THE EDUCATIONAL REVIEW.

FOR THE ATLANTIC PROVINCES OF CANADA.

VOL. III. SAINT JOHN, N. B., DECEMBER, 1889. No. 7

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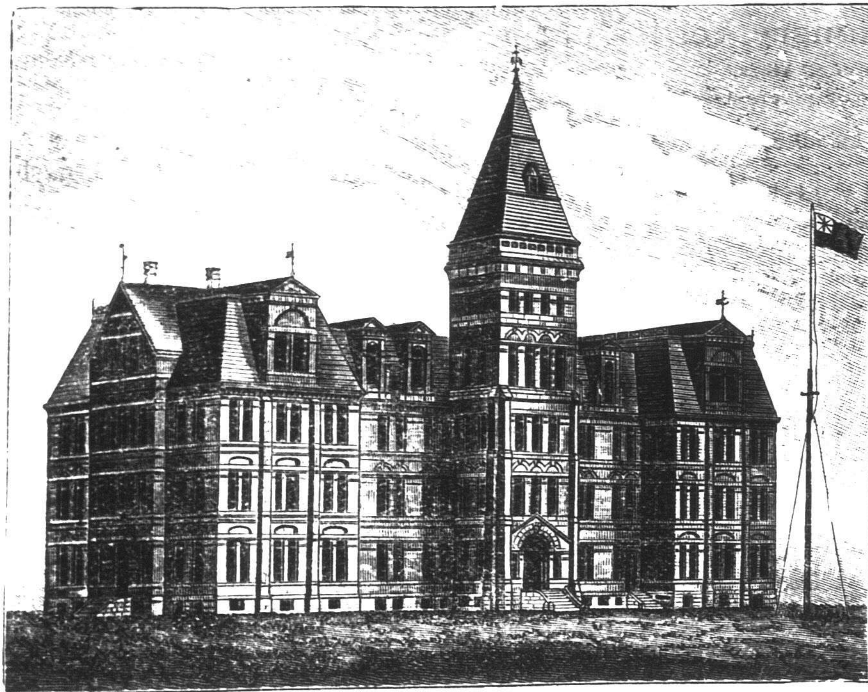

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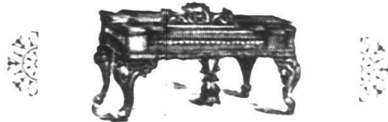

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Notice of Change of Address should be promptly sent to EDUCATIONAL REVIEW, St. John, N. B. The former as well as the new address should be given.

EDITORIAL NOTES.

IN wishing our readers A Merry Christmas and A Happy New Year we have to thank them very cordially for their hearty support of the REVIEW, and for the many encouraging words that have reached us during the past year. We trust that for our teachers the new year may see much that is encouraging and elevating in their work, and that our common schools may reach a much greater efficiency and excellence than hitherto. This progress it will be the aim of the REVIEW to help onward with all its power, and we trust that its increased excellence during the coming year will be an index of educational growth in the Atlantic Provinces.

WE call attention to the advertisement of Mr. Ganong's work on the "Mollusca of Acadia," in the present number.

THE School Commissioners of Halifax call for $90,800 for the coming year, which is an advance of $4,850 on last year. At the same time they have declined to accept the $1,000 per annum hitherto paid the Board, and have determined to serve without remuneration. Popular education in Halifax is rapidly extending, partly due, no doubt, to the growth of the city. The efficiency of the schools has been developing with remarkable activity. The organization is so perfect that at the monthly meetings of the Board the exact condition of attendance, work done, and the wants of each department for the previous month in the whole city is known. If the Commissioners have decided to work for nothing it is not because their work is light and unimportant. The sense of duty well done for the present and future advantage of the city appeared to be a better reward, we presume, than the acceptance of a sum of money inadequate to remunerate their services, yet bearing the implication.

WILL our exchanges and others please take notice of the change of address of the Nova Scotian editorship. EDUCATIONAL REVIEW, *Halifax, Nova Scotia,* instead of *Pictou.*

FREDERICTON is to be congratulated on having such a bright newspaper as the *Gleaner,* which has recently changed from a tri-weekly to a daily.

HALIFAX has at present very preeminent educational advantages. In addition to the public institutions so well known are many superior private schools. Opportunities are given every person. The Victoria Art School is filled with art students during the day, and in the evening persons engaged in business during the day are able to attend. The Medical College has just announced the following course of lectures, which will be free to the public:

Lecture 1, Water in Relation to Sanitation; 2, Air; 3, Ventilation and Warming; 4, Drainage and removal of excreta; 5, Habitations and soil; 6, Food; 7, Beverages and condiments; 8, Exercise, clothing, climate; 9, Prevention of disease and disinfection; 10, Individual hygienic management and a summary.

They are being delivered by the President of the College, Dr. A. P. Reid, A. M., Superintendent of the Asylum for the Insane. The Y. M. C. A. also offers a most valuable course. Professor MacGregor delivered during the first two weeks of December two able lecturets on the "Circle of the Sciences" and "Facts and Fancies." Halifax should ere long give very evident signs of intellectual superiority among the greater cities of Canada,

THE Christmas vacation is approaching when the executives of our educational organizations will be laying the foundations for the convention work of next summer. Any suggestions should be sent in immediately to members of any such committees.

WE regret to learn that Inspector Lay, of Amherst, is seriously ill of typhoid fever, which is nearly epidemic in that town.

THE song and chorus by Mr. E. G. Nelson, of St. John—"Up with the Union Jack"—is a spirited and patriotic piece.

PROFESSOR BOIER, of Halifax, is meeting with great success in teaching German by the Berlitz system.

ST. JOHN CITY NIGHT SCHOOLS.

In the autumn of 1888, the School Board of the late City of Portland established three night schools, in which more than one hundred pupils were enrolled. Through the agency of these schools some very successful work was accomplished.

In the early part of last month schools of a similar character were organized in the Grammar School rooms. At the beginning three schools were opened, but owing to the demand for increased accommodation three others were almost immediately added.

The schools are conducted by male teachers other than those employed in day school work. The schools are open for two hours during four evenings of the week, and the enrolment is now nearly four hundred. The subjects taught are reading, spelling, writing, arithmetic, composition, and, in the more advanced departments, book-keeping, geography and English.

The central location of the schools allows of an almost perfect grading of the departments, and as a consequence much better results are secured.

Members of the School Board and other gentlemen are frequent visitors, and thus lend encouragement to the teachers and pupils in their work. It is but just to state that the very orderly character of the conduct of the schools is largely due to the careful supervision of the Secretary and Superintendent, who are regularly attendant at the schools.

Should the interest which has been manifest since the opening of the schools continue it might be worthy of the consideration of the Board of School Trustees whether the establishment of a permanent department in which business arithmetic, correspondence and kindred practical subjects may be taught to young men who are already engaged in the active duties of life but whose opportunities for acquiring such an education have been limited.

EDUCATIONAL REFORM.

It is customary with writers on education to review with complacency the work which has been accomplished in that department during the last half century, and there is good ground for their satisfaction. Though this period did not give birth to the agitation for national education its historian has to describe the progress of the discussion and narrate the steps by which it grew in strength and vehemence until the popular demand became the law of the land. He has to relate the incidents of the struggle which culminated in the expansion of the curricula of schools and colleges, the introduction of trained teachers and the establishment of institutions to equip them for their work, and the organization of departments to supervise, regulate and systematise the whole educational procedure. It is his duty, also, to note the adoption of better methods of instruction, a discipline more effective and humane, and a more elastic course of study, and to recognize the existence of a livelier interest, sympathy and vigilance on the part of the people at large. These are great reforms, and the philanthropist cannot fail to regard the prospect with pleasure when he sees that the influence of education is felt in every section of the community from the most densely peopled quarters of our towns to the remotest settlements in the backwoods.

Why then the expressions of impatience and dissatisfaction which we hear so frequently uttered respecting our education, and why is it that we can scarcely open a review or magazine which does not contain strictures upon the subjects of study and the way in which they are taught, upon the moral tendencies of our secular system, or its futility as an instrument for the preparation of the youth of the land for the business of life? Have not the schools in Britain and America, even the most conservative of them, bowed to the necessities of the time and modified their course of instruction to meet the demand for an education better suited to the needs of these modern days? Have these changes, then, disappointed the expectations of those who promoted them, or are the complaints which we hear and read the outcome of a hypercriticism, unreasonable, unjust and premature?

We purpose answering this question, and undertake to offer a few suggestions applicable to the education of these provinces, but equally so to the interests of education generally.

