

THE EDUCATIONAL REVIEW.

FOR THE ATLANTIC PROVINCES OF CANADA.

VOL. II.

SAINT JOHN, N. B., SEPTEMBER, 1888.

No. 4.

J. & A. McMILLAN,

THE SCHOOLS OF GREATER BRITAIN. HANDY REFERENCE ATLAS OF THE WORLD

SKETCHES OF THE

WITH COMPLETE

Educational Systems of the Colonies
and India.

Index and Geographical Statistics.

BY JOHN RUSSELL, F.E.I.S., &c.

BY JOHN BARTHOLOMEW, F.R.G.S.

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have a copy of this Book.*

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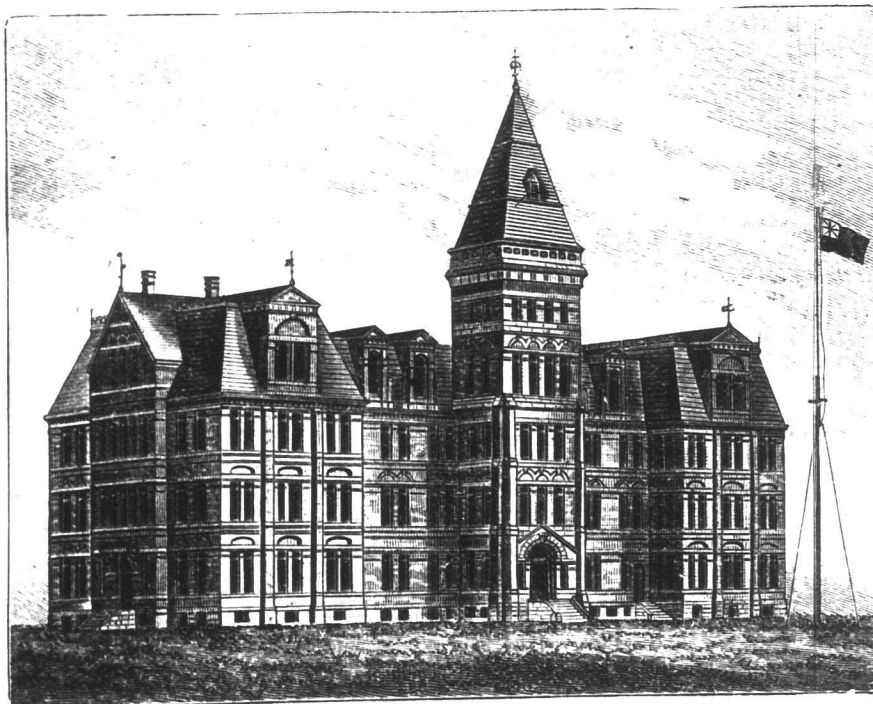
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early in September,
1888.

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Session begins
end of October,
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The Educational Review.

Devoted to Advanced Methods of Education and General Culture.

PUBLISHED MONTHLY.

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VOL. II. No. 4

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EDITORIAL NOTES.

At the late Interprovincial Convention, several speakers put on record their estimation of the REVIEW and what it is accomplishing for education in these provinces. Sir Wm. Dawson said: "Teachers' Institutes in the old time were non-existent. Now there are county, provincial, and lastly, an interprovincial association, which has brought together to-day this large assemblage of earnest and able teachers, as well as the EDUCATIONAL REVIEW, which is marked by a high order of excellence, both in tone and matter," and Mr. Justice King, of St. John, who has an abiding interest and faith in our public school system, said: "There had been a degree of organic union brought about between the teachers of the provinces during the last year by that excellent periodical—the EDUCATIONAL REVIEW—which it had been his pleasure for some time to peruse."

These and other indications point to the influence and popularity of the REVIEW, which it will be the aim of its promoters constantly to increase.

IN this issue of the REVIEW we commence a series of lessons on primary and advanced work in schools. This we hope to make valuable to teachers, and we shall feel obliged to any for suggestions and lessons on school-room topics.

THE Halifax *Herald* and *Chronicle* have had many valuable articles on the kindergarten system during the year. Mrs. Condon's enthusiasm has not, however, been confined to the public press alone. A small grant from the provincial government, to the Truro kindergarten, and its affiliation to the normal school, would confer a boon upon the whole province, as well as upon Truro, and would give the institution an assured stability. The engrafting of kindergarten methods upon our primary education in this manner would be a great public gain from a very small expenditure of public means.

THE address of Dr. J. G. Fitch, in another column, on "Hand-work and Head-work in Schools" will be read with interest. It created a favorable impression at the recent convention. It is conservative in tone; and while Dr. Fitch would proceed cautiously in making any changes in our educational systems, in regard to manual training, he evidently recognizes the necessity for more training in our schools of the hand and eye. Clearly that can be done without turning our schools into workshops. There is a happy mean, and the wide-awake teacher who is adopting kindergarten principles, who is training the pupil carefully in industrial drawing, in penmanship, in teaching him to handle objects and accurately describe them, is taking the first steps toward this training.

IN the September *Century* is an article from the pen of Geo. R. Parkin, M. A., of Fredericton, on Uppingham school, England, and its lamented headmaster, Edward Thring. The article was written before the death of Mr. Thring, but its publication has been delayed till the present, when it appears as the leading article of a series of admirable papers on educational subjects. The frontispiece contains a portrait of Mr. Thring, and the article is illustrated by a series of sketches of internal and external

features of this great school. Mr. Parkin has approached and performed his part of the work with the instinct of the true teacher and friend. He lets Mr. Thring's work speak for itself. In simple language he has described the noble purposes and lofty ideal of this great teacher and the results accomplished.

MR. KINGO MIYABE, a Japanese botanist who is pursuing a special course in cryptogamic botany at Harvard is making a collection of fungi on Grand Manan. He will communicate the result of his studies and observations in a paper to the N. B. Natural History Society the coming winter. This will be the first attempt to arrange systematically the fungi of any portion of the province, and the paper and accompanying list will be looked for with interest.

THE resignation of Mrs. Carr, Principal of the Victoria School and of the Girls' High School, St. John, has caused deep regret in educational circles, not only in St. John but elsewhere throughout the province. Her influence as a teacher made a permanent impression on the mind and character of those under her charge, and whatever station Mrs. Carr may fill in the future she will be followed by the heartiest good wishes for her happiness.

THE N. B. Normal School opened on the first week in September. The English literature subjects for the June examination, 1889, as given by the Chief Superintendent of Education, are: Class I., Royal Reader VI. and Shakespear's "Hamlet." Class II., Royal Readers V. and IV. Class III., Royal Reader IV.

A LETTER from Japan, from a lady teacher in the Normal School at Shidznoka formerly from Halifax, tells us with what appreciation her copies of the REVIEW were read by the teachers of the Normal School. To show how the Japanese teachers can write English, and also appreciate a good educational periodical, we append the note received by Miss C.:

MISS C. —
NORMAL SCHOOL, June 20th, 1888.
I am much obliged to you for your having lent me your EDUCATIONAL REVIEW, which gave me and some others so much benefit. Now, I return them back to you with many thanks. One more number of the REVIEW a teacher in my school wishes to have a little longer, so I will return it to you a little after. And I remain,
Yours very sincerely,
Shidznoka, Japan. I. SUGANUMA.

THE importance attached to the kindergarten system by the National Educational Association of the United States is shown by the very influential character of its kindergarten department. The desire to assist the development of the system in Canada was very gracefully and effectively indicated by the

following telegram, conveying a resolution of congratulation to the "Fröbel Institute," of Nova Scotia. No separate section of our interprovincial convention has elicited so much attention from our co-workers in convention on the other side of the line.

COPY OF TELEGRAM.

SAN FRANCISCO *via* TRURO, August 14.*To Mrs. Hinkle Condon:*

Kindergarten Department of National Educational Association passed resolution of congratulation to "Fröbel Institute of Nova Scotia." Please present the same.

SARAH COOPER,
President Golden Gate Kindergarten Association.

The Truro "Kindergarten Committee," virtually part of the "Fröbel Institute," are requested to receive this resolution as addressed also specially to them, as *their work* is the special object of sympathy.

THE notice of the opening of the N. S. Normal School in November appears in another column. In addition to the staff of skilled instructors in this institution, the student teachers are to receive the advantages of kindergarten instruction. We congratulate Principal Calkin on this step, which cannot fail to give a wonderful impetus to primary education throughout the province.

THE annual gathering of the Bands of Mercy in connection with the S. P. C. A. took place on Saturday afternoon, September 8th, in the Mechanics' Institute, St. John. No more pleasing and encouraging sight could be witnessed than the throng of bright faced happy children gathered together for the purpose of renewing their pledge and to listen to addresses and exercises, the object of which was to stimulate their interest in the humane treatment of animals. Mr. John Sears, President of the S. P. C. A., gave an address, in which he explained the objects of the Bands of Mercy and their progress in England and on this continent. Miss Murray, President of the Ladies' Auxiliary, and patroness of the bands, addressed the members, urging them to greater activity in the work. The prize for the best essay on "Personal Observations on the Habits of Animals" was given to Ernest Smith of the Centenary Band. The pledge, recited by all the Bands standing, was— "We agree to be kind to animals, to do all in our power to protect them from cruelty, and to promote their humane treatment." The effect of such gatherings as these, and the instilling into young minds kindness towards the lower animals, cannot fail to be attended with the happiest results. And the efforts of the ladies and gentlemen who are devoting themselves to the furtherance of this movement are worthy of imitation.

SCIENCE FALSELY SO CALLED.

Now that we have an outline of oral lesson work on nature in our common school curriculum, many people think we should begin soon to feel the beneficial effects of such a system. But we fear such are doomed to disappointment. The mechanical teacher who possibly has the best disciplined school in the district, who is a perfect drill in arithmetic, spelling, geography and the like, may be a complete failure as a science teacher. Much more likely is the one with little system, and no power of drill. Most astonishing misconceptions of the purpose and nature of this portion of the course have appeared in quarters whence better should be expected. The teacher in the graded school wants to know just exactly what the pupils are to be examined upon. The principal prescribes so much of some book. The pupils can now be prepared for examination. Every question is in the book. To the mind of the teacher and the principal there is nothing absurd in this—it is only fair. Or, if it looks like cram, why it is the council of public instruction which is to blame. They object to all this science-teaching any way. Science teaching! why it is simply dogma cramming. A theology without a God and without a nature—mythological anti-science. *Book Question:* "What is the difference between a cricket and a horse?" *Answer:* The cricket has no backbone, the horse has." It is a matter of faith not of sight. The little boy thought the cricket's backbone was stiffer than the horse's, from his experiments with them. But the teacher tells him the correct answer for the examination is directly the opposite of his observations. The boy submits, and tries to learn science by remembering the unseen and unknown difference. *Question:* "What is the calyx made up of?" *Answer:* "Sepals." But when you give the little fellow a buttercup and ask him to pull off all the sepals and count the number of them, he looks all over the plant, wondering where the sepals really might be. *Question:* "What is thunder?" *Answer:* "The noise attending the passage of electricity between the earth and a cloud." The answer is rolled out simultaneously in chorus at the public examination with a vim suggesting a current of cloud electricity. But all their knowledge was discharged in that one bolt. There was no science, no correlation of facts, simply words. Many a time and oft did miniature thunderstorms and lightnings play in their golden hair as the vulcanite comb was drawn through it, or the cat's fur was made to crackle and sparkle in the dark. But what in the thunder had such child's play to do with the grading examination? Any teacher found drilling scholars to memorize any such answers

as science teaching should be dismissed. It is totally subversive of the very object for which such work was prescribed. How, then, should principals examine pupils in common school grading. We would suggest questioning somewhat as follows: "What minerals have you examined in school?" The amount of ground covered will be indicated by the answer. Then select one on the pupil's list, and question him as to the properties which his examination should have revealed. A half a dozen good oral object lessons, each on minerals, plants, animals, physical properties, chemical properties, natural phenomena, etc., per term, might be all the time devoted to this teaching. By all means let them be object lessons, and let the teacher select the objects from those most common or of most importance in the particular locality. The only limitation we would recommend is so many lessons on each sub-division to prevent the total neglect of any portion. But let the particular objects be left to the taste and circumstances of the teacher. Do not lecture them on the insects of South America, or cause them to memorize facts about those of France. Teach the pupils to observe and know our own. Teach them to *observe*. And the grading or promotion examination on nature lessons, according to our idea, should not be a test or measure of the amount of facts memorized, but of the amount *systematically observed*. Under such a system "Nature Lessons" will not be an anti-scientific cram, but a relief from mnemonical work and therefore a rest to the pupil. It will not over-crowd the teacher, because it does not fix an absolute amount of work to be done, but only a certain amount of attention which will allow of the free exercise of the teacher's own originality. The teacher should be a student of nature, whose heart is in the work. Those who wish simply to earn a little money for a few years, will want to know only just how much of a certain book the pupils "must be made to learn." The object of nature lessons is to stimulate the young citizen to be an accurate observer, to read correctly his environment, to discover as much as possible of the truth of nature, to know its laws, so as to obviate the penalty of transgressing them, and to gain the advantage of making them his servant.

