties in Parliament have accepted the principle of the obligation of the State to provide free education in all elementary schools in England—the only question remaining to be discussed being the time when, and the manner in which it is to be done.

On the present occasion there was a singular unanimity among the speakers as to the necessity of assent to the free school principle as the logical complement of the education act of 1870. And notwithstanding the vigorous protest of Sir R. Temple, it must be conceded that there was little opportunity for difference of opinion on this part of the subject. It was held that it was the duty of the State to see that every one of its future citizens is qualified to play his part intelligently in the government of the country, and that he has the opportunity of preparing himself to earn a living; and that as the community is just as interested in this as the man himself, and perhaps more so, the community ought to provide the expense. It was also urged that, should the government undertake this responsibility, compulsory attendance could be enforced without irritation, and that with increased and regular and cheerful attendance, the work of the teacher would be greatly improved. And the fact was emphasized that not only would the poor be relieved of a burden, but they would be spared the indignity of appearing before the poor-law guardians

by being placed on an equality with their more fortunate neighbors.

The chief difficulty that stands in the way of immediate legislation is the vast number of voluntary schools in the country and the difference of opinion that prevails respecting them. In England there are 19,200 elementary schools receiving aid from the State, and of these not more than 4,600 are under the government of School Boards, the remaining 14,600 being in connection with the various religious bodies. These latter do not participate in the school rate, but are subject to examination by the government inspector and are assisted according to the terms of his report. For additional support they depend upon the voluntary contributions of the religious denomination to which they belong. In the year 1887-8 the amount obtained from this source was \$3,725,000, while the average number of children in attendance was 2,255,000. During the same period the total sum received in fees in State aided schools amounted to \$9,311,500. Of this \$6,204,500 was collected in voluntary schools. From these figures one can perceive the financial magnitude of the interests involved, and the prodigious outlay that would have to be undertaken by the government should they, in framing a measure, render it impossible for voluntary schools to exist alongside of free board schools. School places would be required for more than two and a quarter millions of children, at an estimate varying from a minimum of \$140,000,000 to a maximum of \$200,000,000, while an additional annual outlay would be incurred by the extinction of these schools to the amount of the sum of the fees and the voluntary subscriptions, \$9,929,500. And this leads us to speak of that phase of the difficulty which provides us with the only reason for the existence of these schools as distinguished from board schools. It is not owing to any superiority in the education received in the one set of schools over that provided by the other, for the board schools are generally recognized as being better equipped and better taught. Mr. Mundella says of the voluntary schools, that while some of them are as good as money can make them, many of them are as bad as they can be. They are maintained for the sole purpose of training the youth of the various denominations under the supervision of their respective religious instructors. Religious education is thus guaranteed and a claim for denominational support made good. Private schools, though they share in the government grant, they are managed by their own committees, in their own way, for their own purposes and without the interference of the outside public.

It is manifest, therefore, that if the schools under the School Boards be declared free under a partial

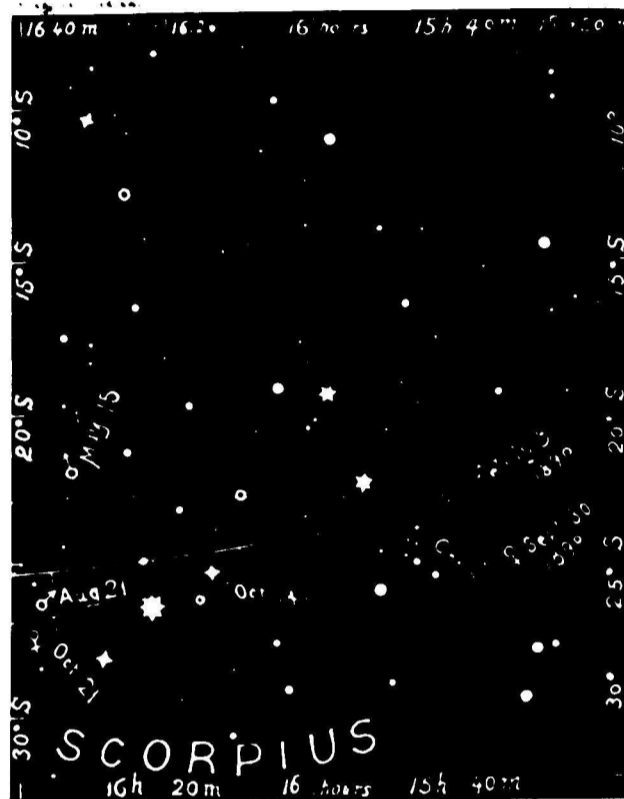
system of free education, the voluntary schools will cease to exist, while if it be claimed that popular representation, with a controlling power in their committees, must accompany grants sufficiently enlarged to admit of the remission of all fees, the voluntary contributions will be greatly diminished or entirely fail. But if, as Mr. Chamberlain recommended, an additional grant be made to all schools, voluntary and board schools, equivalent to the fees collected, the difficulty will disappear. Both classes of schools would work as before, the denominational question and the religious difficulty would remain untouched, and the possibilities of increased benefit from the new order of things would be the same for all.

There is little doubt that the time is near when all elementary schools in England, under government inspection, will be open to all children free of charge, but we would deprecate any step that would weaken or destroy the religious instruction that is therein imparted. Not that we desire sectarian teaching, but we consider that no calamity could be fraught with more disastrous consequences than the banishment of the Bible from the common schools. The teaching of scriptures has hitherto been a prominent feature in school work in England and Scotland, and we trust that in the future it will maintain the same distinctive position.

We had a very pleasant visit to the institution for the deaf and dumb at Halifax. J. Scott Hutton, Esq., M. A., the Principal, with his assistant teachers, Mr. Lawrence and Miss Bateman, revealed in one hour more than could be outlined in many columns, as to the development of the idea and use of language in the children of silence. When one sees the intelligence developed against such difficulties, he cannot help admiring the genius of the skilful educator. Some very interesting illustrations of the method of teaching the dumb to speak were given; and a marvellous case of a blind deaf mute from Newfoundland whose training enables him to communicate his thoughts to us in writing. Figuratively, if not literally, the deaf are made to hear and the dumb to talk. Seventy-four have been in attendance during the past year, from the following provinces, Nova Scotia, 50; Newfoundland, 7; P. E. I., 7; and New Brunswick, 7. They have been receiving a course in calisthenics from Mr. J. S. McKay, and in modelling in clay from Mr. Harvey, headmaster of the Victoria School of Art and Design. From their work, we think deaf mutes are specially adapted for excellence in the department of drawing and design; and that in this department they may find a congenial and profitable employment.

## Astronomical Notes.

## THE SCORPION.



Between the middle and end of May and between nine and ten in the evening, look at the south-east sky. That big red star is Mars, the little red one is Antares. It is with Antares and the constellation it belongs to that we have to do at present. The constellation is Scorpio, and is of special interest this year on account of its distinguished visitors. Mars is there now in all the glory of an unusually good "opposition," and he will remain there until the end of August. Then in October Venus will be there in the full splendor of her "greatest brilliancy."

We see Scorpius in the evening during the summer months only, and only at a low altitude. It rises in the south-east and sets in the south-west. When due south and highest up, Antares—which is Alpha Scorpii, and is in the middle of the constellation—is only twenty degrees above the horizon in the south of Nova Scotia, and only sixteen degrees above in the north of New Brunswick. In the mean latitude of these provinces Antares rises at midnight towards the end of March, at nine o'clock about the middle of May, and at sunset early in June. It is due south at midnight near the end of May, at nine about the middle of July, and at sunset about August 8. It sets at midnight at the end of July, at nine about



the middle of September, and at sunset about November 20.

So, at nine o'clock we may examine Scorpio from the end of May to the beginning of September; and from the middle of April to the end of October at some time between midnight and sunset. The "nine o'clock" and the "midnight" are mean time.

Scorpius is a constellation easy to recognize and remember even when there is no such distinguished stranger within its gates as there is at present. Antares alone by its brightness and red color is sufficient to distinguish it from the neighboring constellations. Then there is also the arrangement of the stars above and below Antares. With the help of a little imagination those above may be made to take the shape of a boy's kite; and those below, when they can be all seen, make a very good tail, with a curl-up on the left.

This tail—it is the Scorpion's tail on celestial globes—is not shown on our map. In our latitude it trails over only a small arc, low down near the horizon. But it is well worth looking at when you get a good chance. It contains three stars brighter than any others in the constellation except Antares, and contains also several good doubles and trebles for small glasses.