The aim of education is to prepare men and women to play their part faithfully and well in their various positions and relations in life. As individuals with personal responsibilities and duties, as members of

society with its calls and obligations, and as citizens of a dominion, in the government of which each of them has to take an interest and a share, they can only acquit themselves to the extent of their powers when their minds have been duly disciplined, their characters moulded under the best influences, and their memories stored with the choicest thought and richest experience of past ages. It is true that the educator is of necessity compelled, in the first place, and chiefly, to remember that his pupils will have to go out into the world to earn a livelihood. His efforts must, therefore, be directed to that end. Time, energy and talent must be generously expended by him that his charge may be adequately provided with the mental equipment required for the various avocations which are open to them. But his highest conception of his duty ought not to be to send out from his school farmers, mechanics or tradesmen, but youths endowed with a disciplined intelligence, trained in habits of order, accuracy and observation, and with hearts responsive to the touch of generous emotions, and aglow with an enthusiasm for the good and the true.

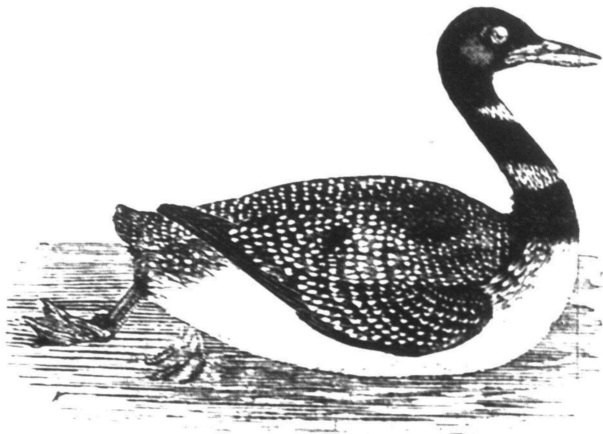
Were this ideal realized we would not be compelled to listen to so much unfavorable criticism of our education. But so long as the teacher holds his present relationship to his profession (if we may call it so), so long as he enters upon his duties without thorough preparation for their discharge, and performs them mechanically, without enthusiasm and without sympathy, we cannot expect that the results will be commensurate with our desires. We grant that there are many teachers doing good work, and that the normal schools are conducted with ability, fidelity and zeal, but the conditions under which they exist and operate are not favorable to the attainment of a high degree of excellence. The normal schools have to undertake the education of the student-teachers in studies which ought to have been completed at an earlier period of their career, and thus to devote time to ordinary school-work which could be more advantageously spent in professional training. An intermittent attendance at the district school, a term at the normal school and perhaps a year at one of the high schools or academies form, unquestionably, a very limited period in which to furnish one with all that is indispensable to such a vocation as that of the teacher.

But few of our teachers propose making it their profession. It is a business to which they betake themselves for the purpose of saving money and when that object is accomplished they abandon it forever. They only regard it as an easy means by which they may assist themselves in their ambition to become lawyers, doctors, ministers or merchants. Can they be expected, then, to exhibit a painful anxiety to make themselves accomplished teachers or to exhaust their energies in the schoolroom, when they know that their occupation is only temporary, and look forward with pleasure to the time when they can leave it? And yet we are free to confess that some of the best teaching, of which we have had experience, has been done under these circumstances. But these are not the conditions under which education can flourish. Frequent changes of teachers hastily prepared are not conducive to progress. Until steps are taken to render the teaching profession more permanent the same shortcomings will be observed, the same disinclination of able men to make it their life work.

And how is this feature of permanency to be secured? Only in one way, and that is by offering greater pecuniary inducement. The teaching profession must be able to compete, in its highest positions at any rate, with the other professions. Orators exhaust their vocabulary in extolling the advantages of education and magnifying the office of the teacher, and yet when the most distinguished in the profession are suppofed to be well paid for their labor their renumeration is far short of what is earned by inferior men in the other professions. We remember hearing an eminent public man say, respecting a large public school in which the discipline and teaching were very unsatisfactory, that "We ought to have at the head of this school an accomplished and scholarly man, a man of character and force, a man endowed with great magnetic power and gifted with high executive ability, whose influence would be felt in every class-room and whose word would be law to every pupil." There are men in the profession possessed of these attributes, men of singleness of heart and devotedness of aim, willing to spend and be spent in an occupation which they love and to which they lend lustre, but we question the justice of the opinion which regards such a man well paid by a salary of eight hundred dollars a year. But men who answer to the ideal head-master above described, do not, as a rule, remain in the profession, but carry their talents into a field where they can earn thousands instead of hundreds. And it is but right that the public should learn at once, as they must sooner or later, that the efficiency of their educational system depends upon the men and women who are the teachers under it, that the steady drain on them by other professions cripples effort and retards progress, that if the moral and intellectual advancement of our country is to be assured our best teachers must be induced to remain in the profession, and that these objects can only be attained by a more generous support of the teacher.

FERNDALE SCHOOL.

No. XXVIII.—DIVING SWIMMERS.



THE LOON. [illegible]

> The wild-fowl nestled in the brake,
> And sedges, brooding in their liquid bed.
>
> BYRON—*Don Juan*, Canto XIII., St. 57.

T. Here we have a sketch of our common Loon, sometimes called the great Northern Diver. Do you notice anything peculiar about the position of its feet?

S. Its feet are very far back.

JACK. I guess if that bird tried to walk on land it would have to stand nearly upright, its feet are so near one end of the body.

ANOTHER S. It would appear to be walking on its tail nearly.

JACK. Tail! I think it must have been walking on its tail until it was worn off. It has only the rump left.

T. Not so bad Jack. The Greek for "rump" is *pyge*, the *g* sounded hard; and *podes*, you know, is Greek for—

S. Feet.

T. And all birds which have this character which you have noticed so well developed, are called by ornithologists the *Pygopodes*. What is the meaning of the term, will you please guess?

S. Rump-footed.

T. Correct. Which position would be most easy for these birds to maintain—the vertical one on land or the horizontal on water?

S. The horizontal on water.

T. You then see why the water should be their most natural home and why they should be so expert in all aquatic movements.

S. Do they dive?

JACK. The Loon will dive at the flash of a gun and be under water before the bullet can reach it.

T. Quite correct—especially if at long range. You can understand now why naturalists have called them diving birds. The position of their feet which causes them to move so akwardly on land is favorable to swimming and diving.

S. Are there many kinds of diving birds in these provinces?

T. About a dozen or fourteen. The following seven are the most common: Holbœll's Grebe, Pied-billed Grebe, Loon, Red throated Loon, Puffin, Black Guillemot, and Murre. The following rarer: Horned Grebe, Razor-billed Auk, Dovekie, and Great Auk. Brunnich's Murre has been reported from Nova Scotia, and the Tufted Puffin and Large-billed Puffin from New Brunswick.

S. How can we distinguish the Loon from the others?

T. *First* the *Pygopodes* are divided into two sub-orders, those with *tail feathers wanting*, and *tail-feathers present but short*.

S. The Loon belongs to the latter.

T. Correct; the Grebes form the first sub-order. *Second*, the latter sub-order is divided into two divisions, those with the *hind toe present* and those with the *hind toe absent*.

S. The Loon belongs to the first of these.

T. Correct; those with the hind toe absent are the Auks, Puffins, Guillemots and Murres.

S. How large is the Loon?

T. From two and a half to three feet long, and weighs about sixteen pounds. Wing from thirteen to fifteen inches. Bill about three inches in length and one inch in depth at base. Eggs three and a half by two and a quarter inches, generally two, of a dirty white or stone color.

Astronomical Notes.

Our shortest day on Dec. 21, a total eclipse of the sun on Dec. 22, and our nearest approach to the sun on Jan. 2,—these are the chief astronomical fixtures for the next few weeks.

And the chiefest of these is the eclipse. Belcher's Almanac announces it thus: "A Total Eclipse of the Sun, Dec. 22, 1889. Visible at Halifax."

Visible at Halifax—let us see.

The total eclipse, caused by the sweeping over the earth of the moon's umbra or true shadow, will begin at 7.13 a. m. (60th time) in the Caribbean Sea to the south of Hayti. From there the shadow will sweep southeast along the coast of South America, just touching the land at a few favored spots. At several of these spots observing parties from England and the United States are waiting for it. One of the English parties, sent out by the government, is in charge of the Jesuit Father Perry. When clear of South America, the shadow will curve down and

across the South Atlantic. Near St. Helena its direction will change to the north of east. It will strike Africa near St. Paul de Loanda, where there are other observing parties. Then it will sweep northeast across some of the darkest parts of the dark continent, and will leave the earth at 10.35, just after reaching the Indian Ocean. It will be a very respectable total eclipse, being over four minutes long at its best; but this will be in the middle of the Atlantic, and so will benefit nobody.