Mr. W. F. Ganong, M. A., of Harvard University, Cambridge, Mass., is collecting information and will publish shortly an article on the origin of geographical names in New Brunswick. He would be glad to receive any information from those who are specially interested, and who may have in their possession any facts bearing on the subject.

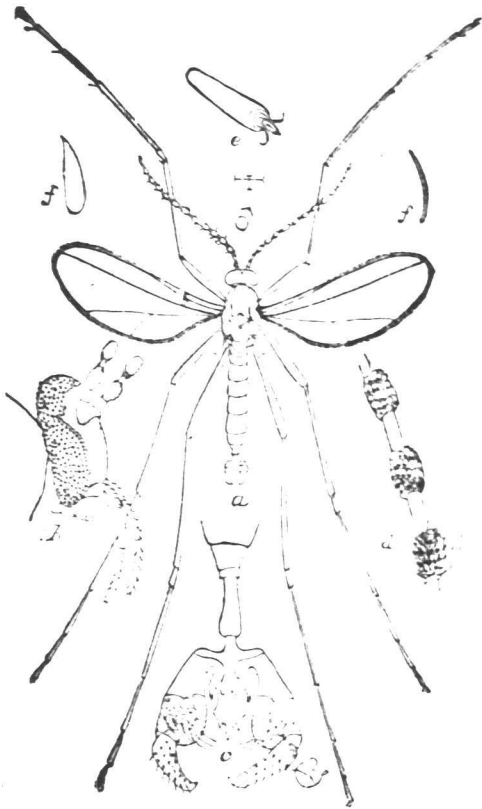
FERNDALE SCHOOL.

NO. XV.—THE CLOVER SEED MIDGE (*Cecidomyia leguminicola*, Lintner.)

TEACHER. What insect did we consider in our last lesson.

SCHOLARS. The Wheat Midge and the Hessian Fly.

T. To complete our lessons on the midges I take another one of them to-day—the third and last which we shall notice. This one does to the clover seed just what the Wheat Midge does to the wheat seed. The fly is so small that it could stand inside of a capital letter, such as an O, in this article. Here we have the male and female magnified very greatly so that all their parts can be distinctly seen.



THE MALE, magnified.

The sign σ signifies the male insect and the crossed lines above its real size. It is very much of the size and appearance of the Wheat Midge. *a* shows the peculiar clasping organ at the end of the abdomen, *c* is the same still further magnified, *b* is the head still further magnified, showing the large compound eye, the base of the fifteen-jointed antennae, and the small four-jointed palpi or feelers. *d* a portion of the antennae highly magnified, *e* the claws at the end of the legs, *f* the dusky hairs on its wings and body highly magnified.

The sign ν signifies the female insect, and the lines near it its actual size. The abdomen at *a* terminates in a long tube shown highly magnified at *c*, which is



THE FEMALE, magnified.

called the ovipositor, because it is the organ which places the egg in the minute flower of the clover. *b* is the head highly magnified, showing the lower joints of the sixteen or seventeen jointed antennae and the small four jointed palpi. *d* shows a portion of the antennae highly magnified.

S. When the fly is so small, I suppose one could hardly see the egg with the naked eye?

T. True, one hundred of them would make a line about an inch long.

S. When are they laid?

T. As it lives on the young clover seed when do you think?

S. When the clover blossoms.

T. Exactly. In May when the clover blossoms. In ten days they hatch into orange-colored footless maggots which feed upon the growing clover seed, and are about the twelfth part of an inch when full grown. Here we have it magnified at *a*, the small line by its side showing its real size. At *b* its head is shown still further magnified.

When it has eaten as much of the soft juicy growing seed as it wants it falls to the ground towards the



THE ORANGE-COLORED LARVA, magnified.

first of July, seeks cover, spins a minute silken cocoon, changes into the pupa, and after ten days in the chrysalis the perfect fly emerges ready to deposit its eggs in the second flowering crop of clover towards the latter part of July. The second brood may partly emerge in the fall and partly next May.

S. Does it do much harm?

T. Let us see. Professor Lintner, entomologist of the State of New York, discovered its existence in 1877. Ontario about that time was raising annually about \$600,000 worth of clover seed and was exporting it. In 1881 it was noticed in Ontario doing some mischief. By 1885, Ontario stopped exporting and had to import clover seed.

S. And have they found a remedy?

T. Yes, as soon as they understood its habits. They pasture the clover fields until about the middle of June. What happens then?

S. All the clover blossoms and the midges' eggs are eaten up.

T. They then allow the clover to grow and get a good fall crop for seed.

S. Should not such information be given to all our farmers?

T. You are right, Mr. Fletcher, our Dominion entomologist, had cuts and a description of the fly sent to every part of Canada as soon as it was found to be doing mischief in Ontario. Some people don't pay very much attention to these things; but the young farmers who leave this school, I hope, will keep their eyes open.

S. But would we not need a very expensive microscope to magnify a small fly, like a sand fly, to see whether it might be a wheat or clover seed midge?

T. Oh no, ordinary lenses costing from fifty cents to very superior ones costing not much more than two dollars, will be quite sufficient for most purposes. Just such a lense every one should carry about in his pocket for botanical or any other purpose. A good lense would be found interesting and useful to every person, in an office or on a farm.

N. B. TEACHERS' INSTITUTES.

Carleton County Teachers' Institute will meet at Woodstock, on Thursday and Friday, September 27th and 28th. Exhibitions of manual work in schools will be given.

St. John County Teachers' Institute will meet in St. John, on the 27th and 28th inst.

The tenth annual session of the Charlotte County Teachers' Institute will be held at St. Stephen on Thursday and Friday, September 27th and 28th.

The Westmorland County Teachers' Institute will meet at Dorchester on the 27th and 28th inst. Prizes will be awarded for the best specimens of work from schools throughout the county.

THE SCHOOL ROOM.

Lessons on Color.
(For the Teacher.)

No season gives so good an opportunity for the study of color as the autumn. The nearly universal prevalence of the greens and blues of early summer are succeeded by the reds and yellows and browns of mature vegetation. In some people the color-sense is more or less absent. But with a greater number there is a confusion in naming colors which can be recognized, simply on account of a lack of proper training. In several occupations, as for instance in railroading, the accurate distinction of color signals is absolutely necessary, so that applicants are tested for accuracy of the color-sense before they are employed. But the training in the accurate naming of the tertiary colors and the various shades, hues and tints is so defective, that in the study of the *algæ, fungi*, or any department of science in which the color is an important characteristic, we are apt to get wrong ideas of color from the descriptions. For instance, in Nova Scotia, N. A. Calkins' Primary Object Lessons are recommended to our teachers; and in the other provinces as well as in the United States we find his classification in his book and on the charts to be at variance with high English authority and our general usage. And when we find doctors differing, it is no wonder that the uneducated color sense of the ordinary man or woman should be found more widely diverging.

The teacher is assumed to know that white light is a combination of all the colors seen in a well developed rainbow; that it is caused by almost infinitely minute vibrations of what is called the luminiferous ether. There is very plain evidence to show that when a ray of white light falls on a prism properly situated and is bent by passing through the prism, that the more rapidly vibrating rays are bent most. The white light ray is decomposed as follows:

Heat.	RED.	Orange.	YELLOW.	Green.	BLUE.	Violet.
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There is satisfactory evidence to show that the violet rays produce the sensation of violet in the retina of the eye because they vibrate about twice as fast as the red. We have here what is called the colors of spectrum, the true scale of pure colors. For instance, the darkest red or radiant heat rays may vibrate about 400 trillions of times per second, while the extreme violet vibrates nearly 800 trillions

of times per second. There are then many thousands of pure distinct colors in white light, beginning with the dark reds, which become brighter as they vibrate more rapidly and change into the color of the oranges, then of the yellows, then of the greens, and so on. Spectroscopists can name pure colors more accurately than the artist. They can speak of the yellow of a rate of vibration say of 530 trillions per second, or 531, or 532, or 548, or 549, etc., etc.

But in the mixing of colors we find that a red and a yellow produces orange; a yellow and a blue, green; and a red and a blue, purple or violet. But by no mixture of colors can we produce a red or a yellow or a blue. We therefore call these *primary* and the other, *secondary* colors. The combination of secondary colors produce what have been called *tertiary* colors. We give the scheme below. The teacher should have colored crayons, colored thread which can be wound around cards; and the more painstaking may use paints or water colors. The best primary color representatives are for red, *carmine*; for yellow, *chromo yellow*; for blue, *ultramarine*.

Lessons for Advanced Classes.

1. SECONDARY COLORS.

Prove by mixing colors with crayons on the blackboard, or with paints or water colors on paper, that these

Primary colors make these Secondary colors.

Red,	} Orange.
Yellow,		
Yellow,	} Green.
Blue,		
Red,	} Purple or Violet.
Blue,		

2. TERTIARY COLORS.

<i>Secondary.</i>		<i>Tertiary.</i>
Orange,	} Olive (or Citrine, <i>Calkin.</i>)
Green,		
Green,	} Slate (or Olive, <i>Calkin.</i>)
Purple,		
Orange,	} Brown (or Russet, <i>Calkin.</i>)
Purple,		

3. COMPLEMENTARY COLORS.

Red, yellow and blue, are the primary colors making white light. A complementary color is one which will make white with the given color. (In the mixing of paints a gray instead of a white is produced for reasons not necessary to explain at present.)

- ∴ Complement of Red = Yellow + Blue = Green.
- “ “ “ Yellow = Red + Blue = Purple.
- “ “ “ Blue = Red + Yellow = Orange.

- And ∴ complement of Green = Red.
- “ “ “ Purple = Yellow.
- “ “ “ Orange = Blue.

The complement of a color is the color which with it theoretically completes a white, which is the sum of all colors.

4. EFFECT OF COMPLEMENTARY COLORS.

Red surrounding *white* fatigues the red-perceiving element of the eye, which is equivalent to taking some *red* out of the *white*, and makes the *white* therefore look *greenish*.

Yellow surrounding white, in like manner, would deaden the eye to a portion of the yellow in the white, and would therefore give it a *purple* tinge.