Of the stars that our map does show, those to the left of the broken line belong to Ophiuchus, those to right of it to Libra. The broken line is the boundary of the part of Scorpio here shown. This boundary line, like those of other constellations, is not exactly the same on all star maps, but ours is "according to the best authorities." In regard to the relative brightness of the stars, also, you must not expect our map to agree exactly with all other maps, or even with what seems to you the relative brightness of the real objects. Perfection in this respect is impossible in a map. Make for yourselves whatever corrections you think necessary.

The continuous lines represent the paths of Mars and Venus through the constellation between now and the end of October. The marks along these lines are the positions of the planets at intervals of a week. The bent line is the path of Mars, and the almanac symbol for him stands in front of the dates May 15, July 3, and August 21. The straight line running right across the map is the path of Venus, and her symbol stands in front of September 30 and October 21.

The marks just mentioned you will not find in the sky, but on the given dates you will find the given planets in the given positions with respect to the given stars. The star-marks are of seven kinds—an eight-point star for first magnitude, six-point stars for second magnitude, four-point ones for third, large dots for fourth, medium dots for fifth, small dots for

sixth and "dough-nuts" for what in a small glass look like nebulae.

The eight-point star is Antares, the Alpha of the constellation. The third magnitude one below it on the left is Tau, the one above and on the right is Sigma. (Don't forget that the positions of stars on a map with respect to *right, left, above, below*, are exactly like the sky-positions only when the constellation is on the meridian.) Of the two second magnitude stars, the upper is Beta, the lower is Delta. Below Delta is Pi. These three form the right side of the bow of the kite. The left side is not nearly so well defined. Its three stars are, in order from Beta: Nu Scorpii, and Psi and Omega Ophiuchi. Begin your study of Scorpius by getting the arrangement of the nine stars just named well fixed in your mind; then you will have no trouble afterwards in recognizing the constellation.

Antares is of the first magnitude and is red. Both of these characteristics are obvious at ordinary times, but are somewhat masked at present owing to the proximity of the much brighter and redder Mars. If you have any doubt about it, get Mars out of the way behind a house or something, and then compare Antares in color and brilliancy with the other stars in sight. If you do this when Antares is on the meridian, you won't find half a dozen brighter stars anywhere, nor will you find one as red.

It is to its redness—the same fiery redness that Mars shows—that it probably owes its name. The Greek name for Mars was Ares, and the red rival of the red Ares is Antares. Just at present the star makes a rather sorry rival to the planet, but it is not always thus. The last time Mars passed through Scorpio—in September, 1888—he was but little, if any, brighter than his rival, and one not well acquainted with them would have been at a loss to say which was Ares and which Antares. When he passes there next—in February, 1892—Mars will be less bright than he was in September, 1888, and those who then care to get up in the morning and look at the two can judge for themselves as to Antares' claim to rival Ares.

The red stars like Antares and Aldebaran are supposed by some to be the oldest and coldest stars, the white or blue ones like Sirius and Vega to be the youngest and hottest, others like Capella and our Sun are classed as middle-aged and of moderate temperature. This, like several other astronomical speculations, affords a fine opportunity for committing eloquence. One writer speaks of Antares as "sinking into decrepitude," "having one foot in the grave," etc., etc.; another tells us that when we look at that star "we can actually behold almost the dying throes of a giant brother of our giant Sun." But this is only sup-

position. Of the age of the stars we know nothing. As to their temperature it is *probable* that the white and blue ones are *at present* the hottest, and the red ones the least hot. What is certain about the pairs mentioned is that they have very different spectra.

Antares is attended by a small green companion of the seventh magnitude, but it keeps so close that a good telescope of not less than three inches (object glass) is required to see it.

Beta is nearly nine degrees north-west of Antares. It is the brightest of the stars in the top of the kite. If Bayer, when naming the stars of this constellation by the letters of the Greek alphabet, distributed the letters according to the then (1610 A. D.) relative brightness of the stars, Beta must then have been the second brightest star in Scorpius. It is not so now. There are three stars in the tail decidedly brighter than it, and two more in the same appendage that excel it according to the photometric observations of Herschel and Pickering. Of those on our map Delta certainly excels it, and Pickering makes even Tau a shade brighter. So Beta, although the second in name, is not even the sixth in brilliancy. Like Antares, it is double—a very pretty double, and not nearly so difficult as Antares, but too difficult for a field-glass. The companion is of magnitude 5½, and is distant twelve seconds of arc. Anything worth calling a telescope will show it.

If you have a first-class field-glass—one that easily splits Zeta Lyrae (see November REVIEW)—try it on the star to the left of Beta. That is Nu. Its companion is of the seventh magnitude and is forty seconds distant. Nu is a double-double like Epsilon Lyrae, but a good telescope is required to show the four.

For a naked-eye pair look at the Omegas below Beta. They are fifteen minutes apart. Try your glass on the "dough nuts." They are telescopic star clusters. The one near Antares is 4 Messier; the one farther up (on the track of Mars) is 89 Messier.

The lower Omega is almost exactly in the ecliptic, and the sun passes between us and it on November 24th. The distance between the upper Omega and Beta is fifty-five minutes. This is nearly enough to allow two full moons to pass, but to many eyes there does not seem room for one. As a matter of fact the moon does pass right through there sometimes. She will do so every month from September 1890, to August 1891, but not in our latitude. She will do it in our latitude on the 16th of October next, but the phenomenon will not be visible on this side of America. Every month between now and then she will, in our latitude, pass directly between us and Beta, and occult the star; but not one of these occultations is visible here. Next year we shall see the moon pass south of the Omegas, between them and Delta. In 1892 she will be occulting Delta. In July 1893 she will be far enough south to occult Antares, and she will repeat the operation every month after that for about five years.

A. CAMERON.

Yarmouth, N. S.

P. S.—Belcher's Almanac for Nova Scotia and McMillan's for New Brunswick and Prince Edward Island announce that at the end of May Mars will be *too near the sun to be seen*. Wait and see. A. C.

S. P. C. A. Column of Review

### The Bell of the Tower of Justice.

Once there was a king who was a very uncommon king indeed. He was not proud, selfish and unjust, as kings are so apt to be; he seemed to live only for the welfare of his subjects. This king had a tower built which he called "the tower of justice." Then he said to his Prime Minister, "Hang a bell in the tower, and drop a rope over the wall outside, where any man who has been wronged and who wishes for justice, may reach and ring the bell; for though he be the poorest wretch in our kingdom we will hear his cause and do him right." The Prime Minister did as he was told; and afterwards when any man had been injured by another, or by the laws, he had only to come and pull the rope which hung from the bell of the tower of justice; then the king would assemble his wise men and hear his cause and right his wrongs. When, from long use, the lower end of the rope was worn away, a piece of wild vine was fastened to the end to lengthen it.

Now it chanced that the Prime Minister had a horse that had served him long and well, but which, having grown old and useless, was cruelly turned out on a barren common to take care of itself. One day, being starved, and seeing the vine hanging from the rope, he reached up his head to bite it. The king was sitting in his palace, which adjoined the tower, thinking what new thing he could do for the happiness of his people, when he heard the bell ring. Immediately he sent for his Prime Minister and summoned all his wise men, and all assembled in the tower of justice to hear the cause of the ringing; and lo! it was only the Prime Minister's starved horse pulling the rope as he gnawed away on the wild vine. All were astonished and the Prime Minister was ashamed; and the king said, "Even the poor beast comes to me for justice, and justice he shall have." Then turning to the Prime Minister he said, "O you who neglect in his old age a noble animal that served you faithfully in his youth, how can you be entrusted to administer justice in my kingdom?" The Minister replied, "While I have jealously compelled others to do justice I have acted unjustly, and am unworthy to serve my lord the king." "Nay," said the king, "you have served well in your youth, and in your old age you shall not be deprived of my favor lest I, too, prove unjust. He whose life has been faithful should not be condemned for one fault." So the wise king retained his Prime Minister, and the horse that had rung the bell of justice was ever after cared for by his old master.—*Animal World*.



### What Provision might be made for Technical Education in this Province?

BY W. S. CARTER, M. A.

(Read before the Educational Institute of New Brunswick in June, 1889.)

In preparing this paper I can lay no claim to originality as I have no opportunity of observing the working of any technical schools, but am indebted for any information I may be able to give on the subject to the reports of the superintendents of the schools of several American cities and to the public press, which has for sometime been giving it a great deal of attention.