"Visible at Halifax" is certainly not true of this. Let us try the partial eclipse, caused by the moon's penumbra. That will be visible from Cape Breton to Chili, and from Florida to Arabia. A piece of the northwest corner of the penumbra will be swooping down on the earth just as Nova Scotia is swinging up into the morning sunshine, and it will select our province for its landing-place. This will give some parts of the province a chance to see a part of a partial eclipse. And that will be all. What the almanac should have said is that the eclipse will be partially visible at Halifax as a partial eclipse. And so it will to most of the province. But both the 'partial' and the 'partially' are very emphatic. In the north of Cape Breton and the west of Cumberland there will be no eclipse at all. Along the south coast from Halifax to Cape Sable there will be a small black patch on the lower right edge of the sun for five or six minutes after his disc is above the horizon. The nearer you are to a curve passing through Halifax and Cape Sable, the closer you will come to having that much of an eclipse. And the nearer you are to another curve passing through Baddeck, Pictou, Parrsboro, and along the North Mountain to Briar Island, the closer you will come to having none. At Yarmouth we may see a notch in the Sun's limb, 156 to the right of the vertex, for nearly two minutes after he is above the horizon, but it may be off in less than three-quarters of a minute. The *exact* time of sunrise at a given place on a given day can't be calculated beforehand.

These are very small eclipse favors, but they are the best we shall get from the sun until October, 1892.

The day before the eclipse, Saturday the 21st, is the day of the winter solstice. At 11 a. m. (60 time) the sun will reach his greatest southern declination, and, according to the almanacs, will enter Capricornus. If you could see the stars on that day while the sun is up you would find that he was in Sagittarius, a little west of the handle of the Milk Dipper, and just where you used to see Jupiter at the end of September. This you must take on faith. But don't squander your faith on things you may learn by sight. Such things, in connection with the winter solstice, are (1) that on that day the sun rises and sets to us farther south than on any other day of the year, (2) that at midday his altitude is less and the shadows he casts are longer than at any other midday, and (3) that the day is our shortest day. At Yarmouth, in the south of Nova Scotia, the length of the day will be 8 hours 54 minutes; at Dalhousie, in the north of New Brunswick, it will be thirty-two minutes shorter. At Yarmouth the meridian altitude of the sun will be $22\frac{3}{4}°$, and the shadow of an upright ten-foot pole will be twenty-four feet long; at Dalhousie the altitude will be $18\frac{1}{2}°$, and the pole's shadow thirty feet. At Yarmouth the points of rising and setting will be S. E. by E. and S. W. by W., at Dalhousie 3° farther south. At intermediate places these quantities will, of course, have intermediate values, If you know your latitude you can calculate the values for yourselves, or, better still, take a watch, a compass, a tape measure and a sextant, and get them by observation. Then wait a while and repeat the observation, and compare the two sets of results. But don't expect to find any appreciable difference close to the 21st. All the above quantities are then changing their values very slowly. In length of day, for instance, the 20th and 22nd will differ from the 21st by no more than two or three seconds. For a change of a foot in the length of the midday shadow of our pole, you will have to wait about a fortnight; and for a change of a degree in the sun's meridian altitude, a few days longer. For an increase of an hour in the length of the day, you will have to wait about six weeks; and three or four days more than that for a change of a point in the rising and setting positions of the sun.

Another quantity which reaches one of its extreme values on December 21st is twilight. We shall have ten minutes more of it at each end of that day than we had when it was shortest in October. (See notes in October REVIEW.) This will be its minor maximum (the major one falling at the summer solstice), and its total amount for morning and evening together will be three and a half hours at Yarmouth and three and three-quarter hours at Dalhousie.

And there is yet another quantity which has an extreme value on December 21,—the time that the sun takes to rise or set. This is only a small quantity at best, but it has its variations just like bigger quantities. For a given place it is least at the equinoxes and greatest at the solstices—the December maximum being a little bit the larger. Ask your friends who have not observed or calculated it how much they think it is, and you will likely get some rather wild guessing. I have had guesses all the

way from two seconds to two hours. At Yarmouth the maximum is three and a half minutes and the minimum three. At Dalhousie these are four and three and a quarter minutes. At the poles it takes the sun thirty-three hours to rise and as long to set, but he can afford it there as he rises and sets only once a year. On the equator and at the equinoxes the time is least of all, being a little over two minutes.

We were at our greatest distance from the sun — or, as the almanacs say, the sun was in apogee — or, if you are a bigoted Copernicist, the earth was in aphelion — this year on July 1st. (See notes in July REVIEW.) We have been drawing nearer to the sun ever since, but there will be no perihelion for us this year. Never mind, next year we'll have two. The first of them will happen at 3 a. m. on January 2nd. We shall then be more than three millions of miles nearer the sun than we were on July 1st. There are people who find it hard to believe that we can be so much nearer the sun in midwinter than in midsummer. If this is your case, get a sextant and measure the sun's diameter at the beginning of January. Then wait until the 1st of July and measure it again. If you do it well, you will find that the January diameter is larger than the July one by nearly three and a half per cent. This should help your unbelief, unless you prefer to suppose that the sun swells up in winter and contracts again in summer.

The interval from one perihelion to the next is what astronomers call the anomalistic year. Its mean length is twenty-five minutes more than the tropical year, (the one generally used by mankind), but its actual length is variable. From the last perihelion to the one on January 2nd the interval is 366 days 15 hours; and from that one to the one on December 31, 1890, the interval will be 363 days 12 hours. At the coming one the earth will be 3000 miles nearer the sun than at the one in December last, and 1000 miles nearer than at the one in December next.

Mercury will be evening star from December 7 to January 29, at his best in January, especially from about the tenth to about the twentieth.

Venus is still morning star and will be so until February 18. Morning star-gazers may amuse themselves trying how near to that date they can see her, and then they will know how soon after that they may expect to see her in the evening.

Mars is brightening up for his opposition next year. He won't be visible before midnight until the end of March.

Jupiter is still visible for a little while after sunset, but the sun is gaining on him fast. They will be in conjunction on January 10, and after that our evening sky will know Jupiter no more for about five months.

Saturn is getting ready to fill Jupiter's place as evening star. In the middle of December he will rise about 10 p. m. (mean time), and about nine at the end of the month. He is now between five and six degrees east and south of Regulus, and is creeping very slowly eastward. He will stop that on December 15, when he will be less than two degrees north and a little west of Rho Leonis, a fourth magnitude star. Then he will move west again, back towards Regulus. If you have a glass that just showed his ring last spring you may find that it won't do it this winter. If so, don't break your glass, it is the ring that is to blame.

Uranus may be seen on the morning of December 24th about one degree south of Mars, both planets being near Spica.

Neptune became an evening star on November 25th. He was visible in the east before midnight a couple of months before that, but a planet is not considered an "evening star" until it is on the meridian before true midnight. In Neptune's case it is almost an abuse of language to call it an evening star at any time, for, as it is only about as bright as a ninth magnitude star, it can't be seen by the naked eye. But a field glass will show it, and an opera glass may, if it is a good one. If you would like to be able to say that you have seen Neptune, try the following prescription: First find Omega Tauri. Taurus has two Omegas, about two degrees apart. They lie about half way between Aldebaran and the Pleiads. The east one is of magnitude five and a half, the west one six. It is the west one you want. Point your glass at it and look for a small star close to it on the north-west side. If you can't see it, then your glass, your eye or the night is not good enough to see Neptune. If you can, then find Neptune from what follows: Previous to December 21 he will be south and a little east of Omega. On December 21 he will be directly south of it and about as far from it as the distance between Alcyone and Merope (the brightest Pleiad and the one nearest it). He will move west until February 10th, and will then be about three quarters of a degree west and south of Omega. On April 1st he will be back under Omega again and nearer it than on December 21st. During these three months and more he will wander among the stars about as far as Jupiter does in five days at present, and as far as the moon usually does in about two hours and a half. A year from next February your glass will still show Neptune and Omega at the same time.

C.

Sketch of Prof. Ch. Fred. Hartt.

Few lives present a more inspiring example to the student than that of Prof. Charles Frederick Hartt, whose portrait is here given. In a short but brilliant scientific career he achieved results that are almost incredible, and that have made his name known throughout the world. And it was in our own rugged climate, amid the fostering influences of our own educational institutions, in a home where Christian principles were held as the most sacred trust, that those talents and capabilities that gained such signal triumphs were nurtured.