Blue near white, in like manner, would bring out the *orange*.

Green would bring out the *red*, *purple* would bring out the *yellow*, and *orange* would bring out the *blue*.

PROOFS.—Put cards of each of these colors on a white sheet of paper one at a time; look at the centre of the card steadily without moving the eye for one minute; slip the card suddenly off the paper, keeping the eye still directed to the same spot, and the shape of the card with its complementary color will be seen for a short time on the white paper. (Inferences in next lesson).

Lessons for Primary Classes.

1. (a) Show them the primary color *red*; (b) Let them select the *reds* from a chart, colored crayon drawings, or from cards with colored worsted wound on them; (c) Let them select the *reds* in any things which can be seen about the schoolroom or from it; (d) Let them mention all the red things they can think of, such as an apple, a brick, the tongue, blood, clouds at sunset, etc.

2. Follow the same order (a), (b), (c) and (d) with *yellow*.

3. Follow the same order (a), (b), (c), (d) with *blue*.

4. Review by (a) asking them to name the reds, yellows and blues on charts, worsted cards, or colored crayon drawings on the blackboard; (b) To name the three colors visible in objects around them; (c) To name red, yellow, and blue objects natural or artificial from memory.

The English system of spelling (I protest against its being called orthography) is a labyrinth, a chaos, an absurdity, a disgrace to our age and nation.—*Sir C. E. Trevelyan, K. C. B.*

It cannot be denied that the English language is shockingly spelled.—*James Hadley, LL.D., late Professor of Greek in Yale College.*

Hand-Work and Head-Work in Schools.

[Paper read by Dr. J. G. Fitch before the Interprovincial Convention, July 18th, 1888.]

There has been a strong wave of public opinion of late in favor of what is sometimes called Technical Education, or Manual Training. These phrases are used in various senses, often with some vagueness, and by persons who have very different objects in view. But they have become popular, and it may be well to examine into the two or three very various meanings which are attached to them.

There is, first of all, the desire to obtain such instruction in various forms of handicraft as may prepare the artisan for his special employment, and may make all the difference between a skilled and an unskilled workman. Those who urge this view are anxious to secure the industrial success of the nation to which they belong, and to obtain a good supply of the trade and manufactures of the world.

Then there are those who, without seeking to prepare the young scholar for the particular form of handicraft by which he is to get his living, wish to provide for him the means of obtaining such general manual and scientific instruction as shall make him readier for any form of skilled industry which in future life he may happen to choose.

A third class of advocates of manual training urge that in all our systems of general education, the memory, the judgment, and the purely intellectual faculties have been too exclusively cultivated, and that the discipline of hand and eye, and of the bodily powers generally, has been too much neglected. The Spartan training of the bow and the palaestra proceeded on the assumption that in fitting a man for the business of life we have to consider, not only what he knows, but what he can do. Is he deft with his fingers? Can he run and swim, handle tools, use all his physical powers with promptitude and energy? If not, the Greeks would have said he is not a well trained or complete man. His education is deficient.

There is a fourth class of persons who rank as advocates of industrial education because they dislike intellectual training for the poor and the humbler classes altogether. They say in effect: We must have a *proletariat*. It is fitting that there should be hewers of wood and drawers of water. Let us train the lowest class of our people on the supposition that they are to fulfil this function. For them strength of limb, hardihood and handiness are needed. Books, and the sort of aspiration which is encouraged by books, would only tempt them into employments wherein possibly they might compete with persons of a higher social level, and become inconvenient rivals. The education of the artisan should not be too ambitious. It should be designed to fit him for the humble work to which the circumstances of his birth have called him, and to keep him in this lower rank. This sort of reasoning is hardly avowed, but it closely underlies some of the arguments we occasionally hear used in England on this subject. Under the disguise of a solicitude in favor of more practical training for the ploughman and the laborer, there lies in many minds a deep distrust of the value of mental training altogether, a desire to use the common schools as a means of maintaining the social order, of repressing inconvenient social or intellectual ambition, and a wish to restrict the instruction of the artisan classes to the special work of their trade: not necessarily because they will thereby do that work better, but because they may be practically disqualified from attempting any other.

For the present we need not dwell either on the motives or the plans of this last class, except, perhaps, for the purpose with which I hope this audience will sympathize, of repudiating them utterly. But in some countries the holders of such views form a larger class than is generally believed. The other three views of technical or industrial training already described in outline, can all be defended effectively, though on very different grounds. And we may be helped to distinguish between them, and to avoid confusion, if we consider in what way each of the three other purposes I have described has been attained, or may be attained in practice. An illustration or two will suffice:

Last year I visited Belgium, a small country, with a total population hardly larger than that of the city of London. In that prosperous and industrious community great attention has been given to the whole problem of industrial training, both from the manufacturing and from the educational point of view.

At Courtray there is the *Ecole des Arts et des Metiers*. Its professed object is to encourage the introduction of new industries, to form good workmen and good foremen, to inspire them with the love of work and with habits of order, to impress them with the sense of social and religious obligation, to increase the means of subsistence and to arrest the progress of pauperism.

The institution with this large and comprehensive programme has a large building devoted partly to the purposes of general instruction and partly to the ateliers or workshops. The minimum age of admission is twelve, but the ordinary age is fourteen. The course lasts three years. No one is admitted who has not received a fair elementary education.

The course of general instruction comprises, in the first year, Drawing, Arithmetic, French Language, Practical Geometry; in the second year, Drawing, French, Experimental Physics, Mechanics, Geometry, Inorganic Chemistry; and in the third year, Drawing, Applied Mechanics in its application to trades, Knowledge of Materials, Organic Chemistry, Industrial Economy, the calculus.

Five ateliers are attached to the Institute: (1) Mechanical construction. (2) A foundry. (3) Furniture. (4) Electricity and its applications. (5) Hosiery. (6) Weaving. Each of these is under the care of a skilled director, chosen partly for his practical knowledge of the business, and partly for his scientific acquaintance with the principles on which the particular industry depends. The workshops are real places of business, and are not educational only. They produce machines, electrical and other apparatus, furniture, and articles of many kinds, which are sold in the market at a profit. A substantial part of every day is spent by each student in the workshops, the work being regularly graduated in difficulty and carried on under supervision. But it is notable that from two to three hours per day are devoted to ancillary studies, not directly mechanical, but calculated to secure *pari passu* the development of the students' intelligence. Hence, exercises in language are continued during the whole course. Drawing, design, and geometry are part of the routine prescribed for every student, while courses on electricity, chemistry, strength of materials, mechanics, etc., are given to each group of students to correspond to the particular character of the department of industry to which they are severally attached. In the last year there is a special course of lectures on Economic Science and the laws which regulate industrial life and progress—*e.g.* Production, Division of

Labor, Capital, Money, Banking, Partition of Profits, Partnership, Wages, Trade Unions, Strikes, Savings, Investment, Credit, Direct and Indirect Taxation. Visits to neighboring factories and industrial centres are regularly organized, especially in the third year of training, and after each such visit a full account, with illustrative drawings and descriptions, is required of each pupil. An elaborate scientific and general library, with abundance of drawings and plans of famous machines and factories, is accessible to the students.

Now, the object of such an institute is technical instruction in its definite relation to the particular form of skilled industry which the student proposes to adopt as the business of his life. It has an essentially economic and industrial purpose. That purpose is to provide fully for the future masters, foremen, and captains of industry a sound professional training. But it is to be observed, that from the first, mental cultivation by means of language and abstract science, and the investigation of principles, is regarded as indispensable parts of this training. There is, on the part of the enlightened founders of this institution, no belief in any antagonism or inconsistency between head work and hand-work. The two are regarded as inseparably connected.

Another form of institute is the *École Industrielle*, annexed to the *Musee Royal de l'Industrie*, at Brussels. It is carried on mainly in the winter, from October to May; it receives pupils after the age of fourteen, and it also takes many students who during the day are employed in shops, warehouses and factories, and who seek to increase their knowledge. Here are large class-rooms, lecture-rooms, apartments for study, libraries, and the general object is, not to prepare the learner for any specific form of industry, but rather to place within his reach the particular kind of scientific or artistic training which is most likely to be useful to him in the calling he intends to follow. Here drawing, designing, geometry, form the staple of the instruction, but physics, chemistry, electricity and other branches of applied science are dealt with by special professors, and a course of lectures on economy and commercial law, and industrial legislation generally, is open to all the students.

But here the ideal technical education is not exclusively practical. The great aim is to make of the intending workman, first of all, a student and a capable draftsman, able to observe the special phenomena of his own industrial pursuit, and to describe it, and, above all, to familiarize him with so much of the philosophy of the subject as may explain the nature of the material he is to handle, and the natural forces he is to employ.

I spoke of a third view of the subject of technical instruction—that which regards the training of the hand *per se* as an essential part of human culture, apart altogether from its value as a help in doing the business of life. The advocates of this view cite Rousseau, and Froebel, and Pestalozzi, and urge with truth that the brain is not the only organ which should be developed in a school; that to do justice to the whole sum of human powers and activities there should be due exercise for the senses, and definite practice in the use of the fingers and the bodily powers. They do not want to specialize the work of the primary school with a view to the production of economic results. One of the ablest of the United States superintendents of public schools puts this view clearly: "The object of the public school is education in its broadest sense. If industrial training cannot be shewn to be education in this sense, it has no place in the public school.

We have no more right to teach carpentry and book binding than we have to teach law and medicine. The supreme end of education is the harmonious development of all the powers of a human being. Whatever ministers to this end is education, whatever interferes with its accomplishment, no matter how valuable it is, lies outside of the elementary school."

A true psychology, when it comes to be applied to the practical business of teaching, shows us that the acquisition of knowledge is not the only means by which the human soul can be enriched and the future man is to be provided with his outfit for the business of life. His training should of course enable him to know much that he would not otherwise learn. But it should also enable him to see much that he would not otherwise see, and to do what he could not otherwise do. It is not merely by receiving ideas, but by giving them expression, that we become the better for what we learn. A thought received, and not expressed or given out again in some form, can hardly be said to have been appropriated at all. But there are many ways in which a thought can find utterance. It may express itself in words, or it may express itself by delineation, design, by invention, by moulding, or by some product of the skilled hand or the physical powers and the finer sense. An education which proceeds on the assumption that the only way in which thought and power can express themselves is by the medium of language, is essentially incomplete. Every school numbers among its scholars some who dislike books, who rebel against mere verbal exercises, but who delight in coming into contact with things, with objects to be handled, with the realities of life. And a school system ought to be so fashioned as to give full recognition to this fact. We cannot permit ourselves, of course, to be wholly dominated by the special preferences and tastes of individual scholars, but we ought to allow them fuller scope than has usually been accorded to them in educational programmes. A late eminent school master—Mr. Thring—was fond of saying, "Every boy is good for something." He did not believe in the existence of a good for nothing child. He thought that in the most pervers and uninteresting scholar there were the germs of goodness, aptitudes for some form of useful activity, some possibilities, even of excellence, "would men observingly distil them out," and that it was the duty of every wise teacher to find these out, encourage their development, and set them to work. We make a grave mistake if we suppose that all good boys should be good in one way, and that all scholars should be interested in the same things and reach an equal degree of proficiency in all the subjects of one curriculum. This is, in fact, not possible. Nor even if it were possible, would it be desirable. So one of the strongest arguments in favor of the recognition of manual and artistic exercises in our schools, is that by them we call into play powers and faculties not evoked by literary studies, and in this way are able to give a better chance to the varied aptitudes of different scholars. Boys and girls do not always like the same things. The world would be a very uninteresting world if they did. A school course, therefore, should be wide enough and diversified enough to give to the largest possible number of scholars a chance of finding something which is attractive to them, and which they will find pleasure in doing.