What is Technical Education, and why are the schools attracting so much attention? The general aim of technical education may be inferred from the names which have been given the schools: Mechanical Schools, Hand and Head Work Schools, Technical Schools, Industrial Schools, Trade Schools, Hand Trade Schools, Skilled Labor Schools, Manual Training Schools. Manual training schools are not designed to give instruction in any particular trade to the exclusion of others, but take in all branches of industry. The prime object is the training of the mind, and the hand as the agent of the mind, and to impart knowledge of such working tools and materials as are found in the great industrial pursuits of the world; to lay the foundation for mechanical pursuits, the same as our present literary system lays the foundation for professional and literary pursuits, and to be an important adjunct in all mercantile callings; so that when our boys graduate they will not be obliged to live by their wits alone, but will have the benefit of the dextrous hand, directed by an intelligent brain. Instruction in the use of the common working tools does not necessarily teach them to become mechanics, any more than instruction in Latin and French teaches them to become lawyers or physicians. Its work is preparatory, not final. To quote a common expression it is "putting the whole boy at school" and educating him on all sides, thus giving him a better mental and physical preparation for life's work.

What of the necessity of these schools? The necessity largely arises from the gradual dying out of the old apprenticeship system. A cry has gone up from the manufacturing centres on this continent that skilled laborers were not obtainable from among our own people and that they had to be imported from abroad. Under the old system the boy was taught every branch of a trade; under the present system, of large factories and the division of work into pieces, it is almost impossible for a boy to learn a complete trade. This state of affairs is gradually turning the public eye upon our schools for a remedy.

A century ago, Pestalozzi and Fröbel suggested object teaching, and may be said to have originated the principles of object teaching. The Imperial Technical School, of Moscow, was the pioneer in the movement for the co-education of the head and hand in 1868, and manual training schools soon sprang up in the other countries in Europe. At the Centennial Exposition in 1876, at Philadelphia, the exhibit of the Moscow school attracted so much attention that its main features were adopted by the cities of Boston, Baltimore, Chicago and St. Louis, and soon training schools were established in those cities in connection with their public schools. Since that time manual training schools have been established in New York, Toledo, Philadelphia, Cincinnati, Cleveland, Omaha, Denver, New Haven, New Orleans, and probably many other cities. Of the Canadian cities, Toronto alone seems to be

alive to the necessity of providing such training. Supervisor McKay, of Halifax, in his last report makes a strong plea for industrial training.

The educational tendency of the times is toward manual training; not only have school boards taken up the question but private persons and corporations as well. One great railroad company—the Baltimore and Ohio—and other capitalists, in several instances, as a matter of economy and safety, have established schools at private expense where manual training is taught, and from the pupils in these their employees are selected. This subject is of such importance in England that a national association has been formed, having among its prominent members such men as Prof. Huxley and many other noted educationists, the avowed objects being

(1) The promotion in our primary schools of the better training of the eye and hand, by improved instruction in drawing, in the elements of science, and the elementary use of tools.

(2) The introduction of such changes in the present system of primary instruction as may be necessary to enable children to take advantage of technical teaching.

(3) The more extended provision of higher elementary schools where technical education may be provided for those who are fit to take advantage of it.

(4) The reform of the present system of evening schools, with special provisions for the encouragement of technical (including commercial and agricultural) instruction

(5) The development, organization and maintenance of a system of secondary education throughout the country, with a view to placing the higher technical and commercial education in our schools and colleges on a better footing.

(6) The improvement of the training of teachers so that they may take an effective part in the work which the association desires to forward.

It will, no doubt, be more interesting to the members of this Institute to particularize to some extent and state what is actually being done in the schools of manual training in some of those cities before taking into consideration what is and might be done in the same way in the schools of our province.

There are, as might be expected, different plans adopted in working out the system of manual training in connection with the public schools. In no case that I am aware of are there schools of manual training pure and simple under the control of public school boards. Some of the cities mentioned, in addition to manual training for boys, have incorporated in their school courses domestic economy for girls, but not by any means all of them, though all look upon it very favorably.

The city of Baltimore, one of the first to take up manual training, has perhaps carried it out more successfully than any other. In this city there is a well equipped manual training school, presided over by John D. Ford, an officer in the United States navy supplied by the government. The object of the school is as follows: Instruction and practice in the use of tools and such instruction as may be deemed necessary in mathematics, drawing and the English branches of a high school course. The tool instruction includes carpentry, wood turning, pattern making, chipping and filing, forge work, moulding, soldering and brazing, the use of machine shop tools and such other instruction of a similar kind as may be deemed advisable; the intention being to divide the time equally between manual and mental training.

No foreign nor ancient languages are studied in the school, but great prominence is given to mechanical drawing. Boys must be at least fourteen years of age at admission, and their requirements are about those of pupils passing out eighth grade.

For residents of the city no fee is exacted for the use of tools, materials and books. The fee for non residents is \$50 per year. The course embraces three years, and the literary part of it is closely in line with our Grades IX, X and XI.

**FIRST YEAR.**—Arithmetic, algebra, geometry, mensuration, English language, history, geography, physiology and physics. *Drawing.*—Geometrical and sketching.

*Shop Work.*—Carpentry, wood turning, forging, proper care and use of tools.

**SECOND YEAR.**—Algebra, geometry, plane trigonometry, mensuration, physics, history, English literature and mechanics.

*Drawing.*—Geometrical and mechanical, or architectural.

*Shop Work.*—Pattern making, vice work, welding, tempering, soldering and brazing.

**THIRD YEAR.**—Geometry, plane trigonometry, physics, mechanics, book-keeping, literature, chemistry, political economy, geology and engineering.

*Drawing.*—Machine, architectural and designing.

*Shop Work.*—Machine shop work, filing, turning, drilling, planing, etc., study of machinery.

Throughout the course one hour per day is given to drawing and two hours to shop work.

To give some idea of the popularity of this school,—it started in 1884 with 60 students, in 1887 it closed with 273.

The average cost per pupil in 1887 was \$24.69. This includes interest on plant, books, materials, salaries and every thing pertaining to the cost of the school.

The Superintendent says: "This school does not teach trades. Its aim is more comprehensive—it lays the foundation for many trades and at the same time recognizes the value of intellectual training."

"It is not assumed that everybody who enters this school will be a mechanic. Some will find they have no taste for manual arts and will turn to other paths,—law, medicine or literature. Some who develop both natural skill and strong intellectual powers will push on into higher realms of professional life as engineers or scientists.

"All will gain intellectually by their experience in contact with things. The general result will be an increasing interest in manufacturing pursuits, more intelligent mechanics, more skillful manufacturers, better lawyers, more skillful physicians and more useful citizens."

I have been particular to give details in regard to this school, because I believe a similar one could and should be established at an early date in the city of St. John. It would afford our boys an opportunity to follow a more practical course than is now offered, and would enable them in part, at least, to secure those advantages at home which they now have to go abroad to obtain—to such schools as the Boston School of Technology and other similar institutions. St. John seems destined to become a manufacturing centre and should not depend on foreigners for skilled labor, such as she should afford her own boys an opportunity to acquire a taste for and some degree of proficiency in.

For a long time our schools would be at a disadvantage in advanced industrial training in that the teachers have no special knowledge of the practical part of the work. This

disability would be the sooner overcome if special instruction in wood and iron working were given in the normal school, with a work shop attached for males which perhaps might include females, as I see a school of carpentry has recently been established in England for them, and there are many who advocate giving girls and boys the same trades.

Instruction in the subjects embraced by domestic economy is already given in the normal school and city schools as far as my knowledge extends, whether or not it is advisable to include our boys in this class of instruction I do not venture to say, not caring to be in advance of the advocates of women's rights, who do not appear as yet to have considered this aspect of the question.

Let us now for a few moments examine our own course of instruction and see how it compares, as far as it goes, with the courses of other places in the matter of manual training.

In the matter of domestic economy we are fully up to the times. A comparison of our grade I course with those of other places shows it to be not less comprehensive than any. In fact many large cities are only now taking the subject into consideration. I think it would be an improvement if the Boards of Trustees should be required to furnish the materials, as parents are very often careless and indifferent about it, and teachers, for the sake of peace, supply it themselves. I think any one skeptical as to the utility of this class of instruction would have been convinced had he visited the exhibit of school work in St. John three years ago.

Should we add practical lessons in cookery to this subject? There can be no doubt as to their great advantages in promoting health and economy in the homes of all classes. Yet, I think, we had better wait until some other places more able set us the example.

Industrial drawing is considered by all as the foundation of manual training. Whatever might be said as to our position in this subject a year or two ago, we are to-day exactly in line. The form modelling in clay and drawing from objects are so arranged as to lead in a practical way from the kindergarten to the machine shop.