Prof. Hartt was born at Fredericton in 1840 and died at RioJaneiro, Brazil, March, 1878. Shortly after his birth his family removed to Nova Scotia, and he was educated under the guidance of his father, Jarvis W. Hartt, then Principal at Horton Academy, and graduated from Acadia College at the age of twenty. He gave evidence in very early life of a fondness for natural science. Joined to a passionate love of nature, he possessed a careful and enquiring mind, and his persevering and accurate habits of study admirably fitted him for the minute and searching explorations which he afterwards undertook and so successfully accomplished. He possessed great versatility of talent. A language, music, drawing, were easily acquired by him. He attained such proficiency in Portuguese, the elements of which he learned from a shoemaker at Wolfville, N. S., that he lectured in this language to cultivated audiences in Rio Janeiro. The results of his keen observation and the original investigations which he carried on, even before he left college, brought him under the notice of Professor J. W. Dawson, who greatly encouraged him in his early scientific researches. Prof. Hartt was graduated from Acadia in June, 1860. In the same year he came to St. John, where his father established the High School, in which he was assisted by his son. But the geology of this region proved of such absorbing interest to him that his mind became restive under the routine work of a school. He afterwards made one of the best of teachers when he mastered his favorite study,—ever enthusiastic and thoroughly absorbed in science, his pupils everywhere, interested in the same pursuits, shared his deep and earnest enthusiasm. His passion for science never flagged from the moments when pausing by the roadside at the age of seven he broke open and gazed at the fragments of rock, until death laid its hand upon him in the midst of his life work in Brazil.

CHARLES FREDERICK HARTT, A.M.

It had been ascertained several years before Mr. Hartt came to St. John through the observations of Dr. Gesner, Prof. Robb and Mr. Matthew, that the series of Devonian Ledges on the Lancaster sea beach were fossiliferous, some plant remains having been found there by these gentlemen. These discoveries proved so interesting and valuable to science that Professor (now Sir Wm.) Dawson paid a visit to the locality; and the results of his examinations were shortly afterwards published.

In the summer of 1862 Mr. Hartt spent thirty days at the Fern Ledges, discovering many new

species of plants, and more perfect specimens of those which had been previously collected. But a more valuable and unexpected discovery was that of the remains of insects—five species in all—the very oldest known to geologists, and which flitted about in the old Devonian forests perhaps hundreds of thousands of years ago.

A description of these insects from the pen of Prof. Scudder, the distinguished entomologist, may be found in Dawson's Acadian Geology, pp. 524-526. The first one discovered by Prof. Hartt was named *Lithentomum Harttii.*

After a course of study at Cambridge, Mass., under Prof. Agassiz, Prof. Hartt filled positions in several educational institutions in the United States, and was then appointed to the professorship of geology in Cornell University, New York. But it was in the extensive and distant empire of Brazil that Prof. Hartt was destined to achieve the greatest results of his energy and genius. In a series of five expeditions, covering thirteen years, he explored a great extent of country, examining much of it step by step, mapping out large districts of territory, accumulating a vast mass of geological material, publishing much that was new and valuable; and when the pen dropped from his hand he had prepared much of the MSS. of reports of his final work. The intense heat of the Brazilian summer, his failing health, caused by too close application to arduous and important duties, made him fall an easy prey to that dreadful scourge of the tropics—yellow fever. In the language of a very dear and intimate friend of his, Prof. Daniel S. Martin, he was "a Canadian by birth and education; an American by residence and adoption; a Brazilian, it may be said, by the chief labors and discoveries of his riper years; a scientist always and everywhere."

The results of Prof. Hartt's first and second expeditions to Brazil were published in a large octavo volume of 600 pages, entitled "The Geology and Physical Geography of Brazil," and is an illustration not only of the maturity to which he had brought his geological studies, but also of his great versatility of talent. The numerous maps and sketches by which the work is illustrated were drawn by himself, and the descriptive portions of the work are well written and interesting. Although his later trips yielded such rich scientific results, yet so carefully and accurately was the material of this book compiled that very little, if any, of it needed correction. Prof. Hartt had written before he went to Brazil in 1874 the following works: A quarto volume of 300 pages on "Brazilian Antiquities;" a work of 300 pages on the Mythology of Brazilian Indians; a grammar and dictionary of the language of the Tupe Indians, of about 400 pages. At the time of his death he had prepared voluminous reports as chief of the Brazilian survey. These, with his contributions to scientific journals throughout the country, show marvellous capacity and industry.

That he possessed all the qualities of a great leader and a brilliant scientific teacher is apparent from the abundant results of his comparatively short life. His industrious career furnishes a fruitful example of the rewards resulting from enthusiasm, energy and intelligence when applied steadily in one direction.

For the Review.

N. S. Normal School.

The Truro Normal School has this year an enrollment of but one hundred, of whom fifty are in the first class. Thus, while the total number is the smallest for a long time, the first class is the largest but one ever enrolled in the history of the school.

This diminution of numbers exclusively in the lowest grades is due undoubtedly to the general advance in the facilities offered to students of this class by the county academies and other schools centrally situated. So long as professional training is not a condition of professional qualification so long the opportunities offered for obtaining professional training will not be an important factor in determining the choice of students who wish to select a school where they may prepare for the license examination. If good local facilities for preparation for the second class license are available candidates for this grade will not unlikely in diminishing numbers go a long distance to the Normal School.

So, too, it must be admitted that the relatively large class seeking qualification in the Normal School for the Grade B examination is indicative of a prevalent opinion that in the main better advantages are here offered in the lines of work requisite for that grade than can be obtained elsewhere. While nearly all of this year's first class are teachers of some experience holding a second class license, the indications are that their aims are principally for the literary advancement necessary to secure a higher grade of license, and only secondarily for the professional training which is given at the Normal School.

The principal of the school in his inaugural address dwelt particularly upon the urgent necessity of such changes in our present system which would not only secure on the part of every one entering the service a reasonable degree of professional knowledge and skill but at the same time relieve the Normal School of the heavy burden of purely academic work which under present circumstances, to its serious disadvan-

tage as a professional school, the institution now has to carry.

His remarks on this head were emphasized by Superintendent Allison, who instituted an instructive and interesting comparison between the Nova Scotia and the Ontario systems as related to the question of licensing teachers. The latter system, though perhaps not to be imitated in all respects by us, was shown to be a rational one in that it required other training than that in merely academic studies of all would-be teachers; and differentiates the work of the Normal School entirely from that of the Academy and High School.

Two valuable donations have this year been made to the Normal School furnishings. Miss Ottie Smith, the art teacher, has executed in a most admirable manner a life-size crayon portrait of Dr. T. H. Rand and presented it to the institution. It now hangs in the Assembly Hall, a companion picture to the portrait of Dr. Forrester, presented last spring by Miss McLean, a former student of the school. The group of pioneers in Nova Scotia education will not be complete until some one adds to these two pictures one of Sir Wm. Dawson.

The other gift referred to as having been recently received is from Mrs. Captain O'Brien (*nee* Miss McDougall), an old-time Normal student, who has recently brought from India a magnificent stuffed crocodile and presented it to the school. Such manifestations of continued interest on the part of Normal School graduates are very gratifying, at the same time contributing in very important regards to the efficient equipment of the school.

Truro, N. S., Nov. 29, 1889.

Patriotism is not a sentiment of innate origin in the soul of man, but has its origin in the institution of nationhood, and follows a law of development in the individual in some way associated with the development of the nation to which we belong. A great national deed, a great national history, in course of time becomes a matter of pride to the people composing such a nation. . . . . Is such a sentiment strong among us? Not yet; but we are proud to say it is gaining in the hearts of our people daily. Thanks to our almost unrivalled educational system, the rising generation of our inhabitants, like those of the great neighboring republic, are becoming rapidly indoctrinated with patriotic teachings, and before the advent of the coming century our people will be as patriotic as those of any other country.—*The Weekly Monitor.*

Literature, the Sunshine of a Busy Life.

An Address by Dr. J. G. Fitch, of London, delivered before the Chautauqua Assembly, N. Y., in 1888.

I am right, I think, when venturing to address the members of the Chautauqua Assembly, in assuming that it is largely composed of men and women who are leading laborious lives, who are engaged in various occupations and professions, but who are nevertheless conscious of the need of self-improvement and the desire to avail themselves of some of the manifold resources of this great Assembly in order to add to their own knowledge, to gather fresh ideas, to enlarge the sphere of their own reflection, and in particular to acquaint themselves with some of the best thoughts which have been accumulating from time to time and garnered in the great storehouse of English literature.

Many among you, I know, feel that a life wholly devoted to the study and manipulation of material things or to the business of money-getting is an incomplete life; that any one study or pursuit practised to the exclusion of all others has an inevitable tendency to narrow and pervert the mind; and that there is the need of some other intellectual interests than those immediately and visibly connected with the proper work of your profession, to keep your mind and character duly balanced and to help you to see your special work in its true proportion.