We have in England some experience which is well calculated to emphasize this larger view of the true scope of popular education. Connected with all our public elementary schools, in which nearly 5,000,000 of children are now in daily attendance, there are infant schools or classes, designed mainly

for scholars below and up to the age of 7. Up to 1880 the main subjects of instruction in these infant departments were the rudiments of reading, writing and arithmetic, with a few occasional lessons on objects, and on form, and color, and the chief test of the efficiency of such schools applied by the inspector was an examination in the elements of reading, writing and arithmetic. But when the code of instruction was recast seven years ago, the requirements of the infant school were so enlarged as to include not only reading, writing and arithmetic and lessons on objects and on the phenomena of nature and of common life, but also varied and interesting manual exercises and employments. And since that date no infant school has been able to claim the highest grant unless it satisfied the inspector in this last particular. In other words, the kindergarten system and the little gifts and manual occupations devised by Fröbel have become a recognized part of the system of early training in the English schools. So you have marching and drill, plaiting and moulding the building up of wooden bricks in different forms, drawing, cutting little patterns, weaving, and many other employments designed to give delicacy to the touch, keenness to the observant powers, a sense of beauty in form and colors, and the power to use the fingers with dexterity and care. Teachers have been specially warned in the instructions to Her Majesty's Inspectors that it is of no use to adopt the gifts and mere mechanical exercises of the kindergarten unless they are so used as to furnish real training in observation, in accuracy of hand and eye, and in attention and obedience.

Two results have followed the trial of this experiment. It has been found that the infant schools have become much more attractive to the little ones and to their parents, that order is more easily obtained, and that the infant schools are happier and more cheerful places than they once were. And the other result is not less important. It is found that children who have been thus trained pass the simple examinations in reading, writing and arithmetic, appropriate to the eighth year, not less satisfactorily and much more easily than before. The withdrawal of some of the hours of the day for varied manual occupations, so far from diminishing the chance of progress in the ordinary departments of school instruction, has actually had the effect of accelerating that progress, by means of the general quickening of intelligence and increase of power developed by the kindergarten.

And so the question naturally arises: Why should exercises of this kind cease when a child leaves the infant school at seven years of age? Why should they not be continued further? Relatively to his needs and his general development, is not manual and physical training as important through the later as through the earlier stages of his education?

It cannot be said that the theory underlying these questions has been answered satisfactorily to a very large extent in Europe; or that the best educational authorities are giving much effect to it. In Sweden, under the name *Slöjd* there is much exercise in wood carving and in the use of tools. At Gothenburg and at Naas manual instruction is begun at the age of ten or eleven, and the scholars are drafted into the workshops for two or three hours of every week. There is a carpenter's shop, a forge, a room for the cutting and manipulating of paper patterns and ornaments, a painting and decoration school, and a factory for the making of baskets and other fabrics for osiers and toys. The object of the first year's course is mainly to give to the pupil not merely general aptitude but a respect for manual labors, and to enable him to discover his

own special taste. In this way he is helped in his second year to discover his own *metier* and to devote himself to it. In the words of one of the ablest writers and observers of the system, M. Sluys, of Brussels: "The object aimed at is purely pedagogic. Manual labor is considered as an educative instrument, holding a rank equal to that of other branches of the programme."

There is a remarkable school in Brussels called the Model School, which provides for pupils from the age of six to sixteen, and gives a very efficient and liberal education, including language, mathematics and physical science, according to the most approved modern types. In this school the experiment has been tried of carrying forward the theories of Fröbel all through the classes from the lowest to the highest. Up to six the ordinary employments of the kindergarten are systematically pursued. From six to eight, similar exercises of a more artistic character, chiefly modeling, are used. From eight to ten the chief employment are those included under the general heading—'cartonnage'—the cutting out and fixing paper patterns in all sorts of geometrical and ornamental forms. From ten to twelve wood carving is the chief employment, while in the higher classes artistic and decorative work in wood, metal and other materials is required from every pupil.

Let me give you an example of what was going on in a class of children about ten years old which I found at work. The scholars were arranged round the walls of a room where there was a continuous black-board, breast high, divided so as to give one compartment for each child, and to furnish him on a little shelf with chalk, a graduated metrical ruler, some plastic clay, and a little wooden instrument for fashioning it. The teacher stood in the centre, and gave the order, "Draw a horizontal line five centimetres long." When he saw this was done, he said, "Now draw another line three centimetres long at an angle of 45 degrees." By successive directions, he caused the scholar to produce a very pleasing geometrical pattern, which of course was pre-determined on his part, but which was only gradually evolved. When this was finished, he directed them to take the clay and form round the border of the figure, a frame of a given width and thickness. Great pains were taken by the children to fashion this with care and finish. Afterwards he desired each to add according to his own taste, some additional ornament; and some added triangular or semi-circular pieces of clay or chalk lines to the design, so that every compartment of the black-board presented at the end of the lesson a different pattern. Now here was an exercise not only in accurate observation and in tactual skill but also in intelligence, close attention, in arithmetical measurement, in taste and in invention. I found also that for each of the several forms of manual exercise adopted in this school—for modelling, for basket making, for wood carving, and for working in metals, the teachers had been at the pains to make out from the results of their experience a special tabulated report, showing the effect of the exercise on general power, on the habit of attention, on order, on cleanliness, on the æsthetic faculty, on physical vigor generally, and on manual skill. All the exercises did not profess to serve equally the same purpose, but each was found in its own way to serve one or more of these purposes in different degrees.

And the chief points noticeable in all these exercises are: (1) That they are always connected with drawing, measurement, accurate knowledge and thinking in some way, and are never isolated, or simply manual. (2) That they are

superintended by the director of studies and co-ordinated with other work, not handed over to artisan specialists, and (8) that these manual exercises do not occupy more than two hours a week.

There is, in short, in the view of the directors of such a school, no antagonism between the intellectual and the physical training, no attempt to make one the substitute or rival of the other; but a desire rather to make the whole training of the man more harmonious.

All these experiences point to the need of some caution and foresight in dealing with the problem of technical instruction. We may admit that for industrial purposes special hand training is indispensable; that even for them whose *niche* is not yet discovered but who are probably to join the ranks of the industrial classes, some more of such training is needed and also that for those whose pursuits are to be mainly intellectual and who are not likely to be called on to exercise their hands, some general training in handiness is desirable.

Prof. Fiske has wisely said, "In a very deep sense all human science is but the increment of the power of the eye, and all human aid is the increment of the power of the hand. Vision and manipulation—these in their countless, indirect and transfigured forms, are the two co-operating factors in all intellectual progress." But when this is admitted, we cannot fail to recognize that after all the main factor in both art and science is the intellectual power, the reflection, the knowledge, the spiritual insight which lies behind the merely physical power of vision and manipulation, and which give to these powers all their value.

We must hold fast to the belief that mental culture is the first business of a school and ought never to be permitted to become the second. The reaction from excessive bookishness, from the rather abstract character of mere scholastic teaching is on the whole, well justified; but the opposite of wrong is not always right; and it would be very easy to make a grave mistake by emphasizing too strongly the value of manual exercise, and making too great claims for it.

For what, after all, is the main function of the teacher who is seeking to give to his pupil a right training, and a proper outfit for the struggles and the duties of life? It is, no doubt, to give a knowledge of simple arts, and of those rudiments of knowledge which, by the common consent of all parents and teachers, have been held to be indispensable; but it is also to encourage aspiration, to evoke power, and to place the scholar in the fittest possible condition for making the best of his own faculties and for leading an honorable and useful life.

If this be so, we have to ask what, among all possible exercises and studies, are the most formative and disciplinary. Darwin has shown us that by the law of what he calls "concomitant variations," there is such a relation between powers and organs that the cultivation of one leads by a reflex action to the strengthening of the other. You cannot, in fact, call into active exercise any one power without *pro tanto* making the exercise of other powers easier. But here we must discriminate. This correlation, this mutual interchange of power does not act uniformly. Take an example. You want, it may be, to give to a large number of recruits, none of whom have had any previous practice, a knowledge of military evolutions, the power to handle a rifle, and to do the duties of camp life. Say that half of them are clowns, fresh from the plough, and the other half are men of similar age who have had a liberal education. Both groups are equally unfamiliar with what they have to learn, but there is no doubt as to which group

will learn most quickly. The clowns will need hard work to bring them into discipline; they will misunderstand commands and be clumsy in executing them. But the greater intelligence of the second group will be found to tell immediately on the readiness with which they see the meaning of the manoeuvres, and on the promptitude and exactness with which they perform them. The mental training has here been a distinct help to the mere physical exercise. But it cannot be said in any similar degree that the handicraftsman is a likelier person than another to take up intellectual labor with zest, and to be specially fitted to do it well. Ever since the time when Socrates paid his memorable visit to the workshops of Athens, it has been a familiar part of experience that your mere workman may, though skilled, be, so far as his understanding is concerned, a very poor creature, *born* right and left by the traditions of his craft, and by rules of thumb, and with very confused and imperfect ideas about matters outside the region of his own trade. The use of tools, though a good thing, is not the highest, nor nearly the highest thing to be desired in the outfit of a citizen for active life. The difference between a handy and an unhandy man is no doubt important all through life, but the difference between an intelligent, well read man and another whose mind has been neglected, is fifty times more important, whatever part he may be called on to play hereafter. It is quite possible so to teach the use of tools that the teaching shall have little or no reflex action on other departments of human thought and activity, that it shall appeal little to the reflective, the imaginative, or the reasoning power, and that it may leave its possessor a very dull fellow indeed.

We are not without some very significant and instructive experience on this point. In girls' schools in England we have long had one form at least of technical instruction of undoubted utility. Needlework is not only a beautiful art, but is one of undoubted domestic utility, indeed an indispensable element in a girl's education. It has long received a large, perhaps an inordinate share, of attention in England, and has been prescribed by the government as a necessary subject of instruction in all public elementary schools to which girls are admitted. This requirement has not only been approved, but it has been emphasized by the opinion and practice of the local managers to whom the administration of the details is so largely entrusted. In villages in which the influence of Lady Bountiful or the vicar's wife is dominant, nearly the half of every day is sometimes spent by little girls not in being *taught* to sew, for that might be effectively done in one third of the time, but in mere dawdling over needlework and in the manufacture of garments for sale or for home use. From the point of view of those who desire to make the common school effective as a preparation for the duties and responsibilities of an intelligent life, the amount of time and effort thus spent appears to be out of all proportion to the value of the results produced. In fact, experience has shown that needlework, regarded simply as a manual art, and not taught with intelligence, does little or nothing to improve the general capacity of the learner, and that proficiency in this accomplishment may easily co-exist with dullness and mental vacuity and with complete helplessness in regard to all the other duties and claims of life. Such experience as this is well calculated to moderate any extravagant anticipations and to warn us that for boys and girls alike, hand work is not necessarily educative unless it is associated with other work, and regulated by considerations of another kind.

I conclude, then, with this general inference from recent discussions. There is room in our schemes of instruction for increased attention to manual training. The neglect of this subject, in fact, is an undoubted mistake, and it needs to be corrected. But the necessary change in our educational procedure must be made with caution. We must not exaggerate the educational value of mere hand-work and not make it a substitute for intellectual effort. We must not make a fetish of technical or manual instruction. We must not suppose that the world is to be regenerated by turning schools into workshops, or by dethroning the schoolmaster to make room for the artisan. The urgent question now demanding the attention of all serious educators in both the western and the eastern hemispheres is: What is the true and rightful place to be held by the training of the fingers and the senses, and the artistic faculty, as part of a liberal education, and how can such training be so given as to be instrumental in fulfilling the highest purpose of a school—the development of a complete and rounded character, in force, in refinement, in intelligence, in moral purpose? This is not an easy problem. It is not yet solved. It will not be solved until much larger experience and more thought and knowledge have been brought to bear upon it. But every such convention as this, in which earnest teachers meet to encourage one another in the pursuit of lofty ideals and to confer with each other respecting the best way to make teaching nobler and schools more useful, will do something to render the ultimate solution of the problem easier and more fruitful.