I think our course could be extended and elaborated in some particulars. Our pupils might make relief maps in putty, plaster and wax.

Whittling and gimlet work might be allowed as a Friday afternoon exercise. This is extensively practiced in the public schools of France. Much work such as joints, raised maps, brackets and flower racks can be done with knife and gimlet alone.

Cutting and pasting, as a continuation of the kindergarten, has many useful and educative applications.

Our course of instruction is an excellent one as far as it goes, but it has neither proper beginning nor suitable end. I have spoken of the lack of advanced training schools. I will now refer to the almost entire absence of the kindergarten from our system. Were it not for the solitary example of the kindergarten established in St. John about a year ago, and which cannot be considered a pure school of that class, it might be said that there is not one in this province. In this respect I think it can be fairly said we are behind the age. In many of the cities of the United States the kindergarten is a part of the school system, in others they have been founded by the generosity of citizens and afterwards incorporated as a part of the public schools. In all cases they are very numerously attended and are considered a necessity. In the city of Brooklyn, where the children attend the kindergarten *only* be-



tween the ages of five and six, and between the ages of six and seven one-half the time the kindergarten, and the other half the regular primary, the Superintendent says, "It may justly be claimed for the kindergarten system that it trains children to habits of obedience and fixed attention, that it makes the eye more accurate, the hand more steady, that it teaches to count and develops ideas of color and form, that it leads to imitation and invention in drawing and design, that it quickens the sensibilities and sharpens the intelligence."

The school spoken of in St. John has proved very effective and popular, and there is room for four or five more could they be provided for. There should be one each in Fredericton, St. Stephen, Woodstock, Moncton and many other places. I have always been of the opinion that a pupil could not as advantageously and profitably undertake the work of Grade I at the age of five as he could at six years of age, and I am convinced that he would be physically and intellectually benefited if the intervening year was spent in kindergarten work.

The argument is sometimes used, that by incorporating manual training with our course of instruction the literary part of it may be slighted. In answer to this I will quote from the report of a special committee on manual training appointed by the city of Albany: "It has been uncontrovertibly proven that the combining of the manual with the intellectual does not lower the literary standard of the school. It affords a pleasant relief to the routine of class work and the constant exercise of the memory in abstract problems. Three or four hours a week in the shop will produce marked results and will keep up the boy's interest in his books by this pleasant change. Intellectual development is not to be measured by the length of time passed in the school-room. One hour of active interest in the work is worth more than five hours of indifference. If the interest is only kept up by a change from the classroom to the shop, one great point in a boy's rapid intellectual development has been gained. But the work-shop is not a place of unthinking work. It is there the boy is giving tangible expression to his classroom knowledge. As he uses the hammer, chisel and plane, he must study cause and effect. The finished work is the end to be gained, and as he fashions and moulds the rough piece his judgment and reason act in unison with his hands."

In conclusion I will refer to another phase of manual training touched upon by the same committee—the dignity of labor.

"Our counting-houses and offices are over-run with an army of copyists who have graduated from our schools and who have avoided the factory and the shop. The wide field of mechanical pursuits has not been entered by our American boys, but has been left to those from other countries and a very large majority of the lucrative positions in our manufacturing establishments are filled by comparatively recent arrivals from foreign shores. Is not our educational system at fault? Are we not to blame for the surplus on one side and the void on the other? Have we not rather educated our boys for the so-called genteel employments of life and neglected the more practical? The dignity of labor cannot be impressed on our young men by essays alone, example is also needed. If tools were placed in our schools and our boys perceived the necessity of intellectual effort to properly use them, the smoke-begrimed mechanic with his dinner pail in his hand returning from his day's work would be more to them than the embodiment of brute strength. By being brought into daily contact with the implements of toil and a participation in their use they would beget a respect for the dignity of labor, which it is feared is not entertained now."

An eminent French statesman lately said: "Caste ideas would vanish when tools were found in schools alongside of maps and books."

FOR THE REVIEW.]

### On Collecting, Preserving and Studying Marine Invertebrate Animals.

BY W. F. GANONG.

(Continued from April number).

#### I. HOW TO COLLECT MARINE INVERTEBRATES.

There are three distinct modes of collecting, requiring different apparatus and different methods,—collecting on the shores at low water, skimming the surface of the sea with a net for floating animals, and taking deep-water forms with a dredge. The first of these is that which beginners can most advantageously practice.

The places on the shores which are richest in life occur where irregular rocky ledges, with interspersed patches of gravel and sand, are swept at high water by gentle currents of clear salt water. Especially good are clean tide-pools, quiet basins of different sizes near low-water mark from which the water never entirely runs out, and which may contain animals here to be taken except by the dredge.

Good places usually are the low bars between islands, exposed only at lowest tides and at all other times swept by gentle currents. The times of the new and full moon are the best, for then the tides (as every reader of the REVIEW knows well) run very low or "spring," and leave exposed richer treasuries further down among the ledges. A bright day, extreme spring-tide, wind off shore or none, clear-water ledges, a congenial and helpful companion,—these are the conditions which are dear to the heart of the old collector, and which must ensure a rich harvest to the very beginner.

In equipping ourselves for the shore, the following articles, which the present writer's experience has taught him are the best, should be taken. It must not be thought that *all* are necessary, for good work can be done without any one or more, or even without all of them. But this may be regarded as the full equipment.

First of all comes a friend who will help carry your weapons and will act as general assistant, note-taker, tide-watcher, etc., etc., and if possible the friend should sympathize fully in the work. He need not get wet nor dirty in the least. If one is collecting in Atlantic or Bay of Fundy waters, which are very cold, he should wear long rubber boots, but if in Gulf of St. Lawrence waters, which are comfortably warm in summer, he may not find it unpleasant to take to the water, fishermen-style, wading in it with his old clothes on. Of course he will not wear his best clothes on these expeditions. He should take a pail himself, and give another to the friend, and in his

pockets carry a dozen small bottles and vials (some containing alcohol) of different sizes, for the delicate and rarer specimens which he will not have the heart to throw among the larger animals to be placed in the pails. A stout knife should be taken, for many forms cling tightly to the rocks. Your friend would do well to carry for you a spade with a stout handle, the use of which will be seen presently. And last, but not least, comes the shore collector's special weapon, an implement as distinctive of his methods as is the tow-net of the surface-fisher, and the dredge of the dredger,—the handle-net, or scraping-net.

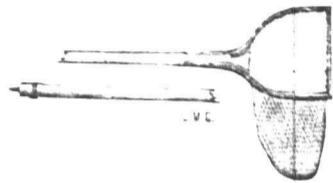


FIG. 10. The Scrape-net.

The illustration shows the form very well. The stirrup-shaped head\* is made of wrought iron, one inch in breadth and three-sixteenths of an inch thick, made sharp along one side to give a scraping edge, and with holes bored along the other for the attaching of the net. It should be about nine inches across the bottom and about eight inches from the middle of the bottom up to the lower end of the handle. It is to be screwed firmly to the end of a hardwood pole, for which a light pitchfork handle answers very well, though it can be made of spruce or other wood. It should be about six feet in length, and if one wants to make it as useful as possible he can have a short spike, projecting about an inch, set in the upper end. This will make it very serviceable in many ways, particularly as a staff or support in walking over slippery ledges. The net may be of any fine-meshed netting or even of coarse canvass, and is best attached to the frame by means of copper wire. With this instrument the collector can scrape from the rocks and from the bottom many animals in the deep tide pools which otherwise he would have to admire and long for but leave undisturbed. With it also, as he wades along at low-water, he may take forms which he can see below the lowest recession of the tide but otherwise beyond his reach. In fact it may be said that this implement almost adds two or three feet to the recession of the tide, since one can do

\* The stirrup-shape of the frame is much better than the round form generally used and recommended, as it has a much larger scraping edge, and with its angles one can pick objects from cavities or hollows where a round frame could not enter. For a work on shore collecting, dredging, and the study of marine animals of our shores and shallow waters generally, we can heartily recommend "Life on the Sea Shore," by J. H. Emerton, published at Salem, Mass., by Bates.

nearly as much with it as he could without it if the tide were to fall two or three feet lower. If he employ it skilfully, he can with it overturn stones below lowest low-water and scrape the animals from their under sides. It is useful also for taking jelly-fishes and other surface forms as they float past on the rising tide. Its cost is but trifling.