I cannot express to you too strongly my own sense of the wisdom of this resolve of yours. There are duties of being as well as of doing, duties to ourselves and to our own faculties as well as to our own profession and to the world in which we live; and be assured that those who are conscious of the possession of tastes which transcend the boundaries of their daily avocations would sin if they did not afford to those tastes some scope for development. We have not only to get a living but to live. And the life we live depends on the tastes we form, on the things we enjoy and like, on the pursuits of our leisure as well as on our diligence in our special calling. We are not to suppose that there is anything incompatible between the duties of the most absorbing profession and the cultivation of tastes outside of that profession. We have in England at this moment a prime minister who is known to be in his hours of relaxation devoted to the study of experimental science. We had until lately another prime minister who has found a solace for his leisure hours in the study of the oldest Greek poems, and in the investigation of problems respecting the state of man and society in the twilight of the Homeric age. Very lately one of the ablest and most laborious of our judges has produced a scholarly translation of Virgil. Shall we complain in all these cases that men of such eminence concern themselves with speculations and studies apparently remote from the pressing duties of their public life? Or shall we not rather recognize that those very duties are likely to be all the better fulfilled because those who undertake them have sought to widen the range of their intellectual interests and so to see the special work of their lives in relation to the larger world of thought and action, and of human history, of which even politics and jurisprudence form a part?

And, you too, however absorbing and interesting your special studies and the professions to which they lead may prove to be, have also leisure to fill, homes to cheer, influence to exert among those whom you love and with whom you come in daily contact. And more than this, you have the world of your own thoughts and fancies and hopes and plea-

sures, and you know well that this world will be enriched and ennobled in just the proportion with which you store it with truth, that,

> "He that made us with such large discourse,
> Looking before and after, gave us not
> That capability and God like nature
> To rust in us unused"

Now, of literature it may be said that in one sense it is a picture and in another a criticism of human life. The student of literature comes in contact not merely with this or that particular branch of knowledge, but with the relation of knowledge to the entire conduct and aims of life. Of course by literature I do not mean all books. A manual of electricity, a text-book of history, a cyclopedia, may be very valuable and, indeed, indispensable in your library, but it is not literature.

So long as the book deals with the acts of its own subject and confines itself to those facts, it does not come into the catalogue of literature at all. Yet a book of science or of history or philosophy may become entitled to this rank on one of two conditions. It may by the breadth and skill with which it is treated show the relation of its own subject to other departments af human knowledge and to the whole science of life. And then it is lifted above the rank of a manual or a book of information up to the higher dignity of a work of literary art. So I should not call Whately's Logic literature, because, able as it is, it is not much more than a compendium of rules and *formulæ*. But I should call John Stuart Mill's Logic literature because it discusses the principles which underlie the rules of formal reasoning, and traces out the relations of the rules to those principles. Or a book may become entitled to a permanent place in English literature whatever be its subject if there be a certain charm, or finish, or beauty in its style. A slipshod, ill written and tawdry story may not deserve to be called literature, even though the story itself is full of incident and interest. But the "Vicar of Wakefield" is literature, notwithstanding its gross improbabilities, and the confusion and incoherence of the plot, because of a certain grace and sweetness, and because of a delicate perception of human character which Johnson detected in ten minutes glance at the manuscript, but which subsequent readers have fortunately been able to recognize at their leisure.

Many of you are familiar with the notion of the storage of electrical force. And you may regard a great library too as a store of the force which has helped to shape the mind of humanity and is still shaping it, and likely to influence it in the time to come. Books are the product of the best thoughts, the loftiest hopes, the brightest dreams of mankind, they represent the outcome of all controversies, the history of human error, the progress of truth. No man born into a world so rich in thought and in experience has a right to live in it who does not learn something about it and feel stirred with a desire to know more.

There is no more attractive form of literature to many minds than biography. "Man," says Carlyle, "is perennially interesting to man; nay, if we look strictly to it, there is nothing else interesting. How inexpressibly comfortable to know our fellow creature, to see into him, understand his goings forth, decipher the whole heart of his mystery, nay, not only to see into him, but even to see out of him, to view the world altogether as he views it so that we can theoretically construe him; and do now thoroughly discuss both what manner of man he is and what manner of thing he has got to work and live on. It must not be supposed that all biographers so called, fulfil these conditions. Many a book called the life of a hero or of a statesman is nothing but a dry chronicle of dates, of his parentage, the public offices he filled and his outward and visible acts. But a true biographer requires not only the knowledge of these things, but insight into character, power to discriminate between relevant and irrelevant, significant and insignificant detail, and to present to you a vivid picture of the struggles, the successes, the fortunes and the work of a life. And it matters little what the position or circumstances of the subject of the biography may be, so long as the story is truthfully told, with sympathy and with discernment, the result is sure to be valuable. There was an old Greek who settled in Rome in the first century and who was greatly interested in observing a sort of parallelism between the lives of some of the Greek heroes and the career of some of the later Roman soldiers and statesmen. His name was Plutarch and he wrote a series of biographies. Fortunately a translation of this work into English happened to appear at the moment when Shakspere was in the fulness of his vigor and literary activity, and the book profoundly interested him. Out of it he procured the material of his most famous plays, the Roman dramas of Julius Cæsar, Antony and Coriolanus. Since that time there have been many biographies in our own language, but those which have taken an abiding place in literature may soon be enumerated: there are Izaak Walton's charming lives of Hooker and Herbert, Boswell's Johnson, Johnson's own Life of the Poets, Southey's Bunyan and Nelson, Carlyle's Life of Sterling, Stanley's Life of Arnold, Mr. Eliot Cabot's Life of Emerson, Sir G. Trevelyan's of his uncle, Lord Macaulay, and a few others. Some of you will perhaps be attracted by Smiles's book, the Lives of Engineers, because the careers of these men resemble that which many young and ambitious men would like to follow. That is natural enough. But Smiles's only heroes are the successful men. His stories are marred a little by his constant insistence on what has been called the "great gospel of getting on." Now, "getting on" is of course one of the legitimate aims of life. But it is not the only thing worth studying. You read biography that you may understand human nature better, that you may find some light and guidance in understanding the great problem, how far can a man control circumstances, and how far do circumstances control him. You want from such reading to obtain self-knowledge, renewed fortitude and prudence in encountering the struggles of life. And I am not sure that the lives of unsuccessful men are not from this point of view the most instructive of all. To me there is profounder interest in tracing the wayward, unhappy life of Richard Savage—his queer alternations of splendor and squalor, his genius and his misery, as told by Johnson, than in many a story of a hero or a saint.

Closely connected with biography is history, which is in one sense a compendium of biographies. And here again you have to distinguish between the history which is mere chronicle or narrative, and the history which is that and something more, and which thus becomes entitled to an enduring place in literature. You have had easy gossipy chroniclers, like Herodotus, Froissart, or Geoffrey of Monmouth, who have simply set down all the stories they have heard, without inquiring too anxiously into their authenticity or their truth. Then you have had other more critical historians such as Thucydides, Livy, Robertson, Hume, Clarendon, Burnet,

Lord Stanhope, Motley, and Francis Parkman, who have taken pains to sift evidence and to present the truth of fact; and have sought "to show the age and body of the time, his form and pressure," but have aimed at little more. In a third class of historians, whose works are illuminated by grace and style, or by the skill and power with which the whole subject has been handled, we have Tacitus, Gibbon, Macaulay, Froude and Carlyle, and in every one of these writings your interest is not merely objective in the actual picture of the events as they happened, but largely subjective, because it is just as edifying for us to know in what light events have appeared to a man of genius, and what impression they made upon him, as it is for us to know the bare truth that such and such a battle was fought or a law passed or a treaty concluded in a particular year. Finally we have a small group of historians who are to be regarded rather as students of human nature and philosophers than as mere story tellers, who have tried to trace out the laws and the principles which have controlled, and may help to explain the march of events and the development of human institutions. Bolingbroke wrote a book called the Philosophy of History, which was better in aim than in execution; but in our own time the remarkable fragment which Buckle lived to complete of the history of civilization, and the works of Mr. Lecky, especially his history of European morals, are examples of a kind of literature which will always have a special attraction for those among you who care to know not only what has happened in the world, but as far as possible why it has happened, and what have been the causes of an event, its consequences and its moral significance, and what light it throws on the government and the future destiny of the world.

Indeed, to a large class of minds, and that by no means the least powerful and the least fruitful, truth of principle will always seem more important than truth of fact; they are led by special taste and aptitude to care more about the reason and the laws which underlie the facts of life than about what is called information in any shape. They value the knowledge of matters which belong to the region of outward experience, only in so far as they shed light upon the deeper truths of inward experience; and on the explanation of man's nature his powers, his faculties, and his relation to what is unseen. To minds of this stamp these questions, "What am I, why am I here, whence arose the power which I possess, how may this power best be strengthened, what use should I make of it, what is the ultimate test of right and wrong, of true and false, what is the true nature of human duty?" will always appear to be of supreme importance.