THE INTERPROVINCIAL CONVENTION.

(Continued).

President Forrest, of Dalhousie, expressed his great pleasure at being again present at the Teachers' Convention, and said that—

He had attended a large number of them in Nova Scotia during the past twenty years, and felt that he had a right to be present. The college professor and the common school teacher were just engaged in different departments of the same good work. He had commenced in a primary school, then taught an academy for years, and although now engaged in college work, he had no thought of deserting the ranks of the teaching profession. He was glad to see so many representatives of the colleges present. Such a meeting as this would show that there was more friendship and less jealous rivalry among the colleges than most people suppose. When asked to speak on the topic of the evening he looked upon it as a sort of call to the colleges to justify their existence to the general public. Everywhere in America the colleges are making great demands on the public for support. Even the wealthy universities of the United States with their millions of revenue producing funds are all the time demanding more money, while our small and poorly endowed institutions are always requiring aid from the people. The amount of money received by the colleges is very small when compared with the growth of wealth in the community. Still it is sufficient to lead those who are asked for it to inquire, What good are you doing with it? And it is not unreasonable to expect the colleges to answer. What influence has the college on industrial and social life? In answering this question historically we have simply to look back and see what the colleges have done. If we look at the influence of the universities at the close of the middle ages we will see that they were one of the

most powerful factors in the great social changes that then took place. When the revival of letters commenced it was the universities which carried on the work. They served for the newspapers, magazines, and reviews of modern times. Indeed if it had not been for the universities the good work must have failed. No man can read the history of Europe from that time without seeing that the great universities have been centres of light ever since. In America we have a much briefer period to examine, but he has read the history of this continent to poor purpose who has failed to see the great influence which the colleges have exercised, particularly upon the social condition of the people. Canada owes not a little to her professional men, and her men in various professions owe almost everything to her weak and poorly equipped colleges. But the question is not what have you done with the paltry pittance you have received in the past, but what can you do with a reasonable degree of support? And it is here that the question raised by Dr. Sawyer comes in. What is a college? Dr. Forrest did not quite agree with all that had been stated. He did not believe in moulding the curriculum of a college to meet the whims of every age and class, but the demands of the age were changing and we must, in some measure, seek to meet them. The fault of the old curriculum was that it was a sort of cast-iron mould—you forced a man into it, whether it fitted or not. If he died in the effort, well and good; if not, you dubbed him B. A. and sent him out to his life-work. Many a good man failed, simply because he had no aptitude for some one subject demanded. There is no necessity for our abandoning the study of classics, but a man is not necessarily a fool who does not succeed in Latin, or in Greek, or in mathematics. The universities of the day realize this, and there is everywhere an increasing desire to put a man to the studies for which he has an aptitude, and to widen the scope of the college and increase the number of subjects taught so as to meet as far as possible the requirements of all classes in the community. If the community would enable the colleges to enlarge the number of subjects taught, to equip proper faculties of law, medicine and engineering, it would pay (even from a mere economic point). Every one must see that a properly trained chemist, physician, lawyer or engineer, is actual wealth to any community. Indirectly if not directly they are producers as well as farmers or fishermen. It requires one hundred medical students to be in college to supply the annual demand for physicians in the Maritime Provinces. The fees of these students alone in colleges abroad will cost \$15,000 a year. Half of the amount will equip a college at home which will do the work equally well. It would surely pay the Maritime Provinces to contribute the amount. And what is true of medicine is equally true of other departments. Other countries have come to the conclusion that their colleges pay and they are liberally supporting them; and it will be well for the social and economic condition of our country when a large proportion of its accumulated wealth is devoted to training its citizens for the higher posts of usefulness. We have special difficulties in our way, but we are not without encouragement. Sir William Dawson has reminded us of the progress made in our common schools. We have made similar progress in our colleges. With many discouragements we have had enough success to stimulate us to greater efforts. Let us all do our duty, whether as teachers of kindergartens or presidents of colleges, and we will yet have cause to rejoice in the educational progress of our country.

President J.R. Inch, of Mt. Allison, Sackville, said: From the circumstances of the discussion of this evening, and the profession of those selected as speakers, it must have been anticipated that a consensus of opinion would prevail in regard to the beneficial influence of the college on the industrial and social life of the country. It might have added point and zest to the discussion had representatives of the distinctively industrial and social elements, as well as representatives of the colleges of the country, been appointed as speakers on this occasion.

That there is more than one side to the question may be frankly admitted. If we adopt the division and the terms, used to-day by Dr. Schurman in discussing his ideal of a curriculum for Canadian colleges, we may set aside the whole range of humanistic studies as having only a regulative or, perhaps, only a negative influence upon industrial life. But even if the influence of such studies act only as brakes on the wheels of industry, they are still of incalculable value to mankind; for without these and other kindred checks the wheels of trade and commerce would revolve with such rapidity and friction as to burn out of society every vestige of the higher attributes of manhood. In a sense somewhat different from that intended by the poet, it may be said:

"Ill fares the land, to hastening ills a prey,
When wealth accumulates and men decay."

It can scarcely be denied that men of books, and men of practical affairs, have often regarded each other with feelings approaching pity or contempt. In comparison with the shrewd business man, the scholar seems so helpless in presence of many practical difficulties of life that it is not a matter of surprise to find the value of his scholarly attainments gravely questioned. Add to this the further facts that pedants and men of unbalanced minds, like Goldsmith's Schoolmaster, or Scott's Dominie Sampson, have often been taken as normal types of the scholar, while men of genius have shone in every walk of life without scholastic aid, and we cannot wonder that the sneer of the poet Burns has been echoed over and over again:

"What's a' the learning of the schools,
The Latin names of horns and stools:
If honest nature made ye fools
What -airs your grammars!
Ye'd better ta'en up spades and shoals,
Or knappin hammers.
Gie me ane spark o' nature's fire!
That's a' the learning I desire."

Extremes meet; and though the college may be of comparatively little value, either to the genius or to the fool, it may be of infinite value to the mass of mankind.

On the other hand, it must be admitted that in their devotion to purely intellectual pursuits, scholars have too often belittled the importance of the material advancement of the world, and of a practical acquaintance with the business affairs of life. These mutual mistakes and misapprehensions are being rapidly dispelled in recent times, by modern methods of education which have exhibited in clearer light than ever before the true relation between the thinker and the man of action. Human energy is too limited, and human life too short, for one man to successfully undertake many things. It is necessary, therefore, that the

intellectual and the industrial functions must, in their highest development, be separated. Thought — individual thought — lies at the very foundation of all material progress. Men of thought tabulate the lessons of experience, trace out the laws upon which safe action depends, make knowledge accessible to men of action at the cost of little effort, penetrate for them the arcana of nature, teach them how to subdue her, to harness her forces, to say to the subtle spirits imprisoned in the winds, and the waters, and the flames, in the bowels of the earth and in the clouds of heaven — "Go!" and they go; "Do this!" and they do it. The patient thinker who, in the seclusion of his study, conceived, designed, and made possible for others the triumphs of modern art and industry, is the most potent factor in results, the pecuniary benefit of which others are more likely to reap. From the time of Archimedes and Euclid, down to the present age of miracles in practical engineering, what have the grand sciences of mathematics done for the world's industrial and business progress? And what of modern science? Had such men as Humboldt and Faraday applied their great talents in caring for ancestral acres, or accumulating wealth, they might have died millionaires; but how much poorer would the world have been to-day? To look for examples nearer home, let me mention on the one hand as types of successful business men, Vanderbilt, and Stewart, and Gould; and on the other as representing the class who have devoted life and energy to the pursuit of science and learning, our distinguished visitor, Sir William Dawson. Which of these will be longest remembered as benefactors of the race?

Upon the other aspect of the theme — the social — I must be brief. I shall assume that the term social is not to be used in any narrow or conventional sense, but is intended to include whatever pertains to the welfare of men in the aggregate of human society. Does the influence of college training, both humanistic and naturalistic, need any elucidation as to its elevating tendency on human society? Look at the history of civilization! Who have been the leaders of men in almost every movement which has marked the purification and the enlightenment of the human race? From the misty years of antiquity to the brightness of nineteenth century civilization, who but the men of study, of patient thought, of well-trained mind, disciplined in porch, or academy, in cloistered seclusion, or amid the contentions of conflicting philosophies, have stood in the front ranks of progress? The rule holds good both for church and state. "The first in the competition of the schools," says Macaulay, "have usually been the first in the competition of life." The fathers of British science and philosophy, the essayists, the historians, the parliamentary leaders, the great preachers, have, in the vast majority of cases, been nurtured in academic discipline on the banks of the Cam or the Isis, or in some other of England's or Scotland's classic retreats. For the last two hundred years at least, every great leader of the British Parliament, and every renowned diplomatist who has maintained the honor of England at foreign courts, has first developed his intellectual thews and muscles at one or more of the universities. On this continent the proportion of college trained men found in public and professional life is not so great as in the older land, but the proportion is

constantly increasing; and as it increases may we not reasonably expect that a higher type of public morality will be developed, that the trade of the mere politician will become more and more discredited, and that loftier ideals of statecraft will be set before our aspiring youth.

There is one aspect of modern education which has a direct and most vital bearing on the question under discussion. I refer to the prominence given in these latter days to the higher education of women. I am old enough to remember when only the most superficial training for girls was sought for; when the suggestion of admitting women to our colleges and universities was regarded as a wild educational heresy, fraught with danger to the colleges, and ruin to the homes; when learned divines and physicians used both tongue and pen in denunciation of the dangerous innovation. But the hideous moral and physiological scare-crows which mistaken men stuck up to frighten timid women from college doors failed to turn away a few of the braver of the sex. They asked admission. A few college doors opened to receive them; they entered, and soon proved themselves intellectually the peers of their sterner brothers; they went forth from college halls without detriment to womanly beauty, or modesty, or grace; they have become in the social edifice, "corner-stones, polished after the similitude of a palace"—a bond of strength and unity, as well as an ornament of grace and beauty. And now, how marked the change! University doors fly open in all directions to these fair students, not as at first, "with impetuous recoil and jarring sound, grating harsh thunder," but as if "on gol'en hinges turning." What "sweetness and light" do these cultured women bring to the homes of our land! As queens of society, as mothers of coming generations, what hopes may we not indulge of their influence upon the race! Surely, if never before, the salutary influence of the college upon social life cannot now be questioned.

Dr. Anderson, Principal of Prince of Wales College and Normal School, said:

It would neither be prudent nor becoming at this late hour to enter upon the general question of the influence of the university upon the social and industrial life of the community, especially when it has been so fully discussed in most of its aspects by the speakers who have preceded me. They have presented a most satisfactory, because most convincing plea for the existence of the university, and have unquestionably put in the clearest light the fact that in these provinces the universities, notwithstanding their inadequate support, aim at, and to a considerable degree succeed in elevating the social condition of the people and stimulating their industrial activity.