The most profitable shore-collecting is that which is carried on an hour before and an hour after low-water. There are animals above these limits, of course, which are to be taken, but they are comparatively few. Going to our place selected, then, an hour or more before low-water, we follow the tide down. Now we must begin to use our eyes, and if they are untried in this kind of work, they will see little at first. But as they become accustomed to it, it is wonderful how much they do see. An immense number of animals are protectively colored, that is, assume the colors of the substance on which they are living so as to be as little visible as possible to their enemies. None of these enemies, however, have such bright eyes as man, and what may be efficient enough against duller optics are only a partial protection from him. Some forms, too, are very minute, and we must keep on the look-out for them. So as our eyes become trained the very stones and sunken logs and sea-weeds become alive with varied strange and beautiful forms of life. And we must neglect no situation, for there is hardly a conceivable position on the shore to which there is not some one or more forms specially adapted. We must peer into all crannies in the ledges and between the boulders; lift and search and shake the great masses of sea-weed; overturn stones of all sizes and shapes; dig in the mud or sand beneath these stones and in the tiny beaches of gravel, mud and sand which occur among the ledges; wade slowly, peering sharply, in the shallower tide-pools and scrape the bottoms of those that are deeper; and withal must keep our ingenuity constantly on the alert to imagine new situations in which animals may occur and new methods of getting at them. One must not mind getting a little wet in kneeling and lying down in his search. At first one will collect omnivorously, taking everything, and will have but little time for studying the habits and surroundings of the animals. Before their habits can be advantageously studied one must know their structure, and this can be studied only when one has leisure and comfort after he has left the shore. So at first it is proper to collect everything; the selective and discriminating collecting and the careful study of habits and surroundings will all come later of themselves. We put everything that is taken into the pails (changing the water occasionaly in the latter) except the most delicate



forms, which should be put into the vials and carefully carried by our assistant. All of our observations on where the animals live and such simple details of habits the same assistant should note down for us. We should keep as near the receding tide as possible. By-and-bye it will stop and then come creeping slowly in, filling the holes our spade has made and our footmarks, and running in tiny streams among the rocks to fill the pools again. But we must fight every inch with it, and not even mind being made a little wet by it. When at length it gains the mastery and we are compelled to leave the shore, we should put in the pails as much sea-weed, of different kinds taken from the lowest part of the shore, as they will hold. This will be good for the animals, as the sea-weeds give off oxygen which the animals need and absorb the carbonic acid gas which is harmful to them. This same sea-weed, when carefully dried in the sun and then thoroughly shaken, will afford many minute Mollusca, Crustacea, etc. It is well to carry back a net-full of it also.

It is hardly necessary to specify what is to be found in these situations. Under the overhanging ledges, when one pushes aside the heavy curtains of sea-weed, there will be found Mollusca of various colors and sculpture. Some Starfishes will be there and Ophiurans; the brilliant red Holothurians, with some Crustaceans, Sea-anemones and plant-like Hydroids. Amongst the fronds of sea-weed are more Molluscs, some of them very minute. Hydroids, Bryozoa and Crustacea are fond of such situations. Under the up-turned stones, some of which will be so heavy that it will be necessary to use the handle of the spade as a lever (and very useful, indeed, for this purpose it will prove) will be found a great variety of forms, and clinging to the under side of the stone itself are many Tunicates, Bryozoa, Molluscs, Sponges, etc. In the mud and sand are many Molluscs and burrowing Worms and some of the slender Holothurians. In the tide-pools are Sponges, Sea-anemones, Molluscs, Crustacea, Echinoderms, all living and generally abundant. In fact, to sharp eyes and willing hands, no part of the lower region of the shore is barren of life. Descriptions are but feeble; one must go to the shore himself to understand its richness.

Of course this is all in favorable situations. As we go to those less adapted for sustaining life, where there is muddy water or a very uniform kind of shore, we find less, and there are places so unfavorable that they contain comparatively little, but it soon becomes easy to pick out those likely to prove productive. After a while, too, the student will go to the shore to study rather than collect.

A modified form of, and often profitable variation from the ordinary method of shore-collecting, is that in which at low tide on a still day, one is rowed in a boat over shallow water. Very many forms can in this way be seen freely expanded and alive on the bottom, and it is much the best way in which to study the habits of some of the larger animals. With the scraping-net we can pick many things from the bottom.\* As the boat moves on, the observer should lie in the bow with his face as near the surface as possible. If there be a ripple on the water the bottom becomes obscure, but an artificial still surface can be made by a simple form of "water-telescope." This is easily made from tin, trumpet-shaped, three or four feet long, three inches in diameter at the upper end and eight or ten at the lower. A piece of glass soldered into the lower end is valuable, but can be dispensed with. A simpler form can be made from a piece of birch bark rolled up, or in other ways which will suggest themselves to the collector whose heart is in his work and whose ingenuity is therefore active.

In my description of these pleasures I have apparently confined them to the stronger sex, for which I now ask the pardon of the fair readers of the REVIEW if I be honored by any of their attention. I beg to assure them that all this is open to them also. The present writer has relatives of their sex who do not hesitate to pin up their dresses to the tops of their rubber boots and follow him into the deepest pools and over the roughest ledges, and whose great interest in the treasures of the shore is not inferior to his.

It will soon be noticed by the student that nearly all of our Invertebrates are either fixed to the bottom when adult or can move but slowly. To prevent the accumulation of the young near the parent, and consequent crowding, and to allow the young to seek new situations, they are almost invariably given the power of free locomotion. They swim about near the surface usually, being attracted by the light and finding the most food there, and are most abundant on still days and on the rising tide. There are also many Jelly-fishes and Crustacea which swim habitually at or near the surface. To take these, the tow-net (or Müller's net) is used.

It consists simply of a brass or copper hoop or ring, one foot in diameter, to which is attached a bag a foot deep, made of "cheese-cloth" or fine book-muslin. Strings are fastened to the hoop as shown in the

\*The present writer has used in this way with great success a scraping-net with a handle twelve feet long. In the passages between the islands about Grand Manan the water is so clear that very small objects can be distinctly seen at a greater depth than this, and with the long-handled net magnificent *Solasters* and other beautiful forms can be easily taken.

figure, and the net is drawn along just on the surface of the water behind a row boat. The best time to use it is on a calm evening on a rising tide, at and after sunset. At such times the surface of the sea swarms with life. As a vast number of these tiny floating forms have the power of emitting light, or, in other words, are phosphorescent, it happens at times that the surface-fisher is treated to sights which



FIG. 2. The Tow net.

cannot for beauty fall far behind what has been so often described as occurring in the Tropics. Often every dip of the oars after dark will start irregular flashes of fire on the water: long lines of flame will roll from the bow, and the net will seem to be floating in a luminous trough behind the boat. But this nobody can well describe: it must be seen.

Occasionally the contents of the net should be turned into a pail of water and the net itself turned inside out and washed in the pail to free the smaller forms. When the shore is reached the pail should be set aside until morning.

As the majority of the animals taken in this way are very difficult to study (the greater part, indeed, requiring the compound microscope) it is not advisable for the beginner to put much time upon it: his time, energy and means can be more profitably employed in shore-collecting or dredging. Still it has many lessons to teach and should not be altogether neglected.

But abundant as is the life of the shore, it bears no comparison to the number and variety of forms which occur below the lowest limits of the tides. To take these the dredge is required. But having already trespassed too far upon the patience of the readers of the REVIEW, we feel impelled to defer the consideration of this instrument until the next number.

Harvard University,  
Cambridge, Mass., April 22nd.

THE moment a girl has a secret from her mother, or has received a letter she dares not let her mother read, or has a friend of whom her mother does not know, she is in certain danger. A secret is not a good thing for a girl to have. The fewer secrets that lie in the heart of woman at any age the better. It is almost a test of purity. She who has none of her own is best and happiest. In girlhood hide nothing from your mother; do nothing that if discovered by your father would make you blush.—*Farm and Fireside.*

OF THE REVIEW

#### London Schools.

In estimating work done in English Board Schools some important points must be noticed, one of which is that the number of these schools, and the range of subjects taught in them, by no means presents a fair picture of the quantity and quality of educational work done in England. Voluntary and proprietary schools of great merit are to be found on all sides, and these are so carefully organized that almost any special educational demand may find supply. These institutions have also afforded a vantage ground for the testing and sifting of theories and methods of the greatest possible diversity, so that any government framing a system of popular education has had an immense amount of work done ready to hand. Nevertheless, in spite of noble foundations all over the country, a heritage from our wise and pious forefathers, and the schools above mentioned, the great mass of the common people have been left to the perils of ignorance.