It is not the only business of an intelligent life to arrive at conclusions, nicely cut and dried, thoroughly verified and warranted fit for immediate application. It is also an essential part of its business to lay hold of the instruments of reasoning, and to learn how to use these for one's self. And if any one of you is conscious of a taste for philosophical inquiry, a deeper interest in the processes by which truth is arrived at, than in the achieved results of other people's enquiries and researches, do not be afraid, in your leisure, of indulging this taste, and don't be deterred from such indulgence because you are told that philosophy is unpractical. Nothing is unpractical which makes you feel intellectually richer and stronger, which interests you strongly, which sets you thinking, and which sends you back to your daily duty refreshed and strengthened, as after a bath or a holiday.

(To be continued.)

Why Sixty Seconds Make a Minute.

Why is our hour divided into sixty minutes, each minute into sixty seconds, etc. Simply and solely because in Babylon there existed by the side of the decimal system of notation another system, the sexagesimal, which counted by sixties. Why that number should have been chosen is clear enough, and it speaks well for the practical sense of those ancient Babylonian merchants. There is no number which has so many divisors as sixty. The Babylonians divided the sun's daily journeys into twenty-four parasangs, or 710 stadia. Each parasang or hour was subdivided into sixty minutes.

A parasang is about a German mile, and Babylonian astronomers compared the progress made by the sun during one hour at the time of the equinox to the progress made by a good walker during the same time, both accomplishing one parasang. The whole course of the sun during the twenty-four equinoctical hours was fixed at twenty-four parasangs, or 720 stadia, or 360 degrees. This system was handed on to the Greeks, and Hipparchus, the Greek philosopher, who lived about 150 B. C., introduced the Babylonian hour into Europe.

Ptolemy, who wrote about 140 A. D., and whose name still lives in that of the Ptolemaic system of astronomy, gave still wider currency to the Babylonian way of reckoning time. It was carried along on the quiet stream of traditional knowledge through the Middle Ages, and, strange to say, it sailed down safely over the Niagara of the French Revolutiou. For the French, when revolutionizing weights, measures, coins and dates, and subjecting all to the decimal system of reckoning, were induced by some unexplained motive to respect our clocks and watches, and allowed our dials to remain sexagesimal, that is Babylonian, each hour consisting of sixty minutes.

Here you see again the wonderful coherence of the world, and how what we call knowledge is the result of an unbroken tradition of a teaching descended from father to son. Not more than about a hundred arms would reach from us up to the palaces of Babylon, and enable us to shake hands with the founders of the oldest pyramids, and to thank them for what they have done for us.—*Max Muller, in the Fortnightly Review.*

Greek is very beautiful; Greek grammar is perfect. We would heartily encourage our young men to gain some acquaintance with the language and its grammar. Of course, a man may be a great lawyer, an eloquent preacher, a profound thinker, a true poet without either Greek or Latin. But culture is desirable; and as instruments of mental culture Greek and Latin are invaluable.

Pluck and Cricket.

Wellington said that Waterloo was won on the field of Eton. He referred to the gallantry of his officers, many of whom had been trained by the games and sports of that famous school. An illustration of the effect of such training in developing a man's limbs and wind was given at Inkerman, one of the most stubbornly fought battles of the Crimean war.

A young officer, who had learned at Eton not much from books but a good deal from its sports, had hot work on that eventful night. His sergeant fell at his side. Seizing the dead man's rifle he fired it, emptied his own revolver, drove his sword through a Russian officer, but was surprised by being surrounded and made prisoner.

While going to the rear in charge of two stalwart Russians, he looked at their long coats and said to himself, "They can't run."

Watching his opportunity, he knocked one soldier heels over head, threw the other by a wrestler's trick into the mud, and took to his heels. Before his guardians were on their legs and could fire, he had got over a good piece of ground.

A Russian lancer made at him: he ran as if leading an Eton foot race, and cleared a good sized fence. The lancer cleared it after him, and with lance fixed pressed the fugitive hard.

A swollen brook, running fiercely, barred his way. It was seventeen feet wide, but the old Etonian had won the long jump when at school, having cleared nineteen feet over Calvary ditch. He now jumped the brook: the lancer refused to follow, and the young officer ran back into the English lines.

"Hurrah for Eton!" he shouted as a school-fellow shook his hand recalling the school where he had learned to shoot, to fence, the art of boxing, the wrestling dodge, the high jump, the long jump and the use of his legs.

A Hard Worker.

Sir Walter Scott's career illustrates the value of hard work, even of drudgery, in early life as a preparation for activity and productiveness when the powers are matured. Scott had an aversion to the mechanical act of writing. His apprenticeship at the law helped him to overcome the aversion, for he was obliged day after day to copy dry law papers.

The drudgery of copying declarations, pleas, replications, rejoinders and surrejoinders, rebutters and surreburters, made him facile in the use of the pen, and cultivated the dogged patience which no labor could irritate. He himself tells us that once during his apprenticeship he wrote one hundred and fifty folio pages without an interval for food or rest.

When he became an author, the habits formed during his apprenticeship enabled him to turn out an amount of work, year after year, which seems almost incredible. The author of "Walter Scott at Work," published in *Scribner's*, says:

"In the year 1814 alone he wrote nearly the whole of the 'Life of Swift,' the second and third volumes of 'Waverley,' 'The Lord of the Isles,' two essays for the supplement to the 'Encyclopædia Britannica,' the introduction and notes to the 'Memorie of the Somervilles,' annotations to a reprint of 'Rowland's Letting Off the Humors of Blood in the Head Vein,' 1611, and kept up an unstinted correspondence with his friends; and all this literary activity was interrupted by a two months' voyages to the Hebrides, and by constant attention to the financial perplexities of the Ballantyne press and publishing house."

Will, energy, patience, method, and an industry which never permitted him "to do nothing" enabled him to write "Guy Mannering" in six weeks, the second and third volumes of "Waverley" in twenty-four days, and the first volume of "Woodstock" in fifteen days.

He did not wait for "inspiration," nor did he idle away the time between "inspirations." Before breakfast one morning he finished "Anne of Gierstein;" after breakfast he began his compendium of Scottish history.

The greater part of "Ivanhoe" and of "The Bride of Lammermoor" was dictated during an illness, the pains of which set him "roaring like a bull-calf." Laidlaw, his amanuensis, begged him to stop dictating.

"Nay, Willie," replied the sick man, "only see that the doors are fast. I would fain keep all the cry as all the wool to ourselves; but as to giving over work, that can only be done when I am in woollen."

Effect of Tobacco Upon Boys.

An experimental observation of thirty-eight boys of all classes of society and of average health, who have been using tobacco for periods ranging from two months to two years, has recently been recorded by *Science*. Twenty-seven showed injury to the constitution and insufficient growth; thirty-two showed the existence of irregularities in the heart's action, disordered stomach, cough, and a craving for alcohol; thirteen had intermittency of the pulse, and one had consumption. After they had abandoned the use of tobacco, within six months' time one-half were free from all their former symptoms, and the remainder had recovered by the end of the year.—*Boston Herald*.

Modelling in Clay.

The outfit for modelling is very simple,—an earthen jar, a mass of clay, a case-knife or a piece of wire or cord. The clay should be kept moist in the jar by spreading a wet cloth over it. When it is needed for class-work, take out on a clean board a mass containing about as many cubic inches as there are children in the class.

Holding the cord well stretched from left to right, cut the mass from top to bottom, beginning about an inch from the further side. Repeat this cutting at intervals of about an inch. Then turning the cord from back to front, cut in a similar way from top to bottom. Without breaking the mass apart, turn it over on its further face. Holding the cord from left to right, cut again as before, thus dividing the mass into pieces about an inch in diameter. These can be quickly distributed, by placing a small piece of clay on the slate of each child, or upon oblongs of enamelled leather provided for the purpose for each child. The children are then ready for the lesson.

When the lesson is completed, the forms modelled should be gathered on a slate and taken to the teacher's desk. From the forms modelled select those which are worthy of preservation.

The remainder of the clay should be put together, moistened, and wedged (thrown on a hard surface until it becomes one mass again) that it may be ready for use at another lesson.

The two processes in modelling the type-forms are rolling for round and curved faces, and flattening for plane faces. The clay may be rolled between the palms of the hands for round faces, and upon a plane surface for curved faces. It may be flattened by gently striking it either upon a plane surface or with something having a plane surface.

In modelling any form however, whether it is a type form or an object, the fingers may be used whenever necessary. In modelling objects, it will be necessary to use the fingers to obtain the irregularities of form. The fingers should be used in preference to any tool; and in no case should a sharp tool be used. Remember that scratching and cutting cannot be called modelling.