There is one feature of the subject, however, which has not been touched upon, and to which I would invite your attention during the few minutes which remain to me. I must confess that I feel no small surprise that some of my predecessors did not refer to it, since at this convention we have assembled all classes of the profession, from the teacher of the humblest country school to the presidents of our universities. I cannot conceive that any question, before such an audience as this and in connection with such a topic as that set down for discussion, can surpass in importance the ex-

pediency, or rather the necessity of drawing closer the bonds which connect the common school and the university. It may be fairly asked: Is there, in present circumstances, any existing relationship between them? They are so widely separated, and there is apparent so little sympathy between the occupants of the two extremes of the educational scale, that one may be pardoned for concluding that they have nothing to do with each other. And yet the work which is completed at the university has been commenced at the common school, and in many cases its excellence or inferiority is greatly influenced by the quality of the foundation which has there been laid. Undoubtedly, therefore, it is of prime importance to the success of the university that the common schools be in a high state of efficiency. Although the students who proceed to the university are for the most part drawn from the academies and high schools, yet the pupils who are educated there are passed into them from the common schools, and not a few enter upon university work without attending these intermediate institutions. And consequently, it should not only be the interest of the university to keep in touch with the secondary schools of the country, and through them with the primary schools, but they ought to transmit directly and immediately to the common schools those benign influences of which they are the centre and the source.

But it may be objected that the normal school is the proper quarter from which schools of this class may obtain their teachers and acquire their influence. Now I do not desire to interfere with the proper work of the normal school. I hold that every teacher, of whatever class, ought to attend that institution and make himself master of methods and principles, and have every opportunity to practice under the supervision of duly qualified instructors in the art of teaching. I wish normal schools, in this respect, to become what their name implies, and to be carried to as high a degree of perfection for purposes of training as it is possible in their circumstances to reach. But as it is necessary in normal schools to provide for the instruction of their students in the ordinary branches of education, the best efforts of the teaching staff are directed towards that end. No doubt their laudable endeavors have been crowned with a high measure of success, but the student teachers should not rest satisfied with this result. They ought to avail themselves of the opportunity of attending one of the universities, and by a complete or partial course equip themselves more thoroughly for the business of their profession.

University education in Scotland has more than once been referred to by speakers at this convention. There is no doubt that improvements in it are not only possible, but very desirable. But what country can show such splendid results? The altered condition of society, commerce, and the industrial arts, necessitate changes to bring the Scottish universities abreast of the requirements of the present day, and these alterations are being gradually but surely effected; but if there be other seats of learning that can claim a larger number of brilliant names as lending lustre to their annals, there are none that have so generally carried their humanizing influences to every class and section of the community.

In the north-east of Scotland, the part of the country with which I am best acquainted—the counties of Aberdeen, Banff, Moray, and Kincardine—the most of the public school teachers are university men. And this has always been the case in that part of the country. The parish teacher of the last generation was generally a university graduate, and if his methods of procedure with the younger members of his school

were not beyond criticism, the enthusiasm with which he inspired his older pupils, and the accuracy and thoroughness which characterized his teaching were admirable. Nor as a rule could anyone but a university man hope to secure one of these schools, for if one received an appointment as teacher it was generally made contingent upon his obtaining the Dick bequest, which in many cases almost doubled his parochial salary. And it is well known that the examination to which candidates had to submit was in many respects as searching and extensive as that for a university degree. This examination, conjoined with the inspection of their schools, to which the participants in the bequest had periodically to be subjected, served, before the days of government inspection, to guard the schools against the appointment of incompetent men, and the people against an indolent and perfunctory discharge of a public duty. The results were excellent. From the parish schools were mainly drawn the supply of students who annually repaired to the university of Aberdeen, and who largely participated in the bursaries that were competed for at the beginning of the session. And an ardent desire for distinction, and an unquenchable love of learning were implanted in the breasts of the younger scholars, who were early fired with the ambition to acquit themselves as their predecessors had done, and were taught that the gates that barred the way to fame and fortune could only be unlocked by the key of knowledge.

I remember well the resentful feeling with which the people at large regarded the interference of government with the parish schools, and the contempt with which they spoke of normal school teachers as distinguished from those who had come to them from the university. The former had, it may be, a better acquaintance with the art of teaching; but the latter, whatever their shortcomings, were gentlemen and scholars, men of cultivated tastes and capable of maintaining what was to the Scotchman of that region a matter of supreme value and importance, the traditional connection between the parish school and the university. And this was not a mere sentiment, but a conviction founded upon an experience which dated from the times of their grandfathers. The history of the progress of the country, the narrative of the development of her resources, of the growth of her commerce, and the amelioration of the condition of the people, started from the parish school and the influences which it brought to bear upon the natural intelligence of the youth who repaired to it for instruction. And when I hear nowadays of what is called practical education (as if all education is not more or less practical), I recall what was done in Scotland for its material, moral and intellectual welfare, before technical schools were dreamed of, before the necessity of commercial or agricultural schools had begun to be discussed, and I question whether the record of the next twenty years, with all its aids to progress, will be a fairer one than that which preceded it. The true basis of all advancement is the cultivated intelligence of the community; and Scotchmen at an early date recognized the fact that the universities are the centre from which proceed those forces which are to rouse to action and regulate the energies of the people, and determined to maintain unbroken the connection which bound their schools and universities together.

I have selected Scottish education as affording the best illustration of the practical working of the system which I would gladly see adopted by candidates for first and second class licenses as far as possible in these Provinces. That it is not unreasonable to hope for it I infer from the fact that a

large proportion of the inhabitants are of Scottish descent, and still retain a strong desire to share in the best education which the country can afford, and because of the ample opportunities for obtaining a university education. Where a normal school and a university exist in the same town, I cannot understand why the student teachers should not be permitted to attend classes in the university on those subjects which it is but reasonable to suppose are taught better than they can be in the normal school. Such a grace is extended to the students at Scottish normal schools, and I have never yet heard that the governing bodies have had any reason to repent of their action. Teachers ought to be brought into personal and intellectual contact with the best minds in the profession, and these are, or ought to be found at the universities. The intellectual discipline of the class room and the study, even if only for one or two years, will prove of incalculable benefit to the teacher, and of supreme moment to the scholars under his charge. Having a cultured mind himself, trained and accustomed to think, and enthusiastic in his work, he will be able to exert a rousing, stimulating and brightening power on his pupils. And the whole community will acknowledge his influence. Coming from the centre of culture and thought, the teacher will carry sweetness and light to the remotest corners and the humblest homes of the land.

Prof. Chas. G. D. Roberts, after referring to Kings College—for which he spoke—and its prospects, said:

There is one respect in which the situation of the Canadian university is unique. This is in regard to the peculiar responsibility under which we rest in the matter of instruction in comparative history and comparative politics. This is a real, a vital, an immediate question for our colleges to consider. It is a responsibility not to be shirked. We now, at this day, are present at the beginnings of a national existence. All about us, for the last few years, mighty forces have been at work. Have our universities been guiding these forces as it is their prerogative, their duty, to guide them? Surely, the university is the heart from which should throb the currents of the intellectual forces of the nation. Canadians are a people that will have ideas. It is for the universities to see that their ideas are right ones. Canadians are a people that will argue. It is for the universities to see that they argue not from false premises, from false principles. Shall not the university then see to it, and at once, that the young men of Canada know something of the facts and the philosophy of history, and of the foundations of economic science? See this our country, standing uncertain, but eager with the restlessness of the race, waiting for the change? But what change? Ah, this it will be for those young men whom we are training now to decide. And whose the responsibility, then, if through ignorance they decide not aright? We are a self governing people. The universities must see to it that we know how to govern ourselves. The change may come not to day, nor yet to morrow, neither, perhaps, within the next ten years. But a change will come. Then, when the issue is thrust upon us, finally, if the Canadian university has been alive to its duty, may we feel confident that this dear Canada of ours will not be astonished or cast down.

A synopsis of the last day's proceedings of the Interprovincial Convention will be given in the next number, to be followed, as space may warrant, by papers read at the section meetings.

For the REVIEW.

THE KINDERGARTEN.

The Truro Kindergarten Committee have been peculiarly happy in retaining the services of Miss Woodcock as Director. The friends of education will rejoice that special instruction in Kindergarten methods and principles will form part of the training of our pupil-teachers during the coming year. The lectures given will bear directly on the practical application of Froebel's ideas to the work of the common school, particularly those of the primary grades.

In a private communication Miss Hallowell, of Philadelphia, writes: "We have made studies this year in assimilating the Training School and Miss Stewart with our Girls' Normal School. She (Miss Stewart) will teach now 250 girls the kindergarten philosophy and prepare them to be teachers; no small work nor unprofitable to our city."

Thus it will be seen that we are in our "new departure" only trying to do what has been found a necessity in other places by earnest, thoughtful workers. In addition, the thorough training for special kindergarteners will go on. It is hoped that many young women may seize this opportunity of preparing themselves for this new department of educational service. C.

SCHOOL AND COLLEGE.

Dalhousie University has received another accession to its bursary funds. Mrs. A. Morrison, (*nie* MacKenzie), Stornoway, Scotland, has left a bequest of \$5,000 to found a "MacKenzie" bursary for students attending the university; students of the name of MacKenzie, MacLean and Fraser to have the preference in the selection of beneficiaries.

Dr. Willets, late headmaster of the collegiate school at Windsor, has been appointed president of Kings college. Professor Jones has been appointed to the chair of modern languages.

The jubilee anniversary of Acadia was held with great *eclat* during the last week of August. The Halifax dailies, especially the *Herald*, which published an extensive series of creditable portraits of the founders of the college, were so well filled with the details that the filling of much space in our columns would be useless. A gold watch was presented to President Sawyer by the alumni; and the degree of LL. D. was conferred upon him by the senate. A large portion of a proposed jubilee fund of \$50,000 was raised. The exercises extended over two days, were participated in by a number of the leading men of the Dominion, and were characterized by the heartiest good feeling and enthusiasm.

Rev. Daniel Chisholm, D. D., has returned to Antigonish after eight years absence in Rome, where he made his course in philosophy and theology. Dr. Chisholm's career as a student has been very brilliant. The *Casket* understands that he will be added to the teaching staff of St. Francis Xavier's college.

The Mt. Allison Institutions have begun collegiate and academic work for the year under very favorable auspices. The freshman class at the college is large and has some promising students.

The N. B. University, it is expected, will have about twenty students in its freshman class this year.

Pine Hill College, the Presbyterian College of the Atlantic Provinces, is very beautifully situated on the Northwest Arm, Halifax, only about a mile from the University of Dalhousie. Its Divinity faculty is about as strong as the Divinity and Arts faculties of some of our colleges taken together.

PERSONAL NOTES.

Mr. James Hannay, the well known author of the "History of Acadia," has completed a history of the war of 1812, viewed from a Canadian standpoint. It will be published in the *Toronto Empire*.

D. M. McIntosh, M. D., is now practising his profession in Washington, Me., after graduating with honor from the college of physicians and surgeons, Baltimore. Dr. McIntosh recently taught the superior school at Bathurst, N. B.

Ingram B. Oakes, A. M., Inspector of Schools for York and Carleton Counties, N. B., succeeds Professor Tufts as principal of the Horton Academy.

Principal McRae, of Hants County Academy, Windsor, goes to Mexico, and is succeeded by C. F. Hall, Esq., M. A., of Amherst.

Herr L. Bober, Professor of German in connection with the Berlitz schools of languages in St. John, has been appointed a director of the schools for New Brunswick.

We have just received the report of Hugh H. Hutchings, Esq., Inspector of the government schools of the Turks and Caicos Islands. The report shows that irregular attendance is an evil there as well as in Canada. This able report does not say good words for every school. More than one-half of them are squarely classified as failures. Mr. Hutchings is a graduate of the Pictou Academy, in Canada, and will soon either improve or wipe out the more defective schools.