The exhibition of 1851 opened the eyes of the nation to the fact that they were lagging behind in *productive industry*, and stimulated the beginning of that system of technical education which has revolutionized England, so that taking one of the fine arts alone as an example—that of painting—competent judges aver that for directness, simplicity and exquisite feeling, the artists of to-day stand second to none. The provision for industrial training is not only increasing in extent, so that art, technical and scientific schools form a net work over the land, but their course of study is almost exhaustive in its ramifications, and devotes to the production of manufacturing skill the encyclopedic method.

But successful specialized training presupposes a high degree of intelligence, and unless such training is to be restricted to a class, nothing but the solid substratum of a sound education for the whole people can support it. The bill of Mr. Forster, in 1870, in spite of its "*Conscience Clause*," was the thin end of the wedge, which, driven home, is to destroy the overweening spirit of caste, and a narrow sectarianism, whether of church or dissent, by a national system of free education, open to all, and so thoroughly good that the great middle class will give it hearty support. The whole history of education during the last fifty years is a commentary and illustration of the intensely practical side of English character. Prove that what you advocate is right and needful, and conscience and common sense heartily respond. The last two years have witnessed a great advance, and, in spite of caste and denominationalism, two



powerful forces, an immense amount of work has been done. The task of organizing schools for nearly 800,000 children in London alone is almost appalling, and yet it is in a fair way of accomplishment. The board schools are so good in their methods, the discipline at once so gentle and firm, and the teachers are so thoroughly fitted for their work by long years of training that in some neighborhoods even professional people are sending their children to them. The cause of free, technical, compulsory and unsectarian education has, on all hands, able defenders who will eventually, perhaps not just yet, carry their principles. The London school board is a truly representative body, from the Rev. Mr. Diggle, the chairman, who is highly esteemed by all, to Mrs. Annie Besant, who is the member for Tower Hamlets, and stands for socialism and free thought, but is, nevertheless, indefatigable in serving the interests of the fifty-five schools in her division.

#### INFANT SCHOOLS.

These are under Miss Lyschinska, as inspector, with an assistant inspector. Her ability as a kindergarten led to her appointment thirteen years ago, for although reading, writing and a little arithmetic are required by the code, the schools are really kindergartens. There is a strong feeling among the teachers, that they should be kindergartens, pure and simple, as the children are received from *three years old* and some even younger. As I was piloted to the head mistress by a girl of about ten or eleven, who was carrying a baby upstairs, I remarked, "Do you bring baby to school? How old is it?" "Fourteen months, ma'am. Teacher lets me bring it or else I could not come to school." This was at St. Andrew's School, Wandsworth, a very poor neighborhood, where five hundred children were to be seen eating their penny dinner, a favorite one that day with them, of suet pudding with plenty of jam, in addition to which each child received a slice of bread with cheese. The singing Tonic Sol-fa and Swedish drill were very good, and must be a boon to those poor little ones who need physical culture. The baby's class afforded a striking example of the deteriorating influence of London on the human frame. Two little cousins, of the same age, sat side by side, one a Londoner, pale delicate and small; the other, a Devonshire child upon a visit, a perfect picture of childish health and beauty and would have outweighed the other twice over, as she was head and shoulders above her and plump in proportion. The basket making, weaving, etc., in the kindergarten is distinctively industrial and well done.

#### MANUAL TRAINING.

A great deal is doing in this as an experiment, but it is so successful and Inspector Ricks so thoroughly in earnest and so competent that it has *come to stay*. The teacher, who is a specialist, being a trained science scholar from South Kensington, has sole charge of this work in the different schools. The boys were making mortise joints and working *con amore*. Drawing and modelling are recognized as absolutely necessary, and manual training not simply as industrial but as a part of *educational development*. This school is also one of the centres fitted up with laundry appliances. The more respectable the children, the more delighted they are with this work and the better they do it.

#### WILLIAMS STREET, KENSINGTON WEST.

This is one of the best for modelling and drawing, specimens of which were surprisingly good. The Eiffel Tower, with scale measurements, done by a boy of not quite fourteen, left nothing, it seems to me, to be desired, being perfect in its neatness and beauty. The modelling by the same boy was admirable; but better even than any few isolated examples of great merit was the general air of intelligence and skill displayed, not only in drawing and modelling, but in pasting colored paper so as to form patterns for wall-papers, oil cloth, etc., also in relief maps, of which, among others, an excellent specimen of the basin of the Thames was shown. The writing was, as is commonly the case in English schools, very neat and well done. A large number of pupil teachers receive instruction in this school and were engaged as follows: Twenty-three second-year girls, domestic economy lesson, "Chemical changes in milk." Sixteen boys, first and second year, mathematics. (On inquiring if algebra were a *bite noir* at examinations, I was told "no;" remembering that it is a subject which sometimes floors our Nova Scotia candidates, I enquired the reason: "They take it as soon as possible right along with arithmetic from the first!") Thirty-nine boys and girls at their geography. Thirty first-year girls at needle work. Teacher at the blackboard illustrating by diagrams the *gusset* and *gore*. The prejudice in favor of very closely set stitches is vanishing, the form and direction of the stitch being of more importance in the judgment of the inspector. Pupil teachers—total number of girls, 180. Total number of boys, 50.

In another room singing was the lesson. A three-part chorus from the music to be sung at the Crystal Palace, June 18th, at the distribution of prizes was sung by boys in good time and tune. The teacher

did not care for Tonic Sol-fa, but he thought it well adapted to teach children to sing well and easily.

LANE STREET SCHOOL, BOROUGH.

This school, situated in a poor, low neighborhood, has 1,100 names on the roll and consists of infant schools and also separate schools for boys and girls. The average attendance is 83 per cent. The head master, an efficient, enthusiastic teacher, has had charge since 1877, when the school opened with 100 pupils. An excellent staff of teachers carry on the work of the school from the kindergarten upwards, where they usually come in at three years old, although some were younger. They learn even here some reading, at any rate the alphabet, during their stay of one year, when, if they pass the standard, they are drafted into a higher division. In the highest class of the infant schools, unfortunately, reading, spelling and arithmetic almost crowd out kindergarten work, but the code is inexorable in its demands, and the last six months of the school year are feverish with exertions to meet its requirements, and as long as *payment by results* is the order of the day, the best fruits of good teaching are not likely to be produced. Another annoyance is the collection of fees and keeping an account of remissions and arrearages. It consumes one hour and a half, weekly, of his, the head master's, time to adjust these matters and keep an account of them; and considering that the fees collected in his school only amounted to £44.0s.4d. last year, the game is hardly worth the candle. The gross cost for each child was £3.10s.11½d. The London school board, to its credit let it be recorded, sends no child away from school because of unpaid fees. The ground site of this school cost £10,000, and the board have lately given as much as 20s. per foot for ground on which to build. The drawing and painting in water colors was excellent, especially when you remember that at thirteen years old, if not before, these boys go out to make their own living. But they have learned to obey orders, to be diligent and punctual. Only two boys in one school-room had had bad marks during the year, and in another, a board—"not one late for the week," had been hanging for several weeks, to the great pride of the boys. One boy had not missed being punctually at his school for over three years. Think of the influence for good in wicked homes exerted by such a school and let us take courage. Needle work is taught in the girls' school, which also sends a contingent of twenty to the cooking centre. Modelling in clay was going on in one of the lower rooms and a very pretty drill with Japanese fans, accompanied with singing, was in progress in one of the girls' rooms. In one of the infant

schools a bright teacher put them through the exercise of "Sir Roger de Coverly," a contra-dance. This lady devotes much care to the study of old English games, some of which are admirably adapted to school and kindergarten.

An ear-test exercise was given in one of the boys' schools, the teacher vocalizing a few notes which were instantly repeated in Sol-fa, almost always correctly. One boy, rather dull, only recognizes one *passage of three* notes, but if he can hold that in his memory he will have a starting-point that will lead him farther afield. This school stood well at the Central Exhibition at Stationers' Hall, to which it sent eight drawings. On the whole, a survey of London board schools not only gives food for thought but a sense of satisfaction, for much of the work done is truly excellent and the teachers are fully alive to their important function. C.

FOR THE REVIEW.

Notes for Teaching Music by the Tonic Sol fa Notation.

SIXTH PAPER.

The pupils may be prepared for singing in two parts by such exercises as these following and by singing rounds. Tell the pupils to listen to the other part while singing their own, to hear the two notes of the chord together, and also to get accustomed to singing one tone while a tone of a different pitch is being sung by other voices. The bracket ( ) means that the parts enclosed are to be sung together.