Model each type-form. In your endeavor to express your idea of the type-form, you will find that idea growing more clear and definite and that while you are modelling the form in clay, you are also modelling your mental image of that type-form.

After modelling a type-form, look for an object based on that form. Do not take any object that may be near at hand, but try to find an object that is representative of its kind, well proportioned and beautiful. For instance, if you have been modelling a sphere and have decided to model an apple as an object based on a sphere, do not be satisfied with a defective, poorly developed, extremely one-sided apple. Find one that is fresh and firm and pleasant to look upon and that brings to your mind all the goodness and pleasure that my lie in an apple. Seek one beautiful in form, but do not make the mistake of looking for one that is perfectly symmetrical; such an one will probably appear more like a ball than an apple. Having selected your object, study it with care, and while modelling, examine it frequently, not only by looking at it, but also by passing the fingers over it. Do not attempt to model without an object. After modelling the ellipsoid and ovoid, and objects based on these type-forms, it will be well to take leaves that are elliptical or oval in outline. Never model from pressed leaves. Select as far as possible leaves with entire margins.

Place a freshly gathered leaf on the table. Notice that it does not lie flat on the table. Frequently one side will be much higher than the other, and there will be undulations of surface here and there.

Having prepared a tablet of clay of suitable size for the leaf, build up the leaf on this tablet. If the natural leaf is higher on one side than the other, build up the clay on the tablet to make your modelled leaf like the natural leaf. Study the variations of surface carefully and endeavor to produce them. Do not endeavor to reproduce all the veins (in many cases the midrib will be sufficient), and never scratch in the veins.

Directions for a class exercise follow, to show the method of carrying on the work of modelling in a school-room.

For modelling, we have the models, and the clay divided into small pieces, ready for distribution. Take a piece of clay, and, holding it carefully between the two palms, roll it gently and skilfully. Turn the fingers backward, that the palms may be as flat as possible, and roll lightly and rapidly. Let the children watch the motion, notice how the hands and fingers are held, how the clay is rolled until it becomes a beautiful sphere, round and smooth. Lay the ball where all can see it, and distribute the models and the clay. Then, taking another piece of clay and rolling it, tell the children they may try to make round, smooth, beautiful spheres of their clay. The little hands take the clay and roll it as well as they can; little fingers turn back in imitation of the teacher; the masses become rounder and smoother. At a given signal let the children place their spheres upon their slates. The spheres will not be all round, to be sure, but they will be better next time. Little hands are soft and supple and are easily trained.

Question the children as to what they have made, and have them compare their spheres and the model spheres by taking one in each hand and telling about them.—*Mrs. Mary D. Hicks in N. Y. School Bulletin.*

Reading vs. Elocution.

This story was told me by Mr. John J. Hayes, the accomplished teacher of reading at Harvard College One day a young girl came to him to take some lessons in reading. She had been told that she had talent and would make her mark as an "elocutionist" —how I dislike that word! Mr. Hayes asked her to read something, and she undertook to recite a poem. She gave no meaning to the lines, but she had a great many gestures: she raised her eyes and her shoulders, and did a great many things that were supposably dramatic, but which were particularly inappropriate to the descriptive poem she was reciting. After she had finished Mr. Hayes said:

"What do you suppose was the poet's thought when he wrote this:

> 'O, Freedom! thou art not as poets dream,
> A fair young girl, with light and delicate limbs,
> A bearded man, armed to the teeth, art thou.'"

A blank look came into the girl's face. "I don't think I know what you mean."

"Why, what do you think the poet meant by these lines?"

"I don't know: I never learned that," was the hesitating reply.

"Yet you tell me you have studied it," said Mr. Hayes.

"Why, yes, I have spent a great deal of time on it, and my teacher marked it for me."

"Let me see it," and Mr. Hayes held out his hand for the book which was put into it with an air of the greatest assurance, as though it was to settle every question of her "study,"

And what do you suppose the "notes" were? Simply these: "right hand extended," "weight forward on the left foot," "raise the eyes," "both hands in appeal," and so on. Not a suggestion about the expression, but all meaningless action—as so many are taught who seem to consider elocution "so far ahead of reading."

The great danger has been, in this late craze, that the world would lose its readers in the flood of elocutionists that are being poured out of the hands of teachers of that terribly overworked "art." In former times it was considered a great accomplishment to read well; that is to read understandingly, behaving in the meantime like a lady or gentleman, and not like a spasmodic marionette whose wires are out of order, and only work by jerks. It is the reading with the understanding that is taught to the little folks I have been telling of, and it is a kind of teaching that will give its results all through a pupil's life. —*Sallie Joy White, in June Wide Awake.*

EDUCATIONAL OPINION.

The memorizing of the technicalities of a course of study, says the *New York School Journal*, is not mastering the subjects presented. No teacher can be found who will say that this statement is false. Yet, when we examine much of the work that is done in our schools, we find that a good portion of time is taken up in the memorizing of technical subjects, in text book work, in the reaping of rules and phrases. Another difficulty in connection with our present system of instruction is a straining at what may be called accuracy. We should not underestimate truthfulness and accuracy of statement, but it is impossible for children to exhaust any subject, however small that subject may be. The unthinking examiner says to the teacher of primary pupils, "Do not leave this subject until your pupils know all about it; be absolutely thorough in what you teach. If it takes a year for them to master this principle, take a year. The time will be well spent." But this is wrong. It is not until the mind grows so that it can reason, comprehend, and generalise, that it arrives at any good degree of accuracy and thoroughness. It is by no means necessary that a child should know all about North America before he studies South America. He may know a little about the whole world, and superficially; but, by and by, the little he learns grows greater until after a few years his knowledge of the world becomes extensive and comprehensive: and when his powers of mind are so developed as to enable him to generalise, he then is able to be minute and accurate, as well as gain a comprehensive understanding of the whole subject. The principal thing to be aimed at in the education of young children is to keep them thinking about those things that will develop their brains. It needs to be said over and over again, that the number of facts learned is unimportant compared with the training pupils get that will lead them to take a deep interest in the subjects before them, and think with some degree of accuracy concerning what is given them to study. The all-important requisite, in any course of study, is interest in things profitable.

Grammar is *not* taught in our public schools. The child who escapes from school with a tolerable knowledge of the English language does so in spite of his training not because of it, or he owes his good fortune to the fact that his teacher has defied the prevailing system and burned the prescribed text-book.—*Truro Guardian.*

A LIVELY discussion at a recent meeting of the Woodstock (Ont.) School Board brought out the fact that the Board has been in the habit of making appointments to the teaching staffs of the schools without consulting the Principal. Principal Garvin was quite right in pointing out that this is wrong and unfair. It is surprising that any Board should think of making an appointment to any subordinate position save with the full knowledge and consent of the man who is responsible for the efficiency of the work done. All such appointments should be made, as far as practicable, upon the recommendation of the Principal, and it should be made clear, too, that with him rests virtually the power of dismissal. If the Principal is held responsible, as he should be, for the work and conduct of the school, it is but reasonable that he should have the authority necessary to enable him to carry the responsibility.—*Toronto Educational Journal.*

BOOK REVIEWS.

ABORIGINAL REMAINS OF NOVA SCOTIA, illustrated by the Provincial Museum Collection, Halifax, by Harry Piers. This with a paper on a "parasitic fungus on the larva of a May beetle" is a reprint from the transactions of the Nova Scotia Institute of Natural Science. The above paper is quite valuable and is illustrated by a plate of excellent drawing by the author.

ANCIENT HISTORY FOR COLLEGES AND HIGH SCHOOLS, by William F. Allen and P. V. N. Myers. Part I., The Eastern Nations and Greece, by P. V. N. Myers. Ginn & Co., Boston, U. S. This volume more nearly realizes our ideal of a text-book of history than any other one that we are acquainted with. The narrative is lively, lucid and condensed. The tables and chronological summaries are useful and convenient, the illustrations are well executed and instructive, while the maps, indispensable in such a work, are well drawn, accurate and distinct. The materials are abundant, but only such as are necessary to produce a clear and effective presentation of the incidents of the history. The social and political condition of Egypt, Babylonia, Assyria, Persia and Greece, their laws, philosophy, arts and religion are discussed with commendable brevity and judgment. Nothing, in our opinion, can be more injudicious than the overloading of text-books of history with ill selected facts. They may be useful for examination purposes, but they are dreary, dry and dull. But this book both attracts and stimulates There is a skill in the arrangement of the materials, a charm in the style and a picturesqueness in the delineation of character and the narrative of events that cannot fail to secure for it the approbation of teachers and students. And it deserves to be read, not simply as a class-book, but as a highly interesting account of the early civilizations, and one which, while scholarly, accurate, and abreast of the most recent discoveries in the East, is suggestive of much that is beyond its scope, and naturally leads up to the study of the great works of Grote and Rawlinson. To arouse and quicken the interest of his students in historical studies is one of the duties of the teacher, and we know of no book better suited to assist him in the accomplishment of this object than this history of the Eastern Nations and Greece.