F. H. Eaton, M. A., of the Normal School, and A. P. Shand, Esq., of Windsor, were appointed to vacancies on the Board of the Governors of Acadia College, at the late meeting of the Baptist Convention.

R. M. Langille, M. A., has been appointed to the mathematical department of the Pictou Academy, becoming vacant November 1st; and D. M. Soloan, B. A., to the classical department. Both have been Munro Bursars in Dalhousie University; and both graduated with honors in their special departments. Mr. Langille also holds a gold medal from the University of Halifax and has graduated in law after attending the University of Michigan. Mr. Soloan was elected valedictorian of the graduating class of 1888.

The address of W. S. Carter, Esq., Inspector of Schools, will in future be 114 Elliot Row, St. John.

Mr. G. U. Hay has been appointed to the principalship of the Victoria and Girls' High School, St. John, and Miss Maude E. Narraway takes the position in the Girls' High School, recently filled by Miss J. P. Robertson.

Inspector Carter is at present engaged in inspecting the schools in Charlotte County.

Miss L. E. Williams, after an absence of a year in New Mexico, has returned to St. John, and resumes her duties as teacher in the Victoria school, St. John.

The marriage of Miss J. P. Robertson, of the Girls' High School, St. John, to Mr. David Blackword, of Halifax, removes an amiable lady and excellent teacher from a position—the duties of which she performed with an assiduity and faithfulness that gained for her the esteem of the public and the affection of her pupils.

The following successfully passed the examination for the Nova Scotia County Academy headmaster's diploma: I. C. Craig, Parrsboro; W. H. Fulton, B. A., (Dal.) Halifax; D. K. Grant, B. A., (Dal.) Hopewell; J. K. Henry, B. A., (Dal.) Shubenacadie; H. M. MacKay, B. A., (Dal.) Plainfield; G. J. Miller, Hantsport; D. M. Soloan, B. A., (Dal.) Windsor; J. D. Sprague, Liverpool; F. I. Stewart, B. A., (Dal.) Charlottetown; J. S. Sutherland, B. A., (Dal.) St. James, N. B.

Wm. R. Fraser, Esq., B. A., classical master Pictou Academy, has tendered his resignation with the intention of proceeding to the Johns Hopkins university. His resignation takes effect Oct. 31st.

Principal E. MacKay, of the New Glasgow high school, is having an addition made to the high school building for a laboratory. The young people of New Glasgow will soon have the opportunity of laying a better foundation in chemistry and physics than is now given in more than one of our rather numerous colleges.

QUESTION DEPARTMENT.

Questions and Answers.

A. W.—Which system of phonography would it be most advisable to learn, "The Ben Pitman," "Isaac Pitman," or "Graham's Standard" system? Is there any institution in the Atlantic provinces where standard phonography is taught?

B. D.—For a person without a teacher, studying with a view to reporting, whose system of shorthand would you recommend?

The Isaac Pitman system is used almost exclusively by English and Canadian shorthand writers. In the United States, the Isaac Pitman, Ben. Pitman, Graham, Munson and Scott-Brown are the leading systems. Each has merits peculiar to itself; but they differ in detail rather than in principle, and each has produced many competent writers and reporters. The Graham employs more contractions and abbreviations than the others, but, probably, what is gained in the use of these is more than balanced by the tax on the memory and the greater carefulness required in writing a condensed system. Any of the above systems may be acquired at the St. John Business College and Short-hand Institute; but preference is given the Isaac Pitman, as the one most generally used.

J. H.—Where can I obtain a copy of the last course of instruction issued by the Board of Education of New Brunswick? I understand it was published in the February number of the REVIEW.

The amendments to the course of instruction for common schools, proposed by a committee appointed by the N. B. Educational Institute in 1887, were published in the February issue of the REVIEW, for the information of teachers. Action on the proposed amendments was deferred until the next meeting of the Institute.

W. C. P.—What is the correct name of the enclosed larvæ? They were found on the Larch (*Larix Americana*). They strip the tree of its leaves and give it the appearance of having been scorched by the fire.

Your specimens arrived at Pictou within a week from your date of mailing; but there were no larvæ. They were all wrapped up in oval whitish silken cocoons, about half an inch in longer diameter.

Keeping them in a warm room, we expect to see a saw-fly, one of the hymenoptera, emerge from each, before next spring. The insect is very probably *Nematus Erichsonii* (Hartig), "The Larch Saw-Fly." This insect was first seen in America, near Boston, in 1880. In South Quebec in 1882. Later in Maine and New Brunswick, where very extensive damage has been done to the larch forests. James Fletcher, Dominion entomologist, has given very full notes of its depredations since its appearance, in his annual reports. Your observation is, we think, the first published notice of the occurrence of *Nematus Erichsonii* in Nova Scotia.

J. R.—At a meeting of our literary society, the enclosed paper was found in the "question drawer." Kindly give required explanation in next issue of REVIEW: "Explain why spring water will not freeze as readily as rain water; and also why will it not mix with rain water—as we sometimes see in the rivers what is termed storge ice; and further, is the so-called storge ice caused by the different kinds of water not mixing?"

1. Rainwater being naturally distilled is nearly free from salts of any kind, except such as may be floating in the atmosphere. Spring water contains salts in solution, and therefore tends to freeze at a lower temperature. Sea water freezes from 4° to 5° Fah. lower than pure water; and when a small portion is frozen, the ice is found to be nearly pure water, while the unfrozen portion is a saturated solution of the marine salts. When mixed, alcohol and water is reduced to a low temperature—the water freezes first while the alcohol is separated.

2. It takes some time for liquids to mix with each other, unless by mechanical or other means currents between each are set up. In rivers two different bands of water may move to a great distance before molecular diffusion at the stratum of union causes the two bands to be fully mixed. Molecular diffusion is comparatively a slow process.

3. We have never before seen the word "storge" used with your meaning or in reference to ice; and we would be glad to know where and to what extent the word is so used. What is "storge" ice? "Shell" ice is generally caused by the surface of water freezing, and the remaining water draining away and being replaced by air, or possibly in some cases, by gas. If tide water overflowed a sheet of ice, we would expect an upper sheet of ice to be formed, separated from the lower by a thin layer of saturated unfrozen water which might partially drain away at low tide and be replaced by air.

J. M. S., CHARLOTTETOWN. No. 1. *Aspidium spinulosum*, var. *Boottii*, Tucker. 2. *Pteris aquil-*

ina, L. 3. *Osmunda cinnamomea*, L. (sterile frond). 4. *Aspidium thelypteris*, Swartz (sterile frond). 5. *Phegopteris dryopteris*, Feé. Additional: *Aspidium spinulosum*, var. B. (two or three fronds), and *Dicksonia punctilobula*, Kunze (sterile frond).

B. E. D., HAMPTON. Your specimen is *Dicentra cucullaria*, D. C., generally called *Dutchman's Breeches*, and belongs to the *Fumitory* family.

R. M. S., MAITLAND. Your specimens are as follows: 1. *Osmorrhiza brevistylis*, D. C. (Hairy Sweet Cicely). 2. *Botrychium Virginicum*, Swartz (Virginian grape fern). 3. Fern frond *infertile*. 4. *Panicum crus-galli*, L. (Barn-yard Grass). 5. *Phegopteris dryopteris*, Feé, (Oak Fern). 6. *Carex pallescens*, L. 7. *Carex* —? 8. *Carex* —? (Sp. of seven and eight too fragmentary for specific determination, as is also 12). 9. *Scirpus eriophorum*, Michx. 10. *Hypnum splendens* (Splendid Feather Moss). 11. *Poa serotina*, Ehr. (False Red-top). 12. *Carex* —? 13. *Xyleborus dispar*, Fabr. (Pin-borer, Shot-borer). This is a small beetle about an eighth of an inch in length which bores small round holes into the trunks and branches of apple trees in the western part of the province. The history of this specimen is given as follows: "No. 13 is from an apple tree about eight years old, and six inches diameter at trunk. It leaved out well; blossoms appeared; but soon all the leaves and blossoms began to wilt, and eventually the tree died. It was cut down this morning (August 9th); and from ten to fifteen insects or their holes were found in it near the ground. Being small, the holes could not be easily found on the bark, which left the roots. The soil was low, but dry and gravelly." Two live beetles were found in the small block of wood transmitted.

WM. M. G., MUSQUODOBOIT. No. 1., *Cornus stolonifera*, Michx. (Red-osier Dogwood). 2. *Monotropa uniflora*, L. (Indian pipe or Ghost-plant). 3. *Arctia saundersii*, Grote. This is a very pretty moth. The larva is a hairy caterpillar, nearly related to those called the "woolly bears."

BOOK REVIEWS.

BRIEF VIEWS OF UNITED STATES HISTORY, for the use of high schools and academies, by Anna M. Juliand, principal of high school, Whitehall, N. Y. (Syracuse, N. Y., C. W. Bardeen, publisher, 1888).

This little book of some seventy pages is in capital form for proper history teaching. Chronological and topical skeletons are given which the teacher should be able to clothe in the vestments of living history. The Yankee genius comes out however, so strongly even in this skeleton, that for instance, the history of the war of 1812 is simply a

caricature in the interests of a meritless national glorification. The young Jonathans are gravely taught that the war of 1812 established the superiority of the United States navy, and the proof is given in a table of naval victories. The *seven* frigates and *eight* sloops of the Yankee navy were superior to *one hundred* ships of the line, and *five hundred* smaller vessels of the British navy, because the Yankee vessels overpowered a few rash and smaller British vessels on their coast which were not equally matched with them in men or metal.

SPELLING, Vol. I., 1887 (Library Bureau, 32 Hawley Street, Boston). The four numbers of this valuable quarterly make a very handsome volume, which retails at \$1.50. Subscribers can get the numbers unbound as they come out for \$1.00 per annum. Nothing is more certain than in the not very distant future a radical change will come over our antiquated and iniquitous law-protected orthography. And when it comes, people will only be surprised that so great, and so unexpected, and so mischievous a popular superstition was found to be interwoven through all the meshes of our practical nineteenth century civilization. Let the doubter read, then dispute. To-day, all the leading philologists in the English world are spelling reformers.

ARITHMETICAL EXERCISES AND EXAMINATION PAPERS, Hall and Knight (London, MacMillan & Co., and New York, 1888).

This neat hand-book of some 170 pages is just what our teachers would find most convenient for school drill. Part I. includes decimals, practice, simple proportion and simple interest; Part II. takes in compound proportion, percentages, averages and proportional parts; Part III., square root, areas and volumes are introduced; Part IV., includes discount and compound interest; Part V., profit and loss, and stocks; Part VI., cube root and duodecimals. The appendix contains two hundred graduated exercises in logarithms and mensuration, arranged in twenty papers of ten questions each; the whole being preceded by a list of numerical constants and formulæ in mensuration.

METRIC TABLES AND PROBLEMS, by Oscar Granfer, and PRIMARY GEOGRAPHY, by Emma L. Pardon, both published by Bardeen, of Syracuse, are valuable hand-books for the teacher. The first contains over twenty pages of excellent problems. The latter, about thirty pages, in which we find an admirable course of instruction for the conducting of lessons in elementary geography.

ARMY EXAMINATION PAPERS, 1882-7. London, MacMillan & Co., and New York, 1888. This small volume of about one hundred pages will be found very useful by the general student as well as by the teacher. It will be specially valuable to candidates preparing for admission to the Royal Military College of Canada. The examination papers are on 1, arithmetic; 2, Euclid; 3, algebra; 4, elements of geometrical drawing; 5, French; 6, geography; 7, English dictation.