*K. & D.*

d:— m:— s:— d:—d:— s:— m:— d:—||  
 ( d:d d:d d:d d:d d:—d:—d:—d:—d:—d:—d:—d:—d:—||

*K. & F.*

d:d d:m m:s s:m m:m s:s m:— s:— d:—||  
 ( d:— d:— d:— d:— d:— d:— d:— d:—||

*K. & F.*

d:m | s:m | m:m | s:m | s:d | s:m | s:m | d:—||  
 d:— | :— | d:— | :— | m:— | :— | d:— | :— ||

*Ear Exercises.* Let the teacher sing the following slowly to the syllable *lah*, get the class to copy, sing a second time to *lah* and make the manual signs, the teacher also making the signs, and then to sing the notes and make the signs.

ddms, smds, smsd, smrd, dmr d  
 ddt'd, dmrrd, drmr d, dmr dt'd.

THIRD STEP.

The class has been taught the tones of the DOH chord and the SOH chord. The next chord includes the other two tones of the scale, FAH and LAH.

Ask the class to watch for a new note, and sing the following or some such phrases to the syllable *lah*.

*K. & D.*

[ d:m | rd | f:— ]||

*K. & F.*

[ d:r: m | f:— | m | r: m: f: ]||



Try to develop the desolate or awe inspiring effect of FAH. Show the manual sign,—the hand closed, the forefinger pointing downwards towards ME, to which FAH has a tendency to go. Give a few ear exercises, asking the class to simply look for the FAH. Next bring out the mournful effect of the weeping LAH, the manual sign for which is the hand hanging down from the wrist.

Key C  
 | d<sup>1</sup> : t | l : — | t : d<sup>1</sup> | m : — | l : — ||  
 Key C  
 | l : l | s : d<sup>1</sup> | t. l : t | l : — ||  
 Key Bb.  
 | m : r | d : — | t<sub>1</sub> : — | l<sub>1</sub> : — ||

From the extended modulator it will be seen that the intervals between the tones of this chord are the same as in the DOH chord. So to the left hand, alongside d, m, s, we have s<sub>1</sub>, t<sub>1</sub>, r, and to the right, f<sub>1</sub>, l<sub>1</sub>, d. Point on the modulator d, m, s, s, m, d. Next ask the same tones to be sung to lah. Then tell them to sing the same tones to f<sub>1</sub>, l<sub>1</sub>, d, d, l<sub>1</sub>, f<sub>1</sub>, pointing to these notes on the side column.

Point and sing such exercises as the following and ask the pupils to copy after the teacher has sung each.

Key D  
 | d : m | s : — | f : l | d<sup>1</sup> : — | d<sup>1</sup> : l | f : — ||  
 | s : m | d : — ||  
 Key C  
 | d : m | s : — | f : d | d<sup>1</sup> : — | s : t | r<sup>1</sup> : — ||  
 | r<sup>1</sup> : t | s : — | d<sup>1</sup> : l | f : — | s : m | r : d ||

After the pupils have learned the notes of this chord the teacher may give simple voluntaries on the modulator. Use the new tones only as passing notes.

Teach tunes on the modulator, then they may be sung to the manual signs, and next from the books or blackboard. Rounds may now be sung as such.

Accustom the pupils to point exercises and tunes on the modulator from memory and to sing them. If the pupil hesitate to sing alone, ask the class to sing with him the first pointing, and then ask the pupil to sing alone the second time. Encourage and help the pupil. In pointing voluntaries on the modulator avoid getting into ruts, and as far as possible point musical phrases that the pupils are likely to meet. In the modulator exercises anticipate any more difficult intervals that will be met in the new tune to be taught in that lesson.

TIME EXERCISES.

6.—Key A. Bugle call "Extend."  
 | m : — | d : — | m. d : m. d | s<sub>1</sub> : — ||  
 | m : — | d : — | m. d : m. d | s<sub>1</sub> : — ||  
 7.—Key F.  
 | d : d. r | m. f | s : — | l | s : f. m : f. s | m : d : d ||  
 | d : d. r | m. f | s : s : l | s : f. m : f. s | m : — : — ||

8.—Key G.  
 | : s<sub>1</sub> | d : — : t<sub>1</sub> | l<sub>1</sub> : t<sub>1</sub> : d | r. m : f. m : r. d | d : t<sub>1</sub> : r ||  
 | : s : — : f : m | l<sub>1</sub>. r : d : t<sub>1</sub> | d : — : — : — : ||  
 taa-aatai taa taatai taa taa taa-aa -aa -aa saa ||

In exercise eight we have a note of one and a half pulses and then a note of half pulse. The tune names are taa-aatai. The last pulse of the measure is silent, so no note is given, the space is simply left blank, no sound, so no sign is needed. The time name is saa. Further, No. 8 is in six-pulse measure, which is made up of two measures of three-pulse, each alternate strong accent becomes a medium accent and is indicated by a shorter line. JAS. ANDERSON.

For the REVIEW.]

Educational Reform.

"Teaching is supplanted by the hearing of lessons." \* \* \*  
 "The remedy rests with school boards and teachers."—  
 Editorial in April REVIEW.

MR. EDITOR,—It seems to a trustee that the "remedy" rests not with the school boards but with the Council of Public Instruction. Let the Council proscribe text-books that allow of the *supplanting* complained of. Teachers then will not have opportunity of *hearing of lessons*. In the meantime blame neither trustees who have no authority and are powerless in the matter, nor the teacher, so long as such books as the three geographies are *prescribed* to be gotten up by the pupils for grading examinations and inspector's visits. TRUSTEE.

Var. Col. N. S.

PERSONAL.

W. E. Thompson, Esq., who was last term promoted to the principalship of the Albro Street School, Halifax, is meeting with much success in his work. Some of his pupils have been making interesting observations in the realm of "Nature Lessons." The *Morning Chronicle* intimates that Master Walter Hart of Windsor Street has made the discovery that the Pear Tree Borer—the Pine Borer—lately discovered in the Western Counties has made its appearance in Halifax.

SCHOOL AND COLLEGE.

The following are the number of students standing the terminal examinations in the county academies reported: Halifax, 150; Pictou, 120; Truro, 70; New Glasgow, 70; 133 made application for admission to the Halifax Academy at the entrance examinations.

The examination of candidates for matriculation into the N. B. University will take place at the Girls' High School, St. John, on the 12th, 13th and 14th June. Other candidates for matriculation to the University

from the southern section of the province may be admitted to the examination by giving proper notice to the President of the University.

Graduates of the N. B. University will henceforth be admitted to the Junior Class at Harvard without examination, while graduates with honors may be admitted to higher standing after giving satisfactory evidence of work accomplished either while at college or after leaving it.

#### QUESTION DEPARTMENT.

The population of a town was 7,600 in 1850; in 1870 it was found to be 9,196. If the increase per cent during the first decade was the same as during the last, what was this per cent?

In the first decade the increase per cent is on the population of 1850; in the second decade the increase per cent is upon the original population plus the increase during the first decade; therefore the principle is the same as in compound interest.

In this example

$$\begin{aligned} A &= P(1+r)^n & A &= 9196 \\ A & & P &= 7600 \\ \therefore \frac{A}{P} &= (1+r)^n & n &= 2 \quad (\text{decades}) \\ \therefore \sqrt[n]{\frac{A}{P}} &= 1+r & \therefore \sqrt[2]{\frac{9196}{7600}} &= 1+r \\ \frac{A}{P} & & \text{Extract root } \sqrt{1.21} &= 1+r \\ \therefore \frac{9196}{7600} &= 1+r & \therefore 1.1 &= 1+r \\ \text{Transpose } r &= 1.1 - 1 & r &= .1 \\ & & r &= 10\% \end{aligned}$$

#### LITERARY NOTES.

D. C. Heath & Co. will shortly issue a manual on the "Reproduction of Geographical Forms," by Jacques W. Redway, author of the "Teacher's Manual of Geography." It is designed for teachers and students who wish to learn the details of sand and clay modelling as applied to geographical forms, and the projecting, drawing, and interpretation of maps. The manual will be illustrated with the various projections used in map-drawing, including a number of very easily constructed ones that may be used by younger pupils.

#### BOOK REVIEWS.

**HANDBOOK OF NEWFOUNDLAND.** This handbook of 123 pages is published by authority of the Surveyor-General of Newfoundland. That the book is an accurate, full and scholarly presentation of the features of this interesting land may be inferred from the fact that its author is the Rev. Moses Harvey, F.R.G.S.

**ANNUAL REPORT OF THE NEWFOUNDLAND FISHERIES COMMISSION FOR 1889.** This report is of more than ephemeral interest, as it contains much well digested information on the rapidly developing science of fish culture. It will be especially valuable to the Maritime Provinces of Canada.

The report bears strong evidence of the masterly genius of the Secretary of the Commission, Moses Harvey, F.R.G.S.

**TWO GREAT TEACHERS.** C. W. Bardeen, publisher, Syracuse, N. Y. Mr. Bardeen has done good service to education in compiling in a neat and convenient volume two admirable memoirs of great teachers. Johnson's *Memoir of Roger Ascham* and selections from Stanley's life of *Thomas Arnold, of Rugby*. The book will be a valuable addition to every teacher's library.

**MISSA VON BARNHEIM,** a comedy in five acts, by Lessing; with introduction and notes by Sylvester Primer, Ph. D., Providence, R. I. Publishers, D. C. Heath & Co., Boston. This, one of the best of Lessing's plays, makes a very desirable text book for German students. It is not only a classical work of high merit but is very suitable to be placed in the hands of the young. It is another addition to D. C. Heath & Co.'s excellent and beautifully printed "Modern Language Series."

**THE CODE,** containing musical selections and a programme for Arbor Day, has just been published by Ginn & Co., Boston. Price two cents.

**PLANT ORGANIZATION,** by R. Halstead Ward, A.M., Professor of Botany in the Rensselaer Polytechnic Institute, Publishers, Ginn & Co., Boston. This is a presentation of an outline of work for beginners in plant study. Teachers or private students will find it very helpful as a guide to the thorough and thoughtful study of a few typical plants.

**SHAKESPEARE'S MACBETH,** with an introduction and notes by K. Deighton, Fellow of the Universities of Calcutta and Allahabad. London, MacMillan & Co., and New York. This is an excellent edition for the student, the type clear and the notes suggestive. The introduction deals very clearly with the question of doubtful authorship of some passages in the play; and the summing up on these points, and the vivid character sketches of Macbeth and Lady Macbeth, are excellent.

#### RECEIVED.

**HEROIC BALLADS.** Ginn & Co., Publishers, Boston.  
**PRACTICAL LESSONS IN GERMAN CONVERSATION.** D. C. Heath & Co., Boston.  
 From D. C. Heath & Co., Goethe's **SESSENHEIM—HUSS.**  
 From D. C. Heath & Co., Hoffmann's "**HISTORISCHE ERZÄHLUNGEN**"—Beresford Webb.

#### PUBLICATIONS RECEIVED.

*The Popular Science Monthly* for May has many features of marked interest. There is a careful comparison of secondary school programmes—French and American—and the conclusion is reached that the courses of study in our high and preparatory schools must be more distinctly specialized before they will yield satisfactory results. . . . *The Century* for May, Memorial Day Month in the United States, is made notable for the number and variety of articles it contains on natural life and history. The number is more profusely illustrated than usual. . . . *St. Nicholas* for May is a fine



number and its illustrations and other departments are very interesting. . . . *Wide Awake* for May has a paper on Spelling, by the master of a Boston public school which gives matter for serious consideration. . . . Recent numbers of *Garden and Forest*, published by D. R. Munro, New York, are more than usually interesting on account of the valuable articles, not only to horticulturists, but to teachers of natural science in our schools. . . . The *American Naturalist*, among many interesting articles in its March number, has the following: "The Teeth, as Evidence of Evolution," by Cahall; and "Instances of the Effect of Musical Sounds on various Animals." The notes under the headings: Geography and Travel, Geology and Paleontology, Botany, Zoology, Psychology, Archaeology and Ethnology, are specially interesting. . . . The *American Geologist* for March contains articles specially interesting to Canadians. Some of these are "The Triassic Traps of Nova Scotia, with notes on other intrusives of Pictou and Antigonish Counties," by V. F. Marsters; "On the Dykes near Kennebunkport, Maine," (illustrated), by J. F. Kemp. "The Occurrence of Native Copper in the Animikie Rocks of Thunder Bay," by Andrew C. Lawson; and a sketch of the life of the late Dr. David Honeyman, of Nova Scotia. . . . The *Microscope* continues its serial notes on "The Microscope Stand and some of its Accessories." Wm H. Patterson sketches a home made glass stage and slide-carrier. This monthly is an admirable one for the young microscopist as well as for the expert.

Official Notice—N. B. Schools.

EDUCATION OFFICE,  
Fredericton, N. B., May 1, 1890.

The Board of Education has been pleased to order that all applicants for admission to the Normal School as student-teachers shall furnish to the Principal a certificate of general good health in the following form signed by a registered physician:—

1. Name of applicant? . . . . .
2. Present state of applicant's health? . . . . .
3. Conditions of the different organs? . . . . .
4. Constitution? . . . . .
5. The effect which attendance at Normal School or employment in the teaching profession would be likely to have on the applicant's health? . . . . .

WM. CROCKET,  
Chief Superintendent of Education.

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. E. 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.

GEOGRAPHY

May be made pleasant and profitable by using the following new aids:

**Picturesque Geography.** 12 lithograph plates, 15x20 inches, and pamphlet describing their use. Per set, \$3; mounted, \$5.  
 Mrs. L. P. HOPKINS, *Supervisor in Boston Schools*: "Altogether the best. I have urged very strongly that a set be furnished each primary school in the city."  
 DR. WM. T. HARRIS, *Concord, Mass.*: "Of real service in teaching the child the concrete meaning of the technical term used in Geography."  
**Jackson's Earth in Space.** Presents simply the main features of Astronomical Geography for Grammar and Intermediate Schools. The only book on the subject. Retail price, 40 cents. Just introduced into the Boston Grammar Schools, and authorized for New York also.  
**Nichol's Topics in Geography.** A Transcript of successful work in the school-room. Generally acknowledged to be the best book on this subject yet made. Retail price, 65 cents.

**Redway's Manual of Geography for Teachers.**  
 1. Hints to Teachers. 2. Modern Facts and Ancient Fancies. Retail price, 65 cents. To illustrate its popularity, over 1000 copies have been sold to Pennsylvania teachers alone in the last few months.  
**Progressive Outline Maps,** printed in dim outline to be filled in by the pupil, with the graphic representation of all kinds of geographical facts. Thousands of cities and towns are using them. Sample Map and Circulars free. Price by mail 2 cents each; \$1.50 per hundred.  
 E. E. WHITE, *recently Supt. of Schools, Cincinnati*: "I hold map drawing to be a means and not an end. I therefore shall use and strongly commend your maps."  
 A discount of 20 per cent from retail prices to teachers.

Write for Circulars and Price Lists.

D. C. HEATH & Co., Publishers, Boston, New York & Chicago.

# McGILL UNIVERSITY, MONTREAL.

The Calendar for the Session of 1889-90 contains information respecting conditions of Entrance, Course of Study, Degrees, etc., in the several Faculties and Departments of the University, as follows:

FACULTY OF ARTS—Opening Sept. 16th, 1889.  
DONALDA SPECIAL COURSE FOR WOMEN—Sept. 16th.  
FACULTY OF APPLIED SCIENCE—Civil Engineering, Mechanical Engineering, Mining Engineering, and Practical Chemistry—Sept. 16th.

FACULTY OF MEDICINE—(Oct. 1st).  
FACULTY OF LAW—(Oct. 1st).  
McGILL NORMAL SCHOOL—Sept. 2nd.

Copies of the Calendar may be obtained on application to the undersigned.

The complete Calendar, with University Lists, Examination Papers, &c., will shortly appear, and may also be had of the undersigned.

Address McGill College.

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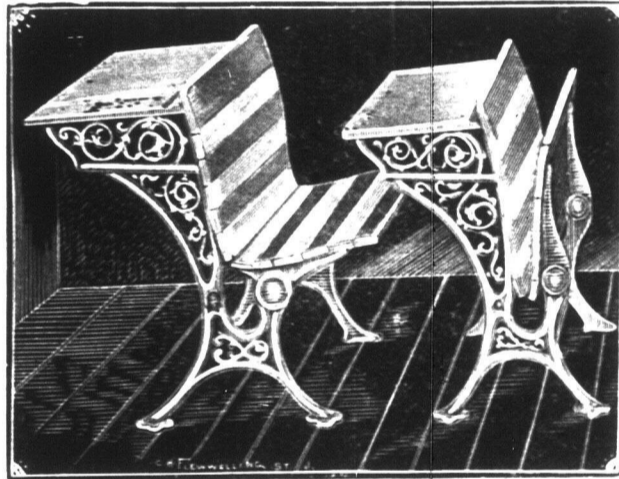
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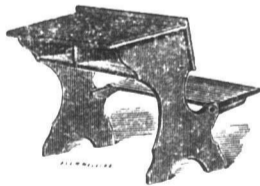
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