"GRADATIM," an easy Latin translation book for beginners, by H R. Heatley and H. N Kingdon. Revised for American Schools by W. C. Collar. Ginn & Co., Boston, U S. For young pupils and for older ones who can spare the time, this book will be an easy and useful introduction to Latin translation. It will serve the important purpose, at this early stage of familiarising the beginner with the Latin idiom, make him master of a fair vocabulary and assist him to overcome the strangeness, both in form and sound, which in many instances proves a serious obstacle to the progress of the young translator. The anecdotes, interesting and sometimes amusing, are well selected and fitted to stimulate and encourage the learner. Since the exercises are carefully constructed and their Latinity pure and simple, they may, in the hands of a good teacher, be made available as a basis for retranslation. We do not doubt that this Reader will become popular with teachers and pupils, as soon as it is tried and its merits fairly tested.

ELEMENTARY MATHEMATICAL TABLES, by Alexander Macfarlane, D. Sc., LL. D., Professor of Physics in the University of Texas Boston, U. S A., and London: Ginn & Company, 1889. This is an octavo of 105 pages of superior typographical excellence, specially designed to lead the eye instantaneously to the proper spot. They are also specially adapted to arithmetical work and the illustration of the theorems of algebra. It contains thirty-one different tables: such, for instance, as: I. Common Logarithms; II, Anti-logarithms; III, Addition Logarithms; IV, Subtraction Logarithms; V, Log., Sines and Cosines; VI, Log., Tan. and Cot.; IX, Nat. Sines and Cosines; X, Nat. Tan. and Cot; XI Nat. Sec. and Cosec.; XII, Radius; XIII, Reciprocals. Also squares, cubes, square roots, cube roots, multiples, circ. of circle, area, sphere, hyperbolic logarithms, comp int. amts., present values, annuity tables, least divisions, exponentials, etc. A capital book for the teacher's desk.

THE STATE ELEMENTS OF HISTORICAL AND PRACTICAL POLITICS, by Woodrow Wilson. D. C Heath & Co, Boston, publishers This is a complete text-book of comparative political science in about 700 pp. It begins with an account of the probable origin of government in the patriarchal idea, noticing *en passant* the theories of a State founded by contract, by an original law giver, or by Divine direction only to pass them by as inadequately proven. It next describes at length the state machinery of the chief Aryan nations—Greece, Rome, the mediæval Teutonic governments, most of the modern nations of Europe, and our own republican neighbors, dealing in close detail with Britain and her colonies, the United States, France—both before and since the revolution—Germany and Switzerland, and tracing with great care the mutual relations of Germany

and Prussia, as also those of the dual monarchies of Austro-Hungary and Scandinavia. The palm in statesmanship is thus awarded to Rome among ancient and Britain among modern communities:

"In this history of development two nations stand forth preeminent for their political capacity, the Roman nation, which welded the whole ancient world together under one great organic system of government, and which has given to the modern world the groundwork of its systems of law, and the English nation, which gave birth to America, which has 'dotted over the whole surface of the globe with her possessions and military posts,' and from which all the great nations of our time have borrowed much of their political thought and more of their political practice. And what is most noteworthy is this, that these two nations closely resemble each other not only in the mental peculiarities which constitute the chief element of their political strength, but also in the institutional foundations which they have laid for their political achievements. Both have been much stronger in creating and working institutions than in explaining them; both of them have framed such a philosophy as they chose to entertain 'after the fact.' Neither has been too curious in examining the causes of its success, or in working out logical sequences of practice."

The book closes with a full analytical summary of the subject, and would prove an invaluable aid to the teacher or student of this important department of social science.

RECEIVED.

MANUAL OF EMPIRICAL PSYCHOLOGY; NATURAL HISTORY OBJECT LESSONS. D. C. Heath & Co., Boston.

SHAKESPEARE'S TWELFTH NIGHT. MacMillan & Co., London.

ELEMENTARY AND HIGHER LESSONS IN ENGLISH (a series of four books in the study of English). Ginn & Co., publishers, Boston.

THE RYERSON MEMORIAL VOLUME, by J. George Hodgins, M. A., LL. D., Toronto.

AMONG OUR EXCHANGES.

In the last number of *Garden and Forest* an account is given of the bequest of Mr. Henry Shaw, of St. Louis, of the whole of his estate, appraised at nearly $3,000,000, and producing a net income of $50,000, for the founding of a botanic garden. It is in the hands of a board of trustees with Prof. William Trelease, the well known botanist, as director. With such an income at his command Prof. Trelease will be able to lay the foundation of an establishment of such scope, that it will soon make St. Louis the botanical centre of the New World.

A writer in the November *Bookmart* in a paper on "The Greek Golden Treasury," says, "The more the Greek language is expelled from schools, the greater, apparently, is the general curiosity about Greek literature. Translations multiply, and it seems not beyond hope that everyone who deserves to know Greek will finally learn it for pleasure, while persons to whom it is merely pain and grief will be spared the terrors of *Tupto*, and of irregular verbs."

[illegible] for December is filled with instructive articles upon subjects which are attracting public attention everywhere.

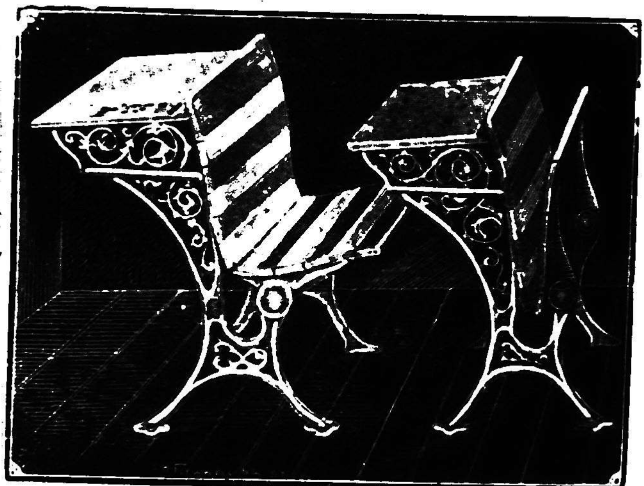
The most striking feature of the December *St. Nicholas*, which is also the Christmas number, is the opening article on "The Boyhood of Thackeray," by his daughter, Mrs. Ritchie, illustrated by fac-similes of letters and drawings for the first time given to the public. The frontispiece is a bust taken when he was eleven years old, and at the close of the sketch is a reproduction of the last photograph taken of the author who endeared himself to the public.

In the December *P[illegible] S[illegible] M[illegible]*, Dr. Charles C. Abbott, in a valuable article entitled "The Descendants of Palæolithic Man in America," shows that the Eskimo as well as the Indian had a probable Palæolithic descent. Among other important papers is a very interesting sketch of the founding of the Royal Society of England, by Dr. William C. [illegible], and Jesse O. Waller says some good things in her paper on "Mental and Physical Training of Children."

In the October *M[illegible]*, which now, by the way, is published at Trenton, New Jersey, Dr. Stokes gives a valuable article on microscopical aquaria for winter use. "Amateur" gives his Article No. II on microscope stands, and is very severe on the cheap high power machines called French Triplets.

[illegible], published at Minneapolis, U. S. A., at $3.50 per annum, has a good November number. Some of the leading articles are "Mathematical Theories of the Earth," "Geology in the High School," "The photographic survey of [illegible] State," "On a possible chemical origin of the iron ores of the Keewatin in Minnesota," "Review of recent Geological Literature."

The New York *Science* comes filled every week as good as if there had been no previous issue. A splendid weekly review of the condition of contemporary science.



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Prof. George P. Fisher, of Yale University, is to write a series on "The Nature and Method of Revelation," which will attract every Bible student. Bishop Potter, of New York, will be one of several prominent writers who are to contribute a series of "Present-day Papers" on living topics, and there will be art papers, timely articles, etc., etc., and the choicest pictures that the greatest artists and engravers can produce.

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The price will be the same as heretofore, $3.00 a year, 25 cents a number, and all dealers and the publishers (THE CENTURY CO., New York), take subscriptions. New subscribers should begin with November.

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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.)
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[116 pages, 22 cuts. See REVIEW for Nov., p. 92.]

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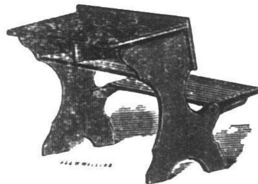

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