ELEMENTARY CLASSICS. Xenophon, Anabasis, bk. II., by A. S. Walpole, M. A. Published by MacMillan & Co., London and New York. This is a small pocket edition with notes and vocabulary. The clearness of the type and the care that has been taken to make the edition free from errors, make it a very desirable work for students.

EXCHANGES.

The *Century* for September is a number that should be in the hands of every educational reader. Among the important articles are Mr. G. R. Parkin's paper on Uppingham School, The Industrial Idea in Education, The University and the Bible, Women who go to College, and other valuable papers on educational topics. . . . *St. Nicholas* for September is an excellent number, and as usual bright with illustrations and wholesome reading. Both magazines are published by the *Century* Company, New York. . . . *Garden and Forest*, published by D. A. Munro, New York, maintains a high order of excellence, and no one who is interested in horticulture and the proper keeping of public and private grounds should be without it. . . . The *Scientific American* of September 1st, has an illustrated article on the great timber ship recently towed into New York, from Joggins, N. S. . . . The *Illustrated London News* (New York edition) for September 1st contains among other fine illustrated articles, a sketch and portrait of Miss Ramsay, now the wife of the head master of Trinity College, Cambridge, the lady who recently achieved the highest academical honors within the reach of female students in England. . . . The greater part of the *Sicilia Cross* for September is devoted to a valuable article containing the address of Prof. S. P. Langley, read before the American Association for the advancement of science on the "History of a Scientific Doctrine." In tracing the history of radiant heat he gives an interesting glimpse at the possibility of error creeping in, in the deductions of even the wisest men, and of its continuing to be maintained for generations. The "Sunfishes and their Allies" forms the subject of an illustrated article which will be read with interest by all the students of natural history. . . . Among the many bright stories and beautiful illustrations of the September *Wide Awake*, will be found an exceedingly interesting account of the Ramona Industrial School for Apache girls, established in Santa Fé, in 1886, and receiving its name in honor of "that tender friend of the Indians, Mrs. Helen Hunt Jackson," and of her great book *Ramona*. Summer Lanes, another very attractive and instructive article, with its choice illustrations taken from the paintings of some of the celebrated masters, gives a very good history of the growth of landscape painting. . . . The *Science of Photography* is a new monthly journal published by Queen & Co., Chestnut street, Philadelphia. It will be invaluable to the amateur photographer who is now becoming legion. . . . The *Microscope*, a dollar monthly, published at 25 Washington Avenue, Detroit, Mich., U. S. A., is the best microscopical journal for its price which is published. . . . The *Enterprise* published at New Glasgow, Nova Scotia, comes out as one of the finest weeklies in Canada. Mr. Albert Dennis, of the *Colonial Standard*, with a name famous all over Canada in journalism, is understood to be the enterprising projector. . . . *Science*, published weekly, 47 Lafayette Place, New York, is one of our most valuable exchanges. It keeps the reader in touch with every new point of scientific interest in the world in general, and in America in particular.

Every Teacher in America Should Read the September
"CENTURY."

FOR the first time in its history "THE CENTURY MAGAZINE" devotes a single issue largely to Educational Themes, while at the same time keeping up its other distinctive features in the way of the Life of Lincoln, the Siberian papers, fiction (two short stories), miscellaneous articles, etc. The papers on

EDUCATIONAL SUBJECTS

include the following: "Uppingham. An Ancient School Worked on Modern Ideas," with a portrait of the late Edward Thring (who is said to be since Arnold of Rugby the most highly esteemed educator of England), and many beautiful illustrations by Joseph Pennell; "The University and the Bible," by T. T. Munger, in which the author takes the ground that the student should obtain as thorough a knowledge of the Christian as of the heathen classics; "Women Who go to College" a brief suggestive history of the growth of the movement toward the higher education of women, by Arthur Gilman; "Art in Education," by W. J. Stillman; an illustrated paper on "The Industrial Idea in Education," by Charles M. Carter; an article on "College Fraternities," with pictures of twenty-eight different society-halls and chapter-houses of American Colleges, and a letter from President Seelye, of Amherst, on the subject of secret societies; editorials on "Modern Collegiate Education" and "Individuality in Teaching," etc.

No one interested in the cause of teaching can afford to miss this great educational issue. The other contents of the September CENTURY include an exceedingly interesting paper on **EXILE (TO SIBERIA) BY ADMINISTRATIVE PROCESS**, by George Kennan, with an "Open Letter" by the same writer. "Is the Siberian Exile System to be at Once Abolished?" Sold everywhere after Sept. 1st, or mailed by the publishers on receipt of price.—35 cents. **THE CENTURY CO., NEW YORK.**

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REV. E. M. KEIRSTEAD, M. A., Professor of English Literature. Logic and Psychology.

A. E. COLDWELL, M. A., Professor of the Natural Sciences, and Curator of the Museum.

L. E. WORTMAN, M. A., Professor of Modern Languages and History.

THE NEXT SESSION will open **THURSDAY, September 27th**. Matriculation Examination will be held on **WEDNESDAY, the 26th**. Applications for entrance or for information respecting courses of study may be made to the President.

N. S. County Academy Entrance Examination, 1888.

THURSDAY AND FRIDAY, APRIL 26 AND 27.

(Continued from the June number.)

USEFUL KNOWLEDGE. 10.45 a. m.—12 m.

(Ten questions will be considered a perfect paper.)

1. What are the following, and for what purposes are they used? Cotton, Silk, Sealing-wax, Whalebone, Tapioca, Saffron, Myrrh.
2. Tell what you know about the senses of touch and taste.
3. What is common Salt and how is it obtained?
4. What is the diamond? Name any other precious stones.
5. Name the principal carnivorous animals, underlining those belonging to Nova Scotia.
6. Describe any two of the following birds: Ostrich, Crow, Owl, Eagle, Swallow, Parrot.
7. Name the chief metals, where and how they are obtained.
8. What is meant by Gravity?
9. Explain the difference between the growth of a plant or animal and the growth of a crystal formed by evaporation of a solution of some salt.
10. What is the soil?

11. What benefit accrues to the farmer from ploughing and harrowing his fields?

12. Tell what you know about the composition of the atmosphere.

13. What is the Calyx, Stamen, Pistil, Petal and Sepal of a flower?

14. Explain the growth of a plant from the seed.

15. Name the chief food fishes found on our shores and inland waters, and the modes of catching them.

BRITISH AND CANADIAN HISTORY. 2—3.30 p. m.

1. Name the Tudor and Stuart Sovereigns of England, with the dates of their accession.

2. For what were the following personages celebrated? Cardinal Wolsey, Oliver Cromwell, William Pitt, Warren Hastings.

3. In whose reign did each of the following events occur? Battle of Hastings, Battle of Cressy, Gunpowder Plot, Act of Uniformity, the Great Fire of London, Battle of Plassey, Abolition of Slavery, Treaty of Berlin.

4. Write a note on the Chinese Wars during the reign of Queen Victoria.

5. Give a short account of Cartier's voyages.

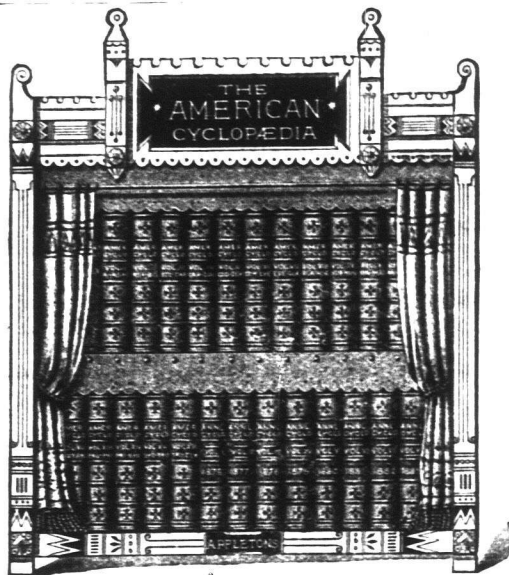
6. Who were the United Empire Loyalists? Tell what you know of their settlement in the British Provinces.

7. Assign events in Nova Scotia History to the following years: 1598, 1621, 1710, 1750, 1784, 1819, 1841, 1864, 1867.

SCIENCE. The following **New Text Books** are sure to be of interest to every **LIVE TEACHER.** We will send postpaid for the following introduction prices:

Shaler's First Book in Geology. For lowest class in high school or highest class in grammar school.	\$1.00	Colton's Practical Zoology. Aids the student in getting a clear idea of the animal kingdom as a whole, by the careful study of a few typical animals.	\$0.80
Shaler's Teacher's Edition of Geology. Adds 14 pages to the above, for teachers' use.	1.00	William's Modern Petrography. An account of the Application of the Microscope to the Study of Geology.	.25
Shaler's Illustrations of Geology. 25 photographs, 15x20 inches, and 25 colored plaster models.	100.00	Clarke's Astronomical Lantern. Intended to familiarize students with the constellations, by comparing them with face similes on the lantern face. With seventeen slides.	4.50
Shepard's Inorganic Chemistry. Descriptive and Qualitative, experimental and inductive, leads the student to observe and think. For high schools and colleges.	1.12	Clarke's How to Find the Stars. Accompanies the above and aids the beginner in becoming acquainted with the constellations.	15
Shepard's Laboratory Note Book. Blanks for experiments, tables for the reactions of metallic salts and pages for miscellaneous matter. Can be used with any Chemistry.	.35	Guides for Science Teaching. For instructing classes in Natural History. Hyatt's About Pebbles - 10; Goodale's Few Common Plants - 15; Hyatt's Commercial and Other Sponges - 20; Agassiz's First Lessons in Natural History - 20; Hyatt's Corals and Echinoderms - 20; Hyatt's Mollusca - 25; Hyatt's Worms and Crustacea - 25; Crosby's Common Minerals and Rocks - 40, cloth 60; and Richard's First Lessons in Minerals - 40.	
Chute's Practical Physics. Intended as an aid in high and preparatory schools in the study of physics experimentally.	1.20		
Remsen's Organic Chemistry. An Introduction to the study of the Carbon compounds of Carbon. For all students of the pure sciences, or of its application to the arts, medicine, etc.	1.50		
Coit's Chemical Arithmetic. With a Short System of Elementary Qualitative Analysis. For high schools and colleges.	.50		
Grabfield and Burn's Chemical Problems. For colleges, high and technical schools.	.75		

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The Entrance Examination, the Examinations for County Scholarships, and the Senior Matriculation Examination, will begin on the first day of October, 1888.

The Scholarships in the Undermentioned Counties will be open to competition: Restigouche, Gloucester, Northumberland, Westmorland, Albert, Charlotte, Kings, Sunbury, Carleton, Victoria.

Copies of the new Calendar for the Academic year 1888-89, may be had from the Registrar of the University.

J. D. HAZEN, B. A., Fredericton, N. B.

THE SESSIONS OF ST. JOHN COUNTY TEACHERS' INSTITUTE

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27th and 28th September.

Cause of change of meeting—Not being able to obtain a guarantee of safety of means of travel.
W. C. SIMPSON,
Secretary.

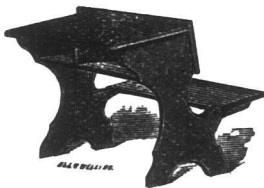
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1878	53,163 63	142,019 00	2,885,314 00	2,885,314 00
1880	62,221 35	227,421 00	5,051,885 00	5,051,885 00
1882	103,370 23	427,429 00	8,419,470 00	8,419,470 00
1884	250,480 68	1,022,001 00	17,216,901 00	17,216,901 00
1885	370,697 44	1,702,344 00	28,250,301 00	28,250,301 00